



# 4th EURASIAN MULTIDISCIPLINARY FORUM, EMF 2016

*27-29 April,  
Vienna, Austria*

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# **Tax Culture In The Context Of Development And Democratic Freedoms**

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## **Abstract**

This study, focusing on understanding the relationship between democracy and economic development over the concept of taxation, aims to analyze the effects of democratic freedoms on a set of economic variables such as economic development, corruption, equity of taxation and informal economic activities. From this point of view, first the concept of economic development has been defined. Then, we have tried to reveal how the relationship between tax and accountability, which restores parliamentary democracy in the West, affects the interaction between democracy and economic development. Analyses carried out taking into account the indicators such as taxation, shadow economy and corruption, showed that these variables are closely related with the concept of democracy and freedoms achieved by economic development. It was revealed that democratic freedoms were strong in countries with high level of economic development, but relatively weak in countries with low level of economic development.

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**Keywords:** Development, Democratic Freedoms, Taxation, Shadow Economy, Corruption

## **Introduction**

Achievement of sustainable economic growth constitutes one of the basic objectives of the concept of development, the scope of which has extended in the course of time. Achieving economic growth is of high importance for increasing the welfare of a society, i.e. providing more employment opportunities. One of the assumptions regarding how to achieve sustainable growth is that economic actors must make investments that will turn into production in the public and private sector. The primary purpose of the public sector is to finance the resources of investment with the taxes collected. However, if a state is incapable of sustaining an effective taxation system, it has to resort to borrowing to finance the investments. Preferring

the borrowing option to finance the investments prevents economic growth from being sustainable.

Private sector is the locomotive of a growth that will ensure economic development. However, in order for the private sector to make investment spending, it must have confidence in the state and functioning of the markets, and must be assured that its capital is protected. However, if the state fails to give such confidence, the entrepreneurs in the private sector prefer not to make any investment or sustain their activities mostly underground. When most of the economic production in a country is run underground, state cannot impose direct taxes on the economic assets produced. Without the direct taxes failed to be collected on production, state has to collect taxes on consumption. Such indirect collection of public revenues is one of the primary reasons for unfair distribution of income in a society. Therefore, efficiency, capacity and form of taxation are of critical importance for ensuring correlation between economic development and social development within a country.

Ensuring transparency and reliability of the interaction between a government and its citizens in an effective market mechanism has been achieved through democratic judicial systems by which freedoms are protected. The first struggle for democracy in history started as a reaction to the arbitrary taxes imposed by the political power. Limiting the taxing power of the absolute power and creating the legal order for taxation is the first step toward the establishment of a constitutional democratic system (Öncel et al. 2002:7). The principle of democratic constitutional state provides legal assurance to the individuals against the state. Tax laws in the constitutional states put the government under obligation not to violate fundamental rights and freedoms. Only in such a legal structure, will the state be able to ensure efficient and effective functioning of economic actors which are classified into two groups, entrepreneurs and households.

Seeking to reveal the relationship between the concepts of development, democracy and tax equity, this study is based on the assertion that greater democratic freedoms and tax equity and less shadow economy and corruption in the societies with high level of development is not a coincidence. Economic development and tax equity emerges out of the interaction of variables such as a management mechanism in which transparency and registration of production activities in the economy is ensured. Failure of certain economically developed countries in achieving social development objectives seems to be caused by the tax inequity and their inability of implementing democratic values. Therefore, tax equity plays an important role in the relationship between the economic concept of development and social concept of democracy.

## **The concept of economic development**

The concepts of economic development and economic growth are sometimes used interchangeably. However, they have completely different meanings. In fact, economic growth is an important subcomponent of the concept of development. It means the increase in the amount of the goods and services produced in a country. Economic development, on the other hand, aims to increase the quality of social, cultural and political lives of the individuals, as well as achieving economic growth.

The term development was defined in the World Bank's World Development Report 1991 as "aiming to improve people's quality of life", which is one of the most comprehensive definitions of the term. The objective of improving people's quality of life includes many different variables such as higher income levels, better education opportunities, better health and nutrition conditions, less poverty, a cleaner environment, providing more equal opportunities, increasing individual freedoms and a richer cultural life. In this sense, the concept of development is a multidimensional process. Development also involves increasing the opportunities provided to the individuals and the society in the economic and social field. In this context, freedoms can be defined as the existence of various alternatives among which the individuals in a society can choose freely depending on their preferences. Sen (1996) indicates that political freedom in the form of democratic arrangements helps to safeguard economic freedom (especially freedom from extreme starvation) and the freedom to survive (against famine mortality). The instrumental roles of freedom include various interrelated components such as economic and political freedom opportunities, transparency and protective security applications. The process of development is crucially affected by these interconnections.

As specified in the study by Meier and Stiglitz (2000), the concepts trying to define underdevelopment only over low level of production were gradually replaced with structural analyses. Most of the structural analyses have focused on the effective functioning of the institutions. The institutions upon which economic activities are built are a set of formal and informal arrangements. In other words, the institutions are the rules of the game played in the society. The rules and institutions reduce the ambiguity of economic actors in the decision-making process. Corruption, bureaucracy, financial system, judicial system and property rights can be classified under the important variables involved in determining the corporate quality. An effective and fast judicial system, together with protection of property rights, is important in reducing the ambiguity faced by the economic actors. Many structural analyses focus on the effective functioning of institutions. Acemoğlu and Robinson (2012) indicate that the difference between the

institutions in a country is the main reason for the differences in the levels of development between countries.

### **Economic Development And Democratic Freedom**

When we examine the academic studies addressing the relationship between economic development and democracy, we can see that there are two different viewpoints. One of these viewpoints has been reflected in the studies by Ghali (2003) and Bardhan (2004) who suggest liberal democracy as a prerequisite for economic development. They argue that democracy must be approved as a prerequisite for economic development, since libertarian values establish the institutional framework and process that guarantees property rights, i.e. the basic institution of economic improvement. The concepts such as freedom of expression and association, multipartyism and elections, the protection of human rights and separation of powers all become internalized within liberal democracy. Doğan (2005) also points out that democracies affect economic development positively, since they bring steady growth as well as investment and consumption opportunities in the short term, and they are less risky for the life. Besides, the presence of democracy makes countries to have more enduring and sound institutions against economic crises. It is also indicated that democracies affect economic growth positively, since democratically governed countries are much likely to be constitutional states and they have means to protect the property rights (Karakayalı and Yanıkkaya, 2005).

Weber argues that modern democracy can occur only in capitalist industrialization, since most of the countries which lack an enduring tradition of democracy lie in the underdeveloped sections of the world. This argument alleges that the wealthiest nations of the world are also the most democratic ones, which provides proof of the relationship between economic development and democracy (Weber: 2008). Similarly, Lipset also argues that, as the nations develop economically, societies develop skills and powers that will sustain liberal democratic governance (Lipset, 1959). Supporting these arguments, the study conducted by Adam Przeworski and Fernando Limongi in 1993 examined the experiences of all countries between 1950 and 1990, and found that the regime had a survival chance of about 8 years in democratic countries with per capita incomes under \$1,500 USD. In democratic countries with per capita incomes of \$1,500-3,000 USD, the expected life of the regime increased up to eighteen years. The probability that a democracy would die decreased down to 1/500 in countries with per capita incomes above \$6,000 USD, and the expected life of the regime in countries with above \$9,000 USD was found to be 736 years. Their study showed that 39 countries out of 69 with low levels of economic

development failed to sustain democracy (Przeworski and Limongi, 1993; 1997; Zakaria, 2007).

The second approach addressing the relationship between economic development and democracy argues that democracy is not fundamental for ensuring economic development. Among the advocates of this approach is Chang (2003), who points out that even if economic development is achieved in the industrialized countries, the practices such as suffrage can only be realized in formal democracies very late, after lasting struggles. Chang also argues that, compared to modern-day industrialized countries in their early stages of development, the currently developing countries have much better record in terms of spread of formal democracy. In none of the modern-day industrialized countries, universal suffrage has been granted below the level of \$2,000 USD per capita income. However, majority of the currently developing countries granted universal suffrage below that level of development. From this point of view, Chang suggests that democratization is not fundamental for economic development (Chang, 2003). Arguing also that democracy cannot be seen as a prerequisite for development, Ìnsel indicates that, in order to make economic development sustainable in a society, it is a must to ensure stability in the political data establishing the institutional framework which determines the economic activities. Existence of political stability in a society causes the entrepreneurs to predict the future, thus leading them to longer-term and more permanent economic activities, which indicates that political stability is a must for development. Thus, the positive nature of the relationship between democracy and development does not universally hold true, since democracy is not the only system of governance that ensures political stability (Ìnsel, 1991). Another study supporting the arguments of Ìnsel and Chang is the one conducted by Adejumobi. Adejumobi argues that the rate of economic development in a country is not necessarily determined by the nature of a political regime. According to his argument, what determines the economic development is not the nature of political governance, but the nature of the state. If the state is developmental, then it is a national state that prioritizes development. It is only possible through the construction of a strong bureaucracy for such a state to have relative autonomy, i.e. the capacity to manage and implement economic policies effectively. In countries with a strong bureaucracy, industrialization, and consequently the economic development speeds up (Adejumobi, 2000; Boschini 2005: 1).

### **The relationship between economic development, democracy and corruption**

As specified previously in this study, we think that freedoms achieved by economic development are more accessible in democratic

systems and they reduce the growth of shadow economy and corruption, thus ensuring effective functioning of the institutions. This study aims to reveal the relationship between development and democracy using the indices that measure the levels of development as well as perceptions of democracy and corruption. For this purpose, first, the data collected using the development index, democracy index and corruption index will be presented, and then the relationship between the data will be scrutinized.

The Human Development Index (HDI) is one of the most objective and widely used indices used in measuring the level of development and comparison of countries. The Human Development Index (HDI) has been published by the United Nations Development Program (UNDP) Human Development Report Office every year since 1990. Based on the values, the countries are classified into four groups as follows: low human development (0.0 to 0.499), medium human development (0.50 to 0.799), high human development (0.80 to 0.90) and very high human development (0.90 to 1.00).

The Democracy Index is an index prepared by the Economist Intelligence Unit to measure the state of democracy in 167 countries (166 of these countries are sovereign states, and 165 are UN member states). The index is based on 60 indicators grouped in five different categories measuring pluralism, civil liberties, and political culture. The index ranks regimes into four as follows: Authoritarian Regime (0 to 4), Hybrid Regime (4.01 to 6), Flawed Democracy (6.01 to 8) and Full Democracy (8.01 to 10).

Corruption Perceptions Index is an aggregate indicator that ranks countries in terms of the degree to which corruption is perceived to exist among public officials and politicians. The index score varies between 0 to 100. High numbers indicate less perception of corruption, whereas lower numbers indicate higher perception of corruption.

The process of development is crucially affected by various interrelated components such as economic and political freedom opportunities, transparency and protective security applications. Related to this, Table 1 shows the relationship between the development levels of countries, the democracy index and corruption. It is striking that countries with high levels of development both have improved democratic systems and low levels of perceived corruption. In addition to that, corruption index decreases with decreasing levels of democracy. When Table 1 is analyzed, a strong correlation between these two variables is revealed, strengthening the hypothesis that we proposed at the beginning. To put in clearly; the lower the democracy levels of countries, the higher the perceived levels of corruption in societies.

Table 1. The. Relationship Between Economic Development, Democracy and Corruption

	Democracy Index	Corruption Index	HDI (Ranking)
Norway	9.93	86	0.944 (1)
Sweden	9.73	87	0.898(12)
Iceland	9.58	79	0.895(13)
New Zealand	9.26	91	0.910(7)
Denmark	9.11	92	0.900(10)
Switzerland	9.09	86	0.917(3)
Canada	9.08	81	0.902(8)
Finland	9.03	89	0.879(24)
Australia	9.01	80	0.933(2)
Netherlands	8.92	83	0.915(4)
Luxemburg	8.88	82	0.881(21)
Ireland	8.72	74	0.899(11)
Germany	8.64	79	0.911(6)
Austria	8.54	72	0.881(21)
United Kingdom	8.31	78	0.892(14)
United States	8.11	74	0.914 (5)
Japan	8.08	76	0.890(17)
Korea	8.06	55	0.891(15)
Spain	8.05	60	0.869(27)
France	8.04	69	0.884(20)
Czech Republic	7.94	51	0.861(28)
Belgium	7.93	76	0.881(21)
Italy	7.85	43	0.872(26)
Chile	7.80	73	0.822(41)
Portugal	7.79	63	0.822(41)
Estonia	7.74	69	0.840(33)
Israel	7.63	60	0.888(19)
Slovenia	7.57	58	0.874(25)
Poland	7.47	61	0.834(35)
Greece	7.45	43	0.853(29)
Slovak Republic	7.35	50	0.830(37)
Hungary	6.90	54	0.818(43)
Mexico	6.68	35	0.756(71)
Turkey	5.12	45	0.759(69)

Source: Human Development Report (2014), Democracy Index (2014), Corruption Perception Index (2014)

Theoretically, many studies indicate that liberal democracy provides the basis for economic development. The libertarian values such as freedom of speech and association, multi-partyism, protection of human rights and separation of powers establish the institutional context and process for economic development to take place. From this perspective, democracy facilitates economic empowerment, provides a stable investment climate and speeds up the mobilization of national energies and resources for economic

development/growth (Adejumobi, 2000). Studying the relationship between democratic systems of governance and long-term economic performance, Persson concludes that democratic systems of governance contributes significantly but at varying levels to the construction of a social infrastructure which encourages long-term economic performance (Persson, 2004: 4).

The Democracy Index rates countries on a 0 to 10 scale, while the Development Index rates them on a 0 to 1 scale. Chart 1 clearly shows the positive correlation between them.

Chart 1. The relationship between the Democracy Index and HDI ratings of the OECD Countries

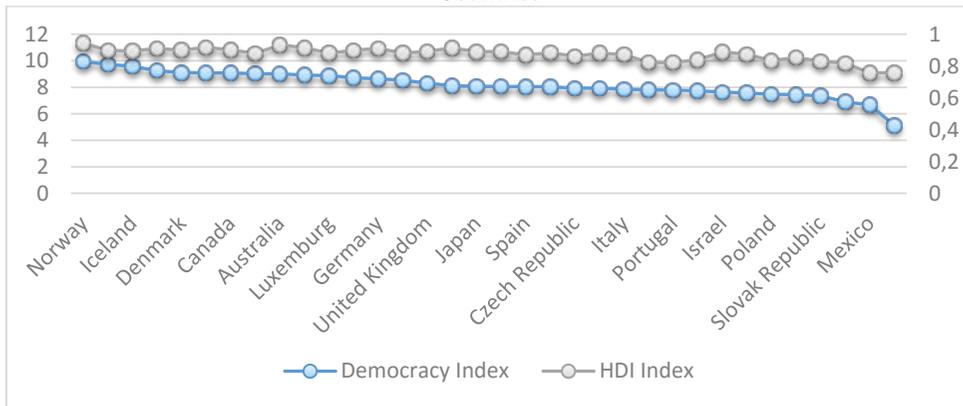
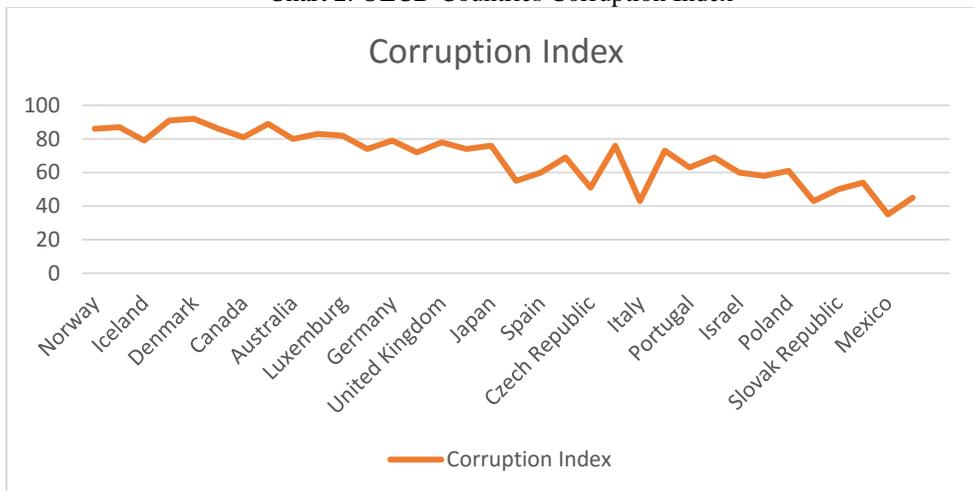


Chart 2, which ranks the OECD countries along the x-axis from the one with the highest level of democracy (Norway) to the one with the lowest level of democracy (Turkey), shows that the level of perceived corruption decreases with increasing level of democracy. As specified previously, decreased index value indicates increased level of perceived corruption.

Chart 2. OECD Countries Corruption Index



Effective functioning of regulations, institutions and the judicial system in a country is important for achieving success in the process of democracy. In that, if a state does not provide services to its citizen through transparent, auditable and effectively run institutions, then the citizens may prefer conducting their business underground. Citizens do not want to give an account of their action to a state which is unable to call them to account within the framework of a judicial system. In that case, corruption, favoritism, lobbying and underground activities become widespread, starting from the level of individual to the level of whole society. As can be seen in the chart above, this situation can be represented with the very high correlation between democracy and corruption

Shadow economy emerges as a natural consequence of high rates of corruption in the economies where democracy is weak. In order to make the democracy culture widespread and to ensure effective functioning of the institutions, government revenues should mostly consist of the tax revenues collected on the manufacturing sectors. In return for the tax revenues collected from its citizens, the government is obliged to provide them with a set of social benefits such as effective services, accountability, good governance and right of democratic representation. The fact that taxpayers are spread to community at large and the share of taxes they pay in the total public revenues is high is an important driving force for making the state transparent and accountable (Polat,2010).

In Turkey, the large share of shadow economy is one of the major problems of the public revenues. Only a small portion of the population pays income taxes, making up only 4% of the working age population. Tax evasion becomes more obvious when Value Added Tax (VAT) is considered. In the year 2005 when the standard VAT rate was 18%, the effective VAT rate was 9.6%. The relatively large difference (47%) between such high official tax rates and the amount of taxes collected points at an important tax evasion problem with VAT. Unreported workers are another source of evasion which led to a loss of 1.3% of GDP in 2008 from unpaid social security premiums (Goldblatt, Lee, Sahin, Sieber: 2012). Moreover, the share of informal sector in GDP is 16% in the developed countries and 37% in the developing countries. Besides, the share of informal sector in labor force is also higher in the underdeveloped or developing countries than the developed ones, just like the informal production. The share of informal sector in labor force is 25% in the developed countries and 48% in the developing countries (IFC, 2013). In this sense, weak democracy and corruption appear to be significant barriers to economic development.

Table 2. Alternative Measures of Informal Employment and Undeclared Work

	Employees in informal jobs % of non-farm employment	Own account workers % of non-farm employment	Unpaid family workers % of non-farm employment	Undeclared Income % of workforce
Hungary	19.4	6.4	0.3	8.6
Korea	25.8	17.1	4.7	7.0
Mexico	31.5	20.6	5.1	30.9
Turkey	21.7	16.6	3.3	24.6

Source: OECD (2008)

Table 2 shows that among the OECD countries with high rates of informal economic activities, Turkey ranks after Mexico in terms of informal employment. The rates are extremely high when compared to the other OECD countries.

We can sum up the damage caused by informal economic activities to the economy as follows: informal economic activities outside the formal sector imply lost tax revenue, limit the ability of the government to provide services, undermine the “fiscal social contract” between the state, business, and citizen, undermine democracy and the emergence of effective states, and limit a country’s capacity to grow. Informal firms are typically smaller and less productive compared to small formal firms, large formal firms, and formal firms which are generally run by better educated managers who are able use opportunities like advertisement and access to finance. The informal sector employs a labor force usually of low quality compared to the formal sector jobs. Informal jobs tend to be lower in quality, often paying lower wages and lacking labor safeguards. Informal workers generally receive no overtime compensation or benefits such as health insurance or retirement savings. The reason is that informal employers are not bound by labor and other standards to protect workers. Formal firms tend to provide safer working conditions than informal firms.

### **Economic development and tax**

In order for a liberal democracy to continue its existence in a mutual relationship of rights and duties based on taxation and representation between the government and citizens, a social structure with a wealth acquired by production is needed. On the other hand, development of modern political institutions, laws and bureaucracies has always been impossible in societies having wealth not acquired by production, as easy access to money (especially countries with natural resources such as oil and mineral resources) means that a government does not need to tax its citizens. When a government taxes people it has to provide benefits in return, beginning with services, accountability, and good governance but ending

with liberty and representation. This reciprocal bargain—between taxation and representation—is what gives governments legitimacy in the modern world (Zakaria, 2007, p. 74-78; Polat, 2010: 26).

We can take the Middle East countries as an example. When we look at the oil rich countries in the Middle East, we can see that wealth not earned by production is one of the biggest impediments to economic and political modernization. A government that does not have to tax its citizens is unable to develop systems such as accountability, transparency and representation. Government with a wealth acquired by natural resources does not expect anything from its citizens, nor does it provide any service to them in return. It is obvious in oil rich countries of the Middle East that economic development or enrichment does not necessarily lead to the emergence of a liberal democratic system.

Therefore, a government's capacity to effectively execute its functions increases when the added value in an economy is registered by means of taxation, because effective taxation is a must for a government to finance the public services. In their study, Ay and Talaşlı (2008) points out how social development is affected by the tax structure (i.e. direct taxes or indirect taxes) and economic development. Indirect taxes are those that are easy to be shifted. Their payers are unknown. Payment time and amount of such taxes cannot be estimated. On the other hand, it is less likely to evade these taxes. Value added tax (VAT), special consumption tax (SCT), customs duties, banking and insurance transactions tax (BITT) are all among the indirect taxes. Direct taxes are those that are not easy to be shifted. Payment time and amount of such taxes are previously determined and evasion of these taxes is possible. Among these taxes are income and corporate taxes, property tax and motor vehicles tax. In general, direct taxes are considered to be fairer than the indirect taxes. Whatever the development levels of countries are, the tax system cannot be said to be modern and fair in countries where indirect taxes occupy much more place in the tax structure. Success of a tax system cannot be measured only by high rates of taxes that are sufficient to finance public expenditures. Success of a tax system should be analyzed taking into consideration its capacity to affect investment and savings in the positive direction; whether it has a destructive effect on resource allocation in an economy; its corrective effect on income distribution, and most importantly, whether it affects economic development positively (Ağbal, 2001). Limiting the taxing power of the absolute power and creating the legal order for taxation is the first step toward the establishment of a constitutional democratic system. An effective tax system must help achieving fundamental economic and social objectives such as efficiency in resource allocation, fair distribution of income and wealth and

economic stability and growth. Thus, a good tax system should first provide the resources sufficient to cover the compulsory public expenditures.

Table 3 showing the tax distribution in OECD countries reveals that Consumption Taxes account for 44.3% of Total Taxation in Turkey, which is much higher than the OECD average of 30.7%. Besides, Taxes on Specific Goods account for 22% of total taxation which is again much higher than the OECD average of 10.5%.

Table 3. Distribution of Taxes in OECD Countries, 2013

Countries	Consumption Taxes % Total Taxation (2013)	Taxes on Property % Total Taxation (2013)	Social Security Contributions % of Total Taxation (2013)	Taxes on Specific Goods and Services % Total Taxation (2013)
Norway	25.9	3.0	23.5	6.9
Sweden	27.5	2.5	23.3	6.4
Iceland	31.8	6.9	10.3	9.7
New Zealand	35.9	6.1	0.0	5.8
Denmark	29.7	3.9	0.2	9.6
Switzerland	19.5	6.7	25.1	6.4
Canada	22.5	10.4	15.8	8.3
Finland	32.1	2.9	28.9	10.8
Australia	23.8	9.4	0.0	10.8
Netherlands	26.4	3.4	40.8	8.6
Luxemburg	28	7.3	28.8	8.7
Ireland	30.6	7.1	17.8	10.2
Germany	26.9	2.5	38.1	7.8
Austria	25.8	1.7	34.3	7.6
United Kingdom	31.7	12.3	18.8	10.7
United States	14.6	11.3	24.2	6.8
Japan	15.9	8.8	40.9	6.7
Korea	28.8	10.3	26.4	11.8
Spain	26.4	6.7	34.5	8.6
France	23.4	8.4	37.2	7.7
Czech Republic	32.5	1.4	43.2	10.7
Belgium	22.8	7.8	31.7	7.2
Italy	23	6.2	29.8	9.7
Chile	50.7	4.1	7.2	9.9
Portugal	35.2	3.3	25.9	11.7
Estonia	39.9	1.0	34.8	13.8
Israel	36.3	8.8	16.6	5.9
Slovenia	37.5	1.7	40.1	14.6
Poland	35.1	4.4	38.6	13.1
Greece	34.7	7.6	31.1	12.7
Slovak Republic	31.6	1.5	43.8	10.6
Hungary	42.9	3.4	32.6	13.1
Mexico	49.2	1.5	15.5	31.6
Turkey	44.3	4.6	27.4	22.4
OECD unweighted average	30.7	5.6	26.1	10.5

Source: OECD Revenue Statistics, 2014

Both Table 3 and Table 4 show that the high share of indirect taxes in the tax revenues is one of the biggest problems that negatively affect the fair distribution of income in Turkey. Because, tax revenues that could not be directly collected from income and activities as well as the taxes levied on consumption without distinction of the rich and poor show that there is no transparent interaction between the government and taxpayers, and the share of informal activities in the economy is high.

Table 4 Indirect Tax and Informal Economic Activities Paradox.

Countries	Direct Tax (%)	Indirect Tax (%)	Informal Activities (%)
United States	76.3	23.7	8.6
Germany	50.7	48.9	16.8
Austria	55.2	44.1	13.8
Belgium	62.2	36.1	21.5
Denmark	65.6	34.2	17.5
France	53.7	46	14.8
Holland	50.3	48.5	12.8
England	60	39.4	12.3
Spain	55.2	44.2	22.3
Sweden	61.6	38	18.7
Switzerland	69.6	30.4	9.5
Canada	68.4	31.6	15.4
Norway	59.4	40.6	18.7
Turkey	34.4	65.6	30-60

Source: Ay,H.M., Talaşlı,,E. Ülkelerin Ekonomik Gelişmişlik Seviyeleri ve Vergi Yapıları Arasındaki İlişki [The Relationship between Economic Development Levels of Countries and Tax Structures], *Maliye Dergisi*, Volume 154, 2008

Although the gross national income per capita increases in some countries, their neither human development level nor democratic freedoms increase as much as the other countries with similar index values in the West. The most important reason for such countries to fall behind in terms of human development and democratic freedoms despite the increasing economic growth is the unfair distribution of income. The government comes into play in cases of income equality, and by means of collecting taxes, takes some steps that will support the low income groups. Trying to achieve the welfare equality among different social classes to a certain extent by means of social transfer expenditures. The government resorts to increasing taxes to carry out this mission. Unable to finance the public expenditures through taxes collected from registered economic activities, the government tries to increase its revenues through indirect taxes. The correlation between the indirect taxes and informal economic activities shown in Table 4 confirms this relationship. However, as specified previously, informal production is inefficient for the economy, as it cannot be controlled. Since many companies that cannot be engaged in any

production activities if they effectively pay their taxes still run their business underground, they can produce products with low costs, but force other uncorrupt companies to unfair competition. This causes a problems called “moral hazard” in the literature.

As analyzed by Işık (2009) in detail, there is a significant correlation between the democracy culture and tax moral. The studies show that direct democracy has a significant impact on tax moral in Sweden. It was detected that democracy and attitudes of the taxpayers have a positive impact on tax moral not only in Sweden, but also in Belgium and Spain. Constitutional confidence (confidence in legal system) and the existing political-economic confidence are important for a society that pays its taxes. Therefore, for the governments and tax administrations, running a strategy aiming to build confidence in themselves and their competencies may result in higher tax moral (Nerre, 2001).

## **Conclusion**

Establishment of a regular tax system that can finance the public services is one of the conditions required for a democratic regime to function properly (Çağan, 1980). Taxation is of critical importance not only for economic relations of production to be grounded in a sound and legal framework, but also for the functionality of the democratic political system. Nowadays, most of the developed Western democracies are derived from the relationship between taxation and representation. An individual paying his/her taxes to the government develops an ability to question the quality of public services provided to him/her in return. In the Western type parliamentary democracies, this led to the emergence of state-citizen relationship based on the mutual rights and responsibilities of the state and citizens. Individuals should be able to foresee the government interventions to the rights and freedoms through taxation, and should make their future plans accordingly. In this way, arbitrary taxation can be prevented to a considerable extent. Therefore, a sound taxation system also indicates a sound legal order in that country. Constitutional state is a must for effective taxation. Lack the confidence in the state and legal order increases corruption and informal activities. Increase in the informal activities affects the total tax revenue to be collected by the government negatively, thus causing the government either to be involved in making investment through borrowing, or not to be involved in investments at all. The high share of informal economic activities in the total production also affects the ability to run effective and productive business activities adversely. The manufacturers reluctant to pay their taxes to the government prefer manufacturing with low labor costs, as they are not subject to any governmental supervision. This prevents the welfare and wealth from extending to the poorer parts of the

society, i.e. the fair distribution of income. Poor quality products produced with low costs and unskilled labor must be cheap, which creates a cycle of low-cost production. Entering into competition with low-priced products at the international markets is one of the biggest impediments to the economic growth of a country.

For a political system with democratic freedoms, it is important to consider how economic development is distributed among the individuals. If economic development is achieved through effective taxation on production, then the size of the shadow economy will be reduced, leading to a fairer distribution of income. Integration of taxation into a system that takes into account the income distribution is closely related with the principle of a constitutional state and can only be achieved with a strong legal arrangement. Countries with a strong legal structure have low level of perceived corruption, just like the low size of shadow economy. In countries where income distribution is relatively fair and taxes are imposed on income, the citizens have confidence in the government for the economic and political matters, which leads to increased tax moral and awareness of citizenship. In countries where such an environment is created, the relations between the citizens and the government are based on mutual rights and duties. Therefore, the representation system which is the most widely used mechanism for the functioning of democratic regimes is mainly based on the rights and duties.

We conclude that the relationship between democracy and development is defined by the nature of the instruments that bring forth economic development. In this respect, existence and continuity of a democratic regime depends on economic development; however, the development must be based on effective taxation and a strong legal order required by such a tax structure.

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# Virtual Identity And New Consumer Behavior – The Role Of Mobile Marketing

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## Abstract

As a part of a new virtual world, paper examines social and marketing environment according to the user level of involvement in virtual life. New marketing is present 24 hours a day and is becoming very unique per each client. Virtual identity of the company tries to be involved in customer everyday life and become its inevitable part. Mobile marketing is a relatively new branch of marketing, referring to the two-way marketing communication between company and customers that takes place via mobile devices whose importance in the past years constantly grows. The aim of this paper is to point out role and importance of the mobile marketing in the new reality and its function in a process of generating virtual identity of the company. The emergence of mobile marketing does not substantially change the system of marketing management but gives marketing experts new efficient tool by which they can easily reach a huge number of new clients. Thus, marketing experts have to adjust strategies to new technologies and media while marketing essence remains unchanged.

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**Keywords:** Mobile marketing, mobile devices, virtual identity, virtual world, consumer behavior

## Introduction

In the recent past, companies were using massive marketing – communication with a large number of potential customers at once via traditional media as TV, radio, newspapers, journals etc. By development of information technologies and the fact that massive market has become fragmented, marketing experts had to change their access to the existing and potential clients. Development of information technology has enabled direct communication with the clients, while companies can find out useful information that can be used for creation different kind of products for each

customer. Also, new kind of directed/target marketing has been continuously developing.

Interaction between technology and people has become firmly close. That kind of a new interaction changed the way of getting information about customer behavior. Customer isn't any more unknown, hidden – it is globally available. Companies like never before, know customers location, time when they are on-line, their preferences, etc. They are actually trying to “attack” their virtual identity by the new marketing strategies and the new media. This paper analyses mobile devices as a new marketing tool in the new “virtual world”.

New information technologies created new media – mobile devices, by which can be applied mobile marketing. Joshi (2013) identifies mobile devices as an important innovation whose impact on the company probably will not stop soon. To emphasize their importance and crucial role in business, Joshi (2013) calls mobile devices “strategic innovation”. Because mobile devices are always close to their owners they create emotional impact.

The purpose of this paper is to point out the importance of the implementation of mobile marketing in the system of marketing management. The aim of this paper is to analyze and point out the role and importance of the mobile marketing in the new reality - its function in a process of building up virtual identity of the company. Mobile marketing appears to be efficient tool and some kind of a mediator which interfaces virtual identity of the company and customer.

### **Virtual Identity and Consumers Preferences**

Identity is a central organizing feature of our social world. Across the social sciences and humanities, it is increasingly treated as something that is actively and publicly accomplished in discourse (Benwell and Stokoe, 2006). Hettinger and Hass (2003) pointed out that virtual and adaptive environments revolutionize the ways in which humans live their daily lives. Virtual and adaptive environments are systems composed of humans, computers, and interface devices. That kind of environment generates virtual identities and provides new business models.

Web-based innovations and technological applications provide marketers with a plenty of information about consumers preferences, what challenges them to re-think and adapt their marketing strategies by using new marketing technological channels. It also offers them new opportunities to understand their consumers. Virtual reality and associated technologies are increasingly influencing people's lives (Cortimiglia et al., 2011).

Moreover, some authors like Cherner et al. (2011) and Lambin

(2013) state that internet – based innovative technologies (such as Facebook, YouTube or Twitter) are constantly changing traditional relationship between companies and customers trying to make unique marketing mix for each group of client due to the new technology which provides them information about consumer desires and preferences.

According to the research of Koles and Nagy (2012) there are three typological levels of people's virtual immersion: purely virtual, mixed and realist, emerging on the basis of the boundary between real life and virtual existence, and the corresponding variation in users' willingness and desires to seek and share personally identifiable information.

Considering the group of individuals purely immersed in their virtual identities, businesses can focus more on visual and readily available attributes or impulses, such as attractive design and external product features, in order to achieve the attention of this group. Realists, on the other hand, as they are more likely to be reading stories and narratives, may require more detailed and in depth information about goods, commodities or services, as well as identification of their potential links to the real world. Finally, users categorized as mixed/analytical, demand information about virtual objects or services inside as well as outside of virtual environment (Koles and Nagy, 2012).

According to Schroeder (1996) virtual environment or virtual reality is a computer-generated display that allows or compels the user (or users) to have a sense of being present in an environment other than the one they are actually in, and to interact with that environment. Moreover, Karjaluoto and Leppäniemi (2012) developed a useful framework for understanding user intentions and behavior within a virtual world environment. Intention to participate in virtual world has been defined by a person's social identity, attitude toward using the service, subjective norms, attitude toward advertising on the service and enjoyment.

There is a great debate around the ways identity is shaped online, mainly as a result of understanding the online as networked individuals. Narrowing down the concept of identity to the software-dependent environment, it comes natural to say that the fluidity of identity is mainly determined by constant transformation the technology is subjected to. Each and every hardware or software upgrade immediately reverberates through the intricate process of identity building (Stoicescu, 2015).

### **Mobile Marketing and its Particularities**

Dushinski (2009) in his paper defines mobile marketing as a revolutionary tool for connecting companies with each of their clients via their mobile devices in the right time, on a right place and with appropriate direct message. Becker and Arnold (2010) emphasize definition of mobile

marketing which have been given from Mobile Marketing Association<sup>1</sup>, which says that mobile marketing is a set of procedures that enables communication with companies target audience on interactive and relevant way via mobile devices.

Although it is possible to reach out target groups via mobile devices, Tanakinjal et al. (2011) state that it's important to make an effort and explore the possibilities to make it work. According to Andrews et al. (2012), mobile marketing is any form of marketing communication that has been using mobile devices during the creation of potential opportunities and benefits for customers, what includes location based mobile services and services for the delivery of mobile content.

Marketing experts agree with the fact that activities that have been going on with the mobile devices, in the last decade, had a huge impact on a development of mobile marketing and on intent for purchase of potential customers in the future (Chinomona and Sandada, 2013). As many people equate the term of marketing with promotion, it also happens with the term of mobile marketing and mobile promotion, what is surely wrong. Tanakinjal et al. (2011) explain the difference between these two terms. Mobile marketing is a driver and a foundation for the exchange of content and direct response, while mobile advertising is form of a message which has been sent via mobile device.

Thus, mobile marketing is a form of communication with existing and potential clients. Basis of this communication has been development of telecommunication, information and wireless technologies. Mobile marketing does not lose the sense of marketing but reflects the creativity of marketing professionals and their strategy while result should be qualitative and successful marketing communication between the company and customers. Hence, mobile promotion is a part of mobile marketing and is one of its most important activities.

Mobile devices are owned by one person what enables communication with a specific person and message that has been sent to them is immediately available Hazlett (2011). Accordingly, interaction with the clients can be totally different for each client, what is not the case in other kinds of marketing (Dushinski, 2009). Because of the opportunities provided by mobile marketing, companies can easily include in the exchange of information with existing and potential customers, with the aim of improving products (Persuad and Azhar, 2012). Companies are increasingly opting for mobile marketing because of the trend and its optimistic projections (Smith, 2011).

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<sup>1</sup> Mobile Marketing Association (MMA) is a world leading association of mobile marketing. (<http://www.mmaglobal.com/>).

## **Mobile Devices and Access to Mobile Internet**

Barutçu (2007) explains that what is of particular importance to the marketing experts is ability to communicate with potential customers anytime and anywhere. The revolutionary contribution to this kind of communication was enabled by mobile devices. According to Dushinski (2009) term of mobile devices includes different kind of mobile phones, smartphone devices, personal data assistant devices, tablet PC and even play station portable because user can connect through it by Wi-Fi technology and surf the Internet, either at home or outside.

Although there are different divisions of mobile devices by category, there has been generally accepted the division in three categories: feature phone, smartphone and connected devices (Pasqua and Elkin, 2013). Feature phones are older mobile devices which are less sophisticated. Lately, in this kind of mobile phones have been installed some advanced options which are still far from those which have smart phones (Rashedul et al., 2010; Pasqua and Elkin, 2013).

According to Becker and Arnold (2010), smartphone is a mobile device which integrates possibilities of mobile cellphone with the main possibilities of personal computer what includes Internet, applications, e-mail, entertainment and media services. Also, Barbour (2011) points out that smartphones are becoming thinner, faster, with much more functions that make them similar like laptops. Analysts of Gartner<sup>2</sup> figure out that total sale of smartphones in 2013. amounted to a record 81 billion units, an increase of 3.4% compared to the previous year 2012.

Connected devices are all mobile devices that do not have the ability to call, but have all other features of mobile devices. These characteristics correspond to tablet devices, e-readers and portable entertainment devices. These devices share many things with smartphones, but their primary purpose is not phoning but browsing the internet, entertainment and reading e-books (Becker and Arnold, 2011).

Shah (2012) also highlights the importance of mobile devices, not only to build a brand, but also to gain customer loyalty and to evaluate the existing brand. Hižak and Mikac (2013) state that there has been daily developed more and more applications for "smart" mobile devices based on the most popular mobile platforms - Android, iOS, Windows Phone and others.

By development of wireless technology, mobile phones became part of our everyday life on private and business plan (Liao et al., 2007). Mobile devices can connect the Internet via network of mobile operator or

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<sup>2</sup> Gartner, Inc. (NYSE: IT) is the world's leading research and advisory firm in the field of information technology ([www.gartner.com](http://www.gartner.com)).

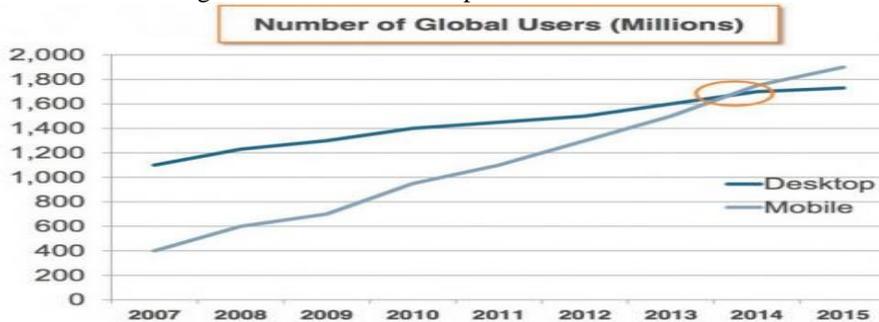
Wi-Fi network – user can choose, depends on a situation how to become connected to the Internet.

Feature phones and smartphones primarily connect the Internet via network of mobile operator which have been using while transfer rate and characteristics of connection depends on the standard used in the network and which device supports. Connected devices connect the Internet primarily via Wi-fi network, but there are also exceptions – like advanced tablets which can have functions of mobile phones and can use networks of mobile operators (Pasqua and Elkin, 2013).

A study conducted by Mobile Marketing Association and Vserv.mobi<sup>3</sup> in 2013. included 3.000 users of mobile internet in France, Italy, Russia, Spain and United Kingdom. The aim of a research was to get more information about the users of mobile Internet in the observed countries to help marketers in their future mobile campaigns. According to the research main conclusions are: 1) more than a half of mobile Internet users are young people, 2) men are using mobile Internet more than women, and 3) people who have higher level of education (undergraduate, graduate, post graduate) use mobile internet more than people who have lower level of education (secondary school).

It's no longer a case of asking whether mobile marketing is important. It's now a question of using the statistics to understand how consumers behave when using different types of mobile devices and what their preferences are. On figure 1 we can see that from the beginning of 2014. number of mobile users in the USA has exceeded number of desktop users.

Figure 1 Number of desktop and mobile users



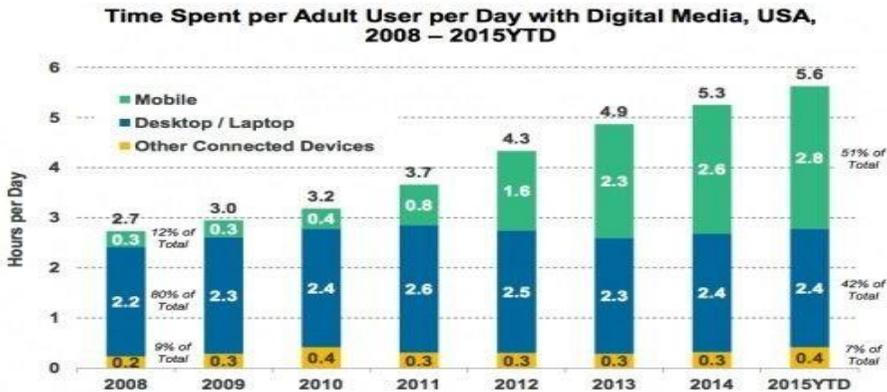
Source: Globalwebindex.net (2015)

The implications are clear - if you're not able to reach your audience through mobile search or display, or you're not providing a satisfactory mobile experience you will miss out compared to competitors who are.

<sup>3</sup> Vserv.mobi is a company whose primary activity is the development of solutions for mobile platforms (<http://www.vserv.mobi>).

Figure 2 shows us how time spent on Internet per adult by using mobile is constantly growing.

Figure 2 Time spent on Internet per adult by using digital media Source: emarketer.com (2015)



Also, according to the research of the global web indeks (2015), 80% of Internet users own a smartphone and it is the second most popular device which they use for surfing the net.

### The Role of Mobile Marketing in a new Marketing Environment

According to Kotler et al. (2006) two main factors have been changing marketing communications: 1) Moving away from mass marketing and developing focused marketing programs which have been designed to build stronger relationships with consumers on a specific market, 2) Segmented marketing has been increasingly used because of the development in information technology.

Further, information technology helps marketers to understand better the needs of consumers. New technologies offer new possibilities for communication with the help of which one can get to the smaller segments of consumers with more personalized messages (Kotler et al., 2006).

Shankar and Balasubramanian (2009) state that existing and potential clients by sending the messages via mobile devices can greatly participate in forming the product. Thanks to location based services, Smutkupt et al. (2010) point out how marketing experts can easily determine the supply of products and services in the specific area with the aim of increasing sales. Also, to the each customer may be offered unique price without others knowing that. That allows sellers price discrimination of the first degree, which refers to the fact that to every customer can be offered a customized price (Smutkupt et al., 2010).

Mobile technologies help companies to increase the efficiency of product distribution. Also, customer can monitor the progress of the delivery of his product via mobile device (Smutkupt et al., 2010). In their work Luo et al. (2013) suggest that mobile marketing enables marketers to access the (potential) customers at a specific time and exact location.

Tools of mobile advertising are: mobile web pages, e-mail, mobile applications, QR codes, SMS and MMS, location based marketing and near field communication (Podmanicky and Turkalj (2011); Becker and Arnold (2010), Stuart et al. (2013)). Their proper application requires some effort, investment and proper strategy. To form a proper strategy, marketing experts should be provided with all information about the market – data on the prevalence of mobile devices on some certain market, the type of mobile devices that are used and the possibilities offered by mobile operators.

Mobile advertising is one of the important aspects of mobile marketing and, according to Bart et al. (2013), is one of the fastest growing forms of advertising. Bart et al. (2013) state that only in 2013. the mobile advertising spent 16.7 billion, with predictions that this number by 2017 will rise to 62.8 billion. Furthermore, Bart et al. (2013) point out that in support of numbers on the growth going and penetration of mobile devices, especially smartphones, whose number is constantly growing, both in the United States, and the rest of the world.

In their paper Bellman et al. (2013) report that mobile applications that advertise a brand, or a simplified - branded applications, play an important role in brand building and also in the increase of customer satisfaction. Bellman et al. (2013) state that, in addition to the data itself of the brand, mobile applications allows clients an ability to purchase the products and services.

Drossos et al. (2013) pointed out how interactivity in mobile advertising comprises a double interaction (between the seller and potential client), sometimes 24 hours a day, with direct responses to SMS or other queries (for example, by clicking on the appropriate link of ads that establishes a connection to an advertiser). Other ways of promotional communications in most cases do not involve a double interaction, and that is what this advertising method (generally mobile advertising and SMS) makes it unique.

Jingjun Xu (2006) in his work states that mobile advertising includes advertising on the (mobile) web site and via SMS and MMS messages, and has the ability of easier adaptation of messages due to the possibility of determining the location of potential users. Banerjee and Dholakia (2008) explain that goal of mobile advertising based on geographic location is to eliminate information barriers between the client

and the market and reaching out to potential clients at the moment when they come into the space in which is the active advertiser.

There are two most common strategies of mobile marketing that are called "push" and "pull". Push strategy is an active way of advertising which aims to reach out to a large number of customers at once and is successful if clients want to receive new information. On the other hand, users can receive new information on their request. Then, information content has primarily value for the user, and that kind of strategy is called pull strategy (Alibabić, 2012).

## **Discussion**

Implementation of mobile marketing strategy in marketing management is a complex and demanding process. To make the implementation possible, companies should first examine the socio – cultural and technological factors which dominate on the market. Presence of the users in the virtual world via mobile devices gave marketers plenty of useful information which they can use to generate products and services that suites them the most.

Thus, mobile devices with their applications challenge marketers to re- think and adapt their marketing strategies what makes mobile marketing so important. Virtual reality and mobile devices are increasingly influencing people's lives so they change traditional relationship between companies and customers. Even more, mobile phones are becoming important marketing channel.

By the level of involvement in virtual world via mobile devices and using the mobile applications marketers should adapt their marketing plans which should comprise three different marketing strategies according to the three segments: young – complete users, middle age – partial users, older age – very poor users.

Mobile marketing has a great impact on all elements of the marketing mix and allows companies to develop products with the shape and characteristics which are desirable with existing and potential clients. Besides, mobile marketing offers complete control over pricing and distribution and provides great promotional activities through mobile devices such as advertising, sales promotion and direct marketing.

The emergence of mobile marketing does not substantially change the system of marketing management but gives marketing experts new efficient tool by which they can easily reach a huge number of new clients. Thus, marketing experts have to adjust strategies to new technologies and media while marketing essence remains unchanged. Because of its' characteristics mobile devices offer new opportunities for marketing management.

During the implementation of each mobile marketing campaign, mobile marketing tools should be used together or in a combination, what means that it is necessary to make a good strategy. The maximum efficiency of mobile marketing is evident when it has been used in a combination with traditional media.

### **Concluding Remarks**

Mobile marketing is a relatively new concept in the marketing discipline. Although sometimes referred to as one of the marketing channels, mobile marketing is much more of that. It is a separate unit of marketing which tries by planning and development of effective marketing campaigns reach the potential clients on interesting and interactive approach via mobile devices and Internet connection.

Paper examined the impact of mobile marketing in a process of virtual interaction between customers and companies. This kind of interaction has a significant impact in a process of creating good relationships between companies and their customers what emphasizes the role of mobile marketing as a significant tool, not only in marketing system but also in a system of Customer Relationship Management in which it has a key role. Therefore, Customer Relationship Management and mobile marketing should take a central place in the process of creating marketing strategy as a significant part of business strategy.

Authors, according to the research, have noted four developing steps of mobile marketing:

- 1.) Mobile marketing as a new tool – new marketing channel.
- 2.) Mobile marketing as a part of marketing system - like all other on- line channels, it became indispensable part of marketing strategy.
- 3.) Mobile marketing, along with technical and cost side got psychological one that has been generated due to the closeness with the owner of the mobile device and by using it almost 24 hours per day. Therefore, examination of a new consumer behavior needs multidisciplinary approach especially involving behavioral sciences such as sociology and psychology.
- 4.) “Points of contact” between companies and customers - generally accepted term of Phillip Kotler on the basis of which is actually generated concept Customer Relationship Management cease to be “points of contacts” by getting timeless and without spatial component due to the new 24 hours communication on the endless global space. This fact brings with it a new, revolutionary conception of marketing activities and brand building what brings us the new paradigm of marketing. Moreover, customer cease to be unknown, his location is well known like his identity and style of living. Technological base for that are mobile devices which

are medium of communication and transmission of valuable customer preferences to the companies.

It is important to clear out how new technology, in this discourse primarily mobile marketing through social networks and other on-line tools and channels, has an impact and will have on the future of our lives through new style of living, and on the adoption of the business strategies whose necessity of involvement in the virtual world is no longer in doubt.

Therefore, it seems clear that managing effectively with marketing system in the new virtual environment is one of the central issues and opens the new paradigm of marketing, management and the whole economical and socio-cultural environment. It needs to be seriously considered the virtual identity of private individuals - customers and business entities as key elements of the new virtual system. Customer Relationship Management with new media and tools seems to be central, crucial part of this system.

How will these new behaviors, new technology and new forms of business activities affect "identity of the company", "brand identity", and what kind of impact will it have on the organizational behavior, organizational culture, and even human resource strategy? There are many issues which are immense. Clear and obvious is the increasing need for interdisciplinary and transdisciplinary approach in economy, regarding to the assessment of powerful and relevant impact of non- economic phenomenon especially in the field of marketing. One of the intentions of the authors of this work is to encourage these discussions, which are certainly of key importance for understanding the new economy and the new "virtual" age in which we live.

The paper did not present the negative aspects of mobile marketing and virtual identity which is the limit of a paper.

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# Housing Choices of Muslim Immigrants in Italy

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## Abstract

This paper aims to study housing choices of Muslim immigrants in Italy using micro level data collected by the ISMU Foundation. For this purpose, a probit model of home ownership is estimated using demographic variables such age, education, marital status, family characteristics, religion as well as financial variables measuring household expenses and financial difficulty. This is intended as a first step in uncovering household preferences for various investment alternatives among Muslim population in Western societies.

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**Keywords:** Home ownership, housing finance, immigrant

## Introduction

There are unique characteristics of the Muslim communities who live in western countries that require a closer look at their preferences regarding home ownership, not only as a portfolio investment and a means of accumulating wealth but also as a mechanism for social integration.

The first set of features concerns the demographic changes. Pew Forum on Religion and Public Life predicts a global trend with a 73% rise in Muslim population between 2010-2050 making it the fastest growing religious group overall. As such Islam is the only major religious group that is expected to grow at a higher rate than the world's population. Muslim population has not only been on the rise but also on the move. According to statistics from the 2010 Global Religion and Migration Database, Muslims count for 27% of all international migrants. With the Syrian refugee crisis still unfolding, this figure likely underestimates the current distribution.

Another characteristic of Muslim population that can further propagate current demographic trends and make the housing question more pressing is the high fertility rate. Averaging at 3.1 children per woman, the fertility rate for Muslims exceeds that of any other group underlying a potential link between high population growth rate and demand for home ownership. Augmenting this effect further is the current age distribution

according to which the highest percentage of women in their primary childbearing years is of the Muslim faith.

Factors that are expected to affect attitudes towards housing demand include the role faith plays in economic affairs. Islam as a religion prescribes a set of rules for conducting economic and financial transactions. The term Islamic Finance (IF) can generally be defined as the provision of financial services and products on the principles of Islamic shariah (law). Some basic principles of Islamic Finance are prohibition of *riba* (interest), *gharar* (uncertainty), and gambling. Another defining characteristic of Islamic Finance is that it is supposed to link financial transactions with activities in real economy and arrange for sharing of entrepreneurial risk. The main implication for housing finance industry is the need for mortgage products that are structured according to these tenets of Islamic Finance. There are a variety of mortgage products such as *ijarah* (redeemable lease), *murabahah* (installment credit purchase) and diminishing *musharakah* (declining balance partnership) that are based on these principles.

It is predicted by the International Organization of Securities Commission that by 2015, investments undertaken according to these principles will account for half of the savings of the world's estimated 1.2-1.6 billion Muslims. Yet, we have very little insight into economic preferences of Muslim populations living in Western societies when it comes to shariah compliant investment opportunities. A 2010 report on Islamic Housing Finance in Canada commissioned by the Canada Mortgage and Housing Company notes that without such information it is impossible to understand how market demand would respond to an ever growing array of Islamic Finance products and services. Earlier work by Maurer (2006) on Islamic mortgages in United States also underlies this lack of systematic studies about Muslim attitudes towards Islamic Finance in particular countries or across different countries.

## I.

The 2012 Islamic Finance Guide reports that real estate sector dominates the most recent market developments in Islamic Finance in countries such as UK and Canada. Home ownership remains an important financial goal among the Muslim population in Canada, which is projected to triple in the next 20 years to account for 6.6% of Canadian population by 2030 according to a recent report by Pew Forum on Religion and Public Life. In UK, one of the contributing factors to the development of the housing sector of the Islamic Finance market was the 2004 abolishment of double stamp duties resulting in more competitive shariah compliant mortgages. Another important development in 2004 was the launch of Islamic Bank of Britain as the first standalone Islamic Bank in the Western world with the

approval of the Financial Services Authority. Currently, there are about 20 banks providing shariah compliant products and services through Islamic windows including some big banks such as HSBS and Lloyds TSB. Consequently, UK established itself as the leading European country in Islamic Finance activities. The UK experience can provide a useful road map for considering how the expansion of Islamic Housing Finance fits within the current Canadian legal, regulatory and tax framework.

In contrast to UK, currently there are no Islamic Banks or windows operating in Italy. Nevertheless Italy remains an interesting case due to government involvement in producing detailed market studies to promote the country as a viable market for Islamic Finance. The country report published in the 2012 Islamic Finance Guide mentions the availability of extremely detailed surveys and market analyses categorized by the countries of origin and the banking services used by the Muslim community in Italy. These data could be utilized to study financial behavior of the Muslim community to fill the existing gap in our knowledge of consumer preferences toward alternative investment opportunities. Such a study could provide interesting insight since the Italian Muslim population is characterized by a variety of countries of origin and not dominated by a single nationality more like the Canadian Muslim population.

The 2011 Italian Report on Migrations provides interesting statistics comparing housing situation of immigrants and Italians. The report is based on Income and Living Conditions survey study conducted by Istat (Italian National Institute for Statistics) in 2008. In the survey, the immigrant status is defined by country of birth where those born outside of Italy are classified as either EU immigrants or extra-EU immigrants. According to statistics provided from the survey, renting or subletting is most common among extra-EU immigrants with 58.8% compared with only 16.1% of renters among Italians. In contrast, a high percentage of Italians are homeowners. Specifically, 71.4% of Italians live in a house they own whereas only 28.4 of extra-EU immigrants are homeowners. In both cases, the figures for EU immigrants fall in between the two although their housing situation resembles that of other immigrants more closely. The survey also provides information on mortgages and other loans homeowners take out for purchase or renovation as well as the interest rates carried on these loans.

The figures provide a very interesting comparison on relevant economic data and indicate further investigation into possible sources of the difference in housing situation is worth undertaking. The literature on determinants of homeownership provides evidence that certain demographic factors such as marital status and financial variables such as income uncertainty have significant effect on homeownership rates. For example, Fisher and Gervais (2011) show that most of the decline in number of young

homeowners in US between 1980 and 2000 can be explained by increasing income risk and an increasing trend for marriage age observed during the same period. In the Italian population surveyed by the Italian National Institute for Statistics, employment stability appears to be different between Italians at 10% and immigrants at 15%. Whether the observed variation in employment stability could have a similar causal effect on home ownership as income uncertainty is an interesting question that deserves further investigation. Marriage status should also be investigated as a potential determinant of difference in homeownership across immigrants and Italians.

It should be stated that although the survey sheds light on some important aspects of the housing status of immigrants in Italy vis-à-vis Italians, it stops short of identifying the immigrant's country of birth. It also provides no information on religious affiliation. Therefore, it is not possible to quantify the casual effects of any ethical considerations based on religious affiliation on home ownership decision. The next step in uncovering household preferences for various investment alternatives among Muslim population in Western societies is control for these factors using datasets that collect demographic and financial variables for groups of households with different religious affiliations.

For this purpose, I use the cross-sectional data set collected by Regional Monitoring for Integration and Multi-ethnicity. The dataset comprised of surveys covering the period 2001-2011 containing information on various demographic characteristics of immigrants in Italy including religious affiliation and housing situation. Of particular interest for the purposes of this study, the following information is collected:

- Demographic variables: age, education, marital status, family characteristics, religion
- Financial variables: Household expenses, questions on financial difficulty

Housing has been paid special attention in the surveys due to its role in facilitating integration of foreigners. There is also recent emphasis on family to facilitate analysis of increasingly family-oriented immigration to Italy.

I will study the homeownership decision using a probit model. The time dimension spanning years 2001-2011 will be utilized to investigate the effect of the financial crises on homeownership decision by including time dummies.

## **Conclusion**

This analysis aims to provide a complementary analysis of household portfolios by focusing on housing decisions of Muslim immigrants in Italy. It

will also provide a comparative view of homeownership status of Muslim households living in other western countries such as Canada and the UK.

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# **Drawbacks And Advantages: The Romanian Two-Party System And The Electoral System (1866-1914)**

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## **Abstract:**

My article, concentrating on a topic that is still viable nowadays, belongs to the field of political history and presents an important feature of the Romanian political life. The process of modernisation of the Romanian state and society was strengthened in the second half of the 19<sup>th</sup> century and at the beginning of the 20<sup>th</sup> century. There were major changes at the political, social, economic and cultural level. The present article proposes to analyse the relationship between the electoral system and the two-party system while investigating historical facts through the support of political science tools.

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**Keywords:** Census suffrage, Romania, liberals, conservatives, two-party system

## **Introduction**

In 1866, the census suffrage seems to have been preferred by the political elite and this census suffrage was also supporting the operation of the two-party system. However, in the second half of the 19<sup>th</sup> century, the European model had gradually become a milestone that could be adjusted by the political elite to all the levels of the political regime. Most of the liberal and conservative politicians preferred the Belgian model concerning the constitutional system and the British model of government regarding the government alternation.

I believe that the relationship between the electoral system and the two-party system during the period I am analysing (1866-1914) lead to positive aspects, but also to limitations regarding the operation of the political regime. It is possible that, in 1866, the Romanian society was not ready for the universal suffrage of male citizens, which would have lead to a real progress in the modernisation process of the country at all levels: political, economic, social and cultural.

### **The establishment of the Romanian two-party system – a long process**

The political scientist Maurice Duverger analysed the construction of the political parties and of the party system starting from the idea that: « les partis <<bourgeois>> du XIXe siècle qui survivent toujours sous la forme des partis conservateurs et libéraux /.../ ne cherchent pas à multiplier leur adhérents ni à encadrer de grandes masses populaires, mais /.../ à grouper des personnalités » (Duverger, 1976, p. 43).

In the Romanian case, the local political elite, especially the liberal one, required a fast rhythm of reform in comparison with the conservative elite, more traditional, which preferred a moderate rhythm of action in adopting various laws and measures. But, despite of the different rhythms they preferred for the modernisation of the country, both the liberals and the conservatives had a strong partnership with Charles I (1866-1914) regarding the development of the country at all levels: political, social, economic and cultural. And that partnership had been established from the very beginning of Charles I's reign.

The conservative C. I. Istrati was convinced that: *“the liberal party was called to continually transform the nation in accordance to the general evolution of ideas and the mission of the humanity. On the other hand, the conservative party, this oak of the Romanian nation that has always been awake, was called to the helm of the nation – to surely and capably lead the boat of the nation and not to let the sails flutter too strongly in order not to allow the storms to destroy them and the entire ship”* (Istrati, 1904, p. 101).

In the Romanian realm, the government alternation mechanism of the conservatives and the liberals “developed in time, depending on the coagulation of the participating political forces”. “From the beginning of the reign of Charles I until 1895 /.../ this functioned in incipient, experimental variants, with unequal periods of government and with different alliances between political groups (1866-1871) or between parties and political groups (conservatives and the “Junimea” group members, 1888-1895)” (Dogaru, 2008, p. 5); between 1895 and 1914, there was a different type of government alternation - an organised one with periods that were approximatively equal for the liberal and conservatives governments, which could not be longer than four years (the specific legislative period), called in the Romanian specialised political history literature “the government alternation” (Dogaru, 2008, p. 5). In the years 1895 and 1914, the alternation became organised and efficient (lasting for one legislature – for an average of four years).

The political scientist Mattei Dogan was the first who analysed this type of alternation and asserted, in 1946, that the *government rotation* was a regular alternation between the National Liberal Party and the Conservative Party: “this government majority in the Parliament was formed by each of

the two government parties, which ruled the country and organised the parliamentary elections alternatively” (Dogan, 1946, p. 108). Likewise, Dogan clearly admitted that: “we can say that we are facing a political system that can be characterised as government rotation in a parliamentary form” (Dogan, 1946, p. 110).

Moreover, the conservative leader Titu Maiorescu reflected that the liberal government formed in 1895, lead by D. A. Sturdza, could not be considered a *personal government* but, “*on the contrary, it is my duty to admit that it was a government that was correct from the constitutional point of view*” (Maiorescu, 2003, p. 65); little by little, the phrase *personal government* became a useless instrument in the political strife – especially after the introduction of the organised alternation of the two parties, the National Liberal Party and the Conservative Party.

Along time, the stabilization of the two-party system became a visible certitude of the age. The conservative newspaper *Timpul (The Time)* highlighted this aspect in 1899: “*we, the conservatives, inaugurated the beneficial system of the natural alternation of the parties in assuming state leadership without violent movements, through the intervention of the Crown*” (“*Pretențiune absurdă*” (“*Absurd Demand*”), 1899).

### **The relationship between the electoral system and the two-party system**

A clearly positive result was the gradual education of the political body within the political regime - the voters started having a certain experience after these elections that allowed them to consciously provide their vote to one of the two parties especially after the consolidation of the government alternation between the National Liberal Party and the Conservative Party. Most of the citizens were participating only indirectly in the Romanian political life - across demonstrations and public meetings.

In the 1866 Constitution - a liberal one according both to Charles I and the political elite of the time - a series of citizen liberties and rights were stipulated - among them, the freedom of speech, of press etc. (Damean, Oncescu, pp. 172-173). The existence of these citizen rights and liberties lead to the framing of a liberal regime in full swing of democratisation.

The conservative political leader Titu Maiorescu considered that: “*the voters did not understand the utility they could obtain from the formation of personal convictions and from the experience of the suffrage because the governments did not have enough wisdom to reduce the pressure and start educating the electoral body from above*” (Maiorescu, 2003, p. 11). The same leader admitted nevertheless that, after 1903, “*in the third Sturdza cabinet, when Vasile Lascarescu held the office of the minister of domestic affairs, the vote of the electors started being independent from the administration*” (Maiorescu, 2003, p. 12).

Concerning the electoral system, Eugeniu Stătescu highlighted the importance of the political education of the citizens: *“it was only through political education and the gradual improvement of the cultural level and of the public morality of the nation that they could bring about a significant improvement in this respect”* (Stătescu, 1886, p. 11); this outcome was attained little by little.

The suffrage, although restricted during that age, “contributed, from prince Cuza onwards, to the political education of the nation and created a progressive maturity of the voters and a better knowledge of the people and of the rules of the modern politics. It also stimulated a better organisation of the political parties and an improvement of their inner structure” (Scurtu, Bulei, 1990, p. 96). The relationship between the electoral system and the two-party system favoured the construction process of the two government parties, the National Liberal Party and the Conservative Party.

In order to accomplish its government programme and to achieve the necessary reforms, the government party needed a clear electoral victory; thus, *“as long as the majorities were not impressive, the government could not work and the voters could see the consequences”* (*“Perdere de timp”* (*“Waste of Time”*), 1899).

### **The need of change regarding the electoral system in that period**

The two-party system, although accepted and supported by the majority of the politicians of the time, was nevertheless contested in some points by some of these politicians, who were wondering whether it truly corresponded to the country’s necessities and whether a major change was not needed; such questions were particularly visible after the end of the 19<sup>th</sup> century.

In this sense, the liberal Vintilă Brătianu considered that a change of the party system was necessary and that it could be done through the introduction of the universal suffrage. He was firmly convinced that *“it was only through an electoral reform, that could bring together all the citizens of the country, without electoral census or professional colleges, that the state could find the support it needed and a strong shield against the damaging action of any political party that was not conscious of its duty”* (Brătianu, 1913, pp. 51-52). But the wish of such politicians was accomplished only after the First World War (WWI) when the census suffrage was changed with the universal male suffrage (the electoral law of 1918 was the one that stipulated this type of suffrage).

Some liberals reflected that it was necessary to impose an extension of the electoral body, given the domestic situation of the country (see the tensions generated in the political life by the electoral problem) and the events in other countries (which, in 1914, already had the universal male

suffrage). *“There are many people in the liberal party who did not cease denouncing the injustice and the lack of sincerity that underlie our electoral regime. It is an unjust regime because a census minority decides for the entire people; it is a regime that lacks political sincerity because, in the restricted colleges, both governmental pressure and corruption can operate; and no matter how much we would guarantee the secret vote, it is a fact /.../ that in the numerically restricted colleges /.../ the coalition interests of a privileged minority can get before the general interests of the state”*; from this motive, *“it is us, the liberal party, that should achieve a wide and democratic reform of the electoral law as soon as possible”* (Speech of the deputy Dr. I. G. Radovici, 1904, p. 173) (which was nevertheless achieved only after the First World War - WWI; the first elections after the introduction of the universal suffrage were those in 1919).

The dissatisfactions regarding the electoral system were quite many, but they did not create an important current of mobilization or change because most of the politicians considered it useful to maintain the census vote since it favoured the two-party system. The electoral *modus operandi* was preserved throughout that age even if some changes regarding the electoral law did exist (in 1903, 1906, 1907) - they were nevertheless related more to the electoral procedure than to the law itself (Radu, 2005, p. 29).

Direct criticism came from Nicolae Iorga, who asserted that the Romanian state was *“the most backward regarding the participation of the citizens in the political life. Beyond our border, people participate to the general life of their countries to a larger extent. Thus, Austria introduced the universal suffrage, Hungary is just preparing it /.../ Beyond the Prut river, the peasants participate in the political life of the country to a greater extent”* (Iorga, 1939, pp. 63-64).

The electoral *modus operandi* (the majority vote in only one voting term) did not support the minor parties, but invariably lead to the formation and maintaining of a two-party system, which permitted the maintaining and the consolidation of the government alternation of the National Liberal Party and the Conservative Party.

### **An analysis concerning the number of inhabitants in relation to literacy**

A contemporary of Charles I, the sociologist Leonida Colescu, made a generous analysis of the number of inhabitants as related to the degree of literacy in the Romanian society. Furthermore, in Romania, in 1899, we can remark that the population was of approximately 6 million inhabitants, out of which only 22% could read, while in comparison, in 1912, there were around 7,2 million inhabitants, out of which 39% could read (Colescu, 1947, p. X). In contrast, we observe that in other European countries concerning the illiterate, the percentages in 1910-1911 were considerable different: in

Portugal 69,7%, in Italy, 37,6%, in Hungary 33,3%, in Austria 16,5% (Colescu, 1915, pp. 33-34).

According to the comprehensive study of L. Colescu, we can perceive nevertheless that “the increase in the number of voters from one period to another was inferior to the increase in the population” (Colescu, 1915, p. 36).

### **The ending of the mechanism of the government alternation**

The death of king Charles I and the break of the First World War hurried the dissolution of the system created by the monarch. After the introduction of the universal male suffrage, the party system itself changed. Out of the two government parties, the only one which adapted to the new political life was the National Liberal Party. Its political adversary, the Conservative Party, slowly disappeared from the political platform, having weaker and weaker electoral results and being in the end dissolved.

The electoral system ensured the power alternation of the liberals and the conservatives and the stabilization of the two-party system during the last stage of the reign of Charles I (1895-1914) brought political stability.

### **Conclusion:**

Throughout that period, the political life of the country, with both its drawbacks and its positive aspects, permitted the delineation of a liberal political regime, on its way to democratisation, thus a major preoccupation of the political elite and of the prince (later the king) Charles I to initiate a process of reform in the Romanian state being observed.

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## The Rights of Children in the EU\*

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### Abstract

The European Communities (later EU) were primary an economic integration and the EEC Treaty (1957) had no specific provisions neither on the rights of children nor on human rights in general. The rights of children were neglected for a long time. The rights of child in the EU were for recognized the first time in the field of free movement rules. Later, the children's rights emerged in the area of freedom, security and justice (FSJ) in terms of protection of children from trafficking and sexual exploitation of violence. The legal protection of children was based on the concept of the child as a vulnerable and passive person – an object. The aim of this paper is to give an overview of the evolution of the rights of children in the EU. The paper shall first examine the evolution of the rights of children in the context of the freedom of movement. Secondly, it shall present legal protection of child in the area of freedom, security and justice. Thirdly, it shall consider the child in the context of EU Citizenship under which they were perceived as citizens *in statu nascendi*. Fourthly, it shall consider the child in the context of human rights protection with special reference to the Charter of Fundamental Rights of the EU. Fifthly, it shall discuss whether the Lisbon Treaty could be the basis for the adoption and development of the ‘EU children policy’ which should ensure that the best interest of the child be taken into account in all policies of the EU. Finally, we will deal with the rights the children of migrants. In the last chapter we will briefly mention the rights of children of immigrants and children as (or of) asylum seekers. This is a ‘burning’ issue in the EU.

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**Keywords:** European Union, Children, Charter of Fundamental Rights of the EU, EU citizenship, migrants, Asylum

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## **Introduction**

The European Communities (later EU) were primarily an economic integration and the EEC Treaty (1957) had no specific provisions neither on the rights of children nor on human rights in general. The rights of children were neglected for a long time.

The rights of child in the EU were recognized for the first time in the field of free movement rules. Later, the children's rights emerged in the Area of Freedom, Security and Justice (FSJ) in terms of protection of children from trafficking and sexual exploitation of violence. The legal protection of children was based on the concept of the child as a vulnerable and passive person – an object.

The aim of this paper is to give an overview of the evolution of the rights of children in the EU. Initially, that protection was based on the perception of the child as a mere object and instrument for achieving freedom of movement; the notion of children as passive subjects of protection from violence and trafficking and finally the today's recognition of their independent rights. For that purpose, the paper shall first examine the evolution of the rights of children in the context of the freedom of movement. Secondly, it shall present legal protection of the child in the Area of Freedom, Security and Justice. Thirdly, it shall consider the child in the context of EU Citizenship under which they were perceived as citizens *in statu nascendi*. Fourthly, it shall consider the child in the context of human rights protection with special reference to the Charter of Fundamental Rights of the EU. Fifthly, it shall discuss whether the Lisbon Treaty could be the basis for the adoption and development of the "EU children policy" which should ensure that the best interest of the child be taken into account in all policies of the EU. The last chapter deals with the rights of children of immigrants and children as (or of) asylum seekers, after which a conclusion shall be reached.

## **I The child in the context of free movement rules**

The freedom of movement of workers is one of the four basic freedoms that aim at establishing a common market.<sup>4</sup> The concept of the freedom of movement originated from the idea that the workers circulate freely where there is a shortage of respective work force. Thus, the aim is the optimal allocation of resources. Seeing as how children are not workers, they were not in the focus of interest of the Community (Ackers/Stalford, 2004, p.

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<sup>4</sup> Art. 26(1) TFEU (ex. Art. 14(2)): "The Union shall adopt measures with the aim of establishing or ensuring the functioning of the internal market, in accordance with the relevant provisions of the Treaties".

6). What is more, the emphasis on economic aspects in the Founding Treaties<sup>5</sup> disregarded interests and rights of children.<sup>6</sup>

The freedom of movement for workers failed to meet the expectations in practice. This was the case in part due to language and cultural barriers, but a very important reason that affected the decision on mobility was the (in)ability of the workers to bring their families with them (Ackers/Stalford, 2004, p. 3). The "Treaty founders" disregarded one important fact – the worker is not merely a resource for production, but rather a social being above all. It was therefore necessary that workers and their families be conferred certain rights in order to encourage them to mobility (Goldner Lang, 2005, p. 163-164). Interventions in this regard were made into secondary EU legislation. Even though rights were conferred upon children for the first time in the field of freedom of movement, they were conferred with the aim of encouraging greater mobility of workers. Children in this context were merely an instrument for the achieving of freedom of movement, i.e. a means for ensuring success of the common market project (McGlynn, 2006, p. 46). Children were mentioned in the context of certain social rights and the right to family reunification, whereas the rights of children were only incidental in the evolution of the right of their parents-workers (Ackers/Stalford, 2004, p. 5). Two important instruments that regulate the rights of workers and their family members are Regulation 1612/68<sup>7</sup> on freedom of movement for workers and their family members that was partially amended by Directive 2004/38<sup>8</sup> and Regulation 1408/71<sup>9</sup> on the coordination of the social security system.

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<sup>5</sup> The Treaty establishing the European Coal and Steel Community (1951), the Treaty establishing the European Economic Community (1957) and the Treaty establishing the European Atomic Energy Community (1957).

<sup>6</sup> One possible justification of the omitting of the rights of children in EU legal regulation lies in the lack of competence based on the founding treaties, the issue of the sovereignty of Member States in this field and respecting the principle of subsidiarity. See: Ackers/Stalford, 2004, p. 6.

<sup>7</sup> Regulation (EEC) No 1612/68 OF THE COUNCIL of 15 October 1968 on freedom of movement for workers within the Community, OJ L 257, 19.10.1968

<sup>8</sup> European Parliament and Council Directive 2004/38/EC of 29 April 2004 on the right of citizens of the Union and their family members to move and reside freely within the territory of the Member States amending Regulation (EEC) No 1612/68 and repealing Directives

<sup>9</sup> Regulation (EEC) No 1408/71 of the Council of 14 June 1971 on the application of social security schemes to employed persons and their families moving within the Community, OJ L 323, 13.12.1996. Consolidated version available at: <http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1971/R/01971R1408-20060428-en.pdf>. New (revised) regulation has been adopted - Regulation (EC) No 883/2004 of the European Parliament and of the Council of 29 April 2004 on the coordination of social security systems.

Below, the child will be defined as a term in the context of provisions on the freedom of movement, followed by a short overview of rights that were conferred upon children and other workers' family members in this context.

### **The definition of the "child" in the EU Law**

While Article 10 of Regulation 1612/68 defines children as descendants under the age of 21 years or dependents, in defining the family as a term Regulation 1408/71 calls to national legislation that regulates the subject matter (Ackers/Stalford, 2004, p. 72). Aside from the different definitions, the traditional understanding of the family was also an issue. Thus the definition of the child under Art. 10 to Regulation 1612/68 included only the children of both spouses.<sup>10</sup> In the case of *Baumbast*<sup>11</sup>, the Court of Justice of the EU (hereinafter: the CJEU) broadened the definition by including stepchildren<sup>12</sup>. The new Council Directive 2004/38 formally confirmed this view of the CJEU.<sup>13</sup> However, the provision on direct descendants is not completely clear, causing doubt in terms of adopted children and children born via artificial insemination (McGlynn, 2006, p. 47).<sup>14</sup> The traditional notion of family and children in the legislation precluded the option of children to use their independency and autonomy (McGlynn, 2006, p. 46). The CJEU broadened the scope and the concept of the rights of the child to a maximum even though it itself is limited in its own competence.<sup>15</sup>

### **The rights of the child in the context of free movement rules**

As regards the material rights of the child, the worker was awarded **certain social and tax advantages**, i.e. benefits under Article 7(2) to

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<sup>10</sup> Thus, for example, children born in cohabitation (i.e. civil union) had lesser rights because – as the CJEU stated in the case *Netherlands v. Reed*, 59/85, ECLI:EU:C:1986:157 ECR: "the term spouse refers to a marital relationship only". However, see Art. 2 to Directive 2004/38.

<sup>11</sup> See case: *Baumbast and R v. Secretary of State for the Home Department*, C-413/99, ECLI:EU:C:2002:493.

<sup>12</sup> Under the term *family*, Directive 2004/38 implies a spouse, but also a registered partner, but only if the national legislation treats registered partnerships as equivalent to marriage. Aside from direct descendants of marital spouses, the new directive includes children of both spouses with a registered partner and/or the child of a spouse or registered partner, i.e. the stepchild, but with the condition of dependency. See Art. 2 of the European Parliament and Council Directive 2004/38/EC of 29 April 2004 on the right of citizens of the Union and their family members to move and reside freely within the territory of the Member States

<sup>13</sup> *Ibid.*

<sup>14</sup> Therefore, even though the child as a term is broad enough in the new directive, due to the still-present traditional understanding of the family as a term it will have limited scope.

<sup>15</sup> See Art. 5 TEU (ex. Art. 5 TEC).

Regulation 1612/68.<sup>16</sup> The conferring of new rights is a consequence of the shift in the orientation of the Union from a purely economic to a social community.<sup>17</sup> Still, the movement, i.e. the cross-border element remained a requisite<sup>18</sup> and the rights of the children continued to be parasitic in relation to workers. The ultimate goal of the conferring certain rights on children retained its economic grounds although the autonomy of the rights of the child became more and more recognized, primarily through the practice and interpretation of the CJEU.

In practice, it was precisely child education-related issues that frequently affected the workers' decision to move to a different state. On the other hand, education is the key dimension in the development of the European immigration policy. School may be viewed as a unit of the new heterogeneous European society (Ackers/Stalford, 2004, pp. 200-260).<sup>19</sup> The child must adapt to a new environment and different cultural, social and language differences. Therefore, its experience with the educational system of the host is very important. Even though the then-TEC did not mention education as a part of the social policy of the Union, it guaranteed the right of the child to *vocational training*.<sup>20</sup> The first explicit reference of Community law to education is that in Art. 12 to Regulation 1612/68 prescribing that child shall have the right of access to the educational system "*under the same conditions as the nationals of that State*,"<sup>21</sup> whereby it covers all types and levels of education. Together with a more broad interpretation of Art. 7(2) to Regulation 1612/68, Article 12 contributes to progression so that the right of the child to education is almost an independent right.<sup>22</sup> In terms of further strengthening of the rights of the

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<sup>16</sup> For instance, in the case: Anita Cristini v Société nationale des chemins de fer français, C-32/75, ECLI:EU:C:1975:120, the CJEU broadened this term and made it applicable even to railway ticket price benefits. In certain cases, the CJEU put childbirth and unemployment benefits under the scope of Art. 7(2).

<sup>17</sup> In 1986, the so-called Agreement on Social Policy was signed, but with the opt-out of Great Britain. The 1997 Amsterdam Treaty incorporated the Agreement into the primary law of the Community.

<sup>18</sup> The Regulation is not only applicable to purely internal situations or third-country nationals, which results in children who are not nationals of an EU Member State are in a different position with substantial disadvantage.

<sup>19</sup> The existence of the so-called international schools (for foreign nationals) indicates the denial of the possibility of child integration in the educational system of the host state.

<sup>20</sup> See Art. 35 TEC (consolidated version).

<sup>21</sup> In the case *Brown*, the CJEU however refused to recognize the student's independent right to education (pursuant to Art. 12 to the Regulation), who was a French national, but whose parents had never lived in Great Britain where he wanted to study. See case: *Steven Malcolm Brown v The Secretary of State for Scotland*, C-197/86, ECLI:EU:C:1988:323.

<sup>22</sup> Relevant in terms of education is also the Directive 77/486/EEC on the education of the children of migrant workers. However, it is not the subject of interest of this paper.

child for which the CJEU is meritorious, certain cases are extremely important and include *Echternach and Moritz*<sup>23</sup>, *Lubor-Gaal*<sup>24</sup> and aforementioned *Baumbast*.<sup>25</sup> Readers should refer to these cases.

Without the right to *family reunification* there would be no interest in migration whatsoever. This right serves the complete integration of workers in the new working and living environment. In accordance with Article 10 to Regulation 1612/68, irrespective of nationality, the right to install oneself with the worker is of the spouse and their descendants who are under the age of 21 and other dependent relatives in the ascending line of the worker and his spouse. The condition is that the worker has adequate housing, but they do not have to be living under the same roof. The new Directive extended this right to registered partners as well.<sup>26</sup> The case law of the CJEU evolved in the direction of recognizing the right to family reunification as a fundamental right of all EU citizens. The adopting of the so-called "*Family Reunification Directive*",<sup>27</sup> the right to move and reside freely within EU territory was extended to third-country nationals as well (McGlynn, 2006, p. 54; Petrašević, 2009, p. 281).

Despite the existence of certain positive developments and efforts of the CJEU to confer certain rights on children – children's rights *per se*, it appears that the child remains a mere figurehead in the game of market competition and a dependent member of the family (McGlynn, 2006, p. 47). Children continue to be passive beneficiaries whose status is derived from the status of their parents: marital status, employment and similar (McGlynn, 2006, p. 49).

## II The child in the area of freedom, security and justice

The term Area of Freedom, Security and Justice (hereinafter: FSJ) appeared for the first time in the Treaty of Amsterdam. Listed as one of the goals of the Union is its evolution from the former area without internal borders into the FSJ,<sup>28</sup> which also marks a new step in the development of the Union by its transition from a predominantly economic and monetary

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<sup>23</sup> See case: *G. B. C. Echternach and A. Moritz v Minister van Onderwijs en Wetenschappen*, Joined cases 389/87 and 390/87, CLI:EU:C:1989:130.

<sup>24</sup> See case: *Landesamt für Ausbildungsförderung Nordrhein-Westfalen v Lubor Gaal*, C-7/94, ECLI:EU:C:1995:118.

<sup>25</sup> See case: *Baumbast*, op. cit. n. 8. See comment on the case in: Ackers/Stalford, 2004, p. 94.

<sup>26</sup> European Parliament and Council Directive 2004/38/EC of 29 April 2004 on the right of citizens of the Union and their family members to move and reside freely within the territory of the Member States.

<sup>27</sup> Council Directive 2003/86/EC of 22 September 2003, OJ 2003 L 251/12.

<sup>28</sup> See: Art. 2(4) TEU (Amsterdam)

union to a common legal and political order.<sup>29</sup> Today FSJ is Title V to the TFEU. The Treaty of Amsterdam mentions children explicitly for the first time in the EU's primary law in Art. 13 to the TEC that relates to combating discrimination and Art. 29 TEU on intergovernmental measures for combating crime against children. The said articles were the basis for the adoption of measures for the protection of children from trafficking, sexual exploitation and violence. This protection was based on the notion of **children as vulnerable and passive persons** needing protection.

Also important are provisions of Articles 61 and 65 to the TEC that provided the legal basis for the expanding of jurisdiction to the field of family law as well, which had direct consequences on children's rights. It was on the basis of these provisions that 2000 Regulation Brussels II<sup>30</sup> and then Regulation Brussels II bis<sup>31</sup> were adopted.

The urgent preliminary procedure (*the so called PPU – procédure préliminaire d'urgence*)<sup>32</sup> is also of great significance in terms of the protection of rights in the area of FSJ. It could be concluded that the FSJ area is a very productive area within the framework of which a range of child protection measures has been adopted.<sup>33</sup>

### III The child in the context of EU Citizenship

The Maastricht Treaty introduced the concept of EU citizenship in 1992. Any person who is a national of a Member State of the EU is

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<sup>29</sup> It could be said that the Union is starting to take on a human form and no longer the purely economic. See: Đurđević, Zlata, *Pravda, sloboda i sigurnost, Pravo azila*, No. 1/2006.

<sup>30</sup> Regulation Brussels II on jurisdiction, recognition and enforcement in matrimonial and matters of parental care for children of both spouses. Regulation Brussels II was preceded by the 1998 European Convention on jurisdiction and the recognition and enforcement of judgments in family matters. However, pursuant to the Treaty of Amsterdam, the 2000 Convention was transformed into a binding instrument of the Union – a regulation. See: Rešetar, 2008, pp. 224-258.

<sup>31</sup> Regulation Brussels II bis on jurisdiction and the recognition and enforcement of judgments in matrimonial matters and the matters of parental responsibility. The harshest criticism said that it related only to children of both spouses so that children from other unions did not enjoy the same level of protection. Criticized in this sense was also the insufficient protection of the child's welfare in procedures for termination of marriage, which was a consequence of a traditional way of viewing marriage and divorce as an adult-related matter that is only of marginal significance to children. See: Rešetar, 2008, pp. 224-258.

<sup>32</sup> See: Council Decision of 20 December 2007 amending the Protocol on the Statute of the Court of Justice, 2008/79/EC, Euratom, OJ L-24/42. More in: Petrašević T., 2012, pp. 793-807.

<sup>33</sup> A more detailed, but not complete list of measures can be found at: [http://ec.europa.eu/justice\\_home/fsj/children/docs/table\\_rights\\_vs\\_policies.xls](http://ec.europa.eu/justice_home/fsj/children/docs/table_rights_vs_policies.xls) (accessed on 5.4.2016).

considered a citizen of the EU.<sup>34</sup> In practice this means that the protection of children who are not “full” EU citizens is very limited (Ruxton, Report, 2005, p. 16).<sup>35</sup> Furthermore, a review of the list of rights enjoyed by EU citizens shows that they are in fact rights of adults and not rights of children. Children cannot vote or be candidates in elections nor petition the European Parliament or apply to the European Ombudsman.<sup>36</sup> Even though they are allowed to move freely, they are dependent on their parents or other adults. The rights of children are thus placed in the framework of their parents' or families' rights and children are regarded as citizens in *statu nascendi*. (Ackers/Stalford, 2004, p. 5).

The interests of children are still superseded by the economic and working conditions of adult workers and subsumed under the general term of the European family policy (Ackers/Stalford, 2004, p. 6).

Despite children having been recognized as citizens of the EU in theory, in reality their rights remain limited. A positive shift in the development of the rights of children in the context of EU citizenship is seen in the decision of the CJEU in the case *Chen and Zhu*.<sup>37</sup> This judgment went in the direction of recognizing children as fully-fledged EU citizens.

#### **IV The child in the context of human rights protection in the EU**

Even though the Union protected human rights as general principles of law even before the adoption of the Charter of Fundamental Rights of the EU (hereinafter: the Charter),<sup>38</sup> it did not take human rights seriously *per se*, but rather as a means to achieving certain economic goals (McGlynn, 2006, p. 9). It was not until the Charter was adopted that the obligation to protect human rights in the EU was established. The Charter represents a new direction in the development of EU law and represents a shift in the preoccupation of the Union with economic goals and regulating the common market in that it recognizes for the first time the impact of the Union policies to family and children (McGlynn, 2006, p. 18). The Charter refers explicitly to children and their rights in several places. To exemplify, they include: the right to education (Art. 14(3)), the prohibition of discrimination based on age

<sup>34</sup> See Art. 20 to TFEU (ex Art. 17 TEC).

<sup>35</sup> There is thus a different level of protection of children within the EU depending above all on whether they are nationals of an EU Member State or a third country. An entirely different problem is minorities, such as Romani children.

<sup>36</sup> For rights arising from EU nationality see Article 20-25 TFEU.

<sup>37</sup> See case: *Kunqian Catherine Zhu and Man Lavette Chen v Secretary of State for the Home Department*, C-200/02, ECLI:EU:C:2004:639.

<sup>38</sup> For more on general principles see: Petrašević Tunjica, Primjena općih načela prava u praksi Europskog suda pravde, Zbornik radova "Načela i vrijednosti pravnog sistema – norma i praksa, Univerzitet u Istočnom Sarajevu, Pravni fakultet Pale, Pale, 2012.

(Art. 21(1)), the right to express their own view (Art. 24(1)), the best interest of the child (Art. 24(2)), the right to live with both parents (Art. 24(3)), the prohibition of child labor (Art. 32). Article 24 represents a sort of mix of the rights of children. Thus Art. 24(1) proclaims the right of children to express their own view and that it shall be taken into consideration on matters that concern them in accordance with their age and maturity. Article 24(3) guarantees the right to maintain on a regular basis a personal relationship and direct contact with both his and her parents, unless that is contrary to his or her interests. In practice, this right is balanced out with the right to respect for private and family life prescribed by Article 7 to the Charter. This right is important not only for contact in case of the parents' divorce, but also for providing the basis from which the right to freedom of movement and family reunification can be drawn. The rights guaranteed under the Charter recognize the child as an independent subject of EU law with individual interests and needs (McGlynn, 2006, pp. 67-70).

The including of children's rights in the Charter is further confirmation of success in terms of the protection of children's rights on the European (international) level. The child is no longer invisible in EU law. Family and children are no longer purely consumers or an appurtenant of the worker (the father). However, the clear listing of rights is just the first step in the protection and promotion of children's rights. The responsibility to ensure that the rights declared by the Charter are put in practice lies with the national courts as well as the CJEU.

## **V Prospects of development of children's rights in the EU in the context of the Lisbon Treaty**

As already pointed out the introduction, the ability of the Union to regulate the rights of children was limited by the lack of a legal basis in the founding treaties. The Lisbon Treaty introduced (proclaimed) the protection of children's rights as one of the objectives of the internal but also the external policy of the Union.<sup>39</sup> Art. 3(5) of the TEU states: "*In its relations with the wider world, the Union shall uphold and promote its values and interests and contribute to the protection of its citizens. It shall contribute to peace, security, the sustainable development of the Earth, solidarity and mutual respect among peoples, free and fair trade, eradication of poverty and the protection of human rights, in particular the rights of the child [...].*" This provision represents a significant turn of the EU policy toward children and the basis for the adoption of effective measures that will ensure that children's rights with a view to *the best interest of the child* are taken

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<sup>39</sup> See Art. 3 TEU. The consolidated version of the Lisbon Treaty is available at: [http://europa.eu/lisbon\\_treaty/full\\_text/index\\_en.htm](http://europa.eu/lisbon_treaty/full_text/index_en.htm)

into account in all policies of the Union when these policies might have an impact on children. The Lisbon Treaty finally recognized the impact of certain policies of the Union on the rights of children.<sup>40</sup> In doing so, the Lisbon Treaty did not create new powers for the EU, but rather provided that in the areas where the EU already has competence certain measures be taken to protect the rights of children.

The conclusion may be that the Lisbon Treaty represents a significant step forward in the protection and promotion of children's rights as well as a potential basis for the creation of the so-called *children policy*, which of course requires sufficient political will.

## **VI The rights of children of immigrants and asylum seekers**

Children who are not nationals of an EU Member State have a different and significantly less favorable position. The decision of the CJEU in the case *Chen and Zhu*<sup>41</sup> has already been pointed out as a step forward in the development of children's rights. In the case, the Court decided that Catherine Chen as an EU national has the right to move freely throughout the EU and that denying a residence permit to her parents and especially to her mother would be contrary to the law of the Union itself seeing as how Catherine was not able to take care of herself. However, the child concerned is an EU citizen and has Irish citizenship.

This begs the question of children of third-country nationals who are residing in EU territory with their parents, the children of asylum seekers and children without parental care who are within EU territory.

The EU has developed a Common immigration policy<sup>42</sup> and established the so-called Common European Asylum System,<sup>43</sup> which applies to children of immigrants and asylum seekers as well. However, the system was designed to function under normal circumstances, i.e. circumstances of a relatively moderate inflow of immigrants and asylum seekers. The (still) current refugee crisis has shown that the entire system does not work and that the Member States do not have a unified position on the issue of refugees. The refugee crisis has had a particularly negative effect on children. It is estimated that at least 10,000 refugee children without guardians disappeared when they arrived in Europe in recent months. It is

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<sup>40</sup> See more at: [http://www.nspcc.org.uk/Inform/policyandpublicaffairs/Europe/Briefings/eu\\_reformtreaty\\_briefing\\_wdf54388.pdf](http://www.nspcc.org.uk/Inform/policyandpublicaffairs/Europe/Briefings/eu_reformtreaty_briefing_wdf54388.pdf)

<sup>41</sup> Op.cit. n. 34.

<sup>42</sup> See more at: [http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/index\\_en.htm](http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/index_en.htm) (access on 7 Apr 2016)

<sup>43</sup> See more at: [http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/asylum/index\\_en.htm](http://ec.europa.eu/dgs/home-affairs/what-we-do/policies/asylum/index_en.htm) (accessed on 7 Apr 2016)

suspected that they have become victims of human trafficking. According to available information, the largest number of children of asylum seekers are in Sweden and a large percentage thereof arrived unaccompanied by parents or guardians.<sup>44</sup> The discussion on the rights of children of immigrants and asylum seekers can be a separate topic for research. The issue has been merely brought up in this paper to attract the attention of the scientific community.

## Conclusion

The paper has given an overview of the evolution of the rights of the child from a mere object and instrument for the achieving of freedom of movement whereby the rights of children were viewed as parasitic and derived from the status of their parents-workers, to passive subjects of protection from violence and trafficking toward independent rights.

The ability of the Union to regulate the rights of children has long been limited by the lack of a legal basis in the founding treaties. Primary emphasis of the founding treaties on the economic aspects left the interests and rights of children neglected for a long time. Positive pressure came from the European (international) children's rights movements, who have pointed out the insufficient protection of children's rights in the Union policy and the lack of effective measures to actively promote and protect children's rights (Ackers/Stalford, 2004, p. 7).

The European Commission adopted in 2006 the "*EU Strategy on the Rights of the Child*"<sup>45</sup> and it is the first ever strategy of the Union for the promotion and protection of children's rights. However, it was not until the Lisbon Treaty that a significant turn of EU policy toward children was brought about. The Lisbon Treaty could serve as a basis for the adoption of the "children policy" and the adoption of effective measures to ensure that children's rights, i.e. the best interests of the child are taken into account in all policies of the Union.<sup>46</sup>

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<sup>44</sup> See mora at:

<http://balkans.aljazeera.net/vijesti/djeca-bez-starateljja-traze-azil-u-svedskoj> (accessed on 7 Apr 2016)

<sup>45</sup> See: Towards an EU Strategy on the Rights of the Child, EN, COM (2006), 367 final, 4 Jul 2006. The basis for the adoption of the strategy was the then Art. 6 TEU. The strategy is based on six goals, whereby each of them supported by a series of actions.

<sup>46</sup> The list of all relevant EU documents relating directly or indirectly to the rights of children may be found in: FRA/CoE, *Handbook on European Law relating to the rights of the children*, 2015, pp. 250-254.

A positive development is also the EU Agenda for the Rights of the Child (2011)<sup>47</sup> that aims to reinforce the full commitment of the EU – as enshrined in the Treaty of Lisbon and the Charter – to promote, protect and fulfill the rights of the child in all relevant EU policies and actions.<sup>48</sup>

To conclude, the position of the child in the EU has improved greatly and today the child is recognized as a subject of EU law. However, this is true for children who are nationals of an EU Member State. In terms of children of third-country nationals (immigrants and asylum seekers), they are in a significantly less favorable position and do not enjoy sufficient protection. There is a serious threat that the many refugee children become victims of violence, sexual exploitation and trafficking.

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<sup>47</sup> See: Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions – An EU Agenda for the Rights of the Child, COM/2011/0060 final

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[http://ec.europa.eu/justice/fundamental-rights/rights-child/eu-agenda/index\\_en.htm](http://ec.europa.eu/justice/fundamental-rights/rights-child/eu-agenda/index_en.htm)  
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# Social Networking Interaction In Foreign Language Teaching To Non-Linguistic Learners

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## Abstract

This study investigates the practical experience of using social networking interaction for educational purposes. The feedback elicited from 82 members of the social networking “closed” “Flyingcats English” group was analyzed. The main findings reveal that social networking interaction allows to achieve certain teaching goals and meet learning needs of the digital generation of learners. Social networking interaction supplements the face-to-face classes and accumulates the best features of the Blended Learning technology such as round-the-clock and round-the-world availability and accessibility of training materials, ease of usage, enhancement of learning strategies and self-organization, increase of learners’ autonomy, eco-friendliness. The study highlighted that social networking interaction is able to perform informative, managerial, communicative, instructional, training, creative, productive, promotional, and inspirational functions. In summary, social networking interaction turns out to be a powerful motivational tool which encourages extrinsically motivated learners to become interested in improving skills and enhancing foreign language competence. The study found that an increase of the teacher’s time spent on electronic materials development and online activities represents a relative inconvenience of using social networks for educational purposes. Although, this inconvenience can be compensated by the fact that a great number of the teacher-made materials appear to be Reusable Learning Objects and can be used on a long term basis.

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**Keywords:** Social networking interaction, blended learning, intrinsic motivation, extrinsic motivation

## Introduction

Nowadays, foreign language education is facing a number of formidable challenges like academic mobility of specialists, life-long learning necessity, relative stagnation of traditional classroom education,

increased learners' demands, lack of learners' motivation, need for novelty of instruction, educational use of electronic devices, etc. Current net generation learners are not satisfied with the classical classroom training any more. They want to be educated in an engaging, inspirational, motivational and interactive environment. To withstand and survive the current situation, social networking interaction is being implemented in English language teaching to non-linguistic higher education students of the Institute of Chemistry and Biology (the ICB) of Immanuel Kant Baltic Federal University (the IKBFU), Kaliningrad, Russia. Traditional face-to-face lessons are supplemented with digital interaction of the teacher and students by means of the "Flyingcats English" group created on the platform of the popular social network vk.com. The theoretical basis of the "Flyingcats English" group formation and the analysis of its practical effectiveness are presented in the paper.

### **Theoretical basis**

In order to develop a workable interactive educational environment on the Internet, the creators of the "Flyingcats English" group concentrate on certain theoretical concepts which proved to be essential for meeting learning needs of the digital generation.

Firstly, the "Flyingcats English" group is based on the blended learning approach which is "a combination of face-to-face delivery with eLearning activities" (Arshavskiy, 2013, p. 6).

Secondly, the "Flyingcats English" group bears the features of asynchronous eLearning which is self-paced and allows learners to go through the training materials "as quickly or as slowly as they desire at their convenience" (Arshavskiy, 2013, p. 5). Podcasts, forums, blogs, net publics, and wikis are the most preferable asynchronous networking tools used by modern learners.

Thirdly, the "Flyingcats English" group realizes the importance of the person's motivation for successful studies. According to Marina Arshavskiy, a seasoned instructional designer, there are different types of motivation. Intrinsically motivated learners are inspired by internal drivers and enjoy learning. While extrinsically motivated learners are inspired by external drivers and are aimed at getting certificates and good grades rather than acquiring skills (Arshavskiy, 2013, p. 32). As the "Flyingcats English" Group addresses non-linguistic learners, the problem of their motivation is absolutely vital. Oftentimes, the majority of such learners is extrinsically motivated, that is why the format and content of their education must be a matter of particular consideration.

Fourthly, successful training is impossible without meeting learners' psychological needs. According to Abraham Maslow's hierarchy of needs,

effective education only takes place in a safe environment where needs for belongingness, self-esteem, and self-actualization are satisfied (Maslow, 1943). Learners must know that they are the part of the community, that they are respected, and that they can pass their own remarks revealing their individuality. Admitting the crucial role of learners' inner needs, the "Flyingcats English" group aims to create a comfortable environment in which learners feel free to share their opinions, ask questions and be sure to receive prompt and supportive feedback in return.

Fifthly, recognizing the priority of performance over training principle, the "Flyingcats English" group offers a number of practical activities to be fulfilled by their participants. These activities address learners' personal experience and allow them "to apply their new knowledge and skills to real-life situations" (Arshavskiy, 2013, p. 34). Such tasks as photo projects, blog writing and presentation making are particularly enjoyed by teenage learners because they give them an opportunity to express their personality and creativity.

Last but not least, educational interaction is a two-way process. It should be beneficial not only to students, but also to the teacher, who devotes a great deal of time to developing the training content. One of the most meaningful positive aspects of networking educational interaction is that it makes possible for teachers to create and use training components which are known as Reusable Training Objects. They are "designed as standalone objects" (Arshavskiy, 2013, p. 102) and can be used in different teaching contexts during long periods of time. All the materials made by the "Flyingcats English" group are the unique author's products. They are created using the same style, and they bear the recognizable logo of the "Flyingcats English" group. A large proportion of training materials developed by the "Flyingcats English" group are Reusable Training Objects. The "Flyingcats English" group's Reusable Training Objects include materials devoted to mastering grammar, vocabulary, the IKBFU's history, the ICB's history, the UK's traditions, etc. Time spent on their development is repaid by their long term use. Moreover, the upgrade of the existing Reusable Training Objects takes far less time than the creation of the new ones.

### **Practical effectiveness analysis**

#### **"Flyingcats English" group description**

The "Flyingcats English" group was created on the popular social networking platform vk.com in 2012 for students of Dr. Irina Ostroverkhaia, PhD in Linguistics. The privacy setting of the group is "Closed" that is its content can be seen and used only by its current members. The goal of the group is to assist and to inspire the training process of non-linguistic students

of the ICB of the IKBFU. The “Flyingcats English” group provides an electronic support to face-to-face university classes. The recognizable logo of the “Flyingcats English” group depicts two winged cats looking at each other. The slogan of the group reads, “Flyingcats English”: coming off with Flying Colours”. For the time being (March 2016), there are 110 group members, including 1 teacher-administrator, 92 current students and 17 former students who proved to be active after finishing their university English language course. The rotation of members takes place after each term. About 80% of the group members have extrinsic motivation for learning English because their priority is getting a university degree in Chemistry or Biology rather than developing and enhancing language skills. The members’ level of English skills varies from Pre-Intermediate (A2 according to the CEFR) to Intermediate (B1 according to the CEFR).

### **Survey details**

In order to evaluate the effectiveness of the social networking interaction in the English language teaching to non-linguistic learners, the online survey was conducted in March 2016. The 3 open-ended questions were included into the survey:

- (1) Is the social networking “Flyingcats English” group an effective way of educational interaction and why?
- (2) Are there any inconveniences about the “Flyingcats English” group?
- (3) What would you like to improve in the “Flyingcats English” group?

The questions were posted on the Wall of the “Flyingcats English” group. Participants were asked to send their answers by a personal message to the teacher. Within 3 days, the feedback came from 82 participants (including 69 current students and 13 former students) which makes about 75% of the group members. The analysis of the members’ feedback allowed to identify advantages, inconveniences, and prospects for further development. The findings of the survey are presented below.

### **Advantages**

The advantages of the “Flyingcats English” group are determined by its activities which are carried out in the online “rooms” because they accumulate certain resources combined by mutual purposes. The “Flyingcats English” group functions as *Info-Room*, *Study-Room*, *Work-Room*, *Show-Room*, and *Play-Room*.

**Info-Room** performs informative, managerial, and communicative functions. It contains *Discussions* listing tasks which must be done by learners of a particular speciality and course while preparing for the

forthcoming face-to-face classes; *Wall Announcements* providing information about the common events like Olympiads, changes in the schedule, and group quizzes; *Hot Line* allowing to ask questions and receive quick replies from the teacher and members of the group. Info-Room helps the teacher to manage the training process. It also assists students in organizing their learning as they are taught to meet deadlines for completion and become more organized. *The respondents wrote*, “It is always easy to find information about the homework in the group, and it is a very useful format” (Respondent 32); “With the help of this group we always exactly know what we must prepare for the next lesson” (Respondent 10); “You don’t need to annoy your classmates by asking them about the homework if you miss the lesson. All navigation is perfectly clear” (Respondent 77); “We can ask questions to our teacher if something is unclear. This is a very good connection of students and the teacher” (Respondent 17); “The group is cool. I’ve never seen that before. You can ask questions online. There is the community of students who are eager to help” (Respondent 80); “The group helps us to interact with the teacher” (Respondent 59); “I’m satisfied with the group. It is always possible to learn about some events and other useful and interesting things in time” (Respondent 28).

**Study-Room** performs instructional and training functions. It contains *Electronic Resources* supplementing face-to-face classes and allowing learners to enhance their language competence; *Useful Links* to free authentic Internet resources for learning English; *Training Manuals* helping to master English for Specific Purposes in the fields of Biology and Chemistry. Study-Room promotes learners’ autonomy and independence because learners have an opportunity to work at their own pace using the online resources which are easily accessible 24 hours a day, 7 days a week, from any point having access to the Internet. One more obvious advantage of social networking interaction is its paperless and environmentally friendly nature thanks to the fact that all the resources made by the “Flyingcats English” group are freely downloadable onto learners’ personal computers, tablets, and smartphones. *The respondents wrote*, “The group “Flyingcats English” is our “education material”. It helps me very much because I can download any file to my phone and use it for studies. It saves money for copies=)))) And helps to preserve the environment too)) (Respondent 19); “Here we may always find everything we need: grammar tables, rules, worksheets, presentations and so on. We know that our teacher creates these materials specially for us. She wants us to improve our skills. It’s an excellent group!!! With soul and love!!!♥ (Respondent 56); “It’s brilliant that there are electronic word-building tables and exercises in the group. They help me to enrich my vocabulary and lexicon” (Respondent 47); “I enjoy colorful presentations that help you better learn the traditions and customs of the British”

(Respondent 41); “Thematic presentations make information more understandable” (Respondent 63); “One of the best benefits of the “Flyingcats English” is that it has lots of useful materials concerning our specialization. The group helps us to learn professional English” (Respondent 75); “The group “Flyingcats English” is great! It contains useful links to the websites, which help to prepare for different Cambridge exams (PET, FCE, etc.)” (Respondent 78); “The “Flyingcats English” helps to find links to great resources for studying English (for example Spotlight Radio English). I can structure my knowledge with the help of clear tables and English-Russian examples” (Respondent 38); “Training material is always accessible in the group. There we can find different interesting presentations and even jokes in English. It is very convenient to have useful links in one place. Thank you very much for the group “Flyingcats English”:))” (Respondent 27).

**Work-Room** performs creative and productive functions. It contains *Step-by-Step Instructions* for making projects; *Requirements* for making presentations; *Blog Writing Tasks*. Work-Room activities are aimed at learners’ practical performance and creating a real product. The most distinctive feature of making such products is combination of writing skills, visualization, and creativity. Its philosophy is “Learning by Doing”. The products developed by learners testify the level of the learners’ confidence in foreign language acquisition. The learners’ feedback highlights that product creation is the most favourite and enjoyable type of activity. *The respondents wrote*, “Photo projects are my favourite ones. I can express my inner self by making them” (Respondent 29); “Writing blogs is awesome! I can tell my classmates about the true events of my life” (Respondent 31); “I’m keen on photo projects because I can use my own pictures for learning English” (Respondent 44); “Our teacher often gives creative tasks. This is great for students!” (Respondent 5); “I was on cloud nine when my project “Kaliningrad is ...” won the first prize!” (Respondent 13); “Making projects motivates me to learn something new. If the task is creative, I can use my imagination” (Respondent 9).

**Show-Room** performs a promotional function. It contains *Group Photoalbum* showing the group pictures; *Project Albums* demonstrating the best photo projects made by the group participants; *Student Presentations Discussion* storing the best learners’ presentations. Show-Room is aimed at preserving the “Flyingcats English” group’s history and disseminating the best learners’ experiences. *The respondents wrote*, “Watching projects is fun! It’s interesting to see them because they are made by students for students!” (Respondent 11); “The group makes our studies more interesting and pleasurable because of photos which we show for our projects. I think it is the best alternative to formal way of education” (Respondent 19); “The

group “Flyingcats English” offers a new system of training. Here, we share our projects. I enjoy the relaxed atmosphere of the group. There is no pressure at all” (Respondent 26); “There are a lot of presentations and projects. This creates a pleasant and good atmosphere” (Respondent 70).

**Play-Room** performs an inspirational function. It contains activities which are not related to the formal side of the university course, for example humorous posts, mems, quizzes, open-ended questions, interviews, surveys, videos and audios. Play-Room is aimed at creating a comfortable environment for communication, encouraging students to learn English, making learners feel the part of the community. *The respondents wrote*, “The funny name of the group – “Flyingcats English” – creates the positive atmosphere to study English” (Respondent 43); “As for me, I like everything in the “Flyingcats English”. In the group, there are only my students of the institute and cute cats, which makes us a great team=)” (Respondent 17); “I think it’s a very funny group, connected with English and cats :) The logo is so cute. The motto is interesting too, it helps to learn idioms” (Respondent 24); “Interesting articles, cute cats and friendly atmosphere. It’s cool!” (Respondent 57); “There is a friendly community, cheerful material and cute cats))” (Respondent 42); “Students in the group often joke and it makes me positive” (Respondent 1); “Informative posts and funny pictures create a special atmosphere of comfort in the group” (Respondent 73); “I like that I can see not only educational information in the group, but also holiday greetings and funny pictures including the original group logo” (Respondent 80); “Combination of information and cats is a perfect duet for me. It’s a funny way of studies” (Respondent 32).

### **Inconveniences**

The feedback elicited from the group members proved that the “Flyingcats English” group is beneficial for interaction between students and the teacher. All the respondents unanimously highlighted that there are no inconveniences for learners. The only one inconvenience is the time-consuming nature of the teacher’s work on materials preparation and the group administration, which was mentioned by the 2 respondents. *The respondents wrote*, “The disadvantage of this group is that the teacher has to spend a lot time on preparing useful training materials for students” (Respondent 41); “It must have taken the teacher tons of time to make all these tables and posts” (Respondent 38). As practice shows, this relative teacher’s inconvenience can be compensated by the fact that a great number of the teacher-made materials appear to be Reusable Learning Objects and can be used on a long term basis.

## **Prospects for further development**

Several constructive proposals have been made by participants of the survey. The 3 respondents came up with a very useful suggestion concerning the technical part of the “Flyingcats English” group’s operation. In order to enhance navigation, it is proposed to add hashtags for easier search. *The respondents wrote*, “In my opinion, it would be nice if a search by hashtags were added (Respondent 20); “I think you can use the hashtags for easy search” (Respondent 35); “You can use hashtags to share information on topics” (Respondent 30). The feedback received from 32 respondents contains the word “more”. Learners need “more quizzes” (Respondent 8); “more visual English” (Respondent 10); “more modern slang” (Respondent 11); “more funny posts and jokes” (Respondent 13); “more information about the UK” (Respondent 14); “more surveys, quizzes and puzzles” (Respondent 23); “more interesting photos” (Respondent 24); “more reference materials” (Respondent 33); “more information about modern books for studying English” (Respondent 38); “more competitions” (Respondent 39); “more idioms” (Respondent 45); “more information about chemistry in English” (Respondent 48); “more creative tasks” (Respondent 52); “more interesting biological facts” (Respondent 57); “more contests with prizes” (Respondent 59), “more humorous public” (Respondent 61), etc. Such willingness of respondents to improve the group’s interface and receive more edutainment leads to the conclusion that the “Flyingcats English” group appears to be an effective way of interaction between the teacher and the digital generation of learners.

## **Conclusion**

Implementation of social networking interaction into foreign language teaching to non-linguistic learners proved to be effective and beneficial to both learners and the teacher because it allows to achieve certain teaching goals and meet learning needs of the digital generation of learners. The feedback elicited from the learners showed that social networking interaction supplements the face-to-face classes and accumulates the best features of the blended learning technology such as round-the-clock and round-the-world availability and accessibility of training materials, ease of usage, enhancement of learning strategies and self-organization, increase of learners’ autonomy, eco-friendliness. The study highlighted that social networking interaction is able to perform informative, managerial, communicative, instructional, training, creative, productive, promotional, and inspirational functions. In summary, social networking interaction turns out to be a powerful motivational tool which encourages extrinsically motivated learners to become interested in improving skills and enhancing foreign language competence.

The study found that the increase of the teacher's time spent on electronic materials development and online activities represents the relative inconvenience of using social networks for educational purposes. Although, this inconvenience can be compensated by the fact that a great number of the teacher-made materials appear to be Reusable Learning Objects and can be used on a long term basis.

The effectiveness of using social networking interaction for teaching purposes is best described in the respondent's answer. It reads, "I wish every teacher had such a group for the students" (Respondent 14).

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# **Fostering A Culture Of Collaboration During International Pre-Service Teacher Field Placements: The Power Of Mentor Teachers**

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## **Abstract**

This paper reports the results of an action-research case study that investigated the data submitted over three semesters by participating pre-service teachers in an international field experience. The investigation highlights what the the author has determined to be critical components in the implementation of Social Cohesion and effective mentoring by cooperating Austrian teachers .

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**Keywords:** Mentors, Preservice Teacher Preparation, Social Cohesion, Study Abroad, ESL (English as a Second Language)

## **Introduction**

In any profession, there are a series of “firsts” that each person must partake in. For teachers, common “firsts” may be writing a lesson plan, meeting a new classroom of students or assuming the responsibility of teaching a lesson. Each experience requires the pre-service teacher to see themselves in a leadership position, moving away from the persona of a student and toward the role of practitioner. After working several years with pre-service candidates, the researcher of this paper predicts that it is likely pre-service teachers would admit their most intimidating “first” was meeting their cooperating teacher.

A cooperating teacher is a professional educator who assumes the responsibility of allowing a pre-service teacher to participate in the daily activities of their classroom. Traditionally, cooperating teachers are assigned based on the licensure of the pre-service candidate as opposed to pairing candidates and teachers based on personalities, interests or teaching styles. Thus a cooperating teacher has considerable power in determining the tone and expectations of a pre-service teacher’s field placement. According to Bryk and Schneider (2004), the social and emotional climate of classrooms and schools significantly impacts student engagement and achievement. Effective classroom field placements for pre-service teachers are designed to

foster learning communities that validate, share, and extend prior experience and knowledge (Chassels & Melville, 2009, p.735).

The purpose of this paper is to examine the perceptions and best practices of mentoring that pre-service teachers experienced from their cooperating teachers in Gaming, Austria. Using the framework of Social Cohesion (Heyneman, 2002) and its contributions to culturally relevant teaching in a classroom, this researcher will define examples of how Austrian cooperating teachers used mentoring to enhance their relationships with pre-service teachers and foster Social Cohesion in a classroom community.

### **Background of the Study**

As the population of American classrooms change, so should pre-service teacher preparation programs. Many universities who depend on school partnerships find the location and population of their cooperating schools lack the diversity and ESL (English as a second Language) population needed to train pre-service teachers properly. Stewart and Kagan (2005) suggestion teacher preparation programs (1) invest in international classroom observations that foster cultural immersion for teaching candidates, (2) provide institutional partnerships between international schools, universities and schools of education focusing on an open dialog and (3) establish early childhood professional associations to foster a deeper recognition of the international dimension of content pedagogy (p.241). While Lauvas and Handal (1993) propose integration of theory and practice is more effective when there are strong links between the university and field work (as cited by Löfmark, Morberg, Öhlund & Ilicki, 2009).

Since 2010 in Austria, the international field placement program ELISA (*English Learners in Specialized Atmosphere*) has established field placements with six schools located in the towns of Gaming and Schiebbbs, Austria; placing cooperating teachers with American pre-service teachers for a sixteen week field experience. The focus of the course is to immerse pre-service teachers, who may have not experienced working with diversity and ESL students, in the planning and instruction of english lessons. During each school's designated english instruction, mentoring is provided by the Austrian cooperating teachers using a gradual release of responsibility as the semester progresses. Pre-service teachers are required to participate in required readings focused on culturally relevant teaching prior to leaving for Austria and while in Austria, weekly reflections are submitted to the researcher aligned with state and professional program standards. The second components of the course are discussion board posts and a final paper on the topic of Social Cohesion. In addition, pre-service teachers studying early childhood education are invited to spend the day at the local

kindergarten in Gaming and one video conference is scheduled between the researcher and participants, midway through the semester, to add an synchronous component to the course.

### **Social Cohesion**

Within all school systems there is a culture reflected in the curriculum, school mission, faculty and community. According to Dr. Heyneman (2002), "School culture refers to the rituals embedded in social relationships, ceremonies and traditions that attach members to the school and its mission, and to the norms and beliefs that guide the actions of members" (p. 89). A school's culture is a significant contributing factor within the term Social Cohesion. Social Cohesion as stated by Dr. Heyneman (2002), is "the outcome of assimilating peoples of diverse religions, ethnicities, and social groups into a nation with a common language and values" (p.80). The framework of Social Cohesion is divided into four categories (1) curriculum content, (2) community perceptions of fairness to one's children, (3) procedures available for effective adjudication to members of the school community in order to achieve a consensus over what and how to teach, and (4) the school culture consistent with the curriculum expectations" (Heyneman, 2002, p.86).

Whether in America or abroad, the success of Social Cohesion within a school community is based largely on the implementation by classroom teachers. Classroom teachers hold much power in maintaining unity and equality among all students. Teachers are engaged in the daily decisions of curriculum instruction, they provide fair treatment and acceptance within their classroom and are the liaisons between families and administration: furthermore, teachers are accountable for providing data that supports the success of a school's curriculum standards.

The success of Social Cohesion does not stop with the classroom teacher. In a home or host country, when the addition of a pre-service teacher to a classroom begins, the classroom (cooperating) teacher or mentor teacher shoulders much of the responsibility in defining and acclimating the pre-service teacher to the classroom culture. These cultural identities can be defined as social contracts. Social contracts are the values and metaphysical/ philosophical assumptions of a collective society (Pirili & Pifpirili, 2015, p.253) and the determining factor in the success of Social Cohesion within a school.

"People are more likely to adhere to social contracts under certain conditions. They are more likely to adhere to contracts when they do not consider each other as cultural "strangers" that is, when they have more understanding of each other as people, as citizens of the same country or as citizens of a

“similar” country where it is believed that the same norms and expectations govern social contracts“ (Heyneman, 2002, p. 75).

### **Mentor Teachers**

For students entering the teaching profession, multiple classroom observations and collaboration during teacher training is an essential component to expose pre-service teachers to theory and practice in the classroom. The teacher who is facilitating the classroom experience for the pre-service teacher may be referred to as the cooperating teacher, supervisor, teacher of record or school associate; however, the term mentor is not a common identifier in most educational settings. According to Gagen & Bowie (2005), skills that mentors need include communication, collaboration and evaluation, as well as problem solving and decision making skills (as cited by Ambrosetti, 2014, p.32). For the pre-service teacher, the cooperating teacher or mentor is a liaison providing insights and strategies for successful teaching, meaningful feedback and a culture of trust (Gagen & Bowie, 2005).

Mentor and mentee relationships need to begin with a foundation of communication. Pre-service teachers are not only learning the curriculum but are also expected to teach with little to no experience in the early stages of a teacher preparation program. Mentors must possess the ability to demonstrate active listening of pre-service teacher's concerns and further facilitate opportunities for reflective practice during a classroom placement. Schneider (2008) goes on to define four goals to build a successful relationship (1) mentors should focus candidates' attention to specific features of teaching and share ideas about best practice facilitate growth in student learning, (2) mentors can take an active role in guiding candidates' thinking as they plan lessons, practice teaching and reflect on their experiences. Mentors can structure planning and teaching tasks based on their candidate's learning needs and provide feedback that will encourage reflective thinking, (3) as partners in teacher education, mentors can complement and support the work of university faculty. Mentors can communicate with college faculty to refine tasks for candidates, assess candidate learning, and evaluate candidate progress, (4) as professionals, mentors can continue to refine their understanding of learning and teaching. Mentors can participate as learners as they continue (p.114).

### **Methodology**

This qualitative case study used an action research design to investigate the successful practices of mentoring Austrian teachers to 64 American pre-service teachers, 3 males and 61 females, during three

semesters of field experience. Berg (2007) defines action research as “a method of research in which creating a positive social change is the predominant force driving the investigator and the research” (p. 224). Using Schnieder’s (2008) framework of mentoring, the aim of the researcher was to use data collected from weekly reflections and end of the semester papers to define pre-service teacher’s perceptions of mentoring and examples of how Austrian teachers foster Social Cohesion during a semester field experience. Descriptive pattern coding techniques (Saldana, 2009) were applied to the data.

### **Discussion and Findings**

Prior to reading the work of Heyneman (2002), all 64 participants were not aware of the theory of Social Cohesion; however, it was expressed that after reading the work of the author they could identify examples and understood the importance in both American and Austrian classrooms. Of the four components of Social Cohesion (1) curriculum content, (2) perceptions of fairness to one’s children, (3) adjudication to members of the school community and (4) school culture consistent with the curriculum expectations; most candidates focused on perceptions of fairness to one’s children when reflecting on their classroom experiences. Pre-service candidates gave multiple examples of how Austrian teachers, from kindergarten to vocational training, fostered fairness toward everyone in the classroom. Pre-service candidates cited examples of how curriculum was adapted to meet learners at their ability level noting when Austrian students fell short of the learning objective, Austrian teachers used pedagogical practices such as small group instruction, pull out, peer tutoring and extended review of materials to keep the class on task. It was often expressed by pre-service teachers that the Austrian teachers approach to students in the classroom was firm but kind. Austrian classroom teachers expected all students to come prepared, the classroom teacher was the authoritarian and mutual respect among peers was witnessed in multiple semester postings. Pre-service candidates used words such as equality and advocate when defining their experiences working with and observing teacher to student relationships among the mentor teachers.

During the beginning weeks of the ELISA program, most pre-service teachers serve as a support to the Austrian mentor teacher. Pre-service candidates may perform small group review, assist with conversational English or correct grammar on writing assignments as their first classroom duties. As the pre-service teacher transitions from assisting to teaching, it was expressed in pre-service teacher reflections that Austrian teachers made learning engaging. Most Austrian teachers used games to teach English. When a new lesson was introduced, pre-service teachers described how the

lesson would include a game or hands on activity as part of the formative assessment. Pre-service candidates shared when they took over the classroom instruction, usually in the third week, they strived to imitate the engaging atmosphere created by the Austrian teachers. For many pre-service candidates who chose to use worksheets as a formative assessment, they later commented in reflections that the students were not as engaged or they perceived their teaching wasn't as dynamic as their mentor teacher. Finally, pre-service candidates expressed that the practices of Social Cohesion contributed to their classroom experience by fostering a sense of community and lessened their feelings of being the minority within the majority.

The following are excerpts from pre-service teacher data which highlight perceptions of Social Cohesion in the Austrian classrooms.

Social Cohesion	End of the Semester Excerpts from Pre-Service Teachers
Curriculum Content	<p><i>I had an absolutely wonderful cooperating teacher who really strove to establish an environment conducive to learning. One of the first things that I noticed about her teaching was that she made everything fun. Whether the students were working on math, English or science, she turned everything into a game or an activity where the students genuinely wanted to learn. –A.</i></p> <p><i>One of the first things we did together as a class was participate in a traditional German folk dance. The students were very eager to share a piece of their culture with me. It was a fun icebreaker to start to get to know the students and a great introductory class to start off the school semester.-K.</i></p> <p><i>In the classroom, I was able to view this in multiple small acts that the students did. One that was evident was the need for the students to stand when the teacher walks into the room and to remain standing until she relieves them. Through this simple act, the curriculum guides the Austrian students to show respect for those in authority. –S.</i></p> <p><i>While certain daily activities vary according to season and week, the children seemed extremely well-behaved because their teachers employed a consistency of daily routines and expectations. –K.</i></p> <p><i>The school (Vocational) also fosters social growth by having the girls practice what they are taught in the classroom in the “real world.” The girls go to kindergartens to practice teaching, nursing homes to practice pediatrics, and markets to sell the products they make. –M.</i></p>
Community perceptions of fairness to one’s children	<p><i>The small class size, as well as the level of comfort, or familiarity, which is exhibited by both the students and the teachers provides the “trust among strangers”. When students experience that they are a valuable, contributing member of a classroom, they will then easily recognize that as a citizen they are valuable member of society, and have a responsibility to make contributions in this more expansive arena.- M.</i></p> <p><i>She (Mentor teacher) did a wonderful job making sure each student had an equal opportunity to answer questions in class and also completing classroom jobs.- M.</i></p> <p><i>All students attend religious education depending of their faiths. As long as there are 5 or more children with the same faith there will be teacher available to the students for religious education classes. Religion is regards to school is not a matter to be divided over but rather all be given a chance to learn their choice of faith. –M.</i></p> <p><i>She (Austrian teacher) is a good example to her students of how a person who has authority over others should act. She is very kind, respectful, and always willing to listen to the student’s opinions. She makes the classroom feel welcoming and inviting and even</i></p>

	<p><i>brings in her dog, Anya, often to help some of the shy students feel more at ease in the classroom. This shows her willingness to take care of the needs of the persons she has authority over, and she is a good witness to her students of what it means to share what you have with others. –B.</i></p> <p><i>I met a student who was originally from Albania, and two students who were born in Hungary. This integration of students who are from different countries brings a different culture to the classroom. It's a unique experience to see this integration of students who are from several different countries still getting along so well. –M.</i></p> <p><i>Another way the school practices Social Cohesion is through the age in which students start learning English. All across Austria, students start learning English at the age of 7. They are then mandated to learn English until they are 14, so every Austrian is educated for at least 7 years in a foreign language –M.</i></p>
<p>Adjudication to members of the school community</p>	<p><i>After living most of her life in Hungary, she (student) speaks hardly any English or German, yet she doesn't seem behind at all! This is because the students are very accommodating to her and her needs and so are the teachers; despite all their differences, the student has many friends who help her out whenever she needs it! –M.</i></p> <p><i>They (Austrian students) naturally will speak in both languages during their English class which strengthens their English language skill. For example, one of the boys told me he played football and then corrected it to soccer because he knew he had to switch between languages and cultures since I was American; thus accommodating into the English culture and not forcing me to assimilate to his culture or the British English he learned. –J.</i></p> <p><i>Even though Austria is across the ocean from the United States, the schools in both places have set up "classroom governments". These microcosmic imitations of government help the students to learn how society works. By cooperating with each other and learning to trust that the other students will carry out their assigned duties, students can learn about the civic system.–M.</i></p> <p><i>Not only does the school administration agree to increase racial tolerance by inviting American students into their classrooms, but when we enter they treat us with great respect. During some of my first lessons, students would still speak in German and not make the effort to speak in English so that I could understand them. My cooperating teacher did not allow this; she forced her students to make an extra effort so that I felt welcomed by them and be an active member in the classroom.–C.</i></p>
<p>The school culture consistent with the curriculum expectation</p>	<p><i>As part of their curriculum, they (Austrian students) are taught about the culture and traditions of other countries, specifically in this class. Students are also given the opportunity to learn and to ask questions about the educational system and social norms of the US through their school's cooperation with American students participating in ELISA.</i></p> <p><i>Through this exchange the Austrian students are brought- through comparison- to a greater understanding of, appreciation for, and commitment to the educational system and social norms of their own country. This experience can also be seen to foster within the students a respect and toleration for people of a different ethnicity and culture. – M.</i></p> <p><i>The thing that I most valued about her teaching was her uncanny ability to tailor her lessons to each student and really accommodate for their multiple intelligences. The students were always moving and using hand motions to help them learn English words. She always repeated words and then had the children echo her numerous times to aid them in remembering. She would also bring in many pictures during each lesson to help the visual learners.–A.</i></p> <p><i>They (Austrian teachers) all provided an example for how a school community should function by offering assistance with lessons and also encouraging my decision to become a teacher. The encouraging community of cooperating teachers translated into the classroom.–K.</i></p>

Table 1. Social Cohesion

### Mentoring Social Cohesion

According to Raudenbush, Rowen, and Chang (1992), “a high sense of efficacy is required if teachers are to cope successfully with the

uncertainties of classroom teaching” (p. 166). The area of Methods refers to the ways the mentor can increase the competency of the apprentice. Ghafari (2004) suggests that this can be accomplished through modeling, coaching, scaffolding, articulation, reflection, and exploration. By focusing on these initiatives, the mentor can effectively advance the skill level and competency of the pre-service teacher and provide the environment for the pre-service teacher to gain self-efficacy.

Through weekly data collection, pre-service teachers expressed a common perception that the Austrian teacher’s appreciation for their students, as individuals, was evident in their interactions with the pre-service teachers. Pre-service candidates felt the Austrian teachers wanted to know more about them and what their expectations were for the semester. At the beginning of the course, the Austrian teachers invited their pre-service teacher to share coffee and Austrian pastries while discussing the students, the semester curriculum and answering questions the pre-service teachers had. During this initial meeting, pre-service candidates felt their mentor teacher was interested in getting to know them and encouraged pre-service teachers to feel part of the classroom. Austrian teachers were perceived as being very purposeful in their expectations. Pre-service teachers appreciated this given the unfamiliarity of the school, language, and student population. Pre-service teachers felt the Austrian teachers perceived the ELISA program as a team and wanted them to be successful in their teaching and classroom relationships with students. In Schneider’s (2008) goals to build successful relationships, she suggests that mentors should focus candidates’ attention to specific features and take an active role in guiding candidates’ thinking as they plan lessons. Pre-service teachers explained how their Austrian mentor teachers would offer ideas but were willing to give freedom of choice in regards to the lesson planning and formative assessments.

***Pre-service candidate reflection:*** *Today I taught a lesson in the second level English class. First, I had coffee with my cooperating teacher who has been a teacher for over fifteen years. She shared some of her experiences with me.-C*

***Pre-service candidate reflection:*** *I would, in my future classroom, like to apply the gentle yet firm way of challenging students to a higher level of excellence that my cooperating teacher demonstrated. She showed me that by making students repeat an activity, it teaches them that only their best effort will be accepted in the classroom and holds them to a higher standard of learning.-K*

***Pre-service candidate reflection*** : *I am excited to collaborate with my teacher and teach the students a lesson. I have the sense that my teacher is going to allow me to do a lot of collaboration throughout the semester. I could not be more grateful for this opportunity as well as my placement. –E*

***Pre-service candidate reflection*** : *After meeting with the teachers this week I am very eager about our collaboration throughout the semester. The excitement that they showed for the program was fantastic –L*

During the classroom planning and instruction phase of the ELISA program, pre-service teachers felt their mentor teacher was engaged in their lessons and encouraged the Austrian students to practice their English. Pre-service teachers, in the beginning of the semester, noted that this was the first time they had experienced not being the native tongue in a classroom and they relied heavily on the mentor teacher to encourage the Austrian students to participate in the lessons. The pre-service teachers felt they left the program with a better understanding of how an ESL student would feel in an American classroom. Roose (2001) proposes teachers who choose to study abroad reflect a greater ability to take risks in the classroom. They (pre-service teachers) understand the importance of culture and its relationship to community and demonstrate a better sense of classroom discipline, shared respect with faculty, students and their families.

***Pre-service candidate reflection*** : *The change of culture is especially evident in the classroom and ranges from the mere etiquette of the school to the actual material being studied by the students. I learned respect for the Austrian schooling culture through this first experience . All of the teachers I had the pleasure of meeting with expressed pure passion about their vocation.-E*

***Pre-service candidate reflection*** : *The language barrier was the hardest for me. Being the first time inside a classroom as a student teacher all I wanted to do was help, help and help. I hope that as the weeks go by that this experience will encourage me to step outside my comfort zone and allow me to grow in ways that I couldn't in a normal classroom.-M*

Schneider's (2008) suggests that to be effective, mentoring must include the cooperating educational institution; thus creating an ongoing circle of planning, dialog and assessment for all program participants. Schneider proposes as partners in teacher education, mentors can support the work of university faculty through communicating and revisiting shared goals throughout the semester. The university faculty of the ELISA program support Schneider's researched opinion with ongoing communication between participating schools before, during and after each semester. In addition, university faculty travel to Austria to meet with the school administration and cooperating teachers to foster meaningful conversation with all stakeholders about the vision of the program.

Based on the outcomes of this study, this research believes that through a committed alliance between the Austrian and American educators, the ELISA program continues to be a catalyst for mentoring opportunities that build self-efficacy in pre-service teachers and facilitates authentic examples of how Social Cohesion is cultivated in international classrooms. Future research goals of this study (1) to follow education majors, upon returning from Austria, to identify examples of how pre-service teachers connect the examples of Social Cohesion in the Austrian classroom to their teaching in American classrooms, (2) the researcher is looking to other international institutions to studying Social Cohesion and mentoring examples which foster best practices and pedagogical theories.

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## **The Paradox Of Distance Education**

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### **Abstract**

Over the last several years distance education (DE) class offerings at U.S. universities and colleges have been increasing at a rate of approximately 10% or more per year (Allen & Seaman, 2014). While the effectiveness of DE courses vis-à-vis face-to-face (F2F) courses has been sufficiently documented, there are few studies that compare student evaluations of the two class delivery systems. Therefore, we sought to answer the question, is there a significant difference between student evaluations of the teaching methods and styles (TM&S) of DE and F2F classes as measured on a student completed class and instructor survey, examined through the lens of Moore's Transactional Distance Theory's (TDT) constructs of student autonomy, dialogue and structure (1997, 2010, 2012)? Moore maintains that DE is not only a geographical separation of student and teacher; it is also a psychological and pedagogical separation. The twenty TM&S questions included in the survey data for 765 classes offered from September 6, 2011 to December 19, 2013 were collected and analyzed for classes identified as SOC 101 Introduction to Sociology through SOC 340 Applied Research in the Behavioral Sciences that are offered by the College of Social and Behavioral Sciences at a Mid-Atlantic Open University. A t-test analysis of variance was conducted and analyzed. The results of the study indicate that 16 of the 20 TM&S questions returned statistically significant results, 3 of 4 for student autonomy, 8 of 10 for dialogue and 5 of 6 for structure. Three of the TDT construct dialogue/interaction questions and 2 of the TDT construct structure questions returned medium effect size magnitudes. Three of the TM&S questions associated with the TDT construct autonomy returned statistically significant results with low effect size magnitudes. Based on the results of the study, we have concluded that psychological and pedagogical separation, or TD between student and teacher is reduced when the DE course structure

encourages and requires increased dialogue and interaction. Moreover, we found that student autonomy does not play a significant role in reducing TD in computer mediated DE courses.

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**Keywords:** Distance Education, Transactional Distance and Transactional Distance Theory

## The Paradox of Distance Education

### The Distance Education Paradox

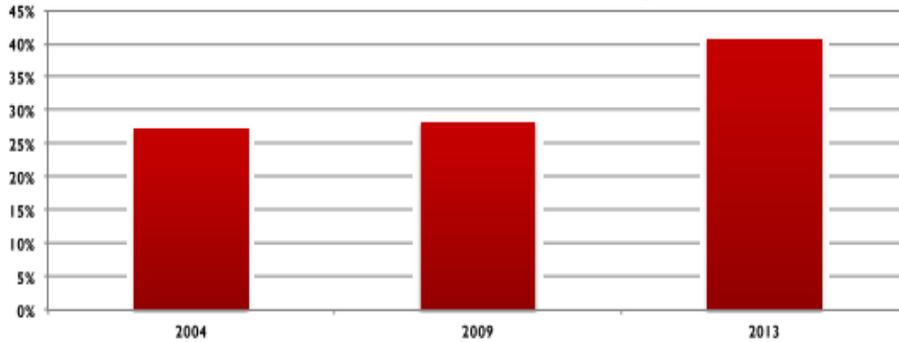
In a study conducted by Babson Research for the Sloan Consortium, Allen and Seaman (2013) reported that over the last 10 years of research, Chief Academic Officers (CAOs) report a less than overwhelming claim for the validity and legitimacy on DE by their respective faculty. As Table 1 below indicates, only about 30% of those CAOs indicated their faculty's agreement that DE is valid and legitimate. The rest disagree or are neutral on the question suggesting that a large percentage of faculty have yet to make up their minds with respect to the validity and legitimacy of DE. It may be that many of that group have not been exposed to DE classes and are reluctant to make a judgment. Such numbers have led one to assume that faculty members are having difficulty adapting to and accepting DE. If, as is discussed below, students are already uncomfortable with DE and are quick to drop a DE class when they discover the reality of DE classes and faculty members are also uncomfortable with DE classes, a problem for the successful growth of DE exists. Yet, in spite of these issues, the number of students enrolled in DE classes increased in 2011 and 2012, albeit at a slower rate than previous years. The Babson Research study estimates that the 2012's growth rate for DE enrollments of "9.3 percent is the lowest recorded in this report series" (Allen & Seaman, 2013, p. 4).

Table 1. Faculty Assessment of Legitimacy of Online Education: (Allen & Seaman, 2013, p. 29)

	Fall 2002	Fall 2004	Fall 2005	Fall 2006	Fall 2007	Fall 2009	Fall 2011	Fall 2012
Agree	27.6%	30.4%	27.6%	32.9%	33.5%	30.9%	32.0%	30.2%
Neutral	59.3%	57.8%	56.1%	51.9%	51.9%	51.8%	56.5%	57.2%
Disagree	7.4%	10.3%	14.7%	11.0%	14.6%	17.3%	11.4%	12.6%

Student dissatisfaction with DE classes, as evidenced by the widening attrition gap between DE classes and traditional F2F classes is becoming an even bigger problem as DE class offerings increase (Patrick, 2009). Moreover, in the most recent Babson Survey Research Study (Allen & Seaman, 2014), over 40% of CAOs report that it is more difficult to retain DE students for 2013 and that percentage has increased significantly since 2004 (see Table 2).

Table 1. Retaining Students is a Greater Problem for Online Courses than it is for Face-To-Face Courses (Allen & Seaman, 2014, p. 18).



Given the incredible development of DE classes throughout the U.S. and the very weak retention numbers cited by Chief Academic Officers, a paradox exists. While there are a number of studies that compare DE classes to F2F classes with similar disappointing results (see Bernard et al., 2004), the current study examined the difference based on students' survey ratings of the teaching methods and styles (TM&S) for both DE and F2F classes.

### **Moore's Transactional Distance Theory**

In the early 1970's, Michael G. Moore (1997, 2010 & 2012) focused on a revised explanation of DE. His revision holds that DE is not only a geographical separation but a psychological and pedagogical separation as well. The theory is known as Transactional Distance Theory (TDT). It is based on Dewey's concept of transactional education (See Dewey & Bently, 1949). They viewed knowledge and its acquisition as occurring in a natural system in which each member of that system is dependent on other members. Therefore, no one stands alone in his or her acquisition of knowledge.

TDT maintains that the greater the transactional (psychological) distance, the less effective the online class. Consequently, Moore's purpose has been to reduce the psychological or transactional distance of DE courses. Moore considered three constructs necessary for TDT. They are student autonomy, dialogue/interaction and course structure. He has hypothesized that "as dialogue increases, transactional distance decreases [and] as structure increases, transactional distance increases" (Moore, 2010, p. 19). Moreover, the need for student autonomy "increases as transactional distance increases" (p. 21). In the end, dialogue appears to be the key variable, as the degree of transactional distance is ultimately dependent upon the level of dialogue, which causes some to consider TDT a tautology and not a viable theory (Gorsky & Caspi, 2005b).

Like others (Connolly et al., 2007; Dron et al., 2004; Fulford & Zhang, 1993; Holmberg, 2003; Lear, Isernhagen, LaCost, & King, 2009;

Salmon & Shephard, 2004; Tsui & Ki, 1996), Gorsky et al. (2004), we have concluded that dialogue is important to student satisfaction (see also Gorsky & Caspi, 2005a). Moreover, they also discovered, as did others (Connolly et al., 2007; Salmon & Shephard, 2004), the importance of the instructor in motivating students to participate in dialogue. Finally, they came to the realization, as did Dron et al. (2004) that in spite of the importance that theorists like Moore (1993) attached to dialogue, the reality is that very often dialogue has been neglected in DE classes.

### The Conceptual Framework

The study considered the TM&S as reported on the student survey through the lens of Moore's Transactional Distance Theory (TDT) (1997, 2010, & 2012). There are 20 IDEA TM&S variables. Each variable was categorized under one of the constructs of Moore's TDT (Autonomy, Dialogue & Structure).

The study categorized the 20 TM&S variables from each IDEA survey and Moore's constructs in the following way. **AUTONOMY:** Moore (2012) defined autonomous students as those capable of taking charge of their learning. Table 3 categorizes Moore's TDT construct with 4 survey TM&S variables.

Table 2. IDEA TM&S Categorized with Moore's TDT Construct Autonomy

Moore's TDT Constructs	SURVEY TEACHING METHODS & STYLES
AUTONOMY	Stimulated students to intellectual effort beyond that required by most other courses (IDEA Survey item #8)
	Encouraged students to use multiple resources (IDEA Survey item #9)
	Inspired students to set and achieve goals which really challenged them (IDEA Survey item #15)
	Gave projects, tests or assignments that require original or creative thought (IDEA Survey item #19)

**DIALOGUE:** Moore described dialogue as a certain kind of interaction between students and instructors that relies on words and images. Table 4 categorizes Moore's TDT construct of Dialogue with 10 survey TM&S variables.

Table 4. Survey TM&amp;S Categorized with Moore's TDT Construct Dialogue

Moore's TDT Constructs	SURVEY TEACHING METHODS & STYLES
DIALOGUE	Displayed a personal interest in students and their learning (IDEA Survey #1)
	Found ways to help students answer their own questions (IDEA Survey #2)
	Demonstrated the importance and significance of the subject matter (IDEA Survey #4)
	Formed teams or discussion groups to facilitate learning (IDEA Survey #5).
	Explained the reasons for criticisms of students' academic performance (IDEA Survey #7)
	Introduced stimulating ideas about the subject matter (IDEA Survey #13)
	Asked students to share ideas and experiences with others whose backgrounds and viewpoints differ from their own (IDEA Survey #16)
	Provided timely and frequent feedback on tests, reports, projects, etc. to help students improve (IDEA Survey #17)
	Asked students to help each other understand ideas or concepts (IDEA Survey #18)
	Encouraged student - faculty interaction outside of class (IDEA Survey #20)

Finally, STRUCTURE: Moore (2012, p. 5) has defined structure as “that which expresses the rigidity or flexibility of the course's educational objectives, teaching strategies, and evaluation methods. Table 5 categorizes Moore's TDT construct Structure with 6 survey TM&S variables.

Table 5. Survey TM&amp;S Categorized with Moore's TDT Construct Structure

Moore's TDT Constructs	SURVEY TEACHING METHODS & STYLES
STRUCTURE	Scheduled course work (class activities, tests, projects) in ways which encouraged students to stay up-to-date in their work (IDEA Survey #3)
	Made it clear how each topic fit into the course (IDEA Survey #6)
	Explained course material clearly and concisely (IDEA Survey #10)
	Related course material to real life situations (IDEA Survey #11)
	Gave tests, projects, etc. that covered the most important points of the course (IDEA Survey #12)
	Involved students in “hands on” projects such as research, case studies, or “real life” activities (IDEA Survey #14)

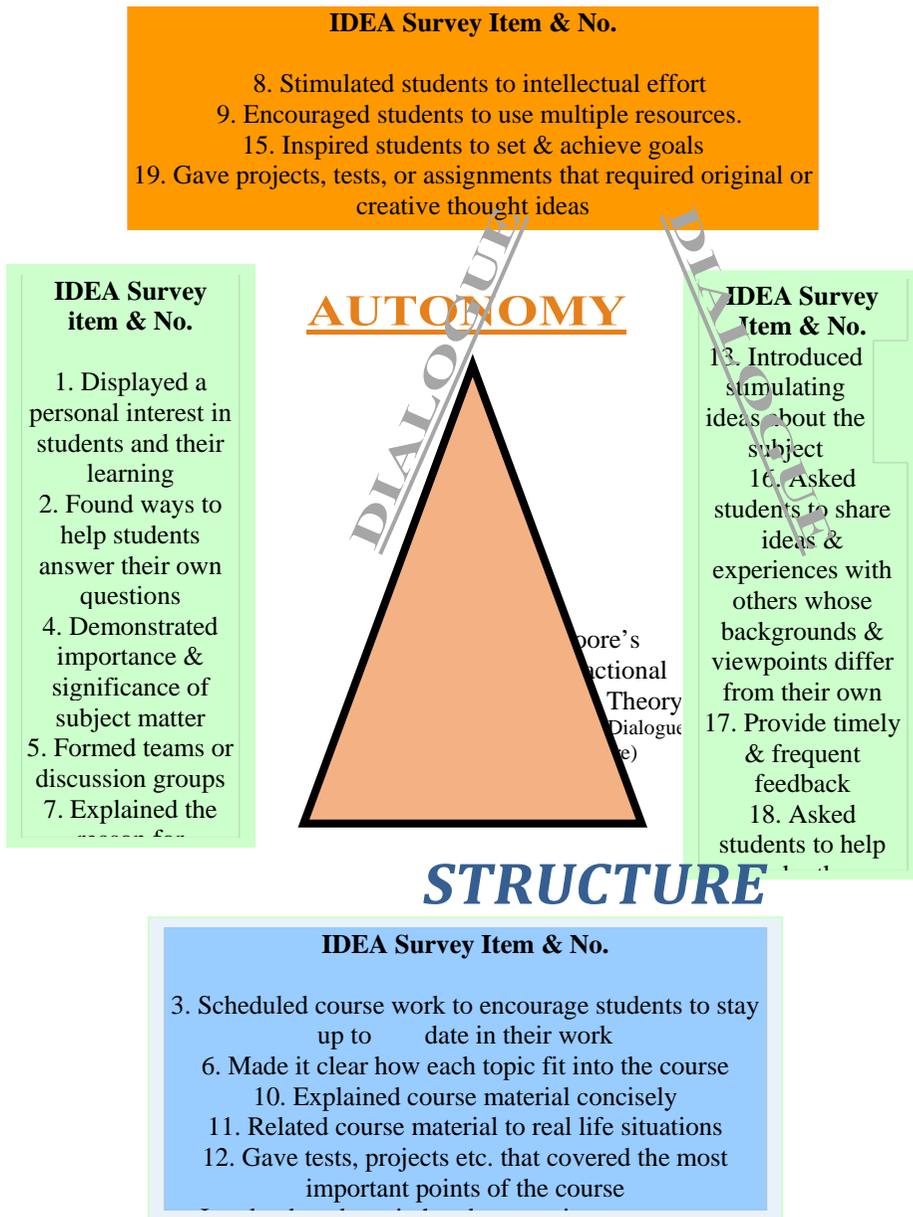


Figure 1. The Conceptual Framework

SURVEY TEACHING METHODS & STYLES

## **Methodology and data collection**

An independent samples t-tests was used for the purpose of examining whether a statistically significant difference exists between the TM&S of DE and F2F student ratings at an Open University in the Mid-Atlantic region of the U.S. with respect to student surveys through the lens of Moore's TDT (see Figure 1) (IDEA, 2013; Moore, 2012). Twenty null hypotheses (See Addendum A, p. 15) were stated to correlate with the 20 TM&S questions listed on the student survey for a range of classes beginning with SOC 101 Introduction to Sociology and ending with SOC 340 Applied Research in the Behavioral Sciences offered from September 6, 2011 through December 19, 2013. Student ratings for 765 classes (488 F2F and 277) were evaluated.

The sampling approach was a comprehensive one that included an analysis of all of the completed surveys for the stated courses and dates. This was an Ex Post Facto design (Campbell & Stanley, 1963) as the data was collected prior to this study. The data for each class was separated into DE and F2F categories.

## **The Instrument**

The data for this study was drawn from a commercially available survey instrument that has been used at the study site for twenty-five years. It is a student-centered survey that is designed to obtain the student's evaluation of both the course he or she has just completed and the instructor responsible for teaching the course (IDEA, 2013). Student evaluations of instructor performance, including this particular instrument, have been shown to be both valid and reliable (Benton & Cashin, 2012; Renaud & Murray, 2005; Theall & Franklin, 2001). There are no identifying factors to any student contained on the instrument. Therefore, all student information was kept confidential and anonymous.

## **Content Validity**

Descriptions of the TDT constructs of autonomy, dialogue and structure and the categorization of the TM&S variables considered consistent with the TDT constructs were sent to a TDT expert, the Senior Survey Research Officer and the Chair of the Behavior Science Department at the study site for their comments for the purpose of testing content validity. The TDT expert did not respond. The senior researcher and the Chair both responded in the affirmative.

## **Significance and Effect Size**

The independent samples t-test was run using IBM SPSS v. 21. P values at the .05 level of significance and effect size magnitudes for each of

the 20 survey variables are reported. The effect size magnitude calculations were based on a Cohen's  $d$  statistic of low, medium and high effect size (Field, 2013; Hinkle et al, 2003).

## Results

The mean scores of the surveys of 15 courses offered in 765 classes (277 DE & 488 F2F) were analyzed from Fall 2011 to Fall 2013 inclusive. Of the 277 DE classes evaluated, there were 2216 responses for an average of 8 responses per class. Of the 488 F2F classes evaluated, there were 4880 responses for an average of 10 responses per class. A total of 7184 responses were examined in the study. Of the 20 null hypotheses from the IDEA TM&S surveys, 16 had statistically significant results.

The analyses of the results for hypotheses categorized under the TDT construct autonomy (Table 7) indicate that three of the four ( $H\emptyset_8$ ,  $H\emptyset_{15}$  &  $H\emptyset_{19}$ ) yielded statistically significant results. Those three hypotheses were rejected. All three hypotheses returned Cohen's  $d$  magnitudes of less than .30 indicating small effects. Taking this information into account, there is likelihood that the effect of the particular variable is not substantive.  $H\emptyset_9$  with a p-value greater than .05 was accepted.

Table 7. Independent Samples t-Test Results for TDT Construct *Autonomy*

IDEA Item #	Equal Var	Levene's Test for Equality of Variances		t-test for Equality of Means			95% Confidence Interval			
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
#8	Y	.221	.638	-2.997	763	.003	-.1079	.0360	-.1785	-.0372
	N			-3.020	586.340	.003	-.1079	.0357	-.1781	-.0377
#9	Y	2.631	.105	-1.457	763	.145	-.0464	.0319	-.1090	.0161
	N			-1.496	619.027	.135	-.0464	.0311	-.1074	.0145
#15	Y	.639	.424	-2.080	763	.038	-.0772	.0371	-.1502	-.0043
	N			-2.116	603.903	.035	-.0772	.0365	-.1489	-.0056
#19	Y	.584	.445	-2.164	763	.031	-.0656	.0303	-.1251	-.0061
	N			-2.215	614.072	.027	-.0656	.0296	-.1238	-.0074

The analyses of the results for hypotheses categorized under the TDT construct dialogue (Table 8) indicate that eight of the ten ( $H\emptyset_1$ ,  $H\emptyset_2$ ,  $H\emptyset_4$ ,  $H\emptyset_5$ ,  $H\emptyset_{13}$ ,  $H\emptyset_{17}$ ,  $H\emptyset_{18}$  &  $H\emptyset_{20}$ ) yielded statistically significant results. Those eight hypotheses were rejected. Three of the eight statistically significant hypotheses returned medium effect sizes ( $H\emptyset_1 / d = .55$ ,  $H\emptyset_2 / d = .52$ , &  $H\emptyset_4 / d = .45$ ) indicating a more substantive effect. The remaining five hypotheses returned small effect sizes.

Table 8. Independent Samples t-test for the TDT Construct *Dialogue*

IDEA ITEM #	EQUAL VAR ASSUM	Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference		
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff	Std. Error Dif	Lower	Upper
#1	Y	8.705		-7.471	763	.000	-.2431	.0325	-.3070	-.1792
	N		.003	-7.135	498.684	.000	-.2431	.0341	-.3100	-.1762
#2	Y	2.584	.108	-6.932	763	.000	-.2520	.0364	-.3234	-.1807
	N			-6.844	551.642	.000	-.2520	.0368	-.3244	-.1797
#4	Y	6.949		-6.091	763	.000	-.1829	.0300	-.2419	-.1240
	N		.009	-5.836	503.841	.000	-.1829	.0313	-.2445	-.1213
#5	Y	4.907		-2.218	763	.027	-.0937	.0422	-.1766	-.0108
	N		.027	-2.316	649.416	.021	-.0937	.0405	-.1732	-.0143
#7	Y	1.318	.251	-1.068	763	.286	-.0407	.0382	-.1156	.0342
	N			-1.041	531.513	.298	-.0407	.0391	-.1176	.0361
#13	Y	.126	.722	-3.804	763	.000	-.1333	.0351	-.2022	-.0645
	N			-3.791	567.748	.000	-.1333	.0352	-.2024	-.0643
#16	Y	2.795	.095	-1.499	763	.134	-.0500	.0334	-.1156	.0155
	N			-1.541	622.117	.124	-.0500	.0325	-.1138	.0137
#17	Y	.232	.630	-2.638	763	.009	-.1126	.0427	-.1963	-.0288
	N			-2.657	586.113	.008	-.1126	.0424	-.1957	-.0294
#18	Y	1.618	.204	-2.196	763	.028	-.0813	.0370	-.1540	-.0086
	N			-2.245	612.499	.025	-.0813	.0362	-.1525	-.0102
#20	Y	.375	.540	-3.729	763	.000	-.1453	.0390	-.2218	-.0688
	N			-3.715	566.890	.000	-.1453	.0391	-.2222	-.0685

The analyses of the results for hypotheses categorized under the TDT construct structure (Table 9) indicate that five of the six ( $H\emptyset_3$ ,  $H\emptyset_6$ ,  $H\emptyset_{10}$ ,  $H\emptyset_{11}$  &  $H\emptyset_{14}$ ) yielded statistically significant results. Those five hypotheses were rejected. Two of the five statistically significant hypotheses returned medium effect sizes ( $H\emptyset_6 / d = .38$  &  $H\emptyset_{10} / d = .46$ ) indicating a more substantive effect.

Table 9. Independent Samples t-Test for the Construct *Structure*

IDEA Item #	EQUAL of VAR ASSUM	Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference		
		F	Sig.	t	df	Sig. (2-tailed)	Mean Diff	Std. Error Diff	Lower	Upper
#3	Y	.096	.757	-2.458	763	.014	-.0792	.0322	-.1425	-.0160
	N			-2.531	624.815	.012	-.0792	.0313	-.1407	-.0178
#6	Y	.214	.643	-5.057	763	.000	-.1642	.0325	-.2280	-.1005
	N			-5.029	564.137	.000	-.1642	.0327	-.2284	-.1001
#10	Y	.041	.840	-4.288	763	.000	-.1651	.0385	-.2407	-.0895
	N			-4.330	590.383	.000	-.1651	.0381	-.2401	-.0902
#11	Y	1.437	.231	-6.581	763	.000	-.2078	.0316	-.2698	-.1458
	N			-6.476	546.482	.000	-.2078	.0321	-.2709	-.1448
#12	Y	3.236	.072	-1.541	763	.124	-.0460	.0299	-.1047	.0126
	N			-1.586	623.940	.113	-.0460	.0290	-.1031	.0110
#14	Y	.022	.883	-3.096	763	.002	-.1113	.0360	-.1819	-.0407
	N			-3.079	564.220	.002	-.1113	.0361	-.1823	-.0403

## **Discussion and Conclusion**

While the constructs of dialogue and structure were found to be important in reducing TD in computer mediated DE classes, the construct autonomy returning 3 of 4 statistically significant results with only small effect sizes was found not to play an important role in reducing TD.

As with the mean scores of DE and F2F classes for dialogue, those for structure are similar and skewed to the high end of 5.0, which causes one to consider the differences between student evaluations of F2F and DE classes at the research site to be more of a preference for F2F classes than dissatisfaction with DE classes.

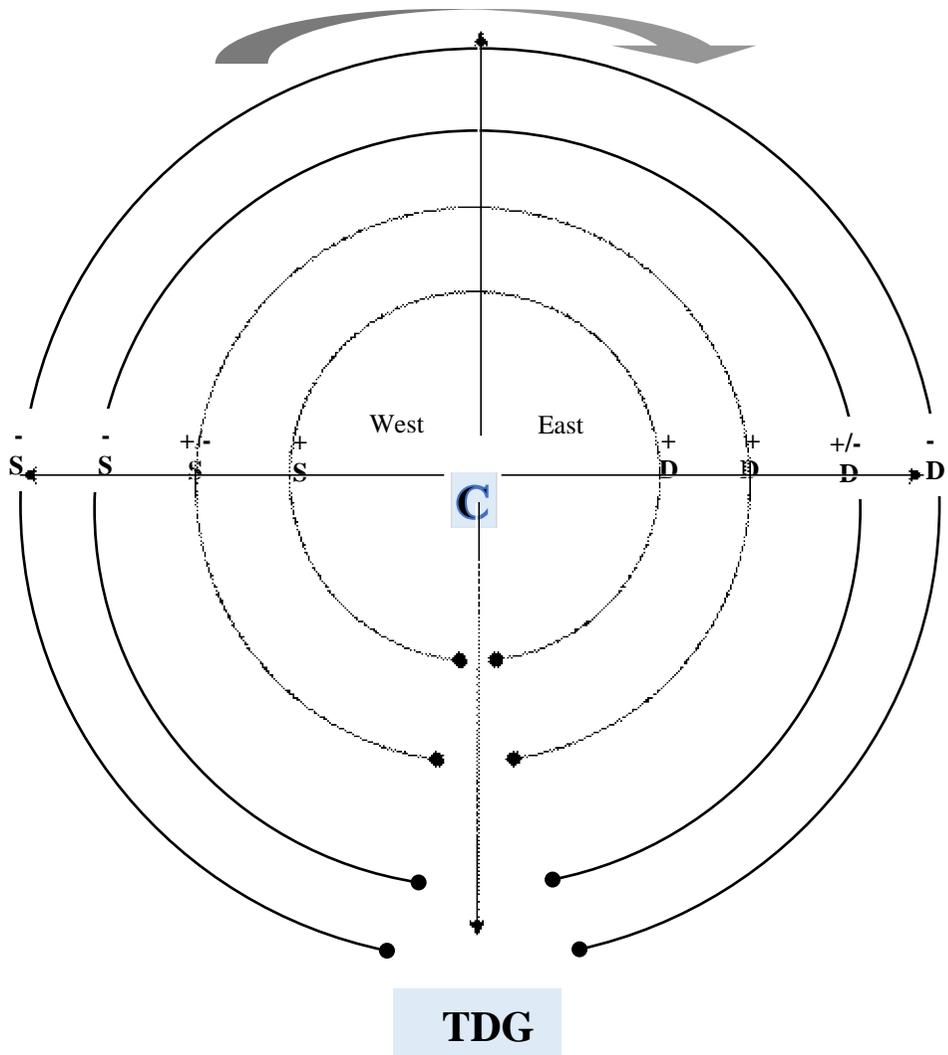
Moore (2010, p. 19) maintained, “as dialogue increases, transactional distance decreases [and] as structure increases, transactional distance increases.” We believe the results of this study indicate the opposite. That is, as structure that highlights the importance of student/instructor engagement (dialogue/interaction) increases, TD decreases. With respect to the relationship between structure and dialogue/interaction, one Ph. D. student, Jacki (2010) blogged that student/instructor engagement (i.e., dialogue/interaction) is necessary for an online course. She references Salmon’s Five Stage Model for online classes. Salmon’s Stage 1 holds for instructors encouraging students to interact in the class. Stage 4 of 5 encourages students to lead the class and keep the interaction ongoing (See Salmon & Shepard, 2004).

## **Proposed Model**

The focus of the current study has been limited to the Open University in the Mid-Atlantic region and as such is much narrower in scope than what Professor Moore intends. Nevertheless, the results of the current study have encouraged the primary researcher to pursue even further study of TDT as it applies to such situations. Based on the reviewed literature as well as the results of the current study, a proposal for a computer mediated distance education model (CMDDEM) is presented in Figure 2. As has been discussed in this paper and has been found by others (Benson & Samarawickrema, 2009; Kanuka, Collett, & Caswell, 2002; Murphy & Cifuentes, 2001; Wikeley & Muschamp, 2004), the results of the current study highlight the magnitude of the TM&S variables categorized in the TDT constructs of dialogue and structure. The CMDDEM assumes instructor engagement and relies exclusively on DE courses delivered by way of the Internet using such systems as Blackboard, Web CT, Angel, Moodle among others existing now or in the future.

The model includes four (4) concentric rings around the constant (C) which represents the computer with access to the Internet. There is a vertical axis that divides each ring into an east/west orientation. The portion of the

rings on the west axis represents “structure” (S); the portion on the east axis represents “dialogue” (D). Each ring is identified by a (-) indicating lesser, a (+) indicating greater or a (+/-) indicating some. As an example, both the outermost western rings (representing structure) and outermost eastern rings (representing dialogue) are identified with a (-) indicating less structure/dialogue. Thus, the outermost ring indicates the largest transactional distance gap (TDG), which indicates greater TD. The innermost rings, which are comprised of an eastern half identified as (+) and a western half also identified as (+), represents the smallest TDG indicating less TD. Thus the CMDEM model theorizes that when DE classes are structured in a way that focuses on the need for dialogue and interaction, TD will decrease. Therefore, as structure increases, so does dialogue/interaction and TD decreases.



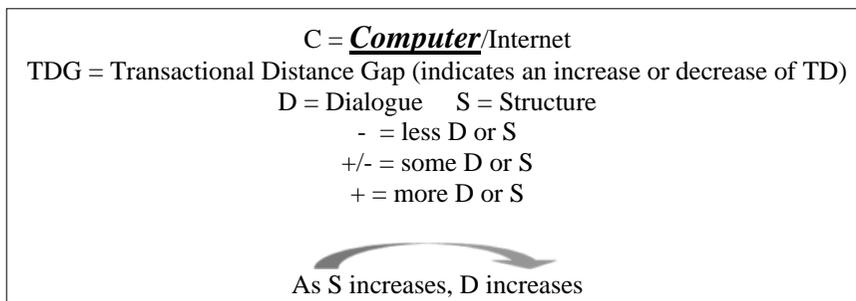


Figure 2. Computer Mediated DE Model (CMDDEM)

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## ADDENDUM A

<u>HØ</u>	<b><u>HYPOTHESES FOR TDT CONSTRUCT AUTONOMY</u></b>
<u>HØ<sub>8</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that students were stimulated to intellectual performance beyond that required by most courses</u>
<u>HØ<sub>9</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that students were encouraged to use multiple resources (e.g., data banks, library holdings, outside experts) to improve understanding.</u>
<u>HØ<sub>15</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that students were encouraged to use multiple resources (e.g., data banks, library holdings, outside experts) to improve understanding.</u>
<u>HØ<sub>19</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that students were given projects, tests or assignments that required original or creative thinking</u>
	<b><u>HYPOTHESES FOR TDT CONSTRUCT DIALOGUE</u></b>
<u>HØ<sub>1</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that the instructor displayed a personal interest students and their learning.</u>
<u>HØ<sub>2</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that the instructor found ways to help students answer their own questions</u>
<u>HØ<sub>4</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that the instructor demonstrated the importance and significance of the subject matter.</u>
<u>HØ<sub>5</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that the instructor formed teams and discussion groups to facilitate learning.</u>
<u>HØ<sub>7</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that the instructor explained the reasons for students' academic performance.</u>
<u>HØ<sub>13</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor introduced stimulating ideas about the subject</u>
<u>HØ<sub>16</sub></u>	<u>There is no significant difference between F2F and DE students' evaluation that the instructor encouraged students to share ideas and experiences with others whose backgrounds and viewpoints differ from their own.</u>
<u>HØ<sub>17</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor provided timely and frequent feedback on tests, reports, projects, to help students improve.</u>
<u>HØ<sub>18</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor asked students to help each other understand ideas or concepts.</u>
<u>HØ<sub>20</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor encouraged student and faculty interaction in or outside of the class (office visits, phone calls, emails, etc.).</u>

<b><u>HYPOTHESES FOR TDT CONSTRUCT STRUCTURE</u></b>	
<u>HØ<sub>3</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor scheduled course work (class activities, tests, projects) in ways that encouraged students to stay up to date with their work</u>
<u>HØ<sub>6</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor made it clear how each topic fits into the course.</u>
<u>HØ<sub>10</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor included clear and concise explanations of course material.</u>
<u>HØ<sub>11</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor related course material to real life situations</u>
<u>HØ<sub>12</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor gave projects, tests, or assignments that required original or creative thinking.</u>
<u>HØ<sub>14</sub></u>	<u>There is no significant difference between F2F and DE students' evaluations that the instructor involved students in hands- on projects such as research, case studies or "real life" activities</u>

# Globalization And The Cultural Impact On Technical Communication

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## Abstract

Technical communication in a multi-cultural online classroom requires an important awareness when the instructor assumes a Western approach to the instructional experience. This paper explores how an intercultural classroom is changing, and how instructors are called to meet the needs of the ever-evolving technical communication field while preparing students of all national origins for the global work place. Through addressing the current advancements that are occurring in the technical communication field, suggestions are provided for adequate textbook selections that will ensure all students are capable of learning regardless of national origin, race, or preferred language, and recommendations are offered regarding instructor pedagogical adjustments that will further enable learning in an intercultural classroom. In the 21<sup>st</sup> century, many advancements are occurring in the technical communication field, and students of all national origins, race, and language preferences need to be able to connect with an instructor from the West who is wanting to prepare the students for the technical communication work field, post-graduation.

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**Keywords:** Intercultural classroom; technical communication; pedagogy; culture

## Introduction

Technology has thrown open the academic doors to new learning strategies that will positively impact the global communication experience. More specifically, the technical communications classroom celebrates the role of technology and the best practices involved in communicating effectively through culturally sensitive design and implementation. Our global mandate presupposes the instructional acceptance of an intercultural focus that includes both the writers as well as the readers of the documents. However, instructors who teach in a technical communications program need

to embrace the potential multi-cultural representation in their class as well as the varied cultures potentially part of the cliental in the global workplace. Once the potential for a multi-cultural dynamic is understood, it is vital that the online instructor consider the necessary adjustments to be made to their technical communications (TC) pedagogy in order to confidently secure a productive multi-cultural learning environment for the students.

An intercultural classroom is one comprised of students who differ according to race, national origin, and language preference. Targeting all students in this multi-cultural classroom involves the assurance that every student, no matter their race, national origin, or language preference, is capable of learning about technical communication at a level that will prepare them for the future of TC in the global workplace. Communicating or teaching on a level where all students in the classroom can understand and glean from the teaching can be seen as adequately meeting the needs of an intercultural classroom in this direct context, especially when considering necessary pedagogical adjustments that have to be a part of a culturally sensitive technical communication classroom. Thus, with a multi-cultural lens in place, there needs to be an active critical examination that takes place resulting in the implementation of measures that should balance an instructor's approach to instruction resulting in the appropriate preparation of the students for the technical communication workplace. While examining the importance for national and international students to be prepared for the future of technical communication, instructors in a technical communication program should consider the varied communication styles that are culturally based, acknowledge the advancements that are happening within technical communication, and make pedagogical adjustments to meet the needs of an intercultural technical communication classroom.

## **I.**

### **Multi-Cultural Technical Communication Classroom**

The formation of identity is pertinent when considering the communication styles of varied ethnicities who are potentially part of a technical communications class. Davis (2000), in his book on identity, explains that identity is "situate[ed] amid competing cultural discourses and social practices, each of which tends to assert claims to priority" (p. 2). For the ethnic student, their cultural discourse is developed outside of the classroom in their own community. This formative development has a continual impact on the way in which a student assimilates information and then disseminates that information. This is true for the student, but it is also true for the recipient of information who is outside the classroom and in the global workplace.

In order for the educator to develop a rhetorical learning environment for all students, their knowledge base must include the subject matter as well as the most effective way to communicate the information to their students. A rhetorically compelling pedagogy for a multi-ethnic classroom, means educators need to discover the ethnic make-up of their students, then they must determine the best way to teach the varied ethnicities that are represented. It is important for teachers at every level to embrace their need for explicit knowledge concerning the multi-cultural classroom in general, to understand the impact the culture has on the students' identities, and to incorporate the communication/learning styles that are specifically connected with each ethnicity (Gay, 2002).

The communication styles associated with each ethnicity are intrinsically tied to their method of learning; thus, the reference to learning styles and communication styles is often used interchangeably, and that will be the case within this article. A particular learning style is a commonly shared student characteristic, rather than associated with the student's intellectual ability. The student's learning/communication style reflects how a student engages in the process of learning. The definition of learning styles provided by More (1987) is "the characteristic or usual strategies of acquiring knowledge, skills and understanding by an individual" (n.p.). A student can approach learning either from a global or an analytical perspective, verbal or nonverbal, and field independent or field dependent. These three categories help describe the manner in which a student codes, organizes, and process information (More, 1987). The category that will receive central focus in this article is the category that relates to the dependency of the student during the learning process. Many of our minority students who have been raised in a setting that prioritizes their cultural heritage and language/dialect will often be identified as field dependent learners. This type of learner needs cues and structure that come from an external source like their environment. They make the learning process contingent on their experiences, and they prefer casual learning environments because they are more socially oriented. Finally, this group of students depends heavily on external stimuli to motivate them rather than on text-based communication that does not result in improved agency (Wooldridge & Haimes-Bartolf, 2006; Mestre, 2008). The first step in developing a culturally sensitive pedagogy is to examine the learning styles typically associated with certain ethnicities. Although there are many potential people groups that make up a multi-cultural classroom, this article will demonstrate the multi-cultural approach through the examination of varied ethnicities in the United States. The same principles can be applied to any people group upon examination, but within this research we will consider more closely the European American, Asian American, African

American, Native American, and Hispanic American students, and the typical way in which they learn in a classroom setting.

### **European American Learners**

The history of America is introduced in grade school. Then in middle school, the students gain further insight into our history that began with European immigrants in search of adventure, land, wealth, and eventual independence. This strong Eurocentric base quickly established the European American approach to learning and communication within academia. That foundation has remained firmly in place with Standard English as the accepted academic language, and the Eurocentric model for learning as the default model for most American classrooms, including the technical communication class. Within this developed model, European Americans value a learning style that prioritizes individual development, self-reliance, and gender equality (Wolfe, Yang, Wong, and Atkinson, 2001). Furthermore, these students are linear learners who are able to isolate facts as needed (Mestre, 2008), value precise communication, and are inclined toward inferred meaning. Also, Eurocentric learners embrace an individualistic approach to education, and they emphasize tasks over relationships (Park and Kim, 2008). These qualities are also the qualities of a field independent learner who is an independent, analytical, task oriented, linear learner (Wooldridge & Haimes-Bartolf, 2006).

### **Asian American Learners**

Although there are many people groups who fall into the category of Asian American, for this study the Chinese American is the student being considered. The traditional values exemplified in Asian behavior, as seen in the mid-twentieth century, indicate their propensity to adopt a more Eurocentric approach to life and learning. Therefore, Asian Americans are typically identified as analytical learners (Zhenhui, 2001). Also, they use an indirect communication style that involves implicit communication of information where the receiver infers the meaning of an indirect message from mutually shared information (Searle, 1969). This people group typically has higher emotional self-control, and they are more conservative in expressing their emotions. Also, they derive their information from the context in which it is given (Park & Kim, 2008). Park and Kim (2008) credit Confucianism for the Asian's focus on context because Confucianism prioritizes relational harmony within communication rather than the outcomes. Respectability and collectivism are two more qualities of the Asian community. Respectability or "face" has to do with the image they portray and collectivism indicates the value of the group placed over the individual (Park & Kim, 2008). Kim, Atkinson, and Yang's (1999) research

indicates that Asian Americans also value collectivism, along with conformity to norms, emotional self-control, family recognition through achievement, and humility. These are important general earmarks of the people within the Asian community, and these qualities have made it easy for this population to assimilate into European American society, which promotes an overall independent approach to learning.

### **African American Learners**

When considering the learning and communication styles of particular people groups in America, there are distinguishing factors with each example, including African American students who communicate through the use of the vernacular. Specifically, the communication distinctives tied to this type of student's formative use of the vernacular has social as well as educational implications; and more specifically, it has a direct impact on their learning style in the classroom (Chambers, 2016). One of the communication distinctives of African American Vernacular English is the reliance on nonverbal cues. Lustig and Koester (1999) acknowledge that nonverbal communication complements or substitutes for verbal messages; thus, these nonverbal cues are needed as part of the perceptual stimulation for African American students (Gay, 2000), both in a social setting and within the learning environment. Nonverbal cues heighten the visual senses, and tonal semantics, another characteristic of African American vernacular communication, perceptually stimulate the vernacular speaking learners. Also, the call-response dynamic associated with vernacular speaking African Americans naturally fits into the social approach to learning that is a desired communication strategy with this people group. Thus, African American students are people oriented, global, field dependent learners who are proficient in verbal and non-verbal communication. These students also prefer oral modalities for learning and communicating, and rely on situation context for interpreting meaning (Burgess, 1996; Griggs & Dunn, 1996). Therefore, these people oriented students are looking for teacher interaction to assist the learning process rather than approaching their work independently. Also, their organizational consideration is global rather than analytical, which is confirmed in their field dependent approach to learning.

### **Native American Learners**

There are around 175 different Native American languages spoken in the United States today. Around eleven percent of these languages are being taught in the traditional manner through parents or grandparents in the home setting. This bilingual group of students who are formally taught or informally exposed to the native language spoken in the home, identify their

native tongue as their first language and Standard English as their second language (Krauss, 1996). It is this people group who are typically field dependent learners based on their culturally based learning.

Within the Native American community, impressions are formed through careful scrutiny of faces. This scrutiny naturally leads to the imitation of behavior (Swisher and Deyhle, 1987). This observational approach is carried into the classroom, where increased cognitive ability in the Native American students occurs through visual processing, especially when imagery is included. It is because there is a visual aspect connected with the traditional verbal story telling that enables the process to be rhetorically effective for the bilingual Native American student. In a Native American home, skills are acquired within the family setting, which forms an intimate group, rather than an independent, self-initiated learning setting. During this learning time, humility is an important character quality, so talking about oneself during the learning process is often considered boastful. Traditional Native American family units do not employ the Socratic Method of questioning everything; rather, supervised participation is the primary approach to acquiring skills through the learning process. This process incorporates both verbal and non-verbal components; however, the non-verbal plays a more significant role in the student's cognitive development (More, 1984). Kaulbach (1984) determined through research that "Indian . . . children are most successful in processing visual information and have the most difficulty performing well on tasks saturated with verbal content" (p. 30). This formative development is seen specifically in the student's tendency to watch an activity being performed and then copying the process; it is a watch-then-do approach. Finally, it is important to recognize that the Native American student is a global learner. Therefore, instruction for bilingual Native American students in a technical communication class needs to include a holistic approach with visuals that allows for observation, collaboration, and reflection (Hilberg and Tharp, 2002), all of which are elements within the field dependent learning style.

### **Hispanic American Learners**

Inside the American borders, a population of over two million has been identified as bilingual Hispanics (Garcia, 2010). Students who fall into this category have Spanish spoken in the home and English spoken in the classroom. This people group is the fastest growing minority group in the United States (Fry and Gonzales, 2008); therefore, it is important that we consider the bilingual Hispanic student's learning/communication style because there is a potential that we will have this people group represented in our technical communication classroom. This people group has a strong society connection (Gonyea, 2010), with a specific focus on family

commitment that results in other-directedness. Also, within the Latino culture, there is an emphasis on the cooperation in the attainment of goals (Griggs and Dunn, 1995). Bilingual Hispanic Americans desire cooperative learning opportunities that are suited for field dependent students. Field dependent learners see the big picture and need personal relevance connected to the assignments. Based on the concept of cooperation, it is evident that Hispanic Americans prefer group work (Mestre, 2008), and they are contextual learners (Rivera, 2011) who need practical situations that have societal connections (Gonyea, 2010) offered during the learning process. Furthermore, this group of students' strongest perceptual strength is kinesthetic, and they do require a higher degree of structure (Griggs and Dunn, 1996). Thus, it is apparent that the bilingual Hispanic technical communication student might be categorized as a field dependent learner.

The Eurocentric approach to the technical communication class will be an approach that is traditionally accepted and enacted by professors because most professors are field independent learners. However, as our educational and occupational world becomes more global, it is vital that the instructor consider the implications that culture has on the process and product. Many higher education courses have the potential to be a multi-cultural class where the instructor should design an effective pedagogy that will rhetorically inform the students who are part of the class. Furthermore, these instructors need to keep in mind that once the technical communication student graduates, the skills gained through his or her education will be used in a global economy that is highly multi-cultural; and within these cultures, there will be clients who will approach the dissemination of information from a field independent perspective and others from a field dependent perspective. When the instructor models an approach to communication that takes in all learning styles, then the student is better equipped to incorporate those same models into their process and product within the hiring company.

### **Technical Communication Advancements**

Technical communication is constantly expanding in this 21<sup>st</sup> century, globalized world. Through these expansions, it is important to determine how the advancements can affect a multi-cultural technical communication classroom. The instructor should investigate all aspects that will help him or her to meet the needs of all students in an effort to adequately prepare them for the work world. Albers (2005) writes, "...in recent years technical communicators have been widening their scope and expanding into areas such as interface and interaction design, information architecture, information design, and usability. In tandem with this expansion, the fundamental methods of delivering information have changed, primarily through the use of single sourcing, XML, and multiple methods of

delivery, all of which have increased the need for both collaboration and project management” (p. 267). These advancements will be examined in the technical communication class, but the cultural implications on design and usability must also be considered.

When developing a cultural pedagogy, it is also helpful for the instructor to consider the parameters of the expanding technical communication world, to identify the difference between teaching tools and teaching technology, and to attempt to incorporate changes and advancements happening with technical communication in the classroom in an effort to keep the teaching styles and material current and culturally sensitive. Although writing and editing have a resounding presence in technical communication, and will continue to play an important role in teaching technical communication, panelists at the STC conference “...all agreed that technical communicators need to move away from simply writing and into the areas represented by the four spokes [information architecture, information design, management, and human factors]” (Albers, 2005, p. 269). The human factor presupposes that within humanity there are varied cultures with varied communication styles, and the field dependent communicator needs that movement away from a text based approach to a multi-modal approach that incorporates group interaction and co-operative processing (Chambers, 2016). However, this can be challenging for the technical communication instructor who is faced with continued advancements regarding the tools utilized in the courses, as well as the narrow path that results from the incorporation of specific tools that are geared toward specific jobs. Instead, instructors need to avoid focusing on one tool to perform a task or one method of communicating that task. In order to model the importance of varied techniques and the incorporation of various tools, the instructor should provide a global perspective that demonstrates the value of using various tool features (Albers, 2005).

When looking at the advancements that are taking place in technical communication, speakers at the 50<sup>th</sup> Annual STC conference “...were implying that the technical communicator of five years ago would not survive five years from now - that the whole profession would go away” (Giammona, 2004). As advancements occur in the TC world, alongside cultural advances that occur in the TC classroom, it is important for instructors to consider both of these advances when adjusting pedagogies to accurately prepare all students for the future of technical communication. Through the consideration of Giammona’s (2004) research, it is essential that instructors prepare a multi-cultural classroom for the work place that utilizes technical communication, while determining the advancements that technical communication experiences as a whole. The TC classroom needs to prepare the students for a global workplace that has expanded to other

cultures where the larger world perspective is progressive in their strategic development of tools as well as gaining a growing awareness regarding the best tools for the effective communication (Breuninger and Hackos, 1997).

The answer to adequately preparing for the future advancements of technical communication is revealed when we investigate the changes that are taking place in technical communication, plan for a future intrinsically tied to these changes, understand that all technologies are interconnected, and realize that multi-cultural writing and rhetorical issues are important (Albers, 2005).

In order to prepare students in a multi-cultural technical communication classroom for the 21<sup>st</sup> century workplace, instructors are required to identify how technology is advancing, determine the difference between teaching tools and teaching technology, and strive to incorporate the changes of technical communication in the classroom. This analysis of technical communication advancements will help create a well-rounded technical communications program for national and international students to learn, grow, and eventually apply those learned skills in the workplace.

### **Technical Communication Teaching Tools**

One of the methods in which an instructor within a technical communication program can help prepare an intercultural classroom comprised of students that differ in race, national origin, or language preference to adequately find a foothold in the technical communication work world is by analyzing the teaching tools that are used in the classroom. The first tool in the instructor's arsenal is the textbook. Wen-Cheng et al. (2001) write, "The textbook selection process often gravitates to one of two extremes. In the process of evaluating textbooks, some educators ask so many questions that they are never able to complete the process. Others choose a reading textbook with little or no evaluation, yet it becomes the centerpiece of the curriculum until another haphazardly chosen reader replaces it" (p. 91). Barker and Matveeva (2006) call for instructors to consider the textbooks that are being used in the technical communication classroom so that they represent students from a diverse background, when looking through the lens of awareness, information, and practice. These three elements suggest a strategic approach that will help the instructor analyze and later assess textbooks, while considering the current information on the latest tools, and multi-cultural sensitivity with the images used, as well as strategies incorporated within the text that will engage both the field independent and the field dependent learners (Barker & Matveeva, 2006).

The idea of awareness, or self-awareness, should be analyzed in textbook use, especially when considering the diverse population of a classroom, how to effectively train all students in the classroom for the

technical communication workplace, and how activities in the textbook can advance self-awareness through the attempt to break the mold of ethnocentrism. Once awareness has been addressed, it is important to determine the informational methods that are explored in the textbook and their appropriateness when addressing a multi-cultural technical communication classroom. Barker and Matveeva (2006) offered some insight regarding their approach to a culturally sensitive technical communication class. These authors explained that “in addition to assessing the presence of theoretical discussions, we also looked for examples (documents, letters, or websites) showing students the cultural characteristics that illustrated the theory in the informational elements” (p. 194). The practice element is a pillar that should be present in the textbook when considering how to incorporate cultural differences when writing and communicating, even on a technical level. If students of a multi-cultural classroom need to understand what it means to communicate effectively with those from other cultures in the global workplace, then the instructor needs to evaluate the components of the textbook used for the TC program based on material and the methods used to present the material.

In addition to analyzing awareness, information, and practice when considering what the most appropriate textbook(s) to use for a technical communication course/program is, it is also important to understand that, “...teachers must learn how to integrate and organize content of a textbook to make learning an interactive and meaningful experience...” (Wen-Cheng et al., 2011, p. 91). Barker and Matveeva (2006) further explore the need for instructional context, and the variety that should accompany this context when reiterated in a textbook that is best suited for a multi-cultural technical communication classroom. When considering the instructional context there should be a balance of textbook material and teaching elements, Barker and Matveeva (2006) take into account Burke’s five elements that are key in determining the correct textbook to use: purpose, scene, agent, act, and agency. Purpose will examine the course goals, and whether or not the textbook meets the requirements of the course goals. Scene takes a look at the classroom in which the material will be taught, the cultural makeup of that classroom, and if the textbook suits the needs of the classroom. Agent addresses the informational needs of the instructor. Act places emphasis on the certain teaching techniques of the technical communication instructor through awareness, information, and practice. Lastly, agency is simply taking the textbook under consideration after evaluating the first four elements of the listed procedure.

The correct textbook used in a multi-cultural technical communication course can be essential when an instructor intends to prepare students for the technical communication workplace. Awareness,

information, and practice are the three main things to analyze when selecting the right textbook for any class of any race or national origin, but the textbook material needs to be adequately applied to the technical communication program that is bound to have a multi-cultural representation. However, considering the purpose, scene, agent, act, and agency is also essential when determining the best textbook to use in technical communication courses. (Barker and Matveeva, 2006).

Not only is the textbook an important component in the instructional process, but for the dependent learner, there also needs to be creative instructional strategies incorporated into the instructional time so that the students might learn through their best approach to assimilating the information. Also, varied instructional strategies demonstrate that the dissemination of material must be more than text based in the global workplace.

The European and Asian American students might be comfortable with a textual approach to the examination of instructional material, but even these students will appreciate a variety in teaching modes. Yet, it is the dependent learners in your multi-cultural classroom who will need to have the varied strategies enacted so that they learn more effectively as well as have modeled a best practices approach to technical communication. Not only do the students need to learn about the tools available to them, but the incorporation of those tools into the instructional process will demonstrate the usefulness of managing a field dependent approach to learning and producing. For example, if the technical communication instructor interviews a project coordinator in a global workplace where technical communication strategies are implemented, then the viewing of that video in the online course shell will provide the African American students with the nonverbal cues and tonal semantics that are helpful for their learning strategy. The Native American students will appreciate a demonstration of the incorporated strategies, allowing them to carefully watch the taped demonstration, thus providing a guide for their own incorporation of the same strategies. Once the class has viewed the video, open an online chat room that will provide an avenue for group interaction concerning the process, allowing the Hispanic students to engage in peer interaction, thus learning while discussing. If you don't want to move this online, then bring in the expert from the work place, and have him or her provide practical examples of how the classroom based learning will play out in the global workplace. This type of demonstration will allow the African American students to engage in a call-response type of communication that gives immediate feedback and confirms that they are tracking with the process being presented. The Hispanic students will appreciate the social interaction that is allowed to take place during the demonstration and in the discussion

that follows. Furthermore, the Native American students will appreciate the ability to watch and learn while examining the expert who is providing the demonstration. The reality is, this type of engaged instruction will not only benefit the dependent learners who are part of your class, but it will be enjoyed by the independent learners who are adept at independent, text based work, but are always open to new methods of instruction.

If we, as technical communication instructors, want all our students to engage in the learning process, then we must move beyond the textbook, and discover learning strategies that not only instruct, but also model a culturally sensitive approach to technical communication.

### **Technical Communication Instructor Response**

There is a growing awareness over the last decade regarding the need for teaching intercultural communication in the technical communication class (Barker & Matveeva, 2006). This need has been widely researched due to the fact that there is a deficit, gap, or problem with the current trends experienced in the intercultural classroom, providing evidence that there is a need for instructors within the technical communication realm to consider their pedagogical approach to reaching all students, no matter the national origin, when it comes to successfully teaching technical communication.

One way in which instructors can first examine the intercultural classroom while making necessary alterations to pedagogies is to assign projects, games and activities that will help break the mold that the students' cultural experience or background naturally creates. These activities help students break out of their ethnocentrism, which is the tendency for students to assume that their cultural standards are the only valid standards (Barker & Matveeva, 2006). This theory is supported by Hunsinger (2006) and is evidenced when he writes, "...[I] interrogate what I take to be the predominant approach to researching and teaching intercultural technical communication . . . the *heuristic* approach" (p. 32). The heuristic approach is designed to examine ethnographic data in an effort to identify the important dimensions of culture, and then rate these dimensions so that instructors may be able to find the dimensions helpful for effectively communicating in a cross-cultural environment (Hunsinger, 2006).

Furthermore, through the use of writing assignments, instructors can grasp the social norms of each student represented in their multi-cultural classroom, attempting to balance the way in which they progress forward in teaching technical communication as a means of adequately preparing the students for the work world. Research has demonstrated that writing is located in the social world, and is fundamentally structured by the shape of that environment. Technical communication is situated in a complex interlocking system of ideas, purposes, interpersonal interactions, cultural

norms, and textual forms (Paretti, 2008). Furthermore, the role of language plays an important part in the pedagogical alterations that are necessary when an instructor is teaching technical communication to a multi-cultural class. Yeo (2001) experienced some challenges teaching Technical Communication Skills (TCS), and he had to learn how to overcome those hardships when faced with a multi-cultural classroom. This instructor goes on to explain, "This problem was seen as an opportunity for me to integrate previous skills taught in TCS into the writing module...Hence, I used the writing module as a platform to explore the communicative behavior of students" (Yeo, 2001, p. 93). Yeo further writes that he used note-taking techniques to help students prepare for writing assignments, and then implemented class discussion and presentations in an effort to encourage students from different cultural backgrounds to learn from the language and communication skills of their fellow classmates (2001). This approach is beneficial to the minority groups who are field dependent learners. The demonstration of techniques, the inclusion of discussion and presentations further helps field dependent learners engage with the material, thus promoting a culturally sensitive technical communication class.

Ultimately, when considering the different approaches taken by instructors as an adequate measure in reaching all students within an intercultural technical communication classroom, there are several methods that can be utilized that will help instructors appropriately adjust their pedagogies. Activities to break students out of their ethnocentrism, a heuristic approach to identifying dimensions of culture, writing as a form of delineating cultural norms, demonstrations from the workplace, and class discussions/presentations in an effort to have students learn from one another are a few suggestions that can be implemented in an intercultural technical communications classroom as a means of reaching all students in that learning environment.

## **Conclusion**

Technical communication as a whole is an ever growing, changing and advancing arena. Students studying technical communication need to be prepared for the expectations of the TC global workplace. This begins when the instructor embraces the importance of addressing the learning styles of all their students, then demonstrating the varied methods that will help to communicate through varied approaches. Several authors delve into technical communication and the implications of the career field, as a whole, when applied to the global work world, and their writings need to be highlighted in the technical communication class. However, there are certain elements to examine within these publications when looking to advance an intercultural classroom in an effort to adequately prepare students of all

national origins for a future career in technical communication. Advancements that are happening in technical communication need to be investigated when teaching a class how to be current in their profession, while still preparing for an evolving arena. Textbook use will help incorporate awareness, information, and practice into an intercultural classroom; however, these textbooks should be analyzed from a cultural as well as an informational perspective in order to determine the best option that will benefit the students post-graduation. Furthermore, the instructional strategies need to perform a dual purpose: providing culturally sensitive instruction and providing modeling for future technical communication production. Finally, adjustments to instructor pedagogies should be considered when dealing with a multi-cultural technical communication classroom, as well as determining what methods of learning would best suit the needs of all students in the classroom as they consider their future profession in a global marketplace.

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# **The Situation Is Tense! Inter- And Transdisciplinary Research Between Social Demands, University Logic And Multidimensional Competence Requirements**

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## **Abstract**

Inter-and transdisciplinary research claims to react to sociopolitical issues and to prepare empiricist and theoretical material that knowledge becomes operative. This means that the concerned people become able to act and realize options on which decisions can be made. The field of research can be described as limitless, divergent and diverse. This contribution focuses on three essential aspects: the inter- and transdisciplinarity and its embedding in the society, the paradigm shift within the science system as a determining factor and the (new) competence requirements for inter- and transdisciplinary researchers. Linked to this, the focus lies on the connection between the poles of role flexibility, project- and process responsibility and the expertise in order to conclusively consider the question which consequences it has on the education of young scientists and which conclusions emerge for the science system.

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**Keywords:** Transdisciplinary research, (social) competences, project management, group dynamics, diversity management

## **Introduction**

One aim of the transdisciplinary intervention research – a form of the transdisciplinary participation research which was developed in Klagenfurt (cf. Krainer et al. 2012; Lerchster 2011) – is to prepare material that knowledge becomes operative by enabling the involved people to act and to recognize options out of which different decision possibilities emerge. In other words: “intervention research generates awareness that a change in the system happens.”(Heimerl et al. 2006, S. 12.).

This premise requires a general interest in the environment and its cultures. Following this interest, it becomes obvious that the field of research

can be described as limitless, divergent and diverse. The research teams are therefore constituted project-specific heterogenic and interdisciplinary and the method faces contradictions and challenges within its paradigmatic. Some aspects and challenges are outlined below in the sense of a reflection or rather two aspects – the inter- and transdisciplinarity and the connected competence demands on scientists – are delved.

### **The call for interdisciplinarity and the (often) ignored obstacles**

An answer to the above described diversity is the *inter- and transdisciplinarity*. The cooperation across disciplines and faculties can be logically argued in several ways (also in respect of the utility of research). Additionally, the science's as well as the society's demand for a synergistic and systematic overlap between increasing specialised and detailed knowhow can not be ignored. Less attention is paid to the pragmatic and practical aspect of this demand and the obstacles in the area of implementation of this "good" and meaningful thought which meanwhile also touches faculties which had no need for such network-collaborations and had no appreciation for that. Despite the (apparent) realization of the necessity, a high degree of scepticism, maybe even distrust, still exists. In most cases you are at least confronted with a certain degree of cautiousness. Sentiments that are on one hand understandable but on the other hand can hinder the research process if they are not addressed frankly. The experiences have shown that cooperation with traditional disciplinary oriented sciences are not easy to organise and that a high degree of attention has to be paid to that prior to the project, especially concerning the constitution of research teams. Dilemmas develop on several levels:

- *The amount of the material*

The achievement of the goal named above seems illusory concerning the increasing specialised, complex and hardly comprehensible and understandable scientific expertise. On one hand, it is necessary to have a more and more specialised and detailed science due to the fact of a rapidly changing environment, on the other hand, the high degree of specialisation delights us and the microscopic approach of the different areas is fascinating. At the same time, a certain kind of discouragement emerges. The work within the scientific community (a community that has not a lot in common with the basic meaning of the term) changes with the demand for interdisciplinary cooperation. Certain areas of expertise are asked to leave their special field – a clear defined territory which was defined for a reason – and to focus on the larger whole. What becomes obvious then, is that no individual is able to get an overview of or to apprehend the amount of global knowledge.

To work interdisciplinary can be an answer to all these challenges. Interdisciplinary teams have the advantage to use the resources of a whole group and since the whole is something different than the total of its individual participants, hope for a more comprehensive result is given. Where results without the emphasis of particular interests are summarised and selected, interdisciplinary research projects can be valuable in terms of the assignment. Where priority is given to the interest of an individual, where participative and “inter”-generated results are seen as an insult to individual competences and where disciplinary dominance is foregrounded, an interdisciplinary project will have little chance of success. The parameters for a successful cooperation is therefore the engagement with special fields as well as the orchestrated dialog on these special fields (and the connected vanities) and the elementary competence to compactly argument the intelligent selected knowledge to finally be able to provide a logical and understandable synopsis of the acquired knowledge.

- *Researchers socialised in their discipline and about the opening of claims*

As already described somewhere else (cf. Lerchster / Lesjak 2014), psychodynamic dimensions become operative on the level of the individuality of the scientists. The issue of the identity of the interdisciplinary formed research groups (who am I here?) is becoming relevant in the sense that cultures, beliefs, values, idioms and phrases imported from the system of origin – dimensions which determine the identity – are being questioned. In this atmosphere of the unknown and the connected uncertainty, the question of acceptance (how do I think about it and how do others see my contributions?) has a more important role than in disciplinary – and sometimes well operating and tested – collaborations. Linked to this is the question of the space (how much space do I have here?). The organisation of the social room is to negotiate, dominance and transgression has to be discussed, territorial shifts and the resulting conflict situations have to be managed. Within these conflicts the matter of motivation and will (what do I want here?) have to be clarified because several different expectations come together. When it is an assigned research project, it is about expectations like concerning the knowledge interest, the formulation of research questions, the determination of content, the survey methods, the available resources and last but not least the way the clients are faced.

To some extend the members of the interdisciplinary research groups are strangers to each other, at least at the beginning. Leading and moderating a discussion as well as a sensible and well-structured organisation of management activities is therefore necessary. The management of such research groups has to consider this moment of unfamiliarity and it has to

consciously organise the start, the processes and the procedures internally as well as the communication externally. Within the universities almost no attention is paid to the communication and if you follow the statistical relevant numbers, the process-related management of research teams as well as the organisation of communication processes with the actors is valueless in the practice.

- *Changed parameters and the role of the university facilities*

Not only the individual or the group face new challenges but also and not least the organisation of the university is asked to examine and ideally to develop its self-conception and culture. The current development in the tertiary education sector currently counteracts an interdisciplinary cooperation. The demands of the society concerning what universities should do are changing and several areas of studies are more often under legitimisation pressure. Economic parameters are becoming more and more constricting and although the wish for a disclosure of the achieved is understandable, the request for a return of investment seems hardly helpful. Universities are asked to implement quality-management-processes, to accredit its apprenticeships, to check knowledge surveys and if it necessary to think of sanctions if the fulfilment of obligations is failed. They are also asked to negotiate performance and objective agreements and especially to take pressure of the national budget and to acquire external funding – without becoming dependent from the economy or political sponsors. The state is stepping back, research budgets are outsourced to external carriers which then decide (often due to criteria which is hard understanding) which research sector and which subject areas are allowed to use the budget. Interdisciplinary (ideally transnational) projects are requested but at the same time the scientists should be excelled in their own discipline, should steadily publish in reputable and international journals. Young scientists should be involved but as soon as there is a project without a reputable member of the scientific community, there is almost no chance for a sponsorship.

In the sense of the freedom of research and science you will be asked to reflect upon institutional heteronomy but this does not change the fact that it is becoming more difficult in science to have the freedom of thought (which normally would require time, space and money) while the tertiary education sector is being surprisingly and almost without the chance to stop economised. “The state’s almost not discussed, neoliberal withdrawal from the former responsibilities means for the science system that the humanistic idea of the *universitas* is given up. The free thought falls by the wayside and the socialisational impact for whole generations of students and their political awareness can not be predicted” (Krainz 2009, p. 9).

The situation is tense! Thinking may seem as it is inefficient and “the human’s unrestrained curiosity which we owe our science and technology is

often an expression of inefficiency. Inventors, broody people, gatherers, everyone who is obsessed by an idea or question – are generally not seen as inefficient. The steadily spreading bad habit of mainly judging scientific achievements by the number of pages, types of publications and the amount of quotations, suppresses what science is ultimately all about: the discourse, consideration of arguments and the lively discussion” (Liessmann 2013).

In a time of ongoing financial crises, it admittedly would be unappropriated to promote a university that devotes itself to the freedom of science and research and operates independently from all economic and public restrictions. It is also wrong to believe in the illusion that the current parameters which are affected by structural deficits can lead to a beneficial development of science (and the society) or even to a disciplinary exchange. Teaching at the universities is becoming more and more school-like and the students have to reproduce learned content rather than to think together. Gert Bachmann (2013) summarises his observations of the university developments and attributes the educational system an “enormous pressure to the trend away from the sophisticated responsible acting human to someone who is metrically-confirmed excellent without a humanistic economic obligation or philosophic education” – the educational institutions are becoming more and more factories of excellence if you look on the requirements that young scientists have to fulfil and therefore you have to worry about the children.

In order to prevail, young scientists have to produce excellent publications, they should visit congresses or hand in presentations by themselves, they should acquire foreign experiences before or after their doctorate, they should teach and ideally be involved in the provision of external funding for projects. Additionally, young scientists find themselves in precarious labour conditions and have to fight in temporary projects for their survival at the universities.

This amount of demands supports the tendency to the anew reinforcement of claims. The demanded attestation of excellence supports egoistic self-profiling activities and the demand for individual expertise and visualization counteracts the demand for intra-scientific cooperation. At the same time – and this is the paradox – science is judged more and more by its success and achievements. Success means to reduce the deficits up to maximize the profit and to be in black figures but it also means to be closely connected to the economic sector and to use the available research budget. The economy on the other hand, has a strong interest in complementary results and possible comprehensible concepts – or in other words, intra-scientific cooperation that leads to productive results that possibly include everything. If local or also national politics are the clients, they are interested in immediate viable concepts while the publications of research results do

not have priority and sometimes are even seen as precarious. The universities are asked to process the here only indicated fields of tension like opening and closure, autonomy and dependence, profit maximization and knowledge acquisition, internationality and local demands, individual excellence and participative inter- and transdisciplinary research. This should happen against the background of limited budgets which are more suitable for managing rather than using them for proactive design.

The demand for an expansion of the interdisciplinary cooperation makes sense and to tackle an issue with different views can help to master the challenges in our environment. Universities can get a new design and can shed their ivory-tower image in order to support a thriving development of the society and to work on their profile. It will also be necessary to react and become active on the level of the students which most commonly come from a school-like environment. In response to the call for a stronger practical orientation from the research and science, students have to be integrated flexible, fit and confident in the academic activities. In some cases it is therefore necessary to re-socialise the intervention-researchers. Furthermore it is necessary to find a way to deal with the given freedom and at the same time with the required adaptation or to find a balance within this contradiction, to enable scientific work which respects the expertise of the practice in order to produce valuable results close to the respective research context.

Therefore it should be of high importance to focus on the education of this “species” and not surprisingly is the question in the field of the transdisciplinary research asked which competences will be required in this research area.

### **Education and competences of transdisciplinary researchers from the perspective of the organisational development and the group dynamics<sup>49</sup>**

From the perspective of the organisational development, especially the question of the cooperation management (cf. Grossmann/Neugebauer 2014) and the for that usable strategies and control procedures (such as large group methods, cf. Krohn 2012) for cooperation issues is focussed. Group dynamics concentrates on social roles, functions and competences that people but also groups have, acquire or develop together in order to be productively effective. Furthermore it is explored which learning settings are especially suitable for the acquirement of these competences.

The following roles and the connected tasks have repeatedly emerged within our research projects (cf. Falk/Krainer 2006):

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<sup>49</sup> See further: Krainer/Lerchster 2015.

- Scientific Administration (communication with clients, responsibility of finances, research activity, data evaluation, theory construction),
- Scientific project staff (operative conduct of the research projects),
- Project coordination (point of intersection between project management and project administration, operative responsibility for the research management),
- Project administrates (research documentation, project- and finance controlling)
- Project supervision (support of the reflexion of the research design, the overall control/management, the balance between the researching detail view and the overall view, team supervision, theoretical reflexions).

An overview of the existing publications from the field of group dynamics or with reference to them, shows that there exists a broad agreement that inter- and transdisciplinary researchers need, besides their specialised and methodical expertise, especially personal and social competences for the administration of and the participation in research projects and that the requirements of the practice need an adequate counterpart in the scientific socialisation (cf. i.a.: Lesjak not published; Reitingner et al. 2014; Krainer et al. 2014; Lerchster 2011; Lerchster/Lesjak 2014; Wieser et al. 2014; Lackner not published; Königswieser 2006; Zepke 2008).

Project management already starts in the phase of the project conception where the experts for the particular research areas have to be selected and the research teams have to be constituted. The scientific expertise of the potential team members is just one side because what is further needed is a) a high willingness to cooperate inter- and transdisciplinary and b) experience to handle time-consuming and energy-intensive negotiation and communication processes (also overcoming conflicts) (cf. Krainer et al. 2014).

The scientific leadership is responsible for the selection of the team members (sometimes in cooperation with the clients) which in further consequence has to organise the team. At this stage – namely the start of projects – the leadership function is responsible for a sensitive and at the same time really important task. The team needs a form of team development, the group has to be “organised” because no new mixed expert group is able to work only by its composition. Especially the management of expert groups is a challenge because all involved participants have a claim of autonomy and can react sensitive to a possible loss of individuality (cf. Krainz 2015) due to the fact that scientists are normally freedom-loving, autonomous operating and competent colleagues (cf. Defila et al. 2006, p. 39).

As already mentioned, right at the beginning of the project the parameters concerning the content and social- and group dynamic level are set (cf. Lerchster/Lesjak 2014). The type/form (the how) is constitutive for the content (the what). With this background, managing mainly means to provide a reflexive clarification process where knowledge interests, methodological preferences, research know-how, personal motives, individual resources (strength, weakness, time and availability) and collective expectations and goals are made transparent. The paradigm of participation (and the often meant and named cooperation on equal footing) which is dominant in transdisciplinary projects, also counts for the ongoing research management. Therefore it is beneficial to have a balanced and reflected relationship with one's own authority and vanity as a project leader due to the fact that participation and equality does not approve a charismatic person that acts in the way of "leader against co-workers.

To direct high heterogenic – and therefore more conflict-prone – groups it needs a social-integrative leadership as well as the understanding that employable (mature) groups can achieve better results than individuals. The model of the reflexive management (cf. Krainz 1995) has proven to be successful in yielding a collective power within the research teams. Reflexion is thereby seen as a medium of self-controlling/autoregulation. Furthermore it brings orientation and relief (cf. Lerchster/Wagenheim 2015), supports creativity and courage, creates self-confidence, promotes implicit knowledge and is per se further education (Königswieser 2006, p. 74 ff). This does not mean that hierarchies can be completely abolished. Governance implies hierarchy and in certain sequences of the research project it needs clear role- and management structures as well internal as external (e.g. rarely are all team members or practice partners responsible for the calculation and final account of the research funds). Since "the Doing of the One is the Doing of the Other", as it is accurately formulated by Stierlin (1971), it depends on how it works out when to be authoritative and when not, to develop an individual reflective awareness for oneself in the role of the manager and to encourage, process, moderate and implement collective reflexive self-controlling in the team and in the field of practice.

### **Necessary competences for the interdisciplinary research team, the practice- and science system**

The described roles and tasks have interfaces and can diverge in their theme variety. As it becomes obvious from the analysis of the literature, the governance of inter- and transdisciplinary research projects and research associations includes several dimensions:

- Professional competences, which are inalienable,

- Method- and field competences (mainly linked to requirements of empiric experiences),
- Social competences,
- Personal / intuitive competences as well as
- Management- and governance competences, which includes three dimensions:
  - Management of the context to balance and adjust the project with the clients or the research program with respect to content and pragmatic-formal style (including the adjustment of the research focus which is to adapt during course of the process as well as the realisation of the aims in the sense of the project conduct and financing).
  - The governance / coordination of the different research teams under the consideration of their structural contexts and differences (environment, original systems, disciplines, languages, cultures) on three different levels (content, methodical implementation, project governance).
  - The governance in the practice field requires also the management of the identified and participating stakeholders which first have to be convinced content-wise and then integrated in the research processes (involvement in the topic as well as administration of addresses and coordination of appointments).

The here described roles, tasks and competence requirements – which require more than a general academic education – justify itself due to the fact that researchers have to switch between three systems or fields of action during the execution of inter- and transdisciplinary projects. Firstly, researchers interact in an interinstitutional and interdisciplinary compound team. Secondly, this team cooperates with a practice system which again can be segmented into different stake-holder groups. Thirdly, they are tied to a scientific system. This system landscape basically corresponds with the reality of projects which try transdisciplinarily to find social stable problem solutions and it is also used for the evaluation of transdisciplinary research projects (cf. Bergmann et al. 2005). When you now try to describe these competences, it is absolutely necessary to consider these three fields of action and to think of the challenges the particular system and the particular interface present to the researchers.

A detailed characteristic for inter- and transdisciplinary researchers is neither affordable nor beneficial or expedient. The following offered overview which adds the governance- and management competences to the fields of the usual basic competences – professional competences, methods- and field competences, social competences and personal/intuitive

competences – and links it to the named systems, serves on one hand for complexity reduction and on the other hand it should give information which resources are useful for inter- and transdisciplinary research projects and which challenges the basis represents for a proper project controlling.

	<u>Interdisciplinary Research Team</u>	<u>Practice Field / Practice System</u>	<u>Educational System</u>
<u>Professional Competences</u>	<u>Disciplinary expertise / Expert knowledge</u>		
	<u>Inductive and interactive generating of theory for practice and science</u>		
	<u>Knowledge of praxeological concepts and local theory generation</u>		
	<u>Familiarity with the paradigms of the inter- and transdisciplinarity</u>		
	<u>Construction of collective research interests</u>		<u>Scientific innovation</u>
	<u>Knowledge of / Understanding for the functionality of groups, organisations and institutions, their reactions/responses to intervention-impulses as well as their system immanent contradictions and fields of tension</u>		<u>Creation/Development of science-relevant results</u>
	<u>Design of communication processes, moderation (setting and tools)</u>		<u>Communication with the „scientific community“ (publications, congress participation, dialogue and examination)</u>
	<u>Creation/Development of practice-relevant results</u>		<u>Integration of the findings/conclusions in the research-led science</u>
		<u>Creation/development of action strategies</u>	
<u>Method- and field competences</u>	<u>Moderation- and advice methods: methods of the group and organisation development, process design, governance of and participation in collective settings, design competences, project management and project architecture</u>		<u>Adherence of scientific standards</u>
	<u>Conflict management (mediation) / creation of space for thematisation of perceptive disruptions</u>		<u>Exact description and argumentation of the method choice and the process operation</u>
	<u>Organisation of intervision- and supervision settings</u>		
	<u>Choice of research methods (qualitative/quantitative)</u>		
	<u>Knowledge of the intervention character of the chosen methods</u>	<u>Exploration and partial immersion in the logic of the practice field (temporary „going native“)</u>	
		<u>Support of the implementation of new action strategies</u>	
	<u>Time management (Adaption to the time-limitation of the practice partners vs. necessity to invest enough time)</u>		
<u>Social competences</u>	<u>Ability for linguistic integration</u>		
	<u>Communicative skills as central competences</u>		
	<u>Experiences how to deal with conflicts and emotions</u>		
	<u>Identification of countertransference phenomena and usage as empiristic material (reflection phenomena)</u>		
	<u>Asking and listening as qualification</u>		<u>Readiness to engage in</u>

		<u>dialogues</u>	
	<u>Pleasure in interactive exchange</u>		
	<u>Experience with open-ended processes</u>		
	<u>Conscious way of being not so authoritative in a scientific way towards non-professionals and appreciation of non-professionals as experts</u>		
<u>Personal / intuitive competences</u>	<u>Openness and flexibility towards unfamiliar disciplines and the expertise of the practice</u>	<u>Broad-minded handling with competitive situations</u>	
	<u>Self-thematisation ability and reflective faculty (own stereotypes, sentiments, sympathies, identification, fears and experiences)</u>	<u>Standing and confidence</u>	
	<u>Sensorium for social situations</u>	<u>Ability to network</u>	
	<u>Flexible handling with unpredictable and open processes</u>	<u>Ability for (critical) self-thematisation</u>	
	<u>Fearless approach to conflict situations</u>		
<u>Governance- and management competences</u>	<u>Generation of research questions, proposal preparation, consideration of funding programs and finance logics, administration of the budget</u>		
	<u>Formation of research teams</u>		
	<u>Creation of a project plan inclusive communication architecture (Stakeholder dialogues, communication within the research association, communication with the science system, communication with the clients as well as team communication)</u>		
	<u>Decision-making competence</u>		
	<u>Resource management</u>		
		<u>Clarification of the assignment and communication with practice partners</u>	<u>Governance of the scientific innovation</u>
		<u>Conduct negotiations (level of the participative participation, funding contribution, own scientific interest etc.)</u>	<u>Planning of the output</u>
	<u>Governance of group dynamic and social processes</u>		<u>University internal, inter-university and international Interconnectedness</u>
	<u>Governance of reflexion as a medium of self-controlling</u>		
	<u>Conflict management, mediation</u>		
	<u>Process- and project management</u>		
	<u>Delegation competence</u>		

This overview demonstrates primarily three things:

- a) The competence requirements mainly in the area of the method- and field competences as well as on the level of the social competences are so diverse that an overload on the individual level has to be considered,
- b) The communication- and governance demands affect all three levels (interdisciplinary research team, practice field/practice system and scientific system) the content level as well as the formal one,
- c) The range of these demands can normally not be covered within a disciplinary-oriented academic curriculum and therefore additional qualifications are necessary.

The ongoing discussion about the competence extension (starting in the secondary educational sector where pupils should be taught competence-oriented) can also be seen as critical and reflected. Young scientists are faced with an almost not comprehensible amount of demands and they often think they have to meet these demands. On one hand, a strategy for overcoming uncertainty can be assumed, on the other hand, this discussion goes along with a change of paradigm within the scientific community. Scientists that work inter- and transdisciplinary deal with processes which have to be managed communicative, social and content-wise. These processes are generally complex and only partially plannable. If competences are understood as “capabilities to act, then they are especially essential for successful actions in open, unclear and complex situations which require creative shaping of the future” (Heyse 2014).

### **The acquisition of necessary competences (education and further education, experience-based learning)**

Since the question, which competences characterise researchers or which qualifications are necessary in order to meet the demands, is widely discussed, it seems that thoughts on the area of education for scientists, if such an education is explicitly offered at all and not only implicit (learning on the job or through qualification agreements), are more the exception (cf.: Defila/Di Giulio 1996, p. 125-142, Paul-Horn et al. 2015).

The most scientific educations are aligned to the respective discipline and primarily to the expertise which serves as the basis for every form of scientific activity and by which the scientists can be measured. On one hand, the expertise generally refers to an established theoretical knowledge within the discipline and on the other hand to science-theoretical and methodological competences. The comprehensive education aims to educate people to be well-informed in their discipline, to produce output (publications, congresses, research projects) and to be theoretically, thematically and linguistically compatible. The reference to the character of the researchers is created on the level of methodology (cf. Devereux 1998; Feyerabend 1986; Lamnek 2010; Flick et al. 2000; Girtler 1988; Strauss 1998 und weiterführend Glaser/Strauss 2005; Felt/Nowotny/Taschwer 1995). In comparison to that, themes of the research management are often outsourced to the area of further education and therefore they are highly individualised. Funding organisations (e.g. the FWF in Austria) or university-external providers have identified the needs and the target groups.

From our point of view, the question in which way these additional qualifications can be acquired, the individual should not exclusively be responsible for it. “Competences are based on values, are consolidated through experiences and are internalised through emotions and (self-)

motivation. When competences should be understood in that way and when they should encourage and strengthen character-development goals, then it is necessary to question the way of their acquisition differently than the imparting of knowledge and skills. At the end, the study should unite knowhow and competences. Competences do not develop through sheer imparting of information and grade-focused memorisation or appeals to the intellect. Possibilities for learning by doing under supervision of trained teachers with additional individual feedback are necessary” (Heyse 2014).

Therefore it is going to be necessary that inter- and transdisciplinary research associations discuss how an adequate education can be conceived. This happens rudimentarily and at different places in form of study courses, conferences, trainings or position papers. Despite this obvious dynamic of change, the call for a comprehensive education at our universities is still there. It seems as the time for a realisation of such programmes or the fundamental change of the curricula is not there yet. Based on this analysis, Schneidewind et al. (2014) develops on one hand a model for “lagging universities”, on the other hand, there are several offers for further education which try to close the gap. The University of Bern provides an overview of further educational offers in Switzerland (cf. Bestvater/Beywl 2005) and at the same university a specific certification course deals with further education in research management (see [www.forschungsmanagement.ch](http://www.forschungsmanagement.ch)). At other places, such as the University of Vienna or the Alpen-Adria University of Klagenfurt, so called extension curricula and elective modules are being developed. These programs have different focuses. Many of them serve as an interdisciplinary perspective extension in the sense of the discipline but we assume that a major part of the curricula deals with the area of social competences, as it is the case in group-dynamical learn setting. In order to achieve this, the focus lies on the development of self-thematisation- and reflexion competence.

In group-dynamic laboratories and interdisciplinary group settings, cooperative learning in the sense of emancipatory education is trained practically and the experienced is theoretically translated. The competence extension in the area of conversation techniques, the governance of interest conflicts, the support of self-enlightenment processes and the connected acquisition of training- and organisational development tools is only partially covered with the reading of relevant publications. In order to operate in research properly, a form of experience learning, participation in supervised learning by doing and a profound theoretical basis referring to logic and functionality of social systems is necessary. The practical doing in the sense of overcoming current and future societal challenges firstly requires a comprehensive subject-specific and at the same time practice-orientated university education. Secondly, reflective acting as well as a conscious and

proper handling with the involved actors is necessary and thirdly a reflective view on existing barriers, objections and often beneficial obstacles is required.

### **Conclusion: How to handle role flexibility, the task diversity and the multidimensional competence demands?**

The degree of cooperation in interdisciplinary research associations as well as the participation respectively the intensity of the participation of the concerned stake-holders from the practice in inter- and transdisciplinary projects are often the reasons for a project to get started or to expire. Therefore highly complex projects need a thorough planned project- and process management.

The worked out role diversity is striking and the accompanied contradictions between disciplinary narrowness and interdisciplinary multi-perspective, hierarchy and project management, proximity and distance (“going native”), counselling and research, scientific expertise and professionalism in the practice, closed systems and participation, authority and cooperation etc. require constant reflection processes within the team as well as between the team and the practice partners.

This management of contradictions needs participation of all people involved, the understanding of the differences which exist and it is necessary that they approach one another in order to create a successful balance. Only if all contribute and evolve as a team together, then it is possible that group-dynamic mature groups (in our case research teams) arise. From our experience, the project governance can therefore not be divided and allocated to different people due to the strong conjunction of form and content. It also seems not reasonable because it became obvious that the communication- and governance requirements always affect the content level as well as the formal one. Since form and content in inter- and transdisciplinary research projects are strongly interwoven and are constitutive for each other, it needs either scientists which are all-rounders and have the necessary competences in governance of social systems and are subject-specific competent (respected and recognized as a subject-matter expert) or a heterogenic constituted research team that covers all the required competences. In this case the focus has to lie on the team composition as well as on the team development- and accompanying process (cf. Lerchster/Lesjak 2014).

Therefore I come to the following results:

- It seems meaningless to demand from the scientific system to establish new professional careers which focus exclusively on research- and project management of inter- and transdisciplinary research associations or research projects.

- I rather argue for enabling successful integration and to focus on the development of more offers which provide the described learning methods. In doing so, it may be a good idea to establish mentoring-models which give young scientists the chance to gain scientific experiences (on the theoretical and methodological level) and to participate in the management of projects of inter- and transdisciplinary research associations and research projects.
- Beyond that, we suggest to add the issue of governance and organisation of (successful) stakeholder-dialogues to the spectrum of publishable empiric data. In times where scientific careers more and more depend on peer-reviewed publications, the only chance for research and learning for further development is to gain the appropriate attention in journals.

Despite the wish for assistance due to the complex problems and the complicated processes it seems not sufficient enough to reduce it on a level of cook book recipes for successful research. In fact, the description of research experiences can contribute to the assistance and parallel to that it is possible to develop peu à peu curricula which could provide answers to the described requirements for inter- and transdisciplinary research projects and research associations.

If the issue is how “science can and should interfere more exact, more effective, more appropriate, more controversial, more honest, happier, more explicit, more radical and more revolutionary” (Winiwarter 2014; p. 12), then the handling of successful participation processes in inter- and transdisciplinary research projects is mainly dependent on the qualifications and skills of the researchers. The question for the required skills is therefore going to stay virulent and we will have to dedicate ourselves critically, reflectively and perpetually to this issue for the purpose of the quality development of a relatively young research practice.

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# Heat Transfer Investigation Of Aluminum Oxide Nanofluids In Heat Exchangers

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## Abstract

An experimental study was conducted to investigate the use of water-based aluminum oxide nanofluids in enhancing the heat transfer performance of heat exchangers. Two types of heat exchangers were studied: a block-type heat exchanger for an electronic system cooling, and a radiator-type heat exchanger simulating an automobile cooling system. Tests conducted on the block heat exchanger used 20 nm alumina particles at a concentration of 5% by mass (1.3% by volume), while tests conducted on the radiator-type heat exchanger used 50 nm alumina particles at a concentration of 3% by mass (0.8% by volume). Tests conducted on the electronic heat sink system show an average enhancement of about 20% in heat transfer coefficient, while tests conducted on the radiator-type heat exchanger show a substantial enhancement in heat exchanger effectiveness that reaches almost 49%. Results demonstrate that the application of nanofluids in low concentrations is sufficient to cause a considerable improvement in the system's thermal performance. Results also show that the increase in bulk flow heat transfer coefficient happens at the expense of the increase in fluid pumping power caused by the increase in fluid viscosity.

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**Keywords:** Heat Transfer Coefficient, Effectiveness, Nanofluid,  $AL_2O_3$

## Introduction

With the ever increasing demand for cooling power in heat exchangers, huge efforts have been devoted to their heat transfer enhancement. Research conducted during the last few years have shown significant improvements in the thermal properties of conventional heat transfer fluids by the addition of nanoparticles to the base fluids. Tests conducted on water-based  $AL_2O_3$  nanofluids have shown enhancement in thermal conductivity that varied from a modest 1.4% at 0.3% volume concentration with 30 nm particles (Lee, 2008), to 10% at 3% volume concentration with 43 nm particles (Chandrasekar, 2010), to 24% at 4% volume concentration with 33 nm particles (Eastman, 1997), to 30% at 18%

volume concentration with 36 nm particles (Mintsa, 2009), and to a considerable enhancement of 88% at 12% volume concentration with 75 nm particles (Ghanbarpour, 2014). It is clearly evident in those studies that the bulk fluid thermal conductivity in general increases with the increase in nanoparticles volume concentration.

The benefit of using nanofluids in heat exchanger applications have been investigated by several researchers. In the cooling of a microchannel heat sink, Ijam et al. (2012) has shown that adding  $\text{Al}_2\text{O}_3$  nanoparticles to water at 4% volume concentration improved the heat flux by about 3 %, and by about 17.3% when the particle volume concentration was 0.8%. Ijam and Saidur (2012) also showed that the addition of SiC nanoparticles to water at 4% volume fraction resulted in an improvement between 7.3 to 12.4% in heat flux. Selvakumar and Suresh (2012) studied the performance of CuO water-based nanofluid in an electronic heat sink. Their study revealed a 29% improvement in heat transfer coefficient for 0.2% volume fraction of CuO in deionized water. Hashemi et al. (2012) studied heat transfer enhancement in a nanofluid-cooled miniature heat sink application. Their study showed an enhancement in the heat transfer coefficient by about 27% when using  $\text{SiO}_2$  at a concentration of 5% concentration by volume. Khedkar et al. (2013) studied the heat transfer in a concentric tube heat exchanger with different volume fractions of water-based  $\text{Al}_2\text{O}_3$  nanofluids. It was observed that at 3% volume fraction, the optimal overall heat transfer coefficient was about 16% higher than water. Sun et al. (2015) analyzed the flow and convective heat transfer characteristics of  $\text{Fe}_2\text{O}_3$  water-based nanofluids inside inner grooved copper and smooth copper tubes. For the same mass fraction of  $\text{Fe}_2\text{O}_3$  nanoparticles, the convective heat transfer coefficient was better in the inner grooved copper tube than in the smooth copper tube. The enhancement in heat transfer coefficient associated with the inner grooved copper tube was about 33.5% for  $\text{Fe}_2\text{O}_3$  mass concentration of 0.4%. All of the above researchers have examined the effect of nanoparticles concentration on heat transfer enhancement, and have studied different types of nanoparticles. However, there are contradictory conclusions on the heat transfer enhancement at lower nanoparticle concentrations among different researchers. Also, still limited research studies have been conducted on the evaluation of alumina nanofluid properties and their performance in heat exchanger applications. The current study aims at investigating some of these issues in addition to investigating the thermal and rheological properties of water-based alumina nanofluids.

## Experimental Setup:

### a) Electronic Heat Sink Application

A closed-loop cooling system using block heat exchangers was built to evaluate the heat transfer performance associated with the use of a water-based nanofluid with alumina particles as a cooling fluid. A general picture of the experimental setup is shown in figure 1a. The nanofluid was prepared by mixing alumina nanoparticles with 20 nm average size in deionized water for a suspension concentration of 5% by mass (1.3% by volume). A digital geared-pump was used to pressurize the nanofluid for circulation in the closed-loop system. Two block heat exchangers were used in the system: one to heat the nanofluid (HXR1), and the other to cool the fluid (HXR2). The interior of the block heat exchanger (figure 1b) consisted of 10 channels through which the cooling fluid travelled back and forth.

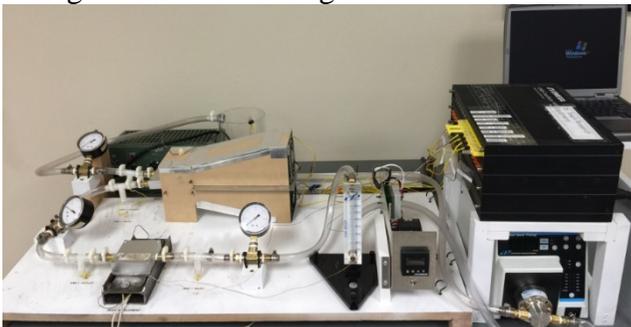


Figure 1a. Experimental setup of the electronic heat sink system.

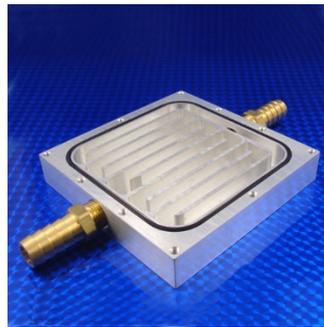


Figure 1b. Block heat exchanger.

The heat exchanger that was used to heat the nanofluid sat on top of a 500 W plate heater separated by a 6.2 mm thick aluminium plate. A temperature control system was used to control the input heat to the base plate of the heat exchanger. The heat exchanger that was used for cooling the nanofluid sat approximately five inches above the base of the closed-loop system. Two cooling fans rated at 120 cfm each were used to cool the upper and lower surfaces of this heat exchanger. Once the fluid exited HXR2 it flowed into a 2-litres reservoir tank. A compact digital mixer system providing a top speed of 2,500 rpm was embedded in the tank. To achieve closed-loop circulation, the outlet from the reservoir tank fed directly into the pump inlet. Thermocouples were embedded at various locations to record the temperature variation throughout the system.

### b) Radiator-Type Heat Exchanger Application

Another closed-loop cooling system was also constructed to evaluate the performance of a radiator-type heat exchanger as shown in the sketch of figure 2. The heat exchanger (202 mm x 89 mm x 160 mm) had a 10-pass

cross-flow finned-tubes with a single tube inlet and outlet, where the tubes were arranged in a staggered array. Each tube had an inner diameter of 7.73 mm, an outer diameter of 9.5 mm, and a length of 12.7 cm. 80 fin plates of 0.15 mm thickness, 120 mm width, and 38 mm depth were packaged normal to the tubes to form narrow passes having 1.4 mm separation distance where air blowing from a fan passed through. A collection tank with a high-speed agitator thoroughly mixed the nanofluid, alumina-water based using 50 nm  $AL_2O_3$  particles with a mass concentration of 3% (0.8% by volume), before it was circulated using a circulation pump. A controlled heating system was installed in the tank to maintain the circulating fluid temperature within a desired range. The fluid was cooled using a blowing fan that was attached on one side of the heat exchanger. Thermocouples and flow sensors were installed throughout the system to monitor the fluids temperature and pressure, and were connected to a data acquisition device to record the data.

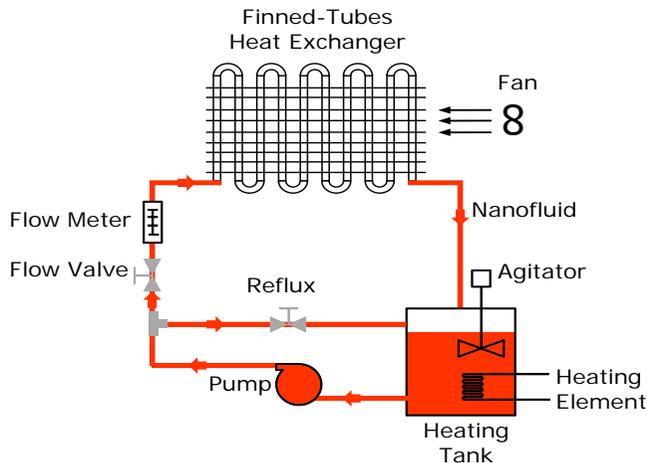


Figure 2. Experimental setup of the radiator-type heat exchanger system.

### Property Measurements

Nanofluid test samples using 20 and 50 nm  $AL_2O_3$  particles in distilled water of various concentrations were prepared and tested in a laboratory experimental setup for the determination of thermal conductivity. Thermal conductivity was measured using a KD2 Pro thermal properties analyzer by Decagon Devices. Details about the design and working of the KD2 Pro device can be found in the operator's manual (Decagon Devices, 2010). The analyser consists of a microcontroller with several needle sensors that can be used. KS-1 sensor needle was selected to determine the thermal conductivity of the nanofluids. The needle contains both a heating element and a thermistor. The needle, 1.3 mm in diameter and 6 cm long, was inserted vertically (to minimize natural convection) inside a test tube

containing the nanofluid sample (figure 3). Tests were carried out at a temperature close to 46 °C, and for nanoparticles mass concentration of up to 40%. Tests reveal that the thermal conductivity of the nanofluid increases with the mass fraction (figure 4). However, there is a slight difference in thermal conductivity between the 20 and 50 nm particle suspensions.

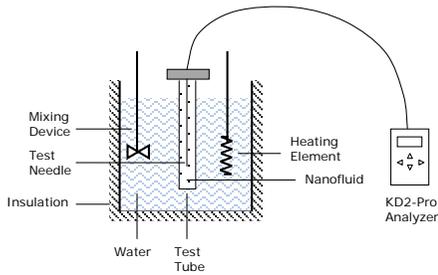


Figure 3. Experimental setup for thermal conductivity analysis.

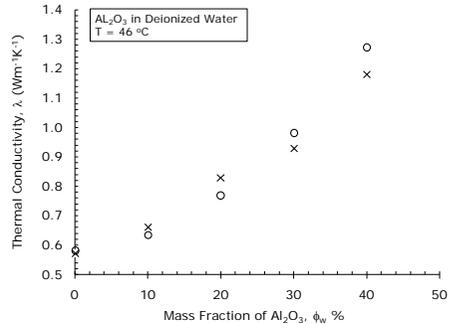


Figure 4. Thermal conductivity versus alumina mass concentration.

Rheological tests were conducted on the same samples originally used for thermal property evaluation. Rheological properties were conducted using UL adapter attached to LVDVII+Pro viscometer. Suspensions were mixed thoroughly using a high-speed mixing device for about 30 minutes before the viscosity tests were carried out. All tests were performed at a temperature ranging from 45 to 49 °C. Figures 5 and 6 show the variation in the nanofluid viscosity for 20 and 50 nm alumina particles, respectively as function of the shear rate and nanoparticles concentration. Suspensions with 50 nm particles show an increase in viscosity with the increase in shear rate; thus, a shear thickening fluid behaviour (dilatant fluid). However, suspensions with 20 nm particles show a decrease in viscosity with the increase in shear rate for the nanofluid having 5% mass concentration (i.e., shear thinning fluid), but an increase in viscosity for the nanofluid having 2.5% mass concentration (i.e., shear thickening fluid).

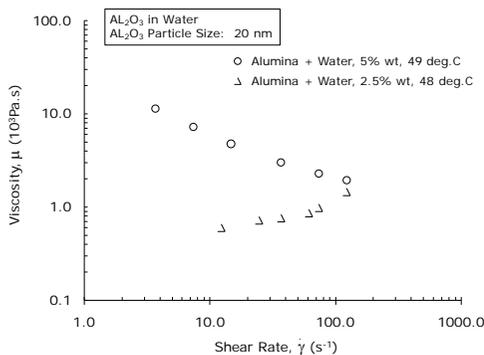


Figure 5. Viscosity versus shear rate for 20 nm alumina-in-water particles.

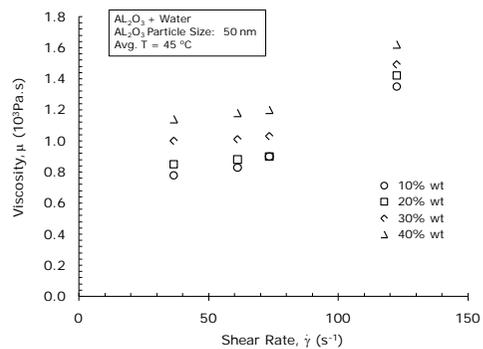


Figure 6. Viscosity versus shear rate for 50 nm alumina-in-water particles.

## Heat Transfer Measurements:

### a) Electronic Heat Sink Application

Heat transfer tests were carried out on the electronic heat sink system using deionized water-based alumina nanofluid coolant with a 20 nm particles and a mass concentration of 5%. The results were compared to that of a cooling fluid consisting of deionized water. The plate heater was set to a constant temperature of 91 °C, and the coolant flow rate was varied between 7.8 and 16.1 cm<sup>3</sup>s<sup>-1</sup>. Interface temperatures, and heat exchangers inlet and outlet temperatures were recorded once steady state temperature in the system was reached. The steady state temperature of the coolant associated with the different flow rates ranged from about 47 to 57 °C. The total volume of the coolant in the system was 2 litres. To minimize the precipitation of nanoparticles in time, a stirring device embedded in the reservoir tank was turned on for the duration of the tests. The heat flux supplied by the electric heater at the base plate of HXR1,  $q''$ , is determined from the temperature variation,  $\Delta T$ , across the plate wall thickness:

$$q'' = \frac{q}{A} = \lambda_p \frac{\Delta T}{\Delta x} \quad (1)$$

where  $\lambda_p$  is the thermal conductivity of the plate,  $\Delta x$  is the plate thickness, and  $A$  is the surface area. The heat transfer coefficient associated with the coolant in the heat exchanger,  $h_c$ , is calculated as:

$$h_c = \frac{q''}{T_i - T_f} \quad (2)$$

where  $T_i$  is the heat exchanger base plate interface temperature (interface between the heat exchanger bottom surface and the base plate top surface), and  $T_f$  is the bulk mean temperature of the cooling fluid in HXR1.

The pumping power of the bulk fluid,  $P_{power}$ , is calculated as:

$$P_{power} = \dot{V}\Delta P \quad (3)$$

Figures 7 and 8 show the wall heat flux (at the base of HXR1) and the coolant heat transfer coefficient as function of the bulk mass flow rate for the case of water-based alumina nanofluid and deionized water, respectively. The wall heat flux and coolant heat transfer coefficient are shown to increase with the increase in bulk mass flow rate. Comparison between figures 7 and 8, show water-based alumina nanofluid has higher values for both the wall heat flux and heat transfer coefficient. An average increase by about 24% is seen in the wall heat flux for the case of water-based nanofluid compared to the case of deionized water. The heat transfer coefficient is also shown to increase by about 20% for the case of water-based nanofluid.

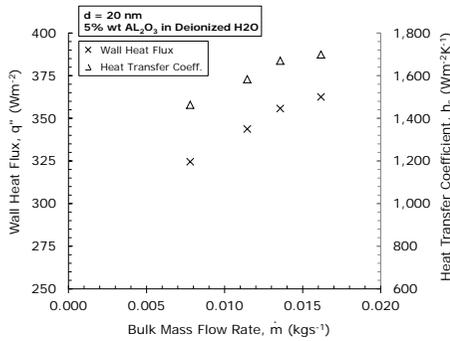


Figure 7. Wall heat flux versus mass flow rate (5% wt AL<sub>2</sub>O<sub>3</sub>).

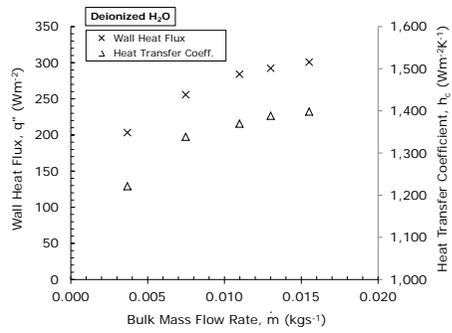


Figure 8. Wall heat flux versus mass flow rate (Deionized water).

Figure 9 shows the decrease in the heated wall cross-section temperature (at the base of HXR1) as function of bulk mass flow rate. For the considered flow rates, the decrease in temperature ranged from 23.7 to 25.8 °C for the nanofluid test case, while it ranged from 18.8 to 21.7 °C for the deionized water test case. Figure 9 clearly shows an additional temperature drop (i.e., enhancement) between 4.1 and 4.9 °C when alumina nanofluid instead of deionized water is used as a coolant.

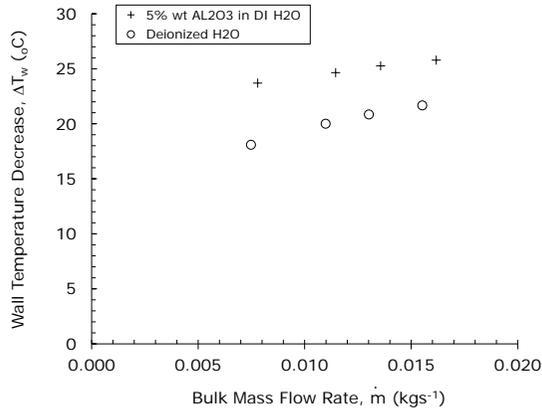


Figure 9. Decrease in wall temperature versus bulk mass flow rate.

Figure 10 shows the pressure drop across HXR1 heat exchanger as function of the bulk mass flow rate. The pressure drop is shown to increase with mass flow rate and with the addition of nanoparticles to the base fluid. The relationship between bulk fluid heat transfer coefficient and pumping power is shown in figure 11. The increase in heat transfer coefficient is shown to occur at the expense of pumping power increase. But for the same pumping power, the presence of nanoparticles in the base fluid is shown to have a significant effect on the increase in heat transfer coefficient, and therefore cooling efficiency.

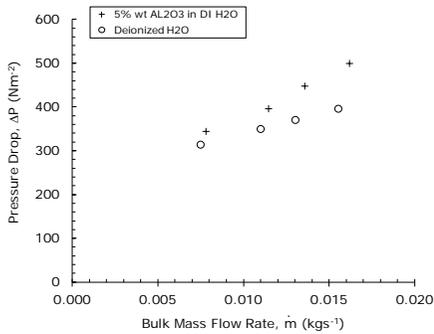


Figure 10. Pressure drop versus bulk mass flow rate.

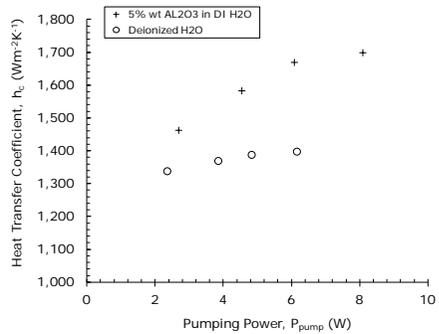


Figure 11. Heat transfer coefficient versus pump power.

### b) Radiator-Type Heat Exchanger Application

Heat transfer tests were also performed on the radiator-type heat exchanger. In this case, the water-based alumina nanofluid consisted of 50 nm alumina particles suspensions having a mass concentration of 3%. The performance of the heat exchanger using the nanofluid as a circulating fluid was also compared to that using distilled water. Several test cases were conducted where the tank immersed heater was set to different temperature settings ranging from 200 to 500 °C. Temperature data were recorded for about 45 minutes after the system reached steady state condition. Figure 12 shows typical results for the temperature drop between the radiator inlet and outlet for the two types of circulating fluids. As expected, the temperature drop increases with the decrease in volumetric flow rate, and the nanofluid is shown to outperform distilled water.

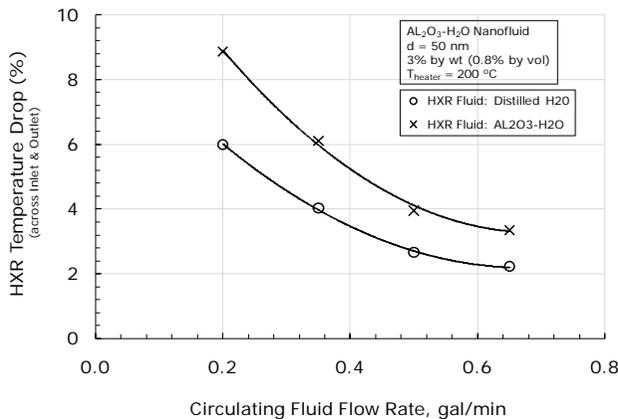


Figure 12. Comparison in radiator temperature drop using aluminum oxide nanofluid versus distilled water.

The radiator heat transfer effectiveness,  $\varepsilon$ , defined as the ratio of the actual heat transfer,  $q$ , to the maximum possible heat transfer that can be achieved,  $q_{\max}$ , is calculated as follows:

$$\varepsilon = \frac{q}{q_{\max}} = \frac{\dot{m}_f c_{p,f} (T_{i,f} - T_{e,f})}{C_{\min} (T_{i,f} - T_{i,a})} \quad (4)$$

where  $\dot{m}_f$  is the mass flow rate of the circulating fluid, and  $c_{p,f}$  is its specific heat.  $C_{\min}$  is the minimum of  $\dot{m}_f c_{p,f}$  and  $\dot{m}_a c_{p,a}$  where index  $a$  indicates air.  $T_{i,f}$  and  $T_{e,f}$  are the inlet and exit temperatures of the circulating fluid, and  $T_{i,a}$  is the air temperature at the fan inlet. Figure 13 shows a comparison in the radiator heat transfer effectiveness between aluminum-oxide water based nanofluid and distilled water. The operating conditions were the same for both fluids. All test cases conducted using the nanofluid showed an increase in heat transfer effectiveness. A substantial enhancement of up to 49% was achieved.

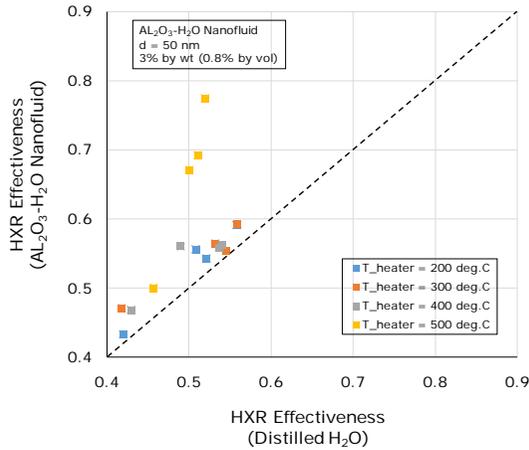


Figure 13. Comparison in radiator heat transfer effectiveness using aluminum oxide nanofluid versus distilled water.

The radiator overall heat transfer coefficient,  $U$ , is calculated using the experimental prediction of the heat exchanger log mean temperature difference,  $\Delta T_{LM}$ :

$$U = \frac{\dot{m}_f c_{p,f} (T_{i,f} - T_{e,f})}{A \Delta T_{LM}} \quad (5)$$

where  $A$  is the peripheral area of the radiator tubes. Figure 14 shows a comparison in the radiator overall heat transfer coefficient between the aluminum-oxide nanofluid and distilled water. The conditions are shown for

an average circulating fluid temperature of 40 °C. An increase of up to 38% can be seen in the highest volumetric flow rate cases.

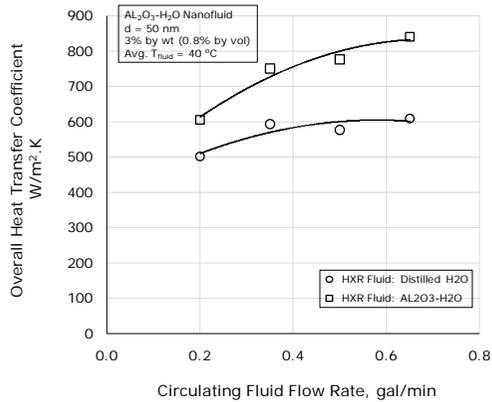


Figure 14. Comparison in radiator overall heat transfer coefficient using aluminum oxide nanofluid versus distilled water.

## Conclusion

An experimental study was conducted to investigate the heat transfer performance of two types of heat exchangers using an alumina-water based nanofluid as a circulating fluid: a block-type heat exchanger for an electronic system cooling, and a radiator-type heat exchanger simulating an automobile cooling system. Tests carried out on the block heat exchanger used 20 nm alumina particles at a concentration of 5% by mass, while tests carried out on the radiator-type heat exchanger used 50 nm alumina particles at a concentration of 3% by mass. In both cases, the suspended particles were thoroughly mixed using a high speed agitator before the start of each test. Thermal conductivity tests conducted on the alumina nanofluids show an enhancement of less than 4% for the above mentioned particles concentration levels. Results also show that the increase in bulk flow heat transfer coefficient happens at the expense of the increase in the bulk fluid pumping power due to the increase in bulk fluid viscosity.

Tests on the electronic heat sink system show an average enhancement of about 20% in heat transfer coefficient and 24% in the wall heat flux. Results also show an additional decrease in the heated wall cross-section temperature ranging from 4.1 to 4.9 °C. Tests conducted on the radiator-type heat exchanger also show a substantial enhancement in heat exchanger effectiveness that reaches almost 49%. Based on these results, it seems that the 4% increase in bulk fluid thermal conductivity may not have been the only driving force behind this substantial increase in the systems heat transfer performance. It is likely possible that another effect such as the Brownian motion of the nanoparticles may have been behind this increase. Since the presence of nanoparticles in the bulk fluid can reduce the thermal

boundary layer thickness (thus enhancing the bulk fluid heat transfer capability), it is possible that the size of the nanoparticles may influence this phenomenon. Even though higher heat transfer performance is achieved in the radiator-type heat exchanger with 50 nm  $Al_2O_3$  particles, the size of the nanoparticles in the base fluid needs to be explored further to verify this effect.

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# Technical Planning To Reduce Air Pollution By Management Of Energy Supply To “Technological Polo” Of Catania University

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## **Abstract**

Forecasted data of energy consumptions to supply energy needs of Technological Polo (TP) equipped with a “Complex Energy System” (CES) allowed calculating amount of polluting emission yearly expected. With same approach people calculated amount of polluting emission in case of energy, supply with a Conventional System of Technologies (CST). By means of comparison between the two amounts of forecasted polluting data, people focused on as much air pollution could be saved adopting CES that is based on “green energy”, CCHP techniques and statements of II Law of Thermodynamics. Firstly, paper shows a short summary of architectural and operational function of TP integrally reported in previous paper [1].

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**Keywords:** Energy, Rationalize, Environmental Control Techniques, Renewable

## **Short summary of TP**

Paper [1] showed characteristics of architecture and building material of TP as depicted in fig.1, fig.2, fig.3, fig.4, fig.5 and fig.6. TP, designed by Author and built in 28 months with a final cost of about €14.000.000.

Thermodynamic Architecture of CES allows utilizing the same thermal energy coming from a certain source but different and decreasing intervals of temperature to supply plants and various utilities as showed in fig.7 and fig.8.

CES utilizes renewable energies coming from Photovoltaic Installation (PI), Solar Panel (SP) and CCHP techniques that Italian Rules consider “renewable techniques” too under certain conditions.



Fig.1



Fig.2



Fig.3



Fig.4



Fig.5



Fig.6

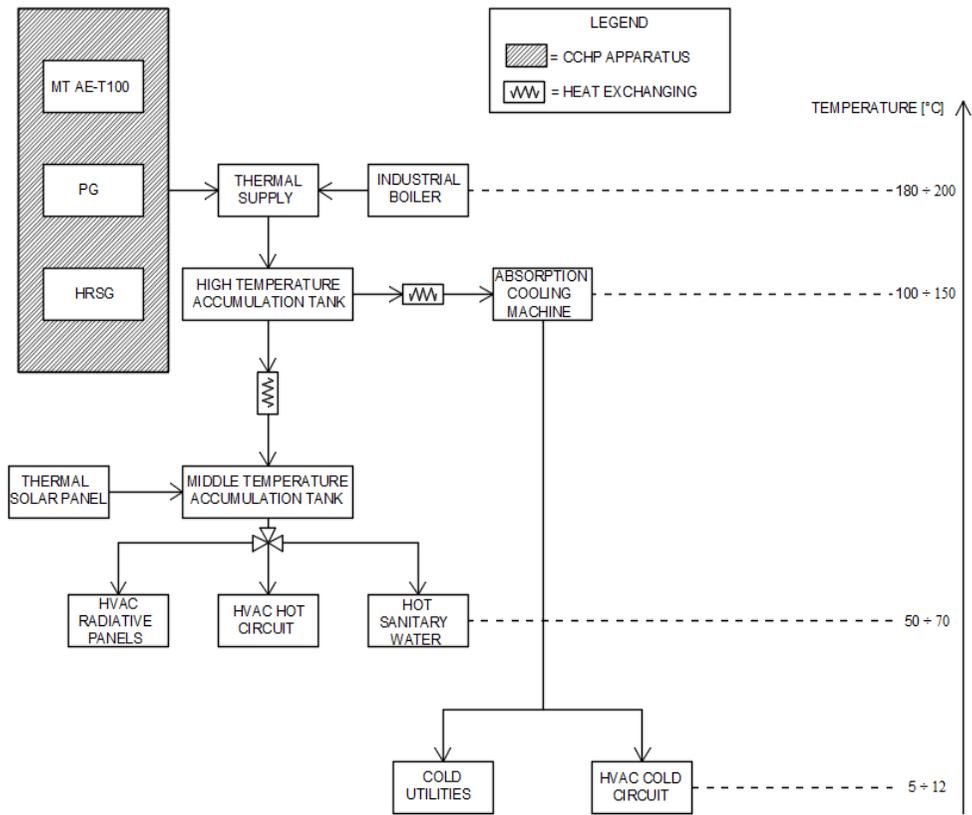


Fig.7 – “Hot” and “Cold” thermal supplies

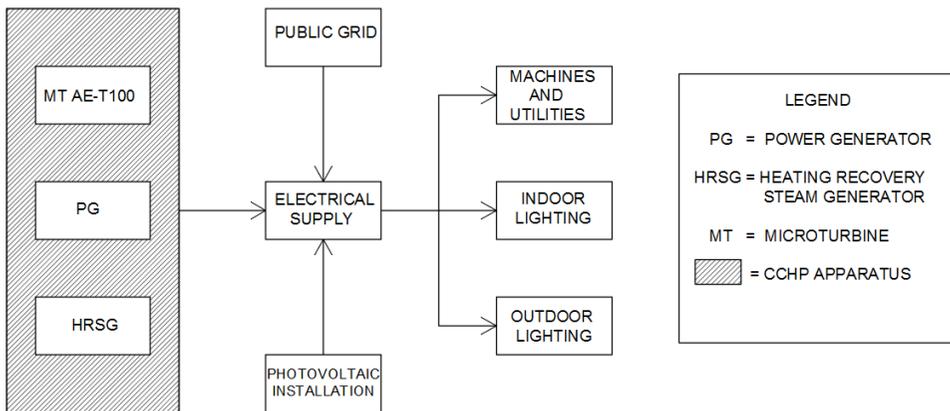


Fig.8 – Electrical supplies

**Energy needs and supplyings of operational TP**

Previous paper [1] paper showed following tables:

- ✓ Tab.1 showing thermal loads requested and sources of supplying.

✓ Tab.2 showing electrical loads requested and sources of supplying.

	REQUEST	SOURCE OF SUPPLY		
	kWh <sub>t</sub>	CCHP kWh <sub>t</sub>	THERMAL SOLAR kWh <sub>t</sub>	INDUSTRIAL BOILER kWh <sub>t</sub>
January	84,500	76,400	2,600	5,460
February	84,500	76,400	2,600	5,460
March	84,500	76,400	2,600	5,460
April	1,300	Maintenance	3,250	NO (-1,950)
May	77,740	76,400	3,250	NO (-1,950)
June	77,740	76,400	5,200	NO (-3,900)
July	77,740	76,400	5,200	NO (-3,900)
August	35,880	35,280 (50%)	2,400	NO (-1,800)
September	77,740	76,400	3,250	NO (-1,950)
October	77,740	76,400	3,250	NO (-1,950)
November	1,300	Maintenance	2,600	NO (-1,300)
December	84,500	76,440	2,600	5,460
<b>TOTAL</b>	<b>765,180</b>	<b>723,240</b>	<b>38,800</b>	<b>21,840</b>

Tab.1 [1]

	REQUEST	SOURCE OF SUPPLY			
	KWh <sub>e</sub>	CCHP kWh <sub>e</sub>	PI kWh <sub>e</sub>	NETWORK kWh <sub>e</sub>	
				GAVE TO NETWORK	SUPPLEMENTARY FROM NETWORK
January	102,960	62,400	711	-.-	-39,849
February	102,960	62,400	782	-.-	-39,778
March	57,200	62,400	1,007	6,270	-.-
April	57,200	Maintenance	1,053	NO	-56,147
May	57,200	62,400	1,189	6,389	-.-
June	45,760	62,400	1,170	17,810	-.-
July	45,760	62,400	1,229	17,869	-.-
August	21,120	28,800	1,179	8,859	-.-
September	57,200	62,400	1,036	6,236	-.-
October	57,200	62,400	967	6,167	-.-
November	102,960	Maintenance	722	-.-	-102,238
December	102,960	62,400	685	-.-	-39,875
<b>TOTAL</b>	<b>810,480</b>	<b>590,400</b>	<b>11,730</b>	<b>69,537</b>	<b>-277,887</b>

Tab.2 [1]

To supply previous energy loads people made use of technologies, plants and system as CCHP system, photovoltaic installations, thermal panels installation, industrial boiler and public national electrical network system.

## Renewable or assimilated energies utilized by CES

CES utilizes CCHP system (assimilated to renewable energy by Italian Regulation under specific condition), solar panels (SP), and photovoltaic system (PHS).

- CCHP system is made up of one “Microturbine AE-T100” of Ansaldo (MT) fed by methane ( $\text{CH}_4$ ), one “Power generator” (PG) and one “Heating recovery steam generator” (HRSG). As regard MT, data coming from technical specification [2] show that MT by  $333 \text{ kWh}_t$  (thermal energy input coming from combustion of  $\text{CH}_4$ ) produces  $167 \text{ kW}_t$  (thermal power output of HRSG) and  $100 \text{ kW}_e$  (electrical power output of PG). In first part of paper, people calculate the yearly average operational time of work of CCHP system in  $5,100 \text{ h/year}$  (instead of  $8,760 \text{ h/year}$ ) to take in account operational times wasted for normal and extraordinary maintenance services.

By means of previous data, people calculate the yearly supplying coming from CCHP system:

$$\checkmark \quad \text{Output of thermal energy: } 167 \text{ kW}_t \cdot 5,100 \text{ h/year} = 851,700 \text{ kW}_t\text{h/year} \quad (1)$$

$$\checkmark \quad \text{Output of electrical energy: } 100 \text{ kW}_e \cdot 5,100 \text{ h/year} = 510,000 \text{ kW}_e\text{h/year} \quad (2)$$

In function of yearly average operational time and thermal input, people calculate the yearly energy consumption:

$$\checkmark \quad \text{Input of thermal energy: } 333 \text{ kW}_t \cdot 5,100 \text{ h/year} \cdot 0.0036 \text{ GJ/kWh} = 1,698,300 \text{ kWh}_t\text{/year} \cdot 0.0036 \text{ GJ/kWh} = 6,113.88 \text{ GJ/year} \quad (3)$$

- Thermal energy production by SP, as showed in first part of paper, takes to an yearly average of  $38,800 \text{ kW}_t\text{h/year}$ , that is:
 
$$38,800 \text{ kW}_t\text{h} \cdot 0.0036 \text{ GJ/kWh} = 139.68 \text{ GJ/year} \quad (4)$$

- Electrical energy production by PHS, as showed in first part of paper, takes to an yearly average of  $11,730 \text{ kW}_e\text{h/year}$ , that is:
 
$$11,730 \text{ kW}_e\text{h/year} \cdot 0.0036 \text{ GJ/kWh} = 42.23 \text{ GJ/year} \quad (5)$$

By means of all previously reported, CES supplies:

$$\checkmark \quad \text{Total thermal energy :} \quad (1) + (4) = 890,500 \text{ kW}_t\text{h/year} \quad (6)$$

$$\checkmark \quad \text{Total electrical energy:} \quad (2) + (5) = 521,730 \text{ kW}_e\text{h/year} \quad (7)$$

## Analysis about polluting substances discharged into atmosphere by operational CES

People limited analysis to  $\text{NO}_x$ , CO,  $\text{PM}_{10}$  and considered pollution produced by CES coming only from combustion of  $\text{CH}_4$  fueling MT since SP and PHS do not produce polluting matters. By technical handbook [3] people

obtained specific polluting emission in the case of gas turbines fed by methane. The average for each specific polluting substance are:

$$\text{NO}_x = 0.048 \text{ kg/GJ} \quad \text{CO} = 0.0048 \text{ kg/GJ} \quad \text{PM}_{10} = 0,0002 \text{ kg/GJ} \quad (8)$$

By (3) and by (8) people obtained total yearly amount of emissions caused by CES.

$$\left. \begin{aligned} \text{NO}_x &= 0.048 \text{ kg/GJ} \cdot 6,113.88 \text{ GJ/year} = 293.47 \text{ kg/year} \\ \text{CO} &= 0.0048 \text{ kg/GJ} \cdot 6,113.88 \text{ GJ/year} = 29.35 \text{ kg/year} \\ \text{PM}_{10} &= 0.0002 \text{ kg/GJ} \cdot 6,113.88 \text{ GJ/year} = 1.23 \text{ kg/year} \end{aligned} \right\} (9)$$

**Theoretical values of pollutant substances in case of energy productions by means of conventional methods and systems**

- Thermal energy

Production of thermal energy commonly happens by “industrial boiler” (IB). Total thermal efficiency of IB depends on many causes: efficacy of combustion, kind of fuel utilized, losses of heat in external blanket of IB, amount of heat contained in smokes discharged in atmosphere by smokestack, sales model of IB, etc. etc.

People elaborated incidence of previous factors analyzing technical data [4] showed in the book of production of IB coming from an important European factory. The evaluation by data processing allows appreciating in about 80% the average of total thermal efficiency of IB. For room reason the copious hypothesis at the basis of previous value are not here reported. Choosing 80% as total thermal efficiency to supply by fuel to IB, people obtain the corresponding thermal energy by combustion of fuel in IB to obtain the same amount of thermal energy produced by CES as follows:

$$890,500 \text{ kWh}_t/\text{year} / 0.80 = 1,113,125 \text{ kWh}_t/\text{year} = 4,007.25 \text{ GJ/year} (10)$$

Usually fuel to supply IB may be gaseous fuel, heavy fuel or gasoil. Technical handbooks [5] show pollutant specific emissions in function of kind of fuel as shown in tab.3.

Pollutants	Gaseous Fuel g/GJ	Heavy Fuel g/GJ	Gasoil g/GJ	Average g/GJ
CO	39	15.1	16.2	23.44
NO <sub>x</sub>	89	142	65	98.67
PM <sub>10</sub>	0.89	25.2	3.2	9.76

Tab.3

By (10) and the average of tab.3 people calculated theoretical values of pollutant emission in case of thermal energy produced by means of conventional methods and system.

$$\left. \begin{aligned} \text{NO}_x &= 98.67 \text{ kg/GJ} \cdot 4,007.25 \text{ GJ/year} = 395,395 \text{ kg/year} \\ \text{CO} &= 23.44 \text{ kg/GJ} \cdot 4,007.25 \text{ GJ/year} = 93,930 \text{ kg/year} \\ \text{PM}_{10} &= 9.76 \text{ kg/GJ} \cdot 4,007.25 \text{ GJ/year} = 39,110.76 \text{ kg/year} \end{aligned} \right\} (11)$$

- **Electrical energy**

The supplying of electrical energy not self-produced commonly derives from network connection with public national electricity grid. Electricity production coming from grid happens by means of energy conversion from thermal to electrical energy in generating station. People calculate here after polluting emissions without considering precautionary losses caused by transport of electricity from generating station to point of user because impossible to calculate in general form. People limit himself to evaluate polluting emissions considering only the efficiency of generating station.

Generating station shows different values of efficiency in function of kind of fuel supply as showed in tab.4.

Fuel supply		Efficiency	Average
Oil	=	0.45	0.43
Coal	=	0.40	
Methane	=	0.44	

Tab.4

Taking in consideration average efficiency and electrical energy produced by CES (7), generating station must produces

$$521,730 \text{ kW}_e\text{h/year} / 0.43 = 1,213,326 \text{ kW}_e\text{h/year} = 4,368 \text{ GJ/year} \quad (12)$$

By (12) and values of tab.3, people calculate theoretical values of pollutant substances in the case of electrical energy production by means of conventional methods and systems as here after reported:

$$\left. \begin{aligned} \text{NO}_x &= 98.67 \text{ kg/GJ} \cdot 4.368 \text{ GJ/year} = 430,990.56 \text{ kg/year} \\ \text{CO} &= 23.44 \text{ kg/GJ} \cdot 4.368 \text{ GJ/year} = 102,385.92 \text{ kg/year} \\ \text{PM}_{10} &= 9.76 \text{ kg/GJ} \cdot 4.368 \text{ GJ/year} = 42,631.68 \text{ kg/year} \end{aligned} \right\} \quad (13)$$

### Environmental balance

Result showed in (9), (11) and (13) allow calculating environmental balance. People underline that positive values (+) mean amount of pollutants really discharged into atmosphere (9) by CES and negative values (–) are theoretical amount of pollutants saved to be discharged in atmosphere of an hypothetical supplying by means of conventional methods and systems (11) (13):

$$\left. \begin{aligned} \text{NO}_x &= (293.47 - 395,395 - 43,990.56) \text{ kg/year} = -826,092 \text{ kg/year} \\ \text{CO} &= (29.35 - 93,930 - 102,385.92) \text{ kg/year} = -196,286.57 \text{ kg/year} \\ \text{PM}_{10} &= (1.23 - 39,110.67 - 42,631.68) \text{ kg/year} = -81,470.45 \text{ kg/year} \end{aligned} \right\} \quad (14)$$

### Conclusion

Results showed in (14) prove that thermodynamic design of CES realized on the basis of criteria stated by II Law of Thermodynamic and with

use of renewable or assimilated energy sources is the right way to respect environment by decreasing impact of pollutant substances as like about 826 tons<sub>NO<sub>x</sub></sub>/year, about 196 tons<sub>CO</sub>/year and about 81.47 tons<sub>PM<sub>10</sub></sub>/year. Authors have to underline that planning choices have general effectiveness as regard the application of criteria of II Law of Thermodynamic whereas practical consequence of CCHP technique is convincing for this specific or comparable cases that maintain similar values of ratio between electrical and thermal energies required by user. It means that correct design of CES and interrelated thermodynamics architecture of plants must take in account a lot of input data [1] as like:

- Weather-climate and geographical position of locality of construction
- Types of activities that will carried out in built volumes
- Total amount of energies that yearly have to be supplied
- The possibility to exploit other renewable sources as locally present
- Etc. etc.

However, with reference exclusively to environmental purpose every kind of Complex Energy System that follow criteria of II Law of Thermodynamic and applications of CCHP technique certainly will take to significant advantages for environment.

### Nomenclature:

TP	:	Technological Polo
CES	:	Complex Energy System
t (subscript)	:	Thermal “hot” energy
f (subscript)	:	Thermal “cold” energy
e (subscript)	:	Electrical energy
CCHP	:	Combined Cooling Heating and Power
MT	:	Micro turbine
PG	:	Power Generator
HRSG	:	Heating Recovery Steam Generator
PI	:	Photovoltaic installation
SP	:	Solar panels
PHS	:	Photovoltaic system

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# POSSIBLE USE OF The Retropolation Method For Estimating Aggregated Indices On The Quarterly National Accounts

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## Abstract

The effort to quickly establish reliable estimates for the values of the quarterly national accounts has led developed countries to attenuate direct statistical surveys as the primary data source in favour of modelling. A number of modelling methods utilise the relationship between an aggregated index on the national accounts and an index that is surveyed currently (quarterly or monthly). This paper presents assumptions and possibilities for the use of the retropolation method as one of the disaggregation methods.

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**Keywords:** Quarterly national accounts , disaggregation methods, retropolation method

## Introduction

The basic data of the national accounts are given by annual values of indices, or annual national accounts. They are predominantly based on extensive surveys. The substance and scope of these activities imply the viewpoint that the goal of executing the annual national accounts (by surveys) is to have at our disposal information *as reliable as possible*, even if the lead time for its acquisition may be rather long.

On the contrary, *the quarterly national accounts* are aimed at getting quarterly values of the respective aggregated indices *as quickly as possible*. In this sense, the same macroeconomic statistical model is concerned as for the annual account surveys but based on different methods for data survey and processing: short-term surveys, modelling, etc. The methods used must always be quick and representative. The current practice of the Czech Statistical Office is predominantly based on quarterly statistical surveys; preliminary estimates for the aggregated indices of resources and uses of the gross domestic product (GDP) are known within about 60 days from the end

of the respective quarter, and quarterly accounts by industry within about 90 days from the end of the quarter. The first preliminary information on the GDP evolution in the past quarter is available on about the 45th day. In the developed member countries in the EU, these lead times are shorter (a preliminary estimate is known on the 20th to 30th day after the end of the quarter, and preliminary estimates for the aggregated indices of resources and uses of the gross domestic product on the 40th to 50th day after the end of the quarter). These conditions are reflected in Eurostat's requirements – a preliminary estimate of the GDP growth should be published by each member country within 30 days from the end of the quarter.

The only way to shorten the lead times for establishing and publishing the data on quarterly national accounts is to replace surveys with modelling, that is, the so-called direct methods with indirect ones. The *direct methods* are predominantly based on quarterly (and in theory even monthly) statistical surveys, possibly complemented with data from administrative data sources. On the contrary, the *indirect methods* make use of economic-mathematical and statistical methods, specifically those of regression and time series analyses.

The crucial point of indirect methods for estimating the quarterly values of the aggregated indices on the national accounts is to provide, as soon as possible, estimates of indices on the quarterly national accounts in the past quarter; at the same time, predictions of the aggregated indices for one or two quarters ahead should also be enabled at a satisfactory level of accuracy and reliability of such predictions. A quality criterion for such estimates should be based on their ability to provide a basis for preliminary estimates of the values on the annual national accounts<sup>50</sup>, and ensuring minimal deviations from the annual national accounts based on year-long surveys. Therefore it is logical that basic considerations concerning the methods for the quarterly estimates should unfold from a relationship between the annual and quarterly indices, or annual and quarterly national accounts. One of the methods providing for that unity is that of *retropolation* (allocation) of annual index values to quarterly ones<sup>51</sup>. This allocation stems from a connection between annual values and a short-term surveyed, so-called reference index.

An indisputable advantage of the estimation methods based on the relationship between the reference and estimated aggregated indices is the

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<sup>50</sup> The preliminary estimates of the values on the annual national accounts are based on the quarterly data because each annual value must be a sum of the corresponding quarterly ones. On the other hand, the data on the quarterly national accounts are subsequently reviewed as soon as the complete data of the annual national accounts have been published.

<sup>51</sup> The retropolation method, in its general form, is one of the disaggregation methods recommended by Eurostat – cf. Eurostat (1999).

fact that these methods are applicable to all types of indices. The goal of the present contribution is to show the way in which the retropolation method may be used to quickly estimate quarterly values of a chosen index on the quarterly national accounts.

### **Assumptions of and conditions for the use of the retropolation method**

The retropolation method combines a short-term surveyed index (called reference index) with an index on the annual national accounts. This relationship is modelled by a regression function between the short-term surveyed index and the corresponding aggregated index on national accounts. This model will allow us not only to allocate the known annual values to individual quarters so that their sum equals the annual value, but also to estimate the value of the respective aggregated index for the current quarter, as well as to predicate its value for one or two quarters ahead.

The retropolation (or any other disaggregation) method cannot, however, be the only method used for estimating the values on the quarterly national accounts. The aggregated indices on the national accounts are governed by fixed horizontal and vertical constraints and, for certain aggregated indices, no suitable reference indices can be identified at all. The allocation method therefore must, from the mentioned viewpoint, be combined with other methods for establishing the quarterly values (such as the input-output tables, surveys, administrative data sources, etc.<sup>52</sup>). Neither can we expect to be able to estimate in the first step, for example, the gross domestic product with the aid of the indirect methods for estimating the quarterly aggregated indices. The model of the quarterly national accounts must be gradually filled with estimates of individual aggregated indices (final consumption, gross fixed capital formation, imports, exports, etc.) by product or industry and subsequently balance and tune up these estimates to provide us with reliable short-term information.

The main condition for using the retropolation model is identification of index pairs: *aggregated index on national accounts* ↔ *quarterly established index*, and the annual value's allocation or estimates of the quarterly value of the aggregated index are based on the evolution within the model. These considerations must obviously be based on the existence of a high-quality model for the allocation, as well as a good overview of the available short-term data.

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<sup>52</sup> In each developed country where the indirect methods for estimating within the quarterly national accounts are used, a combination of methods is used as a rule, and one selected method is viewed as the principal one. For example, in France allocation of annual values prevails, while in the Netherlands the method based on quarterly input-output tables is the key one. In Canada both allocation and input-output tables are used and direct methods are applied as well.

## Reference index

Using the retropolation methods anticipates that a suitable reference index be found from among those surveyed quarterly or monthly. Such indices must be searched for not only among those surveyed by the government statistical services, but also among those surveyed by other institutions, such as banks, professional associations, chambers of commerce, ministries, etc. A criterion for selection is the factual connection with the index on the quarterly national accounts and, above all, the ability to reflect short-term fluctuations in the evolution of the values of the index to be estimated. In general, a suitable reference index should meet the following requirements:

- a) available quickly, easily and without excessive financial demands, i.e., it should be available as quickly as possible after the end of the period under assessment (month or quarter) and it should already be surveyed (not introduced as a newly surveyed one);
- b) a sufficiently long time series of its values should be available; and
- c) it should be manifestly related to the index to be estimated; it may be selected from among indices of a value or natural substance, absolute or relative, established directly or derived.

It is not a simple task to properly identify a suitable reference index. We have to look, from among the indices meeting the above-mentioned conditions, for an index that will best cover short-term evolution of the given index on the quarterly national accounts. The suitability of such an index must be monitored on a longer time scale and separately for each index on the quarterly national accounts whose values have been estimated by the retropolation method. Only then we can relax the requirement for directly surveying the respective indices on the quarterly national accounts and take their estimates based on the model instead. This stage requires thorough analytical work which must not be underestimated or neglected. When applying indirect methods, we need not only to create a formal statistical model but also to build up an entire system of short-term statistical data.

## Retropolation model

The retropolation method based on allocation of an annual value into calendar quarters can, in general, be carried out in two modes:

- *with subsequent adjustment*: within the first step the preliminary estimates of the quarterly values are found; and the second step ensures that a sum of these quarterly values complies with the annual value<sup>53</sup>,
- *without subsequent adjustment*: this method already ensures the compliance between the quarterly and annual values in the first step<sup>54</sup>.

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<sup>53</sup> Cf., e.g., Dureau (1991), Bournay, Laroque (1979), and Nasse (1973).

In the present contribution, the variant with subsequent adjustment will be used. The retropolation method with subsequent adjustment is carried out in two steps:

- *allocation* of the aggregated index's annual value to quarterly ones on the basis of the conjunctural evolution of the reference index;
- *adjustment* of the quarterly values obtained in the first step, based on the rule that a sum of quarterly values in one year must be equal to the respective annual value.

The *allocation* stage is based on establishing a regression equation that represents the relationship between the national accounts aggregated index's annual value on the one hand and the annual value of the reference index, as reported in the regular quarterly surveys, on the other hand; or rather, one-quarter of the aggregated index's annual value and the average quarterly value of the reference short-term index. Let us denote

$A_T$  – value of aggregated index in the year  $T$   $T = 1, 2, \dots, N$ ,

$Z_{T,i}$  – value of index in the  $i$ -th quarter of the year  $T$   $i = 1, 2, 3, 4, T = 1, 2, \dots, N$ ,

$\bar{Z}_T$  – average value of index  $Z$  in the year  $T$   $T = 1, 2, \dots, N$ ,

where  $\bar{Z}_T = \frac{1}{4} \sum_{i=1}^4 Z_{T,i}$ .

The simplest and most often used type of function is linear<sup>55</sup>, that is

$$\frac{1}{4} A_T = a + b \bar{Z}_T, \quad T = 1, 2, \dots, N. \quad (1)$$

The parameters are then estimated with the aid of the least-square method.

When the parameters of the function are known, an approximation of the aggregated indices quarterly values can be calculated because the conjunctural information is available on a quarterly basis:

$${}_R A_{T,i} = a + b Z_{T,i}, \quad T = 1, 2, \dots, N, i = 1, 2, 3, 4, \quad (2)$$

where  ${}_R A_{T,i}$  is an estimate of the aggregated index's quarterly value if its annual value is allocated according to the evolution of the short-term index. This procedure is repeated for all quarters for which the  $Z_{T,i}$  values are available regardless of whether the annual value is or is not known, i.e., for the current quarter but also for one or two quarters ahead.

Establishing the values of  ${}_R A_{T,i}$  represents just the first stage in the procedure connecting the quarterly and annual values. In general, the allocation described above leads to the aggregated index's quarterly values

<sup>54</sup> Cf., e.g., Kozák, Hindls, Hronová (2000a).

<sup>55</sup> However, other regression functions can also be used.

such that their sum is not equal to the annual value of the given aggregated index, i.e.,

$$\sum_{i=1}^4 {}_R A_{T,i} \neq A_T \cdot \quad (3)$$

If the annual value of the aggregated index is known, the deviation  $E_T$  can be established, where

$$E_T = A_T - \sum_{i=1}^4 {}_R A_{T,i}, \quad T = 1, 2, \dots, N. \quad (4)$$

In other words, the compliance between the annual and quarterly accounts (i.e., the condition that the annual aggregated index equals a sum of the quarterly values) must be respected not only within one year but for the entire time series lasting  $N$  years.

The procedure for allocating the data is based on seasonally cleaned values of the  $Z$  index – the original idea of this procedure is an assumption that the relationships between quarterly values copy those valid between annual values. That is why the seasonal cleaning is applied to the original  $Z_{T,i}$  values, not to the allocated  ${}_R A_{T,i}$  values; namely, the allocation will improve if the  $Z_{T,i}$  values express seasonal fluctuations of the index as little as possible.

*The adjustment*, i.e., the second stage, aims at dividing the deviation  $E_T$ ,  $T = 1, 2, \dots, N$ , among four quarters as uniformly as possible while not denying the structure of the estimate obtained at the first stage, and at the same time preserving continuous year-to-year flow of data (the latter condition would not be met if the deviation  $E_T$  were divided into four equal parts, which is also a possible approach). Different methods are used to carry out the adjustment<sup>56</sup>. One of them is to allocate the deviation based on a specific matrix operator  $\mathbf{K}$ , which is represented by a matrix of dimensions  $[4 \times 3]$ , whose entries  $k_{ij}$  are defined by

$$\sum_{i=1}^4 k_{i,1} = 0, \quad \sum_{i=1}^4 k_{i,2} = 4, \quad \sum_{i=1}^4 k_{i,3} = 0, \quad \sum_{j=1}^3 k_{i,j} = 1, \quad i = 1, 2, 3, 4 \quad (5)$$

The quarterly values of the deviations are then calculated by the formula

$$\left[ \begin{array}{c} \mathbf{K} \\ \left[ \begin{array}{c} \bar{e}_{T-1} \\ \bar{e}_T \\ \bar{e}_{T+1} \end{array} \right] \end{array} \right] = \left[ \begin{array}{c} e_{T,1} \\ e_{T,2} \\ e_{T,3} \\ e_{T,4} \end{array} \right], \quad (6)$$

<sup>56</sup> Cf., e.g., Dureau (1991), Bournay, Laroque (1979), and Eurostat (1999)

where  $\bar{e}_T = \frac{1}{4}E_T$  is the average (quarterly) deviation for  $T = 1, 2, \dots, N$ , and  $e_{T,i}$  is the allocated (quarterly) deviation.

The adjusted quarterly value of the aggregated index  ${}_c A_{T,i}$  is calculated by the formula

$${}_c A_{T,i} = {}_R A_{T,i} + e_{T,i}, \quad T = 1, 2, \dots, N, i = 1, 2, 3, 4, \quad (7)$$

In this way, estimates of the aggregated index's quarterly values are obtained such that they sum up to the annual value.

The matrix operator denoted by  $\mathbf{K}$  meets the assumptions for uniform distribution of the distributed deviations in the sense of smoothing up the quarterly values; hence this operator can be utilised for allocating annual values to quarters in instances of less important indexes on the quarterly national accounts for which no suitable reference index can be identified. In other words, the allocation is then carried out in a single step without taking into account relationships to any reference indices.

### **Applications to data in the Czech Republic**

As an example of applying the retropolation method we have made use of the Czech Statistical Office's data. The allocated index (the dependent variable) is the Gross Value Added for the industry in the Czech Republic and the reference index (the independent variable) is the monthly nominal gross wage in the same industry. Table 1 shows the annual values of the dependent variable, while Table 2 shows the quarterly values of the independent variable.

The variables are chosen this way to answer a question whether or not it is possible to estimate the Gross Value Added in industry with the aid of the retropolation method. In addition to the average wages, we have tested the possibility of using other indices as well, such as the number of employees, volume of the wages, volume of new orders, and others; nonetheless, the strongest relationship has been proven between Gross Value Added and the average wages. The fact that the quarterly values of the Gross Value Added are known will enable us to compare the estimates obtained within our model with the actual values of the Gross Value Added for industry in the Czech Republic (based on the direct methods currently utilised), assessing both quality of the chosen model and suitability of the reference index.

Table 1 Gross Value Added (GVA) of the industry in the Czech Republic (million CZK, current prices)

Year	GVA	Year	GVA
2005	915,252	2010	1,071,734
2006	1,014,944	2011	1,122,672
2007	1,102,465	2012	1,132,527
2008	1,135,417	2013	1,137,039
2009	1,067,352	2014	1,248,230

Source: www.czso.cz

Table 2 Monthly nominal gross wages in industry in the Czech Republic (CZK, current prices)

Year	Quarter	Wages	Year	Quarter	Wages	Year	Quarter	Wages
2005	1	16,378	2009	1	21,143	2009	1	24,053
	2	17,580		2	22,156		2	25,307
	3	17,488		3	22,171		3	24,697
	4	19,091		4	24,434		4	26,680
	Average	17,634		Average	22,476		Average	25,184
2006	1	17,471	2010	1	22,160	2009	2	25,009
	2	18,747		2	23,099		3	25,946
	3	18,490		3	22,883		4	25,175
	4	20,353		4	25,214		Average	27,368
	Average	18,765		Average	23,339		Average	25,875
2007	1	18,818	2011	1	23,074			
	2	20,092		2	24,148			
	3	19,800		3	23,628			
	4	21,747		4	25,821			
	Average	20,114		Average	24,168			
2008	1	20,970	2012	1	23,971			
	2	21,781		2	24,889			
	3	21,183		3	24,141			
	4	22,919		4	26,766			
	Average	21,713		Average	24,942			

Source: www.czso.cz

Estimating the parameters by the least-square method, we obtained the following regression equation:

$${}_R A_{T,i} = 6.510 + 127,726.214 Z_{T,i}$$

The quarterly values of the average wage will be substituted into this equation, which expresses the relationship between one-quarter of the aggregated index and the average value of the reference index. We thus obtain an approximation of the industry GVA's quarterly values but without the equality between the annual value and a sum of the quarterly values. The results are shown in Table 3.

Table 3 Gross Value Added in industry in the Czech Republic based on Formula (8) (million CZK, current prices)

Year	Quarter		Year	Quarter		Year	Quarter	
2005	1	234,348.2	2009	1	265,368.4	2013	1	284,315.3
	2	242,175.0		2	271,962.9		2	292,479.0
	3	241,577.6		3	272,064.8		3	288,507.8
	4	252,009.7		4	286,797.3		4	301,417.5
	Sum	970,110.5		Sum	1,096,193.4		Sum	1,166,719.7
2006	1	241,466.9	2010	1	271,991.0	2014	1	290,539.0
	2	249,771.1		2	278,104.0		2	296,639.0
	3	248,096.3		3	276,696.4		3	291,619.7
	4	260,226.8		4	291,870.8		4	305,896.5
	Sum	999,561.1		Sum	1,118,662.3		Sum	1,184,694.2
2007	1	250,236.7	2011	1	277,944.5			
	2	258,531.0		2	284,933.9			
	3	256,624.3		3	281,549.4			
	4	269,303.6		4	295,826.0			
	Sum	1,034,695.6		Sum	1,140,253.7			
2008	1	264,243.6	2012	1	283,778.8			
	2	269,526.6		2	289,759.4			
	3	265,631.6		3	284,890.0			
	4	276,934.9		4	301,976.6			
	Sum	1,076,336.8		Sum	1,160,404.7			

Source: [www.czso.cz](http://www.czso.cz), authors' calculations

A sum of such estimated (allocated) values does not equal the annual value of the given aggregated index – GVA of the industry. The deviations between the aggregated index's annual values and sums of the allocated quarterly values are shown in Table 4.

Table 4 Allocated values and deviations of the Gross Value Added for the industry in the Czech Republic (million CZK, current prices)

Year	Annual value	Sum	Deviation	Average quarterly deviation
	$A_T$	$\sum R A_{T,i}$	$E_T$	$\bar{e}_T$
2005	915,252	970,110.5	-54,858.5	-13,714.6
2006	1,014,944	999,561.1	15,382.9	3,845.7
2007	1,102,465	1,034,695.6	67,769.4	16,942.3
2008	1,135,417	1,076,336.8	59,080.2	14,770.1
2009	1,067,352	1,096,193.4	-28,841.4	-7,210.3
2010	1,071,734	1,118,662.3	-46,928.3	-11,732.1
2011	1,122,672	1,140,253.7	-17,581.7	-4,395.4
2012	1,132,527	1,160,404.7	-27,877.7	-6,969.4
2013	1,137,039	1,166,719.7	-29,680.7	-7,420.2
2014	1,248,230	1,184,694.2	63,535.8	15,883.9

Source: [www.czso.cz](http://www.czso.cz), authors' calculations

The quarterly deviation values will be determined with the aid of the **K** matrix operator, which fulfils the conditions (5). For example, for 2006 we get

$$\begin{vmatrix} 0.291 & 0.793 & -0.084 \\ -0.041 & 1.207 & -0.166 \\ -0.166 & 1.207 & -0.041 \\ -0.084 & 0.793 & 0.291 \end{vmatrix} \begin{vmatrix} -13,714.6 \\ 3,845.7 \\ 16,942.3 \end{vmatrix} = \begin{vmatrix} -2,364.5 \\ 2,391.6 \\ 6,223.8 \\ 9,131.9 \end{vmatrix}$$

For the first and last years the missing values of the average quarterly deviation will be replaced with zeros (the error caused by this approach will be the smallest). The results are shown in Table 5.

Table 5 Quarterly values of deviations (million CZK, current prices)

Year	Quarter		Year	Quarter		Year	Quarter	
2005	1	-11,198.7	2009	1	-434.2	2013	1	-9,246.5
	2	-17,191.9		2	-7,360.9		2	-11,307.1
	3	-16,711.2		3	-10,673.7		3	-8,450.5
	4	-9,756.6		4	-10,372.5		4	-676.5
	Sum	-54,858.5		Sum	-28,841.4		Sum	-29,680.7
2006	1	-2,364.5	2010	1	-11,032.5	2014	1	10,436.7
	2	2,391.6		2	-13,135.4		2	19,476.1
	3	6,223.8		3	-12,783.5		3	20,403.7
	4	9,131.9		4	-9,976.9		4	13,219.3
	Sum	15,382.9		Sum	-46,928.3		Sum	63,535.8
2007	1	13,313.7	2011	1	-6,314.2			
	2	17,839.9		2	-3,667.3			
	3	19,205.5		3	-3,072.0			
	4	17,410.3		4	-4,528.2			
	Sum	67,769.4		Sum	-17,581.7			
2008	1	17,248.5	2012	1	-6,182.5			
	2	18,329.7		2	-7,000.1			
	3	15,310.6		3	-7,378.2			
	4	8,191.3		4	-7,316.8			
	Sum	59,080.2		Sum	-27,877.7			

Source: [WWW.CZSO.CZ](http://WWW.CZSO.CZ), authors' calculations

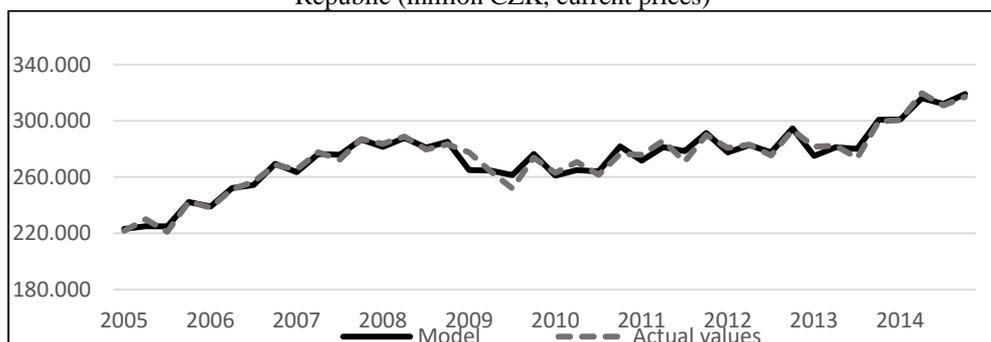
The estimated quarterly values of the Gross Value Added for the industry in the Czech Republic will then be obtained by summing up the values allocated within the first step (Table 3), and the allocated deviation values (Table 5). The results are shown in Table 6.

Table 6 Quarterly Gross Value Added of the industry in the Czech Republic (million CZK, current prices)

Year	Quarter		Year	Quarter		Year	Quarter	
2005	1	223,149.5	2009	1	264,934.1	2013	1	275,068.7
	2	224,983.1		2	264,601.9		2	281,171.9
	3	224,866.3		3	261,391.1		3	280,057.4
	4	242,253.1		4	276,424.8		4	300,741.0
	Sum	915,252.0		Sum	1,067,352.0		Sum	1,137,039.0
2006	1	239,102.5	2010	1	260,958.5	2014	1	300,975.7
	2	252,162.8		2	264,968.7		2	316,115.2
	3	254,320.1		3	263,912.9		3	312,023.4
	4	269,358.7		4	281,893.9		4	319,115.8
	Sum	1,014,944.0		Sum	1,071,734.0		Sum	1,248,230.0
2007	1	263,550.4	2011	1	271,630.3			
	2	276,370.9		2	281,266.5			
	3	275,829.8		3	278,477.4			
	4	286,713.9		4	291,297.8			
	Sum	1,102,465.0		Sum	1,122,672.0			
2008	1	281,492.1	2012	1	277,596.2			
	2	287,856.4		2	282,759.2			
	3	280,942.3		3	277,511.7			
	4	285,126.2		4	294,659.8			
	Sum	1,135,417.0		Sum	1,132,527.0			

The sums of the Gross Value Added quarterly values correspond with the annual values shown in Table 1, or Table 4. Chart 1 depicts a comparison between the model (Table 6) and actual values of the Gross Value Added for the industry in the Czech Republic. It turns out that both the selected model and the reference index meet the required conditions and enable us to properly estimate the industry's Gross Value Added quarterly values under the assumption of small turbulence. The model, however, was not able to cope with the economic stagnation in 2009; other, less significant changes in the dynamics of the Gross Value Added in the period from 2010 to 2014 are reflected relatively well.

Chart 1 Comparison of the actual and modelled GVA values of the industry in the Czech Republic (million CZK, current prices)



Source: [WWW.CZSO.CZ](http://WWW.CZSO.CZ), authors' calculations

Within our research, we have carried out detailed calculations for other pairs of indices; our results confirm that the retropolation model is capable of providing good-quality quick estimates for indices on the quarterly national accounts. The use of the linear function at the first step has also been confirmed: this function's simplicity makes its use advantageous and the quality of the estimates is not injured. The adjustment at the second step could make use of other approaches, such as minimisation of deviations' squares<sup>57</sup> or other criteria as long as they ensure continuous year-to-year flow of data.

## **Conclusion**

Modern state statistics could not do without utilisation of demanding statistical methods; this fact is also supported by the more-and-more demanding requirements of Eurostat with respect to the lead times for publishing the data on the quarterly national accounts. If reliable quarterly data are obtained quickly and efficiently, expenses incurred on their surveying are reduced and they bring about source information for improving our knowledge of the processes that take place in the national economy on a short-term scale. We should also point out the methodological point of view – it contributes to creating a set of methods compliant with the applicable standard valid for the national accounts.

The model presented in this paper enables us to efficiently estimate unknown values of indices on the quarterly national accounts. Of course, the selected method must not be the only one utilised for estimating the quarterly values; it should be complemented with other methods for such estimates (including the use of direct methods); indirect estimates of the quarterly values based on reference indices should not, at the same time, bring about a necessity of additional surveys. An indispensable tool when the quarterly national accounts are finally completed is the use of balance relationships on which the national accounts are based, as well as of expert estimates.

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<sup>57</sup> Cf., e.g., Dureau (1991).

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# The Role Of Wood-Decaying Fungi In The Carbon Cycle Of Forest Ecosystems And The Main Ecological Factors

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## Abstract

Some climatologists accept that recent climate warming is largely due to an increase in atmospheric concentrations of greenhouse gases such as carbon dioxide, methane, and nitric oxide. For this reason, studies on identification and analysis of the sources of these gases are gaining momentum. Decomposition of wood and oxidative conversion of organic carbon into CO<sub>2</sub> carried by myco-bacterial community, in which the leading role played by fungi of the Department Basidiomycota (wood-or xylotrophic Basidiomycetes). It is organisms capable to solid-state fermentation of lignocellulosic wood complex. The role of xylotrophic basidiomycetes in biosphere currently undervalued and many aspects of ecology of these organisms are low-or not at all known. In particular, insufficiently the data about intensity of decomposition of timber, thus the conversion of organic carbon of wood into carbon dioxide pool in vivo. The external manifestation of these processes is the CO<sub>2</sub> emissions, the activity of which is a measure of the intensity of decomposition of wood and conversion of organic carbon by fungi. The results of the study allow us to understand the role of xylotrophic basidiomycetes in the biosphere. This knowledge is needed to predict the carbon cycle of forest ecosystems under climate change and human impacts on the forest biota.

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**Keywords:** Carbon cycle, climate change, forest ecosystems, wood-decaying fungi

## Introduction

The carbon cycle of forests and their C-CO<sub>2</sub> gas exchange with the atmosphere is based on the reduction of atmospheric CO<sub>2</sub> conversion into organic carbon, deposited in the wood, and the oxidative conversion of organic carbon into CO<sub>2</sub> from the decomposition of wood (Mukhin, Voronin, 2007). Due to these processes, the forests are the regulators of the

balance of C-CO<sub>2</sub> in the atmosphere and play an important role in the biotic Earth's climate regulation (Baumgartner, 1979; Cannel, Milne, 1995; Kudeyarov et al, 2007).

Wood is the main carbon reservoir in forests. Carbon returns back to the atmosphere in result of decomposition by special group of organisms – wood-decaying fungi. Under natural conditions, decomposition of dead wood is mainly performed by basidial fungi, which are the only known group of microorganisms capable of biological conversion of all wood compounds. In this work, we showed that wood-decaying fungi play a very important role in global cycle and budget of CO<sub>2</sub>. Changes in climate will modify the fungal complexes and it can lead to a misbalance between the photosynthetic store and the emissions of greenhouse gases and accelerating the climatic changes. The study of the influence of humidity and temperature on the conversion activities of fungi makes it possible to identify those factors related to different types and simulate their response to climate change. The results obtained show, that conversion activity of wood-decaying fungi depends on the humidity, and ambient temperature, degree of decomposition of the wood substrate and physiological types of fungi.

The aim of this works is study of ecological and physiological characteristics and conversion activity of wood-decaying fungi in forest ecosystems. In this revie we combined the results of many years of research into the carbon conversion activity of wood-decaying fungi under natural conditions.

### **Material and methods**

For experiment were taken fragments of wood the affected by wood-decaying fungi (370 samples were analyzed). To assess the CO<sub>2</sub>-emission activity of fungi used gasometric approach - a portable gas analyzer (CO<sub>2</sub> / O<sub>2</sub>) produced by "Microsensor technique", Russia. CO<sub>2</sub> measurement error of ± 20 ppm, CO<sub>2</sub> measurement error of ± 0.2 %. The samples were exposed in sealed glass jars (0.27 - 9.0 l). The exposure time was varied for different experiences from 3 hours to several days (the study of seasonal dynamics). The glass jars were kept during the experiment at 20±1 °C. To determine the absolute dry weight of the samples were dried for 72 hours at 105 ° C. The temperature and humidity measured by Datalogger CEM (the temperature measurement error of ± 1 °C, humidity error ± 2%).

### **Discussion**

According to our data (Fig. 1), the CO<sub>2</sub> emission activity of woody debris is positively related to its moisture content and with increasing humidity by 10%, CO<sub>2</sub> emissions increased almost two-fold, reaching its maximum at 55-60%. Moisture content deciduous and coniferous debris

were not significantly different, independent of the size, volume of wood debris and species of fungi. Humidity of wood debris has a weak dependence with a physiological type of fungi (higher in woody debris with white rot) and a close positive dependence with the destruction debris.

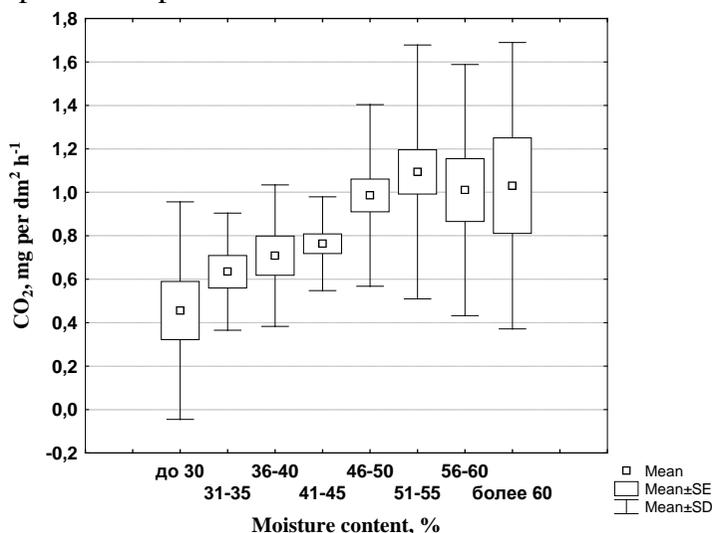


Figure 1. Moisture content of woody debris and CO<sub>2</sub> emission activity.

CO<sub>2</sub> emissions increases linearly with moisture content, reaching its peak at 55%. A further increase of moisture content up to 70% didn't appear to have any influence on the CO<sub>2</sub> emission activity which is achieved at its maximum level.

Also was evaluated intensity of moisture loss in natural conditions, which allowed establishing the dependence from the hydrothermal environment of the flow rate of gas exchange processes of wood-decaying fungi and wood substrates affected by them.

Shown, that the rate of loss of water rather strongly depends on external conditions such as the humidity and the temperature. However, it is the ambient humidity is an increasingly important factor. Therefore, it may be noted daily dynamics of studied process. The most active of loss of water (0.6 g per wet weight day<sup>-1</sup>) is fixed in the daytime, when the average air temperature during the observation period was 20.47 °C, and humidity of 75.07% respectively; while at night, with an average temperature of 16.36 °C and humidity of 86.24%, the water loss was not observed at all or had very low (0.015 g per wet weight day<sup>-1</sup>).

The rate of water loss from the samples destroyed by various types of fungi also varies. Under the same conditions will faster dry the samples having a small diameter (1.36 - 2.3 cm), the average intensity of transpiration of 0.18 g H<sub>2</sub>O per wet weight day<sup>-1</sup>. Larger samples (4.37 - 6.31 cm) has the

average rate of water loss is equal to 0.06 g H<sub>2</sub>O per wet weight day<sup>-1</sup>. This is probably due to the fact that the samples of smaller volume wood and fruit body will react faster to changes in environmental conditions.

As for the respiratory activity of wood-decaying fungi, it may be noted how clearly defined its dependence on moisture content of the sample and poorly expressed.

Thus, it was found that the intensity of water loss of wood substrates affected by different kinds of wood-decaying fungi is directly proportional to temperature and inversely proportional to the ambient humidity, and the humidity being more significant factor. Respiratory activity also depends on the moisture content - with drying of the sample the rate of CO<sub>2</sub> exchange is reduced.

According to the annual cycle of temperatures in the Urals, the seasonal dynamics of the conversion activity of wood-decay fungi has a four different duration periods: spring, summer, autumn, winter. In autumn the respiratory of fungi exchange was recorded before the beginning of November, and its activity was average 0.15 mg CO<sub>2</sub> per g (dry weight) day<sup>-1</sup>. The middle of November, with the onset of stable negative temperatures, the emission of CO<sub>2</sub> has stopped, that indicating the stop of the respiratory activity of fungi. In a state of physiological rest of the winter fungi stayed until the end of March, when they had registered a weak respiratory activity of 0.07 mg CO<sub>2</sub> per g (dry weight) day<sup>-1</sup>.

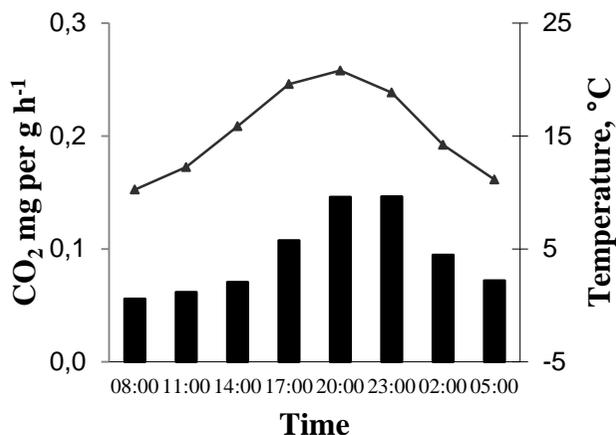


Figure 2. Daily dynamics of respiratory activity of *Fomes fomentarius* (L.) Fr.

In accordance with the process temperature (Fig. 2), maximum activity was observed in the evening hours when the air temperature was 30.3 °C, the minimum - in the night and morning hours (T = 17-20 °C).

Thus, it can be concluded that the temperature is an important factor in determining the seasonal dynamics and intensity of life of wood-decaying

fungi: respiration rate, and thus the conversion of organic carbon into CO<sub>2</sub>, is directly proportional to the ambient temperature. This allows you to estimate CO<sub>2</sub>-emission wood-decaying fungi activity on the basis of temperature characteristics.

### **Conclusion**

Shown that the humidity and temperature are the most important factors of CO<sub>2</sub>-emission activity, but its main determinant is temperature. On the one hand was detected high dependence between CO<sub>2</sub>-emission activity and humidity and on the other hand - dependence between degree of destruction and moisture content of woody debris.

Thus, knowledge of the gas environment is necessary to determine the capacity of acceleration or deceleration of decomposition of wood in the forest. The determination the rate of gas exchange, as well as the major factors affecting the CO<sub>2</sub>-emission activity of wood-decay fungi will help clarify the ecological role of fungi in forest ecosystems.

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# Development Of The Some Regions Of The Russian Empire In The Light Of Modern International Rating Assessments Agencies

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## Abstract

The article deals with issues related to the stages and trends of the three countries that were part of the Russian Empire - Russian Empire as a basis, Finland as a relatively autonomous state in its composition as Estonia, Livonia and Georgia. Analyzes the characteristics of the economic model of the country, changes in the structure of the economy and the level of productivity, economic growth and development on the example of summarizing complex index of the level and dynamics Index economic freedom, Human Development Index, Global competitiveness Index (GCI), Sustainability – adjusted GCI, Economic knowledge index (EKI) , Ease of doing business index (EDI), Legatum prosperity index and others.

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**Keywords:** Economic models, structure and growth of the economy, the index of liberality, human capital, knowledge economy, human development, global competitiveness, entrepreneurship, prosperity, sustainability and others.

This inscription is taken from the survey part of the former Russian empire, being characterized by the development of the regions of the world by credit rating agencies. Especially interesting is to observe, in particular in the former Soviet republics (Russian Federation, Estonia and Georgia) development, as Finland was the Russian Empire, the dissolution of the USSR out and developed their own way of capitalism bosom. The same happened in Estonia, but was incorporated into the USSR in 1940.

The development of capitalism in the Estonian and Livonian provinces began earlier than in the whole of the Russian Empire because of the abolition of serfdom in 1816 (partly it is a merit of the Baltic barons), which is about 45 years earlier than in Russia. In Russia, capitalism has historically a very 'late' character of development.

Estonian province was one of the most developed regions of the empire, with the developed agriculture, industry and rapidly developing

infrastructure. In the period of the first independent state of Estonia has made considerable progress in agriculture and cultural life, as well as the overall development of the state economy. At the moment of "entry" into the Soviet Union Estonian economy was roughly on par with the economy of Finland, which is both politically and economically was under the influence of Sweden.

After the 2nd World War, Estonia remained in the Soviet Union and Finland as an independent, lost war state had to pay a significant indemnity USSR. Finland has developed a good trade relations to the USSR, which partly contributed to its rapid development. In the period of becoming independence from Estonia and Russia, Finland was ahead of these countries in terms of GDP per capita approximately 3-4 times. Georgia belong to Empire from the beginning of the 19th century until independence in 1991. In the 19th century there was created some industries (for some time,

40% of the world production of manganese), but belonged to the Georgian particularly citrus fruits, wine and cognac land.

The starting position was more or less the same in all countries.

On the basis of various quantitative and qualitative indicators based mainly on data from different Rating Agency and social statistics, the author maps the dynamics of the three economies in the period of independence, analyzes the features of the economic model of the country, changes in economic structure and level of productivity, economic growth and development on the example generalizing such complex terms as the level and dynamics of the indices of liberal economics (Index economic freedom), human development (Human Development Index), the global competitiveness (Global competitiveness Index), the knowledge economy (Economic knowledge index) and business (Easy of doing business index) as well as data on the level of economic sustainability. By giving to understand that, in this case, such a comparison is motivated primarily based on the historical aspect of national development. Alone, Russian and Estonian economies against each other is comparable to an elephant and mosquito comparisons, so different is the sole national scale, and comprehensibility. These data in the article are based on official data statistics agencies of Russia, Estonia and Finland, the World Bank, the World Economic Forum, World Factbook and other sources. The purpose of this writing is not to make fundamental conclusions, only possible systematically to provide information, to create some kind of idea of national development and the problems on which it is not successful, and which have shortcomings.

### **Economic model. Economic freedom**

Economic models and the level of liberality of countries economic considered advisable to analyze on the basis of the typology proposed in

monography of Ruslan Hazbulatov (World Economy. "Yurait" 2012), where author gives a typology developed postindustrial countries and identifies a number of models of capitalism: Western European, American, Scandinavian, Japanese, Chinese, Luxembourg, Latin American, South African and Arabic.

Since Finland is clearly representative of the Scandinavian (Swedish) model of the economy. Estonia is still not completely steady economy, too, is committed to this model. As President of Estonia Lennart Meri expressed "... in the end, our goal is to become a boring Scandinavia."

The Scandinavian model is presented in basically all the basic features inherent economic model developed capitalist countries (US, Western Europe, U-Korea and so on.): 1) the welfare state, 2) the social state, 3) the social economy, 4) a high level of income, 5) the high cost of health care, education, culture, human development, 6) high share of spending on environmental protection, 7), the growth of "smart" industries, 8) relative equal distribution of income among the population, 9) percentage ratio between large, medium and small firms – 0,2: 7,1: 93,1) development of the municipal economy, 11) the density of small businesses (one firm per 10 inhabitants).

Scandinavian model characterized by a developed system of regulation, most of conformity concept of "welfare state", low income difference (the lowest Gini index in Sweden - 25, in Finland 27), the lowest poverty rates (below 5%), a high degree of solidarity groups (development of civil society), significant public sector mainly in transport, power, community-municipal level, focus on common interests (decile ratio of 1: 4). This model is characterized by shortcomings, so inflated socially promotes employment and good unemployment benefits allow not bad to live without working.

Estonian model has some special features: the preservation and the desire for greater liberalism as it is possible within the EU (in the ranking of liberal economy it is on the 8th place in the world in 2015), a feature of fiscal policy (proportional income tax, 0 -tax from profits, the equilibrium budgets, low government debt - 10% compared with 60% in Finland and 220% in Japan). Being watched a certain convergence in the EU, especially in terms of the level of prices for goods. Income of the population unfortunately converge to Western European levels more slowly, probably due to lower efficiency of the economy, to some extent due to its structure, a low level of production technologies in many enterprises, lack of economies of scale, associated with larger economies and companies (average real wages about 2,5 times lower than in Finland) . The content of the state for a small economy is very expensive , although it is characterized by the concept of e-government.

Estonia and Finland are included in the EU, they have all freedoms, typical for this union: the free movement of capital, goods, people and commitment to the free movement of services.

In the Russian model of capitalism Ruslan Khazbulatov highlights: the weak development of the first 5 and 10-11 above the inherent Western European model of factors, loss of social economy and the state, the weak development of small businesses, large difference of income (Gini index over 40, the World Factbook 2015). The system of the public sector - different industry enterprises show poor efficiency due to poor organization and poor management. Social separateness of people, increased poverty, low efficiency of large enterprises, their alliance with the government, high corruption (in the ranking of corruption Russia ranked among the countries with high corruption Index 27 (136- th place), Finland has an index of 89 (3 rank), as less corrupt and Estonia 69 (26) - as moderately corrupt country (Transparency International). The increased administrative interference at all levels of power (characteristic of even the so-called "manual management of the economy). Transition model is not moving closer to the European (recently seen attempts at rapprochement with the countries of the BRICS group, economic and political confrontation with the EU).

Here we consider how the countries in question are classified by the index of economic freedom: Experts Heritage Foundation define economic freedom as "the absence of government interference or obstruction of production, distribution and consumption of goods and services, except for the necessary protection and support to citizens freedom itself." The Heritage Foundation every year for the annual accounting results in comments on the basic directions, which gives an indication of advancements and challenges in terms of economic freedom. Index of economic freedom based on 10 indices, measured on a scale of 0 to 100, with the index of 100 corresponds to the maximum freedom, and 0, respectively, the minimum. All countries on this index are divided into the following groups:

- free - with an index of 80-100;
- mostly free - a measure of 70-79,9;
- moderately free - a measure of 60-69,9;
- mostly unfree - a measure of 50-59,9;
- repressed - a measure of 0-49,9.

The weight of each of the 10 factors considered to be the same, so the final index is the arithmetic average of these indicators. According to the authors of the index, economic development is directly linked to the dynamics of this index. In Table 1 represented by the countries in question the classification of the index of economic freedom.

Table 1. Index of Economic Freedom:

	<u>Estonia</u>	<u>Finland</u>	<u>Georgia</u>	<u>Russia</u>	<u>Rank 1</u>	<u>Index</u>
<b><u>Indicators</u></b>	<u>76,8(8)</u> <u>Mostly</u> <u>free</u>	<u>73,4(19)</u> <u>Mostly</u> <u>free</u>	<u>73(22)</u> <u>Mosly</u> <u>free</u>	<u>52,1(142)</u> <u>Mostly</u> <u>unfree</u>	<u>Honk</u> <u>kong Free</u>	<u>89,9</u>
<u>Rule of law</u> <u>1. Property rights</u> <u>2. Freedom from</u> <u>corruption</u>	<u>90(3)</u> <u>68(28)</u>	<u>90(3)</u> <u>89(3)</u>	<u>40</u> <u>49</u>	<u>20,0(138)</u> <u>28,0(132)</u>	<u>New</u> <u>Zeland</u> <u>NZ</u>	<u>95,0</u> <u>91,0</u>
<b><u>Limited government</u></b> <u>3. Fiscal freedom</u> <u>4. Government</u> <u>spending</u>	<u>90(3)</u> <u>68(28)</u>	<u>66,4(15)</u> <u>3,6(173)</u>	<u>73,8</u> <u>87,2</u>	<u>86,1(44)</u> <u>57,8(119)</u>	<u>Arab</u> <u>Emir.</u> <u>Singapur</u>	<u>99,5</u> <u>93,8</u>
<b><u>Regulatory</u></b> <b><u>efficiency</u></b> <u>5. Business freedom</u> <u>6. Labour relations</u> <u>freedom</u> <u>7.</u> <u>Monetary freedom</u>	<u>81,5(28)</u> <u>58,7(105)</u> <u>77,6(78)</u>	<u>92,6(7)</u> <u>54,8(120)</u> <u>79,9(55)</u>	<u>88,6</u> <u>79,9</u> <u>82,7</u>	<u>76,3(40)</u> <u>58,9(104)</u> <u>63,9(174)</u>	<u>Honk</u> <u>Kong</u> <u>USA</u> <u>Dominican</u>	<u>100</u> <u>98,5</u> <u>89,5</u>
<b><u>Open markets</u></b> <u>8. Trade freedom</u> <u>9. Investment</u> <u>freedom</u> <u>10. Financial freedom</u>	<u>88,0(11)</u> <u>90,0(2)</u> <u>80,0(3)</u>	<u>88,0(11)</u> <u>90,0(2)</u> <u>80,0(3)</u>	<u>88,6</u> <u>80</u> <u>60</u>	<u>75,0(104)</u> <u>25,0(158)</u> <u>30,0(131)</u>	<u>Honk</u> <u>Kong</u> <u>Luxemb.</u> <u>Honk</u> <u>Kong</u>	<u>90,0</u> <u>95,0</u> <u>90,0</u>

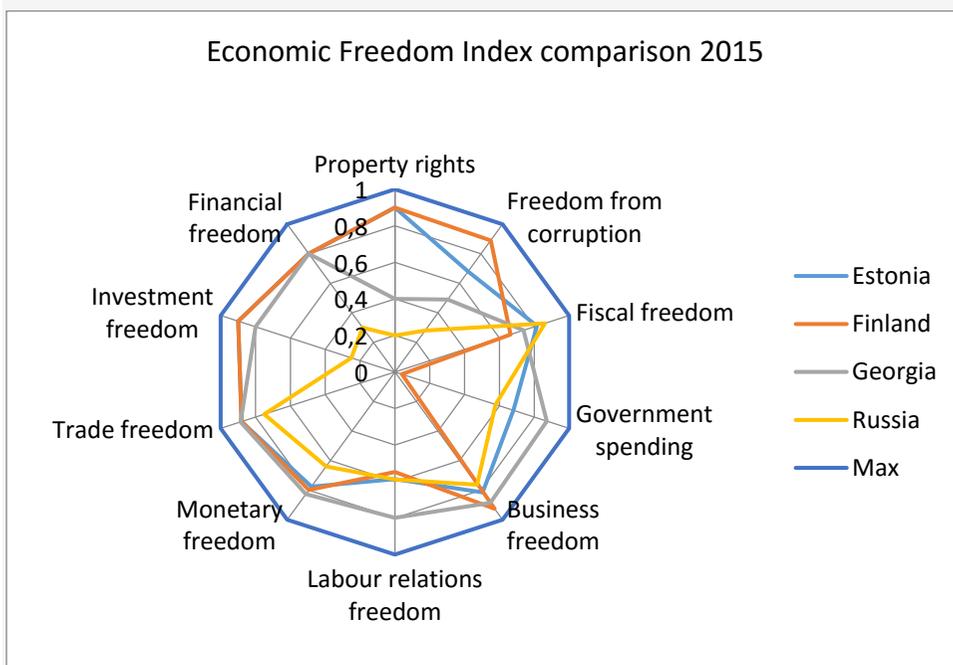


Figure 1. Economic Freedom Index comparison

The above table shows clearly enough the level of liberality in different sectors of the economy. The Heritage Foundation every year causes comments on the main directions of the annual accounting, which allows to judge the advancements and challenges in terms of economic freedom.

Estonia's economic freedom score is 76.8, making its economy the 8th freest in the 2015 Index. Its overall score is 0.9 point higher than last year, reflecting improvements in six of the 10 economic freedoms, including business freedom, freedom from corruption, and labor freedom. Estonia is ranked 2nd out of 43 countries in the Europe region, and its overall score is well above the regional and world averages.

Finland's economic freedom score is 73.4, making its economy the 19th freest in the 2015 Index. Its score is unchanged from last year, with improvements in labor freedom, fiscal freedom, monetary freedom, and trade freedom counterbalanced by declines in the management of government spending, freedom from corruption, and business freedom. Finland is ranked 9th out of 43 countries in the

Europe region, and its overall score is well above the world average.

However, over the past five years, its strong growth in economic freedom has ended, with declines in business freedom, monetary freedom, and control of government spending offsetting significant improvements in labor freedom. Economic growth has also stagnated.

A European leader in information and communications technology, Finland has developed a strong domestic market with openness, efficiency, and flexibility at its core. The rule of law is buttressed by strong property rights, and the perceived level of corruption is one of the world's lowest. As with other Nordic countries, government spending is high relative to the domestic economy, but the government remains committed to meeting deficit targets.

**Georgia's economic** freedom score is 73.0, making its economy the 22nd freest in the 2015 Index. With a 2.6-point score increase over the past five years, Georgia has registered improvements in five of the economic freedoms, including freedom from corruption, the control of government spending, business freedom, monetary freedom, and investment freedom. Achieving its highest score ever in the 2015 Index, Georgia has advanced further into the category of "mostly free."

Economic growth remains solid, foreign direct investment has decreased. Georgia has been committed to Euro-Atlantic integration. It hopes to join NATO and in June 2014 signed Association Agreements with the EU. Corruption is medium (Score 52, rating 48)

The foundations of economic freedom in Russia remain weak. Apart from connections with Europe, Russia remains relatively closed to trade and investment. The government screens foreign investment, and subsidized

state-owned businesses limit competition and market opportunities. Corruption and respect for property rights have improved little since the fall of Communism. The business environment is constrained by suffocating bureaucracy and a rigid labor market.

The Russian economy remains heavily dependent on gas exports. Russia became a member of the World Trade Organization in August 2012, but its bid to join the Organization for Economic Co-operation and Development has been postponed due to its recent actions in Ukraine. Corruption is rampant (Score 29, rank 119). Small elites control most of the nation's assets, and state institutions have been corroded. Anti-corruption campaigns are used to ensure elite loyalty and undermine political opponents. The rule of law is not uniform across the country, and the judiciary is vulnerable to political pressure and inconsistent in applying the law. Protection of private property rights is weak.

On the liberal economy, to some extent it indicates the stock of FDI at home and abroad the country.

Table 2. Stock of direct foreign investment in 2015 for different economies

	Estonia	Finland	Georgia	Russia	USA	Hong Kong
FDI at home, billion \$	26,34	139,7	13,25	360,9	3116,0	1838,0
FDI abroad, billion \$	9,3	208,3	1,8	404	5191	1720,0
Inhabitants , million	1,26	5,45	4,9	142,5	321,0	7,14
FDI at home per cap, \$	20904	25633	2704	2533	9707	<b>257423</b>
FDI abroad, \$	7380	38220	367	2835	16171	240896

### Structural changes in economy, productivity

Structuring of economic activities by type makes it possible to apply the so-called sectoral representation of the economy. The totality of economic activities are grouped in three sectors:

I. The primary sector, including agriculture, forestry, logging, hunting, fishing, mining industry.

II. Secondary - which includes manufacturing, electricity, gas, water and construction.

III. Tertiary - combines service industries and activities

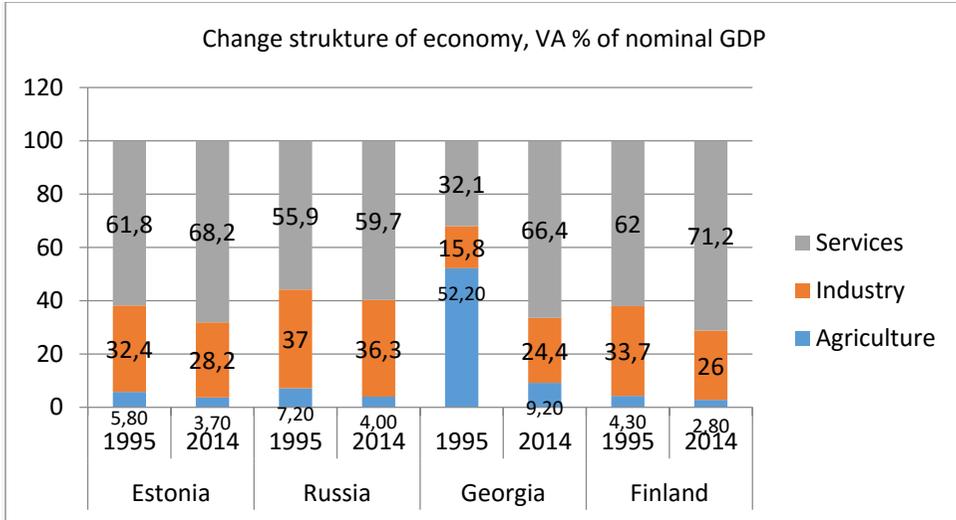


Figure 2: Changes in the sectoral structure of the economy of Estonia, Finland, Russia and Georgia in the value added in the period 1995 – 2014, source: World Bank.

The general trend in all countries is to change the structure of the economy in favor of the growth in the proportion of 3 sectors, mainly services (public and private) in the overall structure created by the DS. Very much happened in Georgia, where the proportion of 3-sector has grown more than doubled due to the decline in the share of the main 1.sektora more than 2.5 times

### Productivity of basis the added value

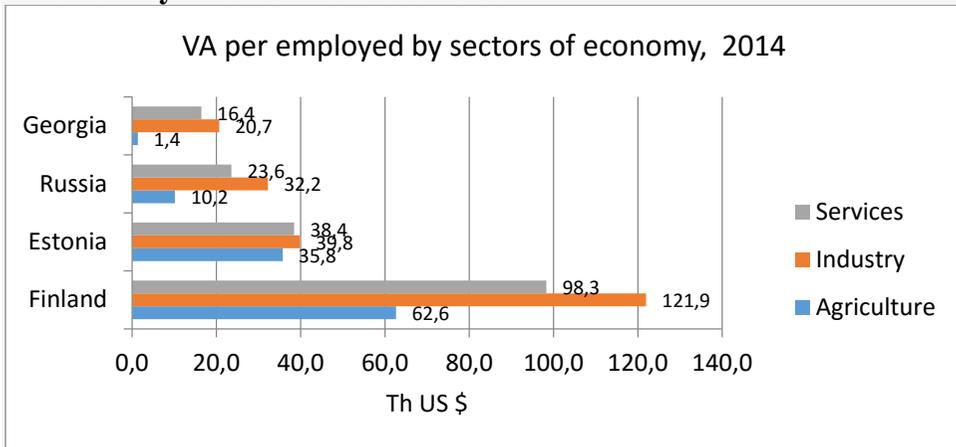


Fig.3 Level of value added per employed person in sectors of the economy of Estonia, Finland, Georgia and Russia in 2014

The level of value added per employed in industries of the economy is shown in Fig 4.

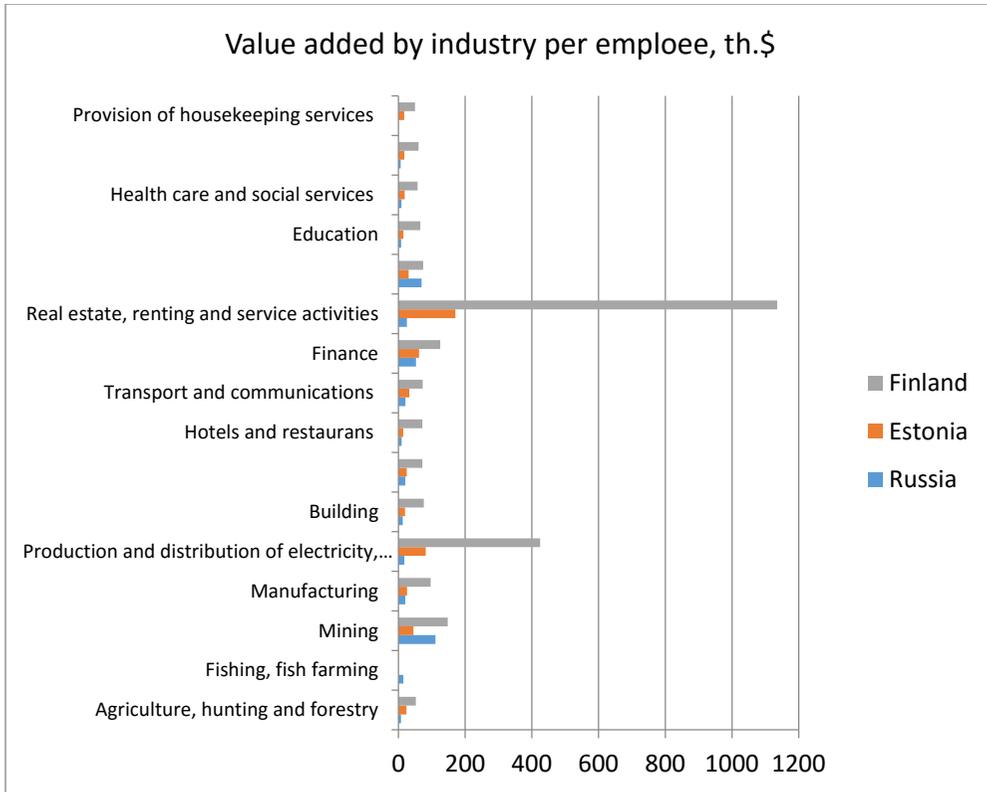


Figure 4. The level of value added per employed in industries of the economy

### The Human Capital Index

A nation’s human capital endowment—the skills and capacities that reside in people and that are put to productive use can be a more important determinant of its long term economic success than virtually any other resource. This resource must be invested in and leveraged efficiently in order for it to generate returns—for the individuals involved as well as an economy as a whole.

**The first edition** of the World Economic Forum’s *Human Capital Report* explored the factors contributing to the development of a healthy, educated and productive labour force.

Table 3. Detailed Ranking in HC Report 2013

Human capital Report Year 2013

Country	Overall index		Education		Health and wellness		Workforce and empl.		Enabling environ.	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Switzerland	1	1,455	4	1,313	1	0,997	1	1,376	2	1,793
Finland	2	1,406	1	1,601	9	0,844	3	1,25	1	1,926
Estonia	27	0,571	20	0,862	22	0,536	39	0,142	26	0,745
Russian Fed.	51	0,01	41	0,377	62	0,027	66	-0,163	63	-0,201
Georgia	77	-0,258	74	-0,191	66	-0,005	102	-0,514	76	-0,321

## In second, revised edition attempts to deepen the analysis by focusing on a number of key issues

that the first edition brought to the fore and that can support better design of education policy and improved workforce planning. The main changes from the first edition is that the first edition's four original pillars of Education, Employment, Health and Enabling Environment have been replaced by five vertical age bands, selected to capture the major phases in an individual's human capital development lifecycle and countries' demographic structure: Under 15; 15–24; 25–54; 55–64; and 65 and over.

Table 4. Detailed Ranking in HC Report 2015

Human capital Report Year 2015

Country	Overall index		Under 15 Age G.		15-24 Age Gr.		25-54 Age Gr.		55-64 Age Gr.		65 and older	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
Finland	1	85,78	1	97,67	2	85,04	1	81,49	6	83,72	7	73,06
Estonia	16	79,88	10	93,2	18	77,09	23	73,59	11	82,59	11	71,69
Rus. F.	26	77,54	44	86,81	13	79,13	26	72,85	17	80,45	15	70,69
Georgia*												

\* - no data

**Finland** (1) is the best-performing country in the world when it comes to building and leveraging its human capital potential, taking the top spot on the Under 15 and 25–54 Age Group pillars and scoring in the top 10 for the remaining age groups.

**Estonia** (16) placing well on the overall index. Võrreldes 2013.a. aruandega tõus 11 kohta. Ka VF tõusis 51 –lt 26 kohale, ehk 25 kohta. The Russian Federation (26) benefits from very high levels of primary, secondary and tertiary attainment across all of its age groups but also exhibits a low healthy life expectancy of 61 years.

## Competitiveness

Ratings competitiveness based on a combination of public statistics and the results of the survey of business executives - a comprehensive annual survey conducted by the World Economic Forum together with its network of partner organizations - the leading research institutions and companies in the countries analyzed in the report. In year 2014, over 14,000 business leaders were polled in 144 countries. The report also included a detailed review of the strengths and weaknesses of countries, making it possible to identify priority areas for policy formulation and economic development of key reforms

Table 5. Global Competitiveness Index (GCI) for 4 country, World Economic Forum

Year	Estonia		Finland		Russia		Georgia		Rank 1	Score
	Rank	Score	Rank	Score	Rank	Score	Rank	Score		
2014-15	29	4,7	4	5,5	53	4,4	69	4,2	Schweiz	5,7
2013-14	32	4,7	3	5,5	64	4,25	72	4,2	Schweiz	5,67
2012-13	34	4,64	4	5,5	67	4,2	77	4,1	Schweiz	5,72
2011-12	33	4,6	7	5,4	66	4,2	88	4,0	Schweiz	5,75
2010-11	35	4,6	6	5,4	63	4,2			Schweiz	5,63
2008-09	32	4,7	6	5,5	51				USA	5,74
2007-08	27	4,7	6	5,5	58				USA	

The Global Competitiveness Index is composed of 113 variables that describe in detail the competitiveness of countries at different levels of economic development. The set of variables by two-thirds consists of the results of a global survey of business executives (to cover a wide range of factors affecting the business climate in the countries studied), and one-third from public sources (statistics and the results of research carried out on a regular basis by international organizations). All the variables grouped into 12 benchmarks that determine national competitiveness:

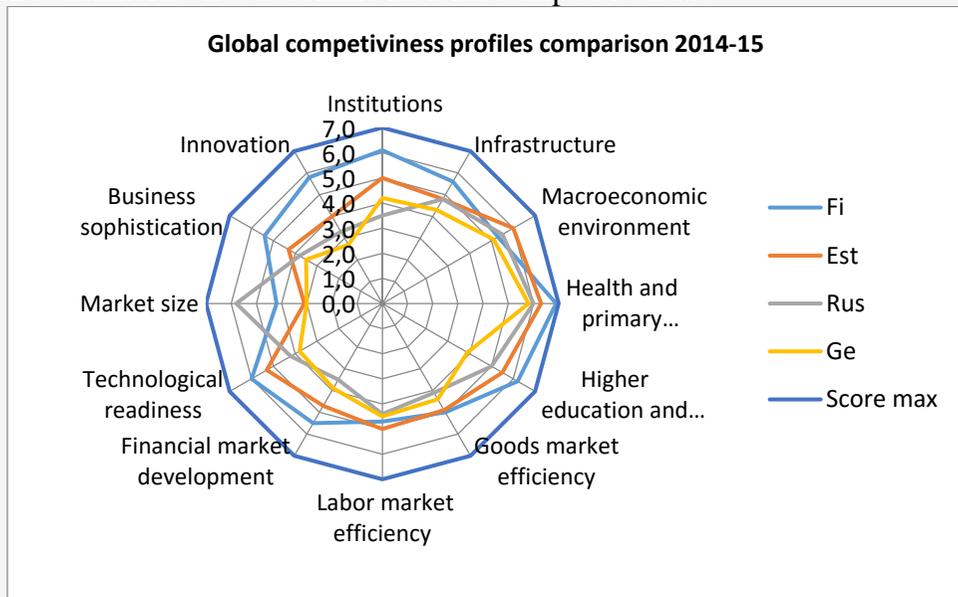


Figure 5 . Global competitiveness profiles comparison. Source: Global competitiveness Report 2014-15.WEF

Finland continues to exhibit a strong performance across all the analyzed dimensions, despite its drop of one place to 4th position. This decline is mainly driven by a slight deterioration of its macroeconomic conditions (43rd), which has led some rating agencies to downgrade the outlook of this Nordic economy. Finland's biggest competitiveness strength lies

in its capacity to innovate, where the country leads the world rankings (1st). Very high public and private investments in R&D (83rd), with very strong linkages between universities and industry (1st) coupled with an excellent education and training system (1st) and one of the highest levels of technological readiness (11th) drive this outstanding result.

Estonia remains the best performing country in Eastern Europe and improves by three places to reach 29th overall. Estonians labor market is also more efficient than most countries in the region (11th).

The Russian Federation is placed at 53rd position this year with some improvements related to the efficiency of goods markets (In particular domestic competition). ICT use, and business sophistication – although this arguably reflects some positive developments that took place before the Ukraine conflict started. At the time of writing, the Russian economy continues to face many deeply rooted challenges that will have to be addressed for the country to strengthen its competitiveness. Russia's weak and inefficient institutional framework (97th) remains its Achilles heel and will require a major overhaul in order to eradicate corruption and favoritism (92nd) and re-establish trust in the independence of the judiciary (109th). Diversification of the economy will need reinforcing the very small. SME sector as well as continued progress toward a stronger and more stable financial system (110th). These challenges prevent Russia from taking advantage of its competitiveness strengths, which are based on a well-educated population, fairly high levels of ICT use (47th), and its solid potential for innovation (65th). Going forward, the reverberations of the Ukraine conflict – such as sanctions and potential disruptions to the gas trade – could affect the country's competitiveness. These implications could be especially serious given the reliance of the education and innovation sectors on public funding, which will become more scarce than it has been in previous years and for accessing technology developed abroad.

Table 6. Subindex weights and income thresholds for stages of development

	STAGE OF DEVELOPMENT				
	<u>Stage 1 Factor driven</u>	<u>Transition from stage 1 to 2</u>	<u>Stage 2 Efficiency driven</u>	<u>Transition from stage 2 to 3</u>	<u>Stage 3 Innovation driven</u>
<u>GDP per capita (US\$), thresholds*</u>	<u>&gt;2000</u>	<u>2000-2999</u>	<u>3000- 8999</u>	<u>9000-17000</u>	<u>&gt;17000</u>
<u>Weight for basic requirements,%</u>	<u>60</u>	<u>40-60</u>	<u>40</u>	<u>20-40</u>	<u>20</u>
<u>Weight for efficiency enhancers,%</u>	<u>35</u>	<u>35-50</u>	<u>50</u>	<u>50</u>	<u>50</u>
<u>Weight for innovation and sophistication factors,%</u>	<u>5</u>	<u>5-10</u>	<u>10</u>	<u>10-30</u>	<u>30</u>
			<u>Georgia</u>	<u>Russia</u>	<u>Finland Estonia</u>

\*For economies with a high dependency on mineral resources, GDP per capita is not the sole criterion for the determination of the stage of development

Table 7. Adjustment to the GCI scores by sustainability indicators

	<u>GCI 2014-2015</u>		<u>Social sustainability-adjusted GCI</u>		<u>Environmental sustainability-adjusted GCI</u>		<u>Sustainability – adjusted GCI</u>	
	<u>Rank</u>	<u>Value</u>	<u>Value</u>	<u>Direction</u>	<u>Value</u>	<u>Direction</u>	<u>Value</u>	<u>Direction</u>
<u>Switzerland</u>	<u>1</u>	<u>5.7</u>	<u>6.75</u>	<u>↑</u>	<u>6.84</u>	<u>↑</u>	<u>6.8</u>	<u>↑</u>
<u>USA</u>	<u>3</u>	<u>5.54</u>	<u>5.97</u>	<u>↗</u>	<u>5.24</u>	<u>↘</u>	<u>5.61</u>	<u>→</u>
<u>Finland</u>	<u>4</u>	<u>5.5</u>	<u>6.38</u>	<u>↑</u>	<u>5.08</u>	<u>↗</u>	<u>6.18</u>	<u>↗</u>
<u>Estonia</u>	<u>29</u>	<u>4.71</u>	<u>5.13</u>	<u>↗</u>	<u>4.71</u>	<u>≥</u>	<u>4.92</u>	<u>→</u>
<u>Russia</u>	<u>53</u>	<u>4.37</u>	<u>4.46</u>	<u>→</u>	<u>4.19</u>	<u>≥</u>	<u>4.33</u>	<u>→</u>
<u>Georgia</u>	<u>69</u>	<u>4.22</u>	<u>3.88</u>	<u>↘</u>	<u>4.1</u>	<u>≥</u>	<u>3.99</u>	<u>→</u>

Nordic countries continue to perform well overall and display specific areas of improvement. Finland, despite and inclusive social system and a track record of managing resources responsibility, has to address a rather high level of youth unemployment (approximately 19%), depleting fish stocks.

As it faces difficulties related to sustainability, especially in the environmental area, the Russian Federation attains an intermediate performance on both pillars again this year. In terms of social sustainability, the Russian Federation is still characterized by a relatively weak social safety net, high and increasing inequality, and limited social mobility. All these indicators have remained constant since the last assessment. In terms of environmental sustainability, regulations are still only weakly enforced and only 21% of the water withdrawn is treated. This low treatment rate could be a source of water stress in the future, although today Russia is endowed with one of the largest water reserves in the world. Emissions, especially CO<sub>2</sub> intensity, are also higher than international standards, and fish stocks are depleting. The country should better manage its natural capital to ensure prosperity in the long run.

### **Innovation and business development**

**Innovation and business development** are estimated knowledge index (KI), economic indicator prepared by the World Bank Institute to measure the ability of the country in terms of the creation, adoption and dissemination of knowledge.

This index - the index of Knowledge Economy (KEI) allows for an enabling environment for knowledge, whether they are used effectively for economic development. It is a composite index that represents the overall level of development of the country or region in relation to the knowledge economy.

KEI is calculated based on the average of the normalized performance ratings of the country or region, based on the four pillars related to knowledge economy - economic incentive and institutional regime,

education and human resources, the innovation system and ICT. So the four pillars of the knowledge economy:

- Economic incentive Regime, which provides incentives for the efficient use of existing and new knowledge for the development of entrepreneurship;
- an educated and skilled population able to create, share and use knowledge;
- efficient innovation system of firms (Innovation and Education), research centers, universities, consultants and other organizations to tap into the expanding global knowledge base, the ability to assimilate and adapt it to local needs, and create new technology;
- Information and Communication Technologies (ICT) to facilitate the effective creation, dissemination and processing of information.

Of the 140 countries Knowledge economies Index Estonia, Finland, Russia, is given in Table 8

Table 8. Knowledge Economy Index, KEI

Country	Rang	KEI	KI	Economic incentive Regime	Innovation	Education	ICT
Sweden	-2000	<b>9,65</b>	9,73	9,42	9,72	9,67	9,79
	1(2014)	<b>9,58</b>	9,55	9,66	9,8	9,88	9,28
The best				9,66(Sing)	9,86(Switz)	9,81(NZ)	9,54(Bahr)
Finland	2(2000)	<b>9,22</b>	9,12	9,5	9,68	8,31	9,37
	3(2014)	<b>9,33</b>	9,22	9,65	9,66	8,77	9,22(6)
Estonia	19(2000)	<b>8,15</b>	8	8,57	7,17	8,61	8,22
	20(2014)	<b>8,4</b>	8,26	8,81	7,75	8,6	8,44(19)
Russia	53(2000)	<b>5,28</b>	6,53	1,54	6,18	7,8	5,6
	49(2014)	<b>5,78</b>	6,96	2,23	6,93	6,79	7,16(45)
Georgia	-2000	<b>4,67</b>	5,19	3,1	5,48	6,22	3,88
	65(2012)	<b>5,19</b>	4,49	7,28	5,15	4,61	3,72

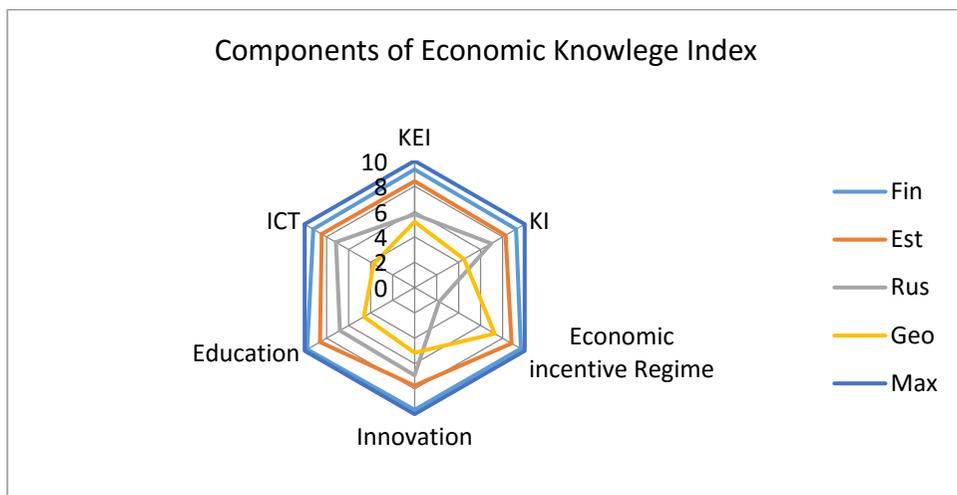


Figure 6. Economic knowledge index 2012 pillars. Source: World Data Atlas, [www.knoema.com](http://www.knoema.com)

**Ease of doing business index** - an index created by the World Bank (Table 9). Higher ratings (lower numerical value) indicates a higher (usually simpler rules for businesses) and the protection of property rights. Empirical research funded by the World Bank show that the effect of improving the rules on growth is strong.

Table 9. Ease of doing business, score and rating

	<u>Finland</u>	<u>Estonia</u>	<u>Russia</u>	<u>Georgia</u>	<u>Rang 1</u>	<u>Score</u>
<u>Ease of doing business index 2016</u>	<u>81,05</u>	<u>79,49(16)</u>	<u>70,99(54)</u>	<u>77,45(24)</u>	<u>Singapur</u>	<u>89</u>
<u>Standard &amp; Poor kredit rating 2015</u>	<u>AAA</u>	<u>AAA</u>	<u>BB+</u>			

Index measures the ease of doing business decisions directly affect business and allows you to directly measure general conditions such as a country's proximity to large markets, quality of infrastructure, inflation, or crime rates. Rating is based on the nation's average of 10 sub-indices, which can be seen in Table 10 and Figure 7 displays the profiles of the countries on this index.

Table 10. Ranking, points and sub-indices of easi duing business	Estonia		Finland		Russia		Georgia	
	2015	2016	2015	2016	2015	2016	2015	2016
Ranking	17	16	10	10	54	51	24	24
Points	79,27	79,49	80,95	81,05	69,26	70,99	76,84	77,45
Starting a business	93,25	95,06	93,10	93,11	92,17	92,35	97,73	97,76
Dealing with construction permits	84,18	80,88	81,61	77,90	56,70	65,23	82,38	82,77
Getting electricity	80,27	83,25	85,29	88,97	60,89	84,22	72,89	76,15
Registring property	90,88	91,01	80,58	82,94	91,27	90,51	91,16	91,16
Getting credit	70,00	70,00	65,00	65,00	55,00	65,00	85,00	85,00
Protecting minority investors	58,33	55,00	55,83	56,67	50,83	56,67	68,33	68,33
Paying taxes	84,93	84,33	88,36	89,38	80,63	81,60	82,76	82,76
Trading across borders	92,76	94,89	89,10	92,44	53,58	37,39	75,31	75,31
Enforcing contracts	68,91	75,16	75,58	70,33	75,85	78,56	73,21	75,06
Resolving insolvency	64,92	65,28	93,85	93,81	49,69	58,39	39,60	40,24

Despite that Finland's total index has not changed, she fell in the rankings by one place, passing to other countries in the initiatives of the business and the loan. In Estonia, the main part of the undertaking in promoting the business.

Russia has advanced in terms of connecting to the electricity and access to credit. Very weak spot - international trade (sanctions), weak - obtaining building permits.

Georgia compared to the general level of economic development has a very high rating. On many items seen some progress.

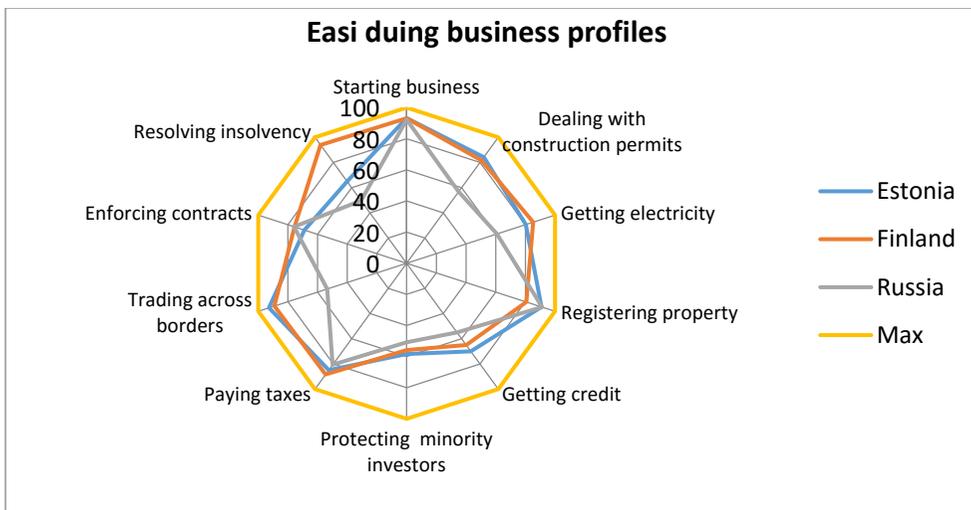


Figure 7. Easi duing business profiles. Source: Easi duing business 2015

### Human development index

The **Human Development Index (HDI)** is a composite statistic of life expectancy, education, and per capita income indicators, which is used to rank countries into four tiers of human development.

Published on 4 November 2010 (and updated on 10 June 2011), starting with the 2010 Human Development Report the HDI combines three dimensions: HDI is calculated as the arithmetic mean of the three equally important components:

1. income as an indicator of the gross domestic product (gross regional product) in purchasing power parity (PPP) US dollars per capita;
2. education, literacy rates determined (with a weight of 2/3), and the proportion of students among children and youth aged 6 to 23 years old (with a weight of 1/3);
3. longevity determined by life expectancy at birth (life expectancy).

The countries are divided by the level of development in four groups: very high - an index of more than 0.8, a high - 0.5-0.8, medium and low levels of human development – below 0.5. These calculations are published in the annual country reports on human development.

Table 11. HDI trends 1980 - 2013

Rank	Country												Rank
2014		1980	1990	2000	2005	2008	2010	2011	2012	2013	2014	2012	2013
1	Norway	0.793	0.841	0.910	0.935	0.937	0.939	0.941	0.943	0.944	0,944	1	1
24	Finland	0.752	0.792	0.841	0.869	0.878	0.877	0.879	0.879	0.879	0,883	24	24
30	Estonia	..	0.730	0.776	0.821	0.832	0.830	0.836	0.839	0.840	0,861	33	33
50	Russia	..	0.729	0.717	0.750	0.770	0.773	0.775	0.777	0.778	0,798	57	57
76	Georgia	.....	.....	.....	0,710	0,730	0,733	0,736	0,741	0,744	0,754	81	79

Table 12. Human development index UNO, 2014 (HDI).

Rank		HDI 2014	Life expectancy at birth	Mean years of schooling	Expected years of schooling	Gross NI per capita	HDI 2012
1	Norwegien	0,944	81,6	12,6	17,5	64992	0,943
24	Finland	0,883	80,8	10,3	17,1	38695	0,879
30	Estonia	0,861	76,8	12,5	16,5	25214	0,839
50	Russia	0,798	70,1	12,0	14,7	22352	0,777
76	Georgia	0,754	74,9	12,1	13,8	7164	0,741

Russian belongs to the group of countries with medium level of development. The coefficient does not exceed 0,7-0,8. In recent years, due to the increase in per capita GDP and the level of education of the Russian Federation HDI tends to rise. In 2014, Russia occupied 50th place among 177 countries, and keeps a place in Russia 2013. Inside RF highest HDI is observed in Moscow, St. Petersburg, in the Tyumen region, Bashkiria, Tatarstan, the lowest in Chechnya, Tuva. (Human Development Report in Russia for 2013)

As for Estonia and Finland, they are on the IPE in the category of countries with a very high level of development, the index above 0,8. At the same time Estonia has a per capita GDP is not significantly higher than the Russian Federation. Significant progress Estonia has in life expectancy, but the backlog from Finland is very significant. It is well known that Finland has a very high level of healthcare and education systems, taking in this part of the highest ratings in the world. In Estonia system of public health has done also very great progress considering the relationship between quality and costs (In Estonia 6% of GDP, in Finland, 8.9% in Russia, 6.2% in the US 17.9

Table 13.HDI main indicators 2013

	Finland	Estonia	Russia	Georgia	Rank 1
GDP per capita, thousand \$ PPP, World Factbook	35,9	22,4	18,1	7,3	Katar - 102
Life expectancy at birth, year					Japan
All	79,69	74,07	70,16	74,3	84,46
Female	83,29	79,61	76,3	77,8	87,99
Man	76,24	68,85	64,37	70,5	81,13
Level of literacy	high	high	high	high	

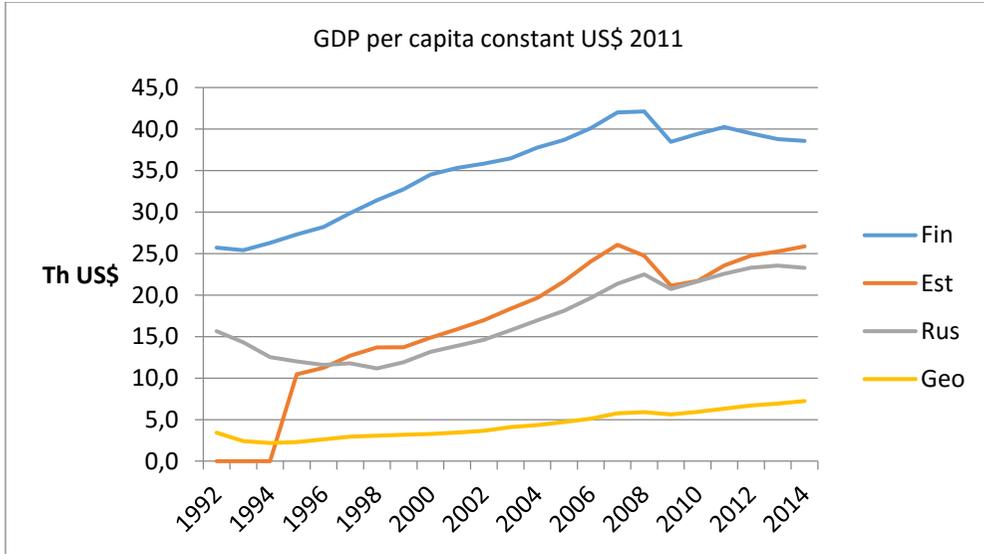


Figure 8. Changes in GDP per capita in US \$ 2011 Source: World Bank

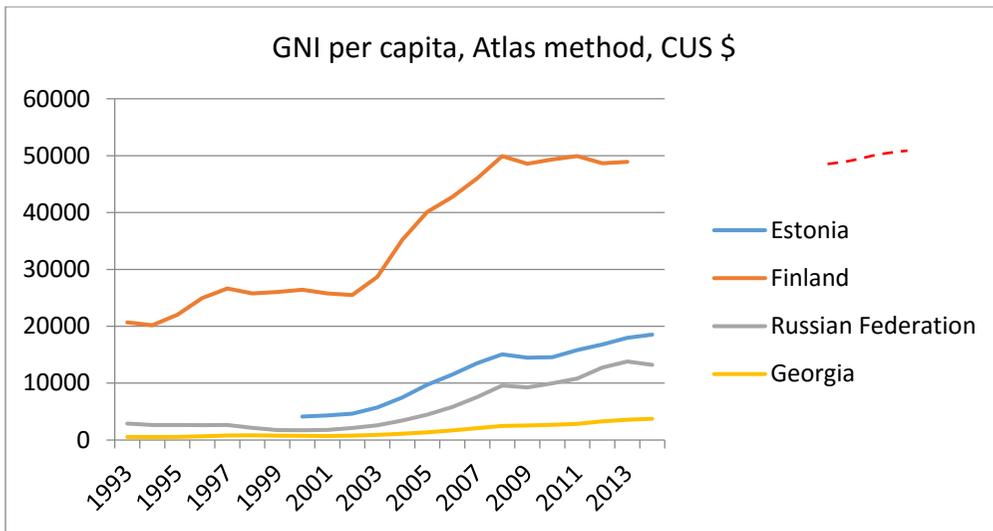


Figure 9. Changes in GNI per capita in current US \$, Atlas method. Source: World Bank

**Sustainability of countries development.** Achieving sustainable development - one of the most pressing challenges facing all countries in the world. The goal - to ensure economic growth while protecting the resource base and the environment. To assess the steady development in the use of indexes.

Table 14. Sustainability of countries development

	<u>Adjusted net savings</u>	<u>Ecological Footprint, ha per person</u>	<u>Environmental Performance Index</u>	<u>The share of fossil fuels, as % of total</u>	<u>The share of renewable energy sources, % of total</u>	<u>Carbon dioxide emissions per capita, tons</u>	<u>Urban pollution, mg / m<sup>3</sup></u>	<u>Depletion of natural resources, % of GDP</u>	<u>Wooded areas % of the territory</u>	<u>Overall satisfaction with life, max 10</u>	<u>Satisfaction with environmental оп., % Удовлетворенность охраной</u>
<u>Finland</u>	<u>12,8</u>	<u>5,6</u>	<u>81,1</u>	<u>58,6</u>	<u>45,3</u>	<u>10,5</u>	<u>16</u>	<u>10,6</u>	<u>32,4</u>	<u>7,6</u>	<u>51,5</u>
<u>Estonia</u>	<u>14,4</u>	<u>7,9</u>	<u>63,8</u>	<u>88,3</u>	<u>12,0</u>	<u>13,6</u>	<u>13</u>	<u>0,7</u>	<u>52,6</u>	<u>5,1</u>	<u>45,2</u>
<u>Russia</u>	<u>-0,8</u>	<u>4,4</u>	<u>61,2</u>	<u>90,9</u>	<u>3,0</u>	<u>12,1</u>	<u>16</u>	<u>14,5</u>	<u>49,4</u>	<u>5,4</u>	<u>18,3</u>
<u>Georgia</u>											

Source: World Bank

A comparison of these indicators of sustainability allows analysts to talk about the meeting outcomes of reproduction - material and spiritual needs of the population.

### **Legatum prosperity index**

National success is about more than just wealth. The Prosperity Index goes beyond GDP to measure countries' success against a broad set of metrics covering areas such as health, education, opportunity, social capital, personal freedom, and more.

The *Prosperity Index* is the only global index that measures national prosperity based on both wealth and wellbeing (objective *and* subjective data). The Index seeks to redefine the concept of national prosperity to include, as a matter of fundamental importance, factors such as democratic governance, entrepreneurial opportunity, and social cohesion.

The 2014 Legatum Prosperity Index is based on 89 different variables analysed across 142 nations around the world. Source data includes Gallup World Poll, World Development Indicators, International Telecommunication Union, Fragile States Index, Worldwide Governance Indicators, Freedom House, World Health Organisation, World Values Survey, Amnesty International, Centre for Systemic Peace. The 89 variables are grouped into 8 sub-indexes, which are averaged using equal weights. The 8 sub-indexes see in table 15:

Table 15 The Legatum prosperity index rankings 2015

Overall Rank	Country	Economy	Entrepreneurship & Opportunity	Governance	Education	Health	Safety & security	Personal Freedom
1	Norway	4	5	8	5	4	8	3
9	Finland	33	8	5	7	13	3	18
31	Estonia	35	26	23	39	40	36	61
58	Russia	55	42	106	29	42	91	111
80	Georgia	119	71	43	66	82	57	72

Sources: Legatum Institute

Table 16. Year-on year prosperity rankings 2009 -2015

Country	2009	2010	2011	2012	2013	2014	2015
Norway	1	1	1	1	1	1	1
Finland	4	3	7	7	8	8	9
Estonia	31	35	33	35	36	32	31
Russia	62	63	59	66	61	68	58
Georgia				93	84	80	80

**Finland** can be explained by a decrease in the rating period (9) of stagnation in the economy (33.positions), and the refugee crisis, the impact of such an indicator, such as personal freedom.

**Estonia** has come back to the ratings of the former (31) in the upper position. Distinctively pulls down the overall rating of poor position in regard to personal freedom (61).

Economic conditions in modern-day Russia are getting worse: falling oil prices have hit the country's economy hard (oil constitutes 50% of government revenue and 70% of exports); interest rates shot up at the end of 2014 (although they have since fallen somewhat); Russia's credit rating has been downgraded to 'junk' status; and the IMF has predicted that Russia could lose up to 9% of GDP due to the economic sanctions imposed by the US and EU. The combination of sanctions, falling oil prices, and lack of diversification has contributed to the present malaise. Between 2009 and 2014 the country saw declines in the Economy, Personal Freedom, and Social Capital sub-indices. Putin's Russia, the Index showed, was becoming increasingly less prosperous. And so it may come as a surprise-an enigma even-that Russia's performance in the 2015 Prosperity Index has seen a marked improvement since last year, rising in the global rankings by ten places. But the overall rankings don't reveal the whole story. Digging into the underlying data reveals more.

The country's strong performance has been driven by big improvements in the areas of Social Capital, Governance, and Personal Freedom. However, these improvements have been caused predominantly by dramatic increases in the subjective data – put simply, despite living in a

country in decline, the Russian people are responding to surveys more positively than they did in year 2014 (Legatum Institute).

### Cost of Living Comparison

Below is a comparison of the cost of living and purchasing power of the country to the level of Estonia (100%), 12.2015

Table 17. Comparison of the cost of living

	Estonia	Finland	Russia	Georgia
Consumer prices,%	100	146	74	54
CP including Rent, %	100	156	86	59
Rent prices,%	100	198	138	81
Restaurant Prices, %	100	170	96	57
Groceries Prices,%	100	161	76	57
Local Purchasing Power,%	100	178	75	41
Average Monthly Disposable Salari, €	785	2189	511	187
Average Monthly Disposable Salari, %	100	279	65	24
Mortgage Interest Rate, % yearly	2,6	2,12	14,21	13
Mortgage Interest Rate, %	100	81,5	446,5	400,0
<i>Source: www.numbeo.com</i>				

### Summary

For better visibility, and the expression of explicit data on differences ratings and some indicators of living standards are summarized in the table :

Table 18. A summary table of the main rankings and indicators

Indicator	Fin	Score Est	Score Rus	Score Geo	Score			
Economic Freedom Index	19	73,4	8	76,8	142	52,1	22	73,0
Human Capital Index , 2013	2	1,406	27	0,571	51	0,01	77	-
Human Capital Index , 2015	1	85,78	16	79,88	26	77,54		
Human Development Index, 2014	24	0,883	30	0,861	50	0,798	76	0,754
Global Competiviness Index, 2014-15	4	5,5	29	4,7	53	4,4	69	4,2
Knowledge Economy Index,	3	9,33	19	8,4	49	5,78	73	5,19
Ease of doing business Index, 2016	10	81,05	16	79,49	54	70,99	24	77,45
Legatum prosperity Index, 2015	9		35		55		119	
Local Purchasing Power, 12.2015, %	<b>100</b>		55,0		42,0		23,0	
AverageMonthly Disposable Salary, %	<b>100</b>		36,0		23,0		8,5	
Mortgage Interest Rate, %	<b>100</b>		122,0		446,0		400,0	

It is striking in Finland a high level, most indicators it belongs to the world's 10 highest levels among the countries, with the exception of HDI and EFI indicator of where Finland's ratings are, respectively, 24 and 19th.

Estonia has the honor for most of the indicators to be elected among the top 30, which is for young capitalist country is a very good achievement. In the beginning of the restoration of independence followed a liberal market

economy, carried out in an effective fiscal policy (the effective tax system and a balanced budget).

Russia has a success on all major ratings and rises to at most improved 50 country rating. Especially striking is the high rating (16) in terms of human capital year 2015 by age groups. In terms of economic freedom Russia is very limited, it belonged to the category of "mostly unfree" and rather high corruption countries, which greatly hinders the normal development. Georgia has moved significantly to liberalize the economy and business activity in the direction of making it easier. The high points of rest for ratings from achieving hinders economic backwardness and the resulting low standard of living.

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# **Estimating The Appropriate “Wage-Setting Space” For External Balance And Job Creation Into The Greek Economy**

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## **Abstract**

A flexible labor market framework is a main instrument for the economy's adjustment in EMU, while wage formation process is of crucial importance for external balance and job creation. In this process, the estimation of the appropriate space for wage setting plays a key role for the economy's performance. In this estimation exercise the inclusion of all factors that determine and affect the economy's competitiveness in today's economic environment is crucial. By this paper, we aim to empirically investigate the role of wage setting in the Greek economy's competitiveness erosion before the crisis and the degree to which it has been restored during the current crisis period. On this basis we estimate the appropriate room for wage changes in the private and public sector that can sustain the country's public and external balance, as a crucial precondition for the economy's restarting in the new Euro fiscal pact framework.

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**Keywords:** EMU, flexible labor market, productivity, competitiveness, wage setting mechanism, room for wage increase

## **Introduction**

Greece continues to suffer by the most severe after-war crisis, with extended negative implications on country's welfare, employment opportunities and macroeconomic stability. This is due to applied policies in the past and also the inefficiency of implemented policies during the current crisis. A crucial factor of decisive importance is to restore country's competitiveness in the European and the international market. Wage-setting policies in the past are responsible for competitiveness erosion and lost market shares. Policies adopted by the program of the European supporting mechanism aim to reform a rigid labor market in order to become more flexible and through wage cuts to enhance profitability and competitiveness.

This paper gives a suitable instrument for wage setting in a flexible labor market framework that would efficiently secure competitiveness, job creation and external balance. This model instrument is an alternative to the Scandinavian model of wage setting and the Europact framework. By using the relative data, it is estimated the room for wage setting, based on factors that secure external balance and explain imbalances in the pre-crisis period. In **Section 2**, it is explained the role of wage setting. In **Section 3** it is presented the model which is going to be used for the estimations. In **Section 4**, according to the model, it is explained the discrepancies among the competitive and sheltered sectors in the economy. In **Section 5** the estimations for the Greek economy are presented, based on the model for the time period 2001-2014, before and during the current crisis. Conclusions are presented in **Section 6** explaining the consequences of implemented policies during the past and also advocate the necessary guidelines of wage setting policies, which may contribute to the competitiveness and the economy's restart.

### **The role of nominal wage setting in EMU**

During the widening and deepening economic integration process in EMU, the nominal wage growth becomes a key factor explaining job creation and external balance in national economic wages accounts for a significant proportion of production costs for most goods and services. They constitute crucial compounds influencing inflation persistence, competitiveness and through this current account imbalances, businesses' or economy's ability to adjust to negative shocks. Wage developments equilibrate demand & supply in the labor market and are also decisive for efficient allocation of labor resources across economic activities. In the EMU environment the overall level of nominal wage adjustment should be consistent with the goal of price (p) stability and on this framework, excessive nominal wage increases trigger inflationary risks, reduce price competitiveness and net export performance (*European Economy 2004*).

On the other hand, wage moderation by reducing domestic production costs and domestic tradable and non-tradable goods prices, achieves competitiveness gains, reduces imports and increases exports, favors employment and restores external balance. The central role of flexible labor market and labor market policies that is assigned by the whole policy framework established in EMU is a common topic (Calmfors L., 1998). It is the only "policy instrument" that remains at national level (*Hallett H. et al 2001*). In this framework the nominal wage developments act as an economic stabilizer. This framework also includes a flexible wage-setting mechanism and wage-bargaining behavior, while the role of appropriate nominal wage-setting becomes decisive and mirrors the degree of the efficient functioning

of the above established flexible labor market framework (Arpaia Al. et al, 2007). On the grounds of this estimation, wage growth room for national sectoral or business level has to rely on appropriate determinants that guarantee an efficient wage setting mechanism.

### **A model-instrument to estimate the room for wage growth**

The wage formation process in the market economies and the settlement of nominal wages both in public and private sector are the outcomes of the bargaining process between employers and employees. An extended literature with a number of studies based on the wage-bargaining model has been developed, aiming to capture the factors which influence the wage formation process (Calmfors Al., 1998, Marg P., 2011, Theodoropoulos S., 2011). Labor productivity - that is real output per hour worked - is the most crucial relevant factor of general acceptance for both nominal and real wage growth. Over the long run improvements in labor productivity are translated into growth of output, wages and income. In a constant unit labor cost, the average rate of increase in nominal wages must be equal to the average increase in productivity for the whole economy. Due to the fact that in every economy, a tradable and non-tradable sector exists and also part of this is exposed to international competition, the average rate of productivity is not the most appropriate tool to determine the nominal wage increase in every sector.

On this point the contribution of the Scandinavian model, by its division of the economy to exposed to international competition and “sheltered” sectors of the economies that accounts to the productivity growth only in the exposed tradable sector industries has more ground (*Edgren G. et al 1969*). The strong interconnection among the nominal wage growth and the productivity growth that the Europact establishes, aims to support the competitiveness effort, almost abolishes the factors affecting real wages level. The Europact creates a new reality for EMU countries labor markets framework. Social partners’ behavior has to be adapted to this reality and undertake their responsibility share in order to protect the national economy’s productivity, as the “key determinant” of the standard of living for the employee population, as well as the distribution of income between labor and capital (*Feldstein M. 2008*). In a flexible wage-setting framework the labor productivity factor has to be used on the distinction basis of the Scandinavian model. The “wage setting space” that supports job creation and external stability, has to be strongly connected with productivity of the competition - exposed sectors (Gc) marketed abroad or in the domestic market. For this reason, using a nation-wide average level of productivity, particularly for sectoral wage-setting framework can give false results,

because productivity changes differ between sectors and sectoral wage-setting has to rely on the these differences.

The output prices changes in the world market (inside and outside EU's internal market) for the competitive sector ( $P_w$ ) have to be accounted for the determination of the wage increases room. The output prices of the exposed to international competition industries will significantly be determined in the world market. These industries therefore cannot compensate for a cost ( $c$ ) increase through an upward adjustment of prices ( $p$ ). If their costs ( $c$ ) increases due to various reasons – imported inputs, home factors – they must absorb the whole effect in the form of reduced profits ( $\pi$ ) and perhaps reduced production ( $q$ ) (*Aukrust O. 1974*). In such cases the room for wage increases shrinks in order to sustain national economy productivity and competitiveness. In other cases, productivity gains can be reflected in quality improvements at unchanged cost ( $c$ ) and unchanged prices ( $p$ ), resulting to an increase in the demand, while also better goods and services can be reflected on higher prices ( $p$ ), expanding this way the wage setting space.

Furthermore, variations in foreign exchange rate ( $E_r$ ) determine also the room for wage increase, while they affect also the economy's competitiveness. The total trade volume of goods and services exported to other countries has to be weighted by the relative shares and their respective exchange rate changes (e.g. appreciations of common currency to other currencies affecting prices diminish the room for wage increase and vice-versa, particularly for sectors trading with these markets). The impact of the exchange rate changes diminishes if the main part of exports and imports is marketed in the EU's internal market.

Other factors included in the conventional inflation analysis and wage indexation practices cannot be used for wage setting in the contemporary EMU environment (Theodoropoulos S., 2011). Furthermore, the unemployment rate ( $U$ ), the labor market institutions and bargaining regimes, the centralized or decentralized collective bargaining process can only affect the wage negotiation process, while their role restricted on how this wage room could be divided among business profits ( $\pi$ ) and wages ( $w$ ). Wage negotiations in a **company, sectoral and economy-wide level**, refer to the division of this wage room, estimated by these abovementioned three (3) outweighed determinants that refer to the competitive sector. These estimations constitute the norm for the wage settlements framework, both on the sheltered sector producing tradable goods and services also for the public sector (statistical function 1):

$W_{re} = G_C \mp P_W \mp E_r$	(1)
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*Where:*

**$W_{re}$  = Wage change**

**$G_c$  = Productivity gains**

**$P_w$  = Rate of Price changes**

**$E_r$  = (%) exchange rate changes**

### **The division in competitive and sheltered sectors**

The external balance and a viable, that means competitive, job creation of the economy depends on its international competitiveness. In order to sustain, restore or improve the competitiveness of an economy, wage changes in the international competition exposed sectors constitute a crucial precondition. In this framework, the wage changes in the competitive sectors have to be the norm and driver for the economy in total. For this purpose, a fundamental distinction has to be drawn between competitive and sheltered sectors.

Competitive sectors are those that are exposed to strong competition at international markets, either because they export most of their products or they sell their products in the domestic market under strong foreign competition. On the other hand, sheltered sectors are considered those whose products and services are marketed at home under conditions that leave them relatively free of foreign competition.

There are two (2) crucial factors affecting profitability and the wage room for wage changes in the two (2) group sectors. The competitive sector operates as a price-taker because its output prices are largely determined at the world market. A cost (c) increase in this sector cannot be compensated through an upward adjustment of prices (p) without negative implications on profits ( $\pi$ ) and market shares. On the other hand, a sheltered sector of the economy is not threatened by market share loss if it tends to compensate by transferring the cost increase to the output prices. Usually the cost in these sectors is passed on quickly, leaving the shares of profits and factor incomes largely unaffected. Furthermore, between the two (2) different sectors of the economy seems to be different trends for productivity. On the one hand, the competitive sector's productivity rises much more rapidly, mainly due to pressures from the international competitiveness and the international market-oriented strategies and developments. On the other hand the sheltered sector, such pressures or weaker, and at the same time service industries weigh heavily on this sector. A particular part of intensively regulated services belonging to this group or public services, and the whole public sector where a lack of productivity calculations exists.

Any division crude in nature of the economy into two (2) sectors provides a more realistic picture of many of the essential relationships in the economy than the traditional approach. That division with the use of broad

classification criteria into the above mentioned categories is not permanent or final in a continuously changing economic environment. The price ( $p$ ) increases at the competitive sector, which are made possible by price increase in the international market, weighted in market shares in euro and other currencies. Profitability ( $\pi$ ) is the ability of a sector to earn surplus available for distribution as wages ( $w$ ) and profits ( $\pi$ ). How this surplus is distributed between business profits ( $\pi$ ) and wages ( $w$ ) depends on the wage negotiations at sectoral and company level. The wage level, which has established itself within the competitive sector, determines the wage level within the sheltered sector. Market forces tend to keep wages in the two groups in a normal relation to each other. The wage level within the sheltered sector together with the sector's productivity determines the output prices ( $P_q$ ) of these industries. Wage impulses go beyond the competitive sector (as wage leader) to the sheltered economy sectors, as also to the public sector, while public expenses for wages have to be paid by taxes from the profits ( $\pi$ ) of both sectors. Wage increases in the competitive sector as in the sheltered economy sectors (private and public), cannot exceed in the long run the wage room that has been created by productivity and price changes and hence threaten the ability of the economy to compete without negative impacts on the real economy, private (and public) investments and employment.

### **Estimations for the Greek Economy**

According to the above analytical framework and criteria, our estimations have to be based on national accounting material of the **International Standard Industrial Classification System (ISIC)**, the so-called two-digit level divided in 64 groups. A further division to a three-digit level in many cases more interesting necessitates enormous additional reworking and expansion of the price and employment data. Possible errors by two-digit estimations do not upset the basic usefulness and our conclusions. Groups of **NACE code** between 01 to 33 including production of primary and secondary sectors of the economy belong to the competitive sector. To this we have to add 49 and 51 land and air transport, 50 water transport, 61 telecommunications while 55-56 group including accommodation and food and beverage service activities have to be divided in that part exposed to foreign competition like the tourist market and that part oriented mainly to the home market. The competitive sector of the Greek economy constitutes around 28% of total Gross Value added, according to the data for 2001 and diminishes until 2009 (crisis period), while then an upward trend exists due to the implemented MoU policies.

Sheltered sectors include the tradable activities of the sheltered sector as also the public sector. As in our model presented above price changes of the competitive sector are the producer prices of net value added, net of

sector's intermediate consumption and depreciation. Net value added in use is divided in the compensation of the employees and the sector's operating surplus. Productivity changes are estimated by the net value added at constant prices with the employment. The factor of exchange rate is not currently estimated and outweighed due to the fact that 75-80% of exports and imports of the Greek economy take place with other European countries. In Table 1, the appropriate room for wage increase is estimated for the period 2001-2011.

Table 1: Room for wage increase - Greece

Year	Size of Competitive Sector*	Producer Price Changes	Productivity change	Room for wage increase 2001-2009
<b>2001</b>	28,7	-	-	-
<b>2009</b>	22,4	0,2	9	9,2
<b>2011</b>	23,1	0,0	0,1	0,1

Source: ELSTAT

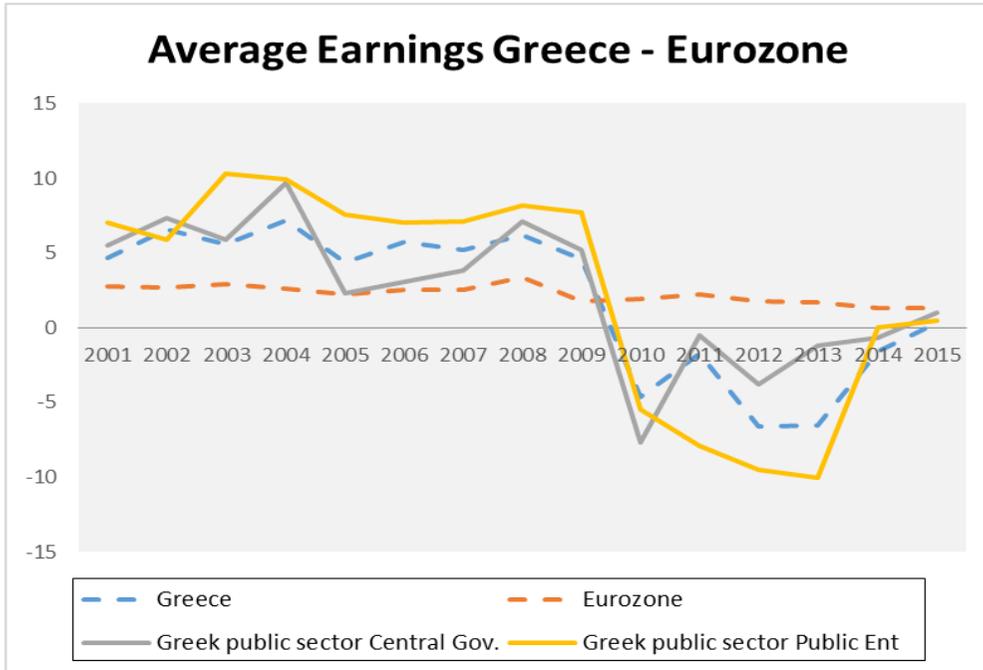
By using the current analytical tools, data presented in the following tables show the dynamic of nominal wage growth in Greece, between 2001 and 2009, the beginning of the economic crisis. A huge deviation in average earning and unit labor cost between Greece and the Eurozone, and also between the public sector acting as the wage leader and the business sector following eroding its competitiveness. High wage changes had severe impacts on the country's business economy and market shares. In the same period, accumulative competitiveness losses, mirrored also by the indicator of real trade-weighted effective exchange rate based on labor cost.

Table 2: Average Earning Greece - Eurozone (Years 2001 – 2015)

	Average earnings				Unit labor cost in total economy	
	Greece	Eurozone	Greek public sector		Greece	Eurozone
			Central Gov.	Public Ent		
2001	4,7	2,8	5,5	7	4,4	1,9
2002	6,6	2,7	7,3	5,9	5,7	2,6
2003	5,6	2,9	5,9	10,3	1,6	2,4
2004	7,2	2,6	9,7	9,9	3,7	0,9
2005	4,4	2,2	2,3	7,6	4,8	1,6
2006	5,7	2,5	3,1	7	1,9	1
2007	5,2	2,5	3,8	7,1	4,5	1,5
2008	6,2	3,4	7,1	8,2	8,9	3,8
2009	4,6	1,8	5,2	7,7	7,8	4,5
2010	-4,6	1,9	-7,7	-5,5	-1,6	-0,6
2011	-1,7	2,2	-0,5	-7,9	0,8	0,5
2012	-6,6	1,8	-3,8	-9,5	-7,9	1,8
2013	-6,5	1,7	-1,2	-10	-7,3	1,3
2014	-1,6	1,3	-0,7	0	-0,3	1
2015	0,3	1,3	1	0,5	-0,1	0,7

Source: Bank of Greece (BoG)

Graph 1: Average Earning Greece - Eurozone (Years 2001 – 2015)



Source: Bank of Greece (BoG)

According to estimations by the Bank of Greece in 2012, 78,1% of lost competitiveness based unit labor cost between 2001-2009 has been restored in relation to 28 countries trade partners and for 2013 estimated and improvement 2,4 %.

## Conclusions

The competitiveness of the Greek economy relies on sector producing exports and import competing goods and services. The profitability of these sectors of the economy is a crucial precondition for external balance, job creation and welfare improvement for the whole economy. To calculate the wage room which is available for wage and profits increase under the assumption that the international competitiveness of the Greek economy is maintained at an unchanged or improvement level is an important task. On this basis, the analytical tool presented in our study can be useful in wage negotiations where the social responsibility of the two partners has to be given. Their basic function of the two parties concerned in wage negotiations is precisely the division of this room for increases.

By the estimations and data presented above about the Greek economy, the violation of these principles and framework had catastrophic implications and is responsible for the deepest after-war crisis of the Greek economy. Current analytical tools connecting productivity and unit labor

costs with the competitiveness of the economy, although very useful and important, fail to focus on the dynamics inside developed in the competitive sector the cornerstone of economy's competitiveness. To estimate at economy-wide, sectoral and company level this room or space based on the above principles as a norm for wage negotiations, has to concentrate the theoretical interest more analytical and empirical research has to be devoted.

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# Selected Forms Of Rehabilitation In Nursing Homes

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## Abstract

Elderly, often disabled people, who live in nursing homes require psychotherapeutic and rehabilitative activities adopted to their condition of health. All activities undertaken with the aim to improve physical and mental health of residents are of paramount importance. The forms of rehabilitation applied in nursing homes are multidisciplinary and they are based on potential for development which is deeply rooted in every man, whether old or sick. This potential has its source in natural vitality of every man, regardless of the level of disability. Various methods of rehabilitation allow residents to free their abilities and predispositions, which makes it possible for them to take part in everyday life of a nursing home community. The main aim of rehabilitation is the improvement of physical and mental health of every person or group of people living in the institution.

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**Keywords:** Geriatrics, rehabilitation, nursing home, old age, disability

## Introduction

Well-being of the elderly should be an important issue for every individual and for the entire society. The increase in the number of elderly people, the deterioration of their condition of health and physical efficiency causes a number of medical, social and economic problems. Due to a considerable number of seniors requiring support and various kinds of medical services, we observe the phenomenon of “the geriatrization of healthcare”. This creates the need for highly specialized medical, nursing and supportive services on the level of primary as well as community medical care. Due to the longer life expectancy, elderly people will more frequently require long-term and complex medical care and professional rehabilitation, combined with pharmacological and dietary treatment. The loss of the ability to live independently is usually an indication that a person requires various forms of professional medical and nursing support. This applies especially to sick people who do not receive adequate personal nursing and care on daily basis. Although they do not require inpatient care, they do need permanent professional support which can be offered by nursing homes. The healthcare

needs of nursing home residents can be fulfilled through the complex work of the team of specialists: doctors – geriatrists, nurses, physiotherapists, psychologists, social workers and occupational therapists. The aim of this article is to illustrate the role of the selected forms of rehabilitation offered to nursing home residents.

## **I. Nursing Homes**

One of the institutions offering support to seniors in need is a nursing home. The role of Nursing Homes is regulated by the Social Welfare Act of March 12, 2004. The institutionalized character of Nursing Homes is manifested in that “it provides housing, caring, supportive and educational services in accordance with the legal standards, in the scope and the form resulting from the individual needs of people living in the institution, who are referred to as “nursing home residents” (Social Welfare Act of March 12, 2004, Journal of Laws, No 54, item 593, art. 55.1.). Nursing Homes provide permanent shelter. In the system of the public social care, the following citizens have the right to be placed in the institution: people who require 24 hour care because of age, illness or disability and who are not able to live independently. According to “the article 56 of the Act, these are: the elderly, people chronically - somatically and mentally ill, mentally disabled grown-ups, children and youngster as well as the physically disabled” (Social Welfare Act of March 12, 2004, Journal of Laws, No 64, item 593, art. 55.1.).

The role of nursing homes is to provide the adequate conditions for safe and good life, intimacy and independence and to adjust the living conditions to the level of the efficiency and independence of residents. There are four main functions of nursing homes: to bring relief to families taking care of a disabled family member; to provide the disabled with adequate conditions for the development, education, work and rehabilitation; to make it possible for young disabled people to leave home and become relatively independent; to provide support and care to the elderly, the infirm and the disabled who are deprived of family support (Koscielska 2001).

Nursing homes offer various services. In the scope of the housing needs the institution is obliged to provide shelter, board, clothes and to maintain cleanliness. The inside and the outside of the building shouldn't have any architectural barriers. The elements of technical equipment are also clearly defined and that is, e.g., alarm and smoke systems. Multistory buildings must be equipped with a lift and in the case where there is no lift, rooms for residents should be situated on the ground floor. The number of vacancies in newly constructed buildings should not exceed a hundred. Rooms should accommodate no more than three persons and they must be

equipped with a bed or a convertible sofa, a wardrobe, a table, chairs and a bedside table for every person. Nursing homes must offer both - single and multi-bed rooms, living rooms, a canteen and an emergency assistance room. They also must offer therapeutic and physiotherapeutic rooms, a guest room, a laundry room and a kitchenette. If there are any smokers among residents, the institution should designate a smoking area for them. In the case when residents are not able to attend Sunday services, there should be a place of worship designated in the building. The fulfillment of the housing needs of residents is one of many tasks of nursing homes, as they are also obliged to offer caring and supportive services. When it comes to caring services, these are: helping with basic activities of daily living, such as: dressing, bathing, eating, nursing and helping residents with taking care of their personal business. One of main tasks of nursing homes is also to assist residents in receiving healthcare services (medical treatment and nursing care).

The aim of supportive services is to raise the level of physical efficiency of residents and to activate them. It is of vital importance to provide them with the possibility to be active, to develop their interests and to gain new experiences. Therefore, it is essential to support them in establishing and developing relationships with family and a local community and in fulfilling their cultural and religious needs. Whenever it is possible, the institution should also try to make residents independent. What is more, Nursing Homes are obliged to allow residents access to information on their rights in a given institution. This assumes that residents have the right to make requests and complaints about the functioning of the institution. In the case of children and youngsters, the responsibility for fulfilling their educational needs, i.e. schooling, revalidation and educational activities, learning through life experience is borne by the institution as well. The aim of the entire set of caring and educational services is to support residents in becoming independent and to create “home-like” conditions to lead satisfactory life. The character of the age related diseases, especially their complexity, leads to the situation when the elderly require totally different healthcare and nursing and supportive services than other sick people in the society. This means that they require intensive nursing and medical care. Nursing home residents, who come from 24 hour medical centres (hospitals, Health Care Centre, Educational Institutions), are in the great need of nursing and rehabilitation.

### **Forms of rehabilitation in Nursing Homes**

The aim of nursing homes is to provide support and care to people in need. This requires not only the fulfilment of their primary housing needs but also the provision of the adequate conditions for the development of interests and talents, the participation in social and cultural life as well as making the

living conditions “home-like”. Residents have the right to lead satisfactory and happy life. Nowadays, rehabilitation is an interdisciplinary area, as it integrates and brings together the effort of many specialists, such as: psychologists, medical personnel, social workers, occupational therapists and special education teachers. It is believed that rehabilitation refers to all spheres of human life and, therefore, it should take place in the following dimensions: medical and social, occupational and social, medical and physical, medical and economical etc. Nowadays, the aim of rehabilitation is to shape and restore the physical, mental and social functionality in people who need it to be able to integrate into social and professional life.

J. Holowka and D. Niklas see rehabilitation as the process which leads to:

- moderate independence (economical aspect),
- better functioning of the body (medical aspect),
- obtaining the right to access healthcare services (legal aspect),
- employment after adequate training (professional aspect),
- mental and emotional re-adaptation (psychological aspect),
- reintegration with a family, peer group, local community etc. (sociological aspect),
- satisfactory results of rehabilitation - from the point of view of the person concerned (self-perception) (Poliwczak, 2007).

Nowadays, the importance of each stage of rehabilitation is explained and defined in a slightly different way. First of all, the process of rehabilitation is analysed as a whole, in a continuing and complex way. It no longer focuses on the stages and the order of rehabilitative activities, but on their scope. The activities include all three aspects: medical and physical, psychological and social. This means that the assumed results of rehabilitation are reflected in each aspect to the same extent:

1. Medical and physical rehabilitation assumes medical activities and the cooperation between physical therapists, kinesiotherapists, professional PE teachers, physiotherapists etc. The medical aspect covers: the evaluation of mental and physical efficiency and the enhancement of treatment (primary activities: physiotherapy, psychotherapy, prosthetics, rehabilitation equipment supplies and additional activities: surgical corrective treatment, pharmacotherapy, dietetics etc.).

The aim of medical rehabilitation is to maximize the improvement of health and to prevent further deterioration of existing defects. According to one of the definitions, medical rehabilitation means “activities which enhance the process of natural regeneration and minimize physical and mental consequences of the sickness or injury” (Kwolek, 2003). Medical rehabilitation lessens or removes physiological or physical consequences of disability through pharmacotherapy, surgeries, physiotherapy –

kinesiotherapy (treatment through movement) and physical therapy (making use of various physical factors which influence the body), diet, occupational therapy (ergotherapy, fun therapy) and orthopaedic supplies. This kind of rehabilitation uses such methods as: physiotherapy, occupational therapy, psychotherapy.

- physiotherapy, i.e., natural medicine, treatment with the use of electricity, light, water, air etc., without pharmaceuticals. We distinguish the following areas of physiotherapy: balneotherapy – treatment with the use of medicinal waters; climatotherapy; hydrotherapy – treatment with the use of water, showering, massages; kinesiotherapy – treatment with movement; medical massages; physical therapy (Rysiewicz, 1967).

- occupational therapy leads to the general health improvement through the use of various intentional and planned manual and intellectual activities (Kozaczuk, 1999). Occupational therapy creates an opportunity for each participant to actively take part in creative activities which are adequate to their individual abilities. The activities should be organized and adopted to each participant individually. The therapy requires the preparation of the outline of activities for the sick as well as for people with development disorders. Occupational therapy should fulfil the following tasks: to enhance participants – mentally and physically, to enhance their independence and to teach them how to live in the society. In occupational therapy all activities initiated by the instructor should be adopted to the condition of participants, i.e. to their lower manual and mental efficiency, lower motivation, current condition of health and well-being. Therapeutic activities should have a form of a workshop and be prepared in accordance with an individual program prepared by the personnel on the basis of the recommendations made by the team of physiotherapists. The techniques used in a given area of occupational therapy to large extent depend on the therapist and their creativity. Therefore, it is of vital importance to select highly specialized personnel who would be able to meet those requirements. Workshop activities alternate with rehabilitative activities. Moreover, sports, tourist and leisure activities are also organized for participants. Occupational therapy involves activities in the area of vocational and social rehabilitation, which leads to the general development and improvement of physical and mental efficiency of every participant. This is necessary to lead independent and active life in the society (Kwasniewicz, 2000).

We distinguish the following forms of occupational therapy: ergotherapy, art therapy within which we distinguish: music therapy, bibliotherapy, dance therapy, theatre therapy, film therapy and therapy with the use of visual arts.

- psychotherapy – the aim of psychotherapy is to enable an individual to establish relationships, to cooperate within a group and to adopt to life in a

community. What is important in physiotherapy is the right atmosphere in a nursing home, the possibility to choose activities or ways of spending pastime, the possibility to decide about important issues related to the functioning of an institution as well as the adequate choice of chores and the acceptance of other residents of a nursing homes (Kozaczuk, 1995, p.41).

2. Psychological rehabilitation – the discipline of healthcare professionals, psychologists and other people, such as: family, friends, volunteer workers, members of self-aid groups, whose main task is to provide mental help and support. We understand psychological rehabilitation as “providing support to disabled people in the process of accepting life with disability and disability itself”. The process of restoring “mental and physical efficiency takes place through certain forms of rehabilitative activities – always with the full participation of a sick person and with taking into account their attitude towards themselves and their medical condition, their commitment to the rehabilitative process and their individual physical and mental condition” (Kawczynska-Butrym, 1994). It is essential for a sick person to accept the rehabilitative methods and to believe that they will work. Positive thinking and attitude are also very important. Psychological rehabilitation aims at helping the disabled with the use of psychological methods, such as various forms of psychotherapy and social therapy. The aim of psychological rehabilitation is for an individual to accept their disability, i.e. to accept themselves as disabled people, to shape and to modify their self-perception, to change their system of values, evaluation and expectations, to restore emotional equality, to enhance or establish tolerance towards difficult situations, to restore internal motivation and ability to deal with stressful situations and frustration, to adjust their behaviour to the conditions of partial disability (Piekut-Brodzka, Kuczynska-Kwapisz, 2004). Providing mental support to sick people, especially the elderly and the disabled, is the primary task of psychological rehabilitation.

### **Social rehabilitation**

Social rehabilitation refers not only to elderly and disabled people but also to local communities and the whole society. The main aim of social rehabilitation is to integrate disabled people into the society, and that means: to help them to adopt to the requirements of social and professional life, to prepare them to have satisfactory lives (life quality – social contacts, entertainment etc.), to remove economical, architectural, social and legal barriers, to prepare the members of the society to live and cooperate with the disabled through the development of the right attitudes towards the disabled.

Within social rehabilitation we distinguish:

- vocational rehabilitation – institutionalized and the most advanced form of rehabilitation. It involves re-education (re-qualification), career

guidance, the preparation and adaptation to work and employment etc. The aim of vocational rehabilitation is to provide support to disabled people in finding employment adequate to their capability and qualifications. The provided support includes: choosing a profession on the basis of the evaluation of one's ability to work, preparing a person for employment through education, helping a person to find employment and to adapt to workplace – new physical and social environment (Kawczynska-Butrym,1996). Through work, an individual will feel needed, fulfilled and content. What is more, being employed brings feasible advantages, such as salary, and it is also important for the mental health of a person. It eliminates or supresses a feeling of “being different”.

- family rehabilitation – poorly developed, based on family interactions. It involves providing help to elderly and disabled people in adopting to life. Most often, the aim of family rehabilitation is limited to primary nursing and caring support.

- community rehabilitation – poorly developed as well. It involves the participation of family, friends and neighbours. The aim of community rehabilitation is to minimize social and community exclusion and to help people to adopt to life in a community (Zablocki, 1997).

### **Summary**

Elderly, often disabled people, who live in nursing homes require psychotherapeutic and rehabilitative activities adopted to their condition of health. All activities undertaken with the aim to improve physical and mental health of residents are of paramount importance. The forms of rehabilitation applied in nursing homes are multidisciplinary and they are based on potential for development which is deeply rooted in every man, whether old or sick. This potential has its source in natural vitality of every man, regardless of the level of disability. Various methods of rehabilitation allow residents to free their abilities and predispositions, which makes it possible for them to take part in everyday life of a nursing home community. The main aim of rehabilitation is the improvement of physical and mental health of every person or group of people living in the institution.

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## **Clinical Case Studies Of The Multiple Scleroses Patients In Vlora Hospital During January -December 2015**

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### **Abstract**

Multiple sclerosis (MS) is an inflammatory chronic disease where the body's immune system attacks the myelin and destroys the central nervous system, causing the loss of the neural synchronization and functional disconnection among various brain regions. The cumulative evidence supports that physical therapy, has been shown to be beneficial in improving disability in patients with MS. The objective of this research was the review of the charts of the hospitalized MS patients, in order to find the positive effects of physiotherapy and its association with the progress of patient's condition. This is a retrospective study conducted during January-December 2015 in Vlore hospital, Albania. *Two tailed P value*, was used to find the significance of positive effects of physiotherapy and the progress of patients with MS. A value of  $P \leq 0,05$  was considered significant. There were nine charts, which met the study criteria and were included in the final analyses. The mean age of the MS patients was 39.77,  $SD \pm 8.21$ , 6 males and 3 females. The most prevalent clinical signs were loss of balance/dizziness, pain /body weakness/muscle rigidity, and memory loss/lack of concentration respectively 66.67%, 55.56% and 55.56%. Six patients had physiotherapy and statistically significance was found between patient's condition and physiotherapy,  $p < 0.05$ . The results of this study show that physical therapy was a very important factor for the progress of the patients in improving impairment and disabilities.

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**Keywords:** Multiple sclerosis, physiotherapy, disability.

## **Introduction**

Multiple sclerosis (MS) is an inflammatory chronic disease where the body's immune system attacks the myelin and destroys the central nervous system (brain and spinal cord). The damage of myelin slows or totally interrupts the transmission of the nervous signals through the cortical-cortical and cortical-subcortical ways causing the loss of the neural synchronization and functional disconnection among various brain regions (NIH, 2001). MS is the most frequent cause of the no traumatic limited ability in young adults (Atlas of SM 2013) with a considerable social impact and economical consequences (M. Pugliatti et al., 2006). In the last five years the number of patients with MS increased with 10%, from 2.1 million in 2008 to 2.3 million in 2013. It is supposed that, in Europe there are 630.000 people with MS. MS may develop at any age, but most of the people are diagnosed between ages of 20-40 (NIH,2001). The mean age, more frequently reported is around 30 years old. A small percentage of the MS patients, up to 5% are diagnosed during the teenage years or even younger (Chitnis TI et al., 2013). A systematic review of the epidemiologic studies on MS shows that the ratio male/female of the incidence has risen from 1.4 in 1955 to 2.3 in 2006 (Alonso A et al., 2008). The raise of the MS incidence in females, may be related with the impact of the environment factors associated to the urbanization (Kotzamani D et al 2012). According to the 2013 report, on the global epidemiology of MS, the highest prevalence of MS is found in North America (140/100,000 residents) and Europe (108/100,000 residents) and the lowest in Sub Saharan Africa (2.1/100,000) and Eastern Asia (2.2/100,000) (. Atlas of SM 2013). The highest prevalence in Europe, is found in Sweden with 189 cases for 100,000 residents and the lowest in Albania with 22 cases for 100,000 residents (Alonso A et al.,2008). The first epidemiological study on the MS prevalence in Albania is performed in 1988 (M. Pugliatti et al 2006). According to this study, the prevalence of MS for 20 years (1968-1987) was 10 for 100,000 residents, while the mean yearly incidence was 0.5 for 100.000 residents (Rose AS et al 1976). In the last study conducted in Albania in 2008, it is noted an increase of MS cases in Saranda (Southwest of Albania) (Kruja J et al.,1994). The incidence is higher in females than males, finding are similar to other European states (Kruja J et al.,2010). In other hand a systemic review suggests that physiotherapy may be effective for the rehabilitation of people with progressive multiple sclerosis (Campbell E et al., 2016).

## **Objective**

To review the charts of the hospitalized MS patients in order to find the positive effects of physiotherapy and the progress of these patients.

## Materials and Methods

This is a retrospective study based on the review of the hospital charts of the MS patients of Vlore hospital, Albania. The study was conducted during January-December 2015. We carefully reviewed each chart separately by taking into consideration all the variables. There were all together 9 charts, the main criteria was to include the diagnosed MS patients.

## Data analysis

Descriptive statistics, including frequencies, means, 95% coefficient interval (CI), and cross-tabulation tables were used for comparison of dependent and independent variables. *Two tailed P value* was used to find the significance of positive effects of physiotherapy and the progress of patients with MS. A value of  $P \leq 0,05$  was considered significant. Epi Info™ 7 software version 7.1.3.10, was used for statistical calculation.

## Ethical considerations

In order to conduct this study we had to get permission from the directors of the Regional Hospital of Vlore and the archive supervisor.

## Results

The total of charts included in analyses were nine. The mean age (years) of patients with MS was 39.77,  $SD \pm 8.21$ .

Table 1. The socio demographic characteristics of the MS patients\*

Variables		Frequency (n)	Percentage (%)	95% CI
Gender	Female	3	33.33	[7.49–70.07]
	Male	6	66.67	[29.93–92.51]
Civil status	Single	6	66.67	[29.93–92.51]
	Married	3	33.33	[7.49–70.07]
Place of living	Village	4	44.44	[13.70–78.80]
	City	5	55.56	[21.20–86.30]
Education level	Elementary	4	44.44	[13.17–78.80]
	High school	2	22.22	[2.81–60.01]
	University	3	33.33	[7.49–70.07]
Employment status	Employed	2	22.22	[2.81–60.01]
	Unemployed	7	77.78	[39.99–97.19]

\*P values > 0.05 for all variables.

Table 2. Clinical characteristics of the MS patients\*

<i>Variables</i>		Frequency (n)	Percent (%)
Diagnoses	MS	8	88.89
	Spastic tetra pareses	1	11.11
Diagnoses of hospitalization	Numbness and feet paralyses	3	33.33
	Urinary Incontinence	2	22.22
	Strong chest pain	2	22.22
	Urinary retention	2	22.22
	Clinical and periodical evaluation of the inability	1	11.11
Clinics	Grave numbness of the extremities	1	11.11
	Loss of balance/dizziness	6	66.67
	Pain and body weakness/muscle rigidity	5	55.56
	Memory loss/lack of concentration	5	55.56
	Depressive state	3	33.33
	Swallowing disorders	2	22.22
	Head aches	2	22.22
	Pain of the spinal cord	2	22.22
	Gastrointestinal disorders/vomiting	1	11.11
	Loss of sight	1	11.11

Table 3. Hospital examinations of MS patients

<i>Variables</i>	<b>Frequency (n)</b>	<b>Percent (%)</b>	<b>95% CI</b>
No treatment	3	33.33%	[7.49-70.07]
Imagery examinations	2	22.22%	[2.81-60.01]
Lab examinations (blood, urine, uremi, creatinemy, glycemia)	3	33.33%	[7.49-70.07]
MRI	1	11.11%	[0.28-48.25]

\*P values &gt; 0.05 for all variables.

Table 4. The treatment of the patients

Treatment before hospitalization	Frequency (n)	Percent (%)	95% CI
3 years without cortisone treatment	1	11.11	[0.28-48.25]
Betaferon	2	22.22	[2.81-60.1]
Betainterferone	1	11.11	[0.28-48.25]
Dexametazone	1	11.11	[0.28-48.25]
Interferon	3	33.33	[7.49-70.07]
Cortisone	1	11.11	[0.28-48.25]
Hospital treatment	Frequency (n)	Percent (%)	95% CI
Betametazon	1	11.11	[0.28-48.25]
Manitol/Betametazon	1	11.11	[2.28-48.25]
No treatment	5	55.56	[21.20-86.30]
Ranitidine/NaCl perfusions	1	11.11	[0.28-48.25]
Salumedrol	1	11.11	[0.28-48.25]
In hospital days	Frequency (n)	Percent (%)	95% CI
2 days	4	44.44	[13.70-78.80]
3 days	1	11.11	[0.28-48.25]
5 days	4	44.44	[13.70-78.80]

\*P values &gt; 0.05 for all variables.

Table 5. The effects of physiotherapy

Physiotherapy	Frequency (n)	Percent (%)	95% CI
Yes	6	66.67	[29.93-92.51]
No	3	33.33	[7.49-70.07]
If the patients has had physiotherapy, how many sessions?	Frequency (n)	Percent (%)	95% CI
Only 5 sessions	1	16.67	[0.42-64.12]
Some sessions	1	16.67	[0.42-64.12]
Some sessions abroad	1	16.67	[0.42-64.12]
Non specified	2	33.33	[4.33-77.72]
For 2 years abroad	1	16.67	[0.42-64.12]

**Table 6.** The association between physiotherapy and MS patients condition

<i>Variables</i>	<i>Yes (n) (%)</i>	<i>No (n) (%)</i>	<b>2-tailed P</b>
<b>The patient condition</b>			
Better	5 (88.33)	1(16.67)	<b>0.047</b>
Worse	0 (0.00)	3 (100.00)	

Table 7. The beginning and progress of the disease

Beginning of disease	Frequency (n)	Percent (%)	95% CI
Acute and immediate	4	44.44	[13.70-78.80]
Gradual	5	55.56	[21.20-86.30]
The disease progress	Frequency (n)	Percent (%)	95% CI
Gradual	4	44.44	[13.70-78.80]
Fast	1	55.56	[0.28-48.25]
Fast the last 2 years	2	77.78	[2.81-60.01]
Progressive deterioration	1	88.89	[0.28-48.25]
Very fast	1	44.44	[0.28-48.25]
The presence of meningeal signs	Frequency (n)	Percent (%)	95% CI
Yes	3	33.33	[7.49-70.07]
No	6	66.67	[29.93-92.51]
Family history with MS	Frequency (n)	Percent (%)	95% CI
Yes	3	33.33	[7.49-70.07]
No	6	66.67	[29.93-92.51]

\*P values > 0.05 for all variables.

## Discussion

The mean age of the MS patients in our study was 39.7 years, very close to mean age reported in literature, 20-40 years old (NIH, 2001).

Referring to the Table 1, the socio demographic characteristics of the MS patients included in the study shows that the number of males with MS is higher than the number of females, with a ration 2:1, which is contrary to the findings of the literature where the females dominate with a ratio 4:1(AAN,2007). The literature shows that the number of MS patients is higher among people that belong to a lower education level and socio economic status, our study is similar too (Bjørnevik K et al.,2015). 44.44% of the patients in our study live in the village and 55.56% in the city, but the literature shows that there is a higher number of patients living in the village. Our study shows that the unemployed people are in 77.88% and the employed people are only 22.22%. We can see this evidence also in literature (Shahrbanian S et al.,2013). In our study we see that 66.67% of the patients are single, and only 33.33% are married. Being married at any point during the course of MS appears to confer a benefit in MS disease progression (Jill R Settle et al.,2014).

**Referring to the Table 2**, as in the literature (Bridget M Wilson, et al.,2015) the clinical signs of the hospitalized patients are similar to the ones that our patients have presented. In our study we see that depressive state is in 33.33% of the patients, and memory loss/lack of concentration in 55.56%, higher that reported in other similar studies, 24% (Amtmann D1 et al.,2014).

Pain affects between 44% and 80% of people with MS and has a significant impact on their lives (Hirsh et al., 2009; O'Connor et al., 2008; Ehde et al., 2006) in our study we see that pain of the spinal cord is in 22.22% of the patients, pain and body weakness/muscle rigidity is in 55.56% of the patients, headaches is in 22.22% of the patients.

The findings confirm (Guan XL et al.,2015), that more than one-third of the multiple sclerosis patients are suffering from swallowing difficulties. In our study, we can see that 22.22% of patients have swallowing disorders. In our study we don't have any patient with pulmonary problems, even if gastrointestinal, musculoskeletal, and pulmonary comorbidities were common in the MS population (Ruth Ann Marrie et al.,2015)

**Referring to the Table 3, and** from what we are referred by doctors neurologists and nurses, these patients due to the lack of specific treatments in our hospitals, they are kept there simply in observation (33.33% ) or when are subjected to laboratory analysis 33.33%. All this done, in order to have the possibility of completing the documentation used to *document* the stated *disability*. **Referring to the Table 4, we can see that the most prevalent treatments before hospitalization of the patients were with** Betaferon and Interferon, respectively 22.22% and 33.33%. In literature we see that the treatment of MS is not so limited (Alan M Palmer et al., 2013) The main characteristic feature noted at these patients is that all of them receive only symptomatic treatment while in hospital. Most of the treatments aim to reduce the symptoms that brought them to the hospital in the first place.

**Referring to the Table 5 and 6,** 66.67% of the hospitalized patients have had some physiotherapy. These sessions, even though not regular, have improved their condition,  $p < 0.05$ .

**Referring to the Table 7,** the beginning and progress of the disease, in 44.44% of the patients is acute and immediate and in 55.56% is gradual. The results are similar with other studies, which confirm that the disease is different for everyone who has it (MSF, 2014).

The presence of meningeal signs are in 33.33% of the patients and we have done the evaluation of this signs, because as we have seen that in the literature exist a risk of under-diagnosis of Mood Disorders (MD), particularly Bipolar Disorders in MS (Carta MG et al., 2013).

In our study, we see that 66.67% of the patients have not a family history with MS, and 33.33% have a family history, Table 7. In literature studies show the higher aggregation of susceptibility variants in multi-case families compared to sporadic MS, using the most updated genetic information available for MS and a large and well-characterized familial dataset (Pierre-Antoine Gourraud et al.,2011).

## Conclusion

Physical rehabilitation in multiple sclerosis (MS) patients is related to their quality of life. Based on evidence and the results of our study physical rehabilitation plays a beneficial role in improving disability in patients with MS. Physiotherapists and Nurses with the involvement of family members can contribute to create a multidisciplinary approach to set a Rehabilitation programme in accordance with the needs and the disabilities of MS patients.

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## **Facilitating Work And Family Conflict: Young Family Case**

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### **Abstract**

The article refers to the concept of work and family conflict as the basic one. The goal of this article is to present the work and family reconciliation model for young families which is based on the qualitative research data findings (narratives, semi-structured interviews and focus group). The present-day individuals tend to take on many roles and responsibilities related to their work and family life, which definitely leads to work and family conflict. Representatives of young families seek to improve their professional life and confront diverse challenges forcing them to modify career. Employers' positive attitude and supportive role here is very significant, as well as clear need for the involvement of career counsellors and human resource specialists into the process of work and family conflict facilitation. The intention of the research was to analyse: the possibilities to reconcile work and family requirements for young families with children (under 12); ability to solve problems related to family needs; role tensions related to solving problems and possibilities for their reconciliation.

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**Keywords:** Work and family conflict, support of executive and organisation, work and family reconciliation

### **Introduction**

The present-day society experiences the constant economic and social change reflecting on the complex reconciliation of work and young family needs. Finding in a vicious circle a young family struggles for both constant learning and integration into a labour market at the same time devoting time for a family having in mind the needs of children and spouse. Discussions referring to the latter issue are often described as work and family conflict or

family and work conflict, though usually both concepts are integral. The present article refers to the concept of work and family conflict as the basic one. The goal of this article is to present the work and family reconciliation model for young families which is based on the qualitative research data findings (narratives, semi-structured interviews and focus group). The object of the research is reconciliation of work and family.

The literature review of work and family reconciliation issue reveals several main themes, namely work and family conflict, the role of personality and satisfaction of involvement in family (work) affairs (Michel et al. 2009, Cesnauskas & Lazauskaite-Zabielske, 2014). Work and family conflicts appear when the needs of work and family do not correlate with the needs of family and work. The nature of such conflict contains negative consequences for all – an employee, his/her family and organization he/she belongs. Outlasting conflict causes stress, depression, as well as increases sickness rate or decreases self-satisfaction of work accomplished, or even family life. Simultaneously an organization is affected by inadequate employees' involvement in the implemented activities, increased intension to change working place, decrease of quality of the achieved results (Cesnauskas & Lazauskaite-Zabielske, 2014). Therefore, executives and administration of diverse organisations attempt to decrease work and family conflict by the different means creating flexible work schedules, supporting maternity/paternity leave or child care services (Moen, 2003, Kempe & Otonkorpi-Lehtoranta, 2006, Vuga & Juvan, 2013, Cesnauskas & Lazauskaite-Zabielske, 2014). Referring to the role theory it might be indicated that each role has specific expectations and needs which ignorance would definitely cause certain conflicts within the roles (Frone et al., 2003). It is highlighted that tension experienced by a person in particular domain, in this case it is work, is usually transferred to another domain, and in this case it is family (Cesnauskas & Lazauskaite-Zabielske, 2014). Following work and family conflict presented in the literature as the dominant construct, three models can be mentioned (Michel et al. 2009):

1) Frone, Russell & Cooper's (1992) model. The model conceptualizes work and family conflict or family and work conflict as mediating components between job stressors, job involvement, family stressors and family involvement, and outcomes of job distress, family distress, and depression.

2) Carlson & Kacmar's (2000) model. This model conceptualizes work and family conflict or family and work conflict as mediating components between work role conflict, work role ambiguity, work time demands, job involvement, work satisfaction and family role conflict, family role ambiguity, family time demands, family involvement, family satisfaction (or live satisfaction).

3) Carlson & Perrewé's (1999) adapted model version. The following model refers to work and family conflict conceptualized as separate work and family conflict or family and work conflict constructs, i.e. work and family conflict or family and work conflict are mediating between work social support, work involvement, work role conflict, work time demands, work role ambiguity, family social support, family involvement, family role conflict, family time demands, family role ambiguity and job satisfaction and family satisfaction.

Discussing the construct of work and family conflict the following elements might be distinguished: work and family conflict, family and work conflict, work social support, work involvement, work role conflict, work time demands, work role ambiguity, family social support, family involvement, family role conflict, family time demands, family role ambiguity, job satisfaction, life satisfaction. Michel et al. (2009) indicates that, for instance, family time demands (hours worked, number of children and age of youngest child) rather fractionally effect family and work conflict. This is highly significant implication for employees experiencing family demands, especially working mothers. According to Michel et al. (2011) research data, one of the main factors affecting decisions being related to work and family conflict refers to support provided for an employee by an organization and its executive. Needless to mention, work and family conflict is also tackled at state level by regulating application of flexible work management means.

Finally, there are career counsellors who are supposed to release presumable tension between parent and employer invoking all the necessary counselling and consultations for both parts. This could be applied by presenting diverse work and family management strategies leading to the gained basic knowledge about mechanisms a person uses to influence or facilitate conflicts (Wayne, Musisca & Fleeson, 2004). In any case, the focus of career counsellors should refer on assisting individuals to re-evaluate career choices, negotiate changes at work, make productive and effective career decisions, as well as enhance their work and life balance (Neult & Pickerell, 2005; Wayne, Musisca & Fleeson, 2004).

## **Methodology**

### **Data collection and analysis**

The article presents data referring to three qualitative research cases implemented under the project "Model of young families' parenthood and work reconciliation". The data obtained covers just a part of the whole project research. The findings of qualitative research would certainly help to distinguish the needs and challenges, as well as perceive the common grounds for collaboration among three major target groups in the process of

family and career reconciliation, i.e. young parents, employers and experts in career counselling. All three research instruments (narrative interviews with young families, semi-structured interviews with employers and focus group with career counsellors and human resource specialists) were prepared according to the theoretical research insights.

The analysis of narrative interviews with young parents is based on the narrative analysis method (Søderberg, 2006). The interviews cover retold experience related to the different life stages starting from child birth. The special emphasis is devoted for the experiencing the return to work after maternity/parental leave, considering diverse possibilities for career changes and/or pursue of career, experiencing employers' attitude and family support during the mentioned process, as well as other issues related to the research problem. The article presents empirical narrative data based on the thematic analysis (Soderberg, 2006, Virgilaite-Meckauskaite & Mazeikiene, 2012), when data is distributed into the themes, then ranked according to the relevance in a codebook.

The semi-structured interview instruments designed for employers were focused on the following topics: a) creation of family-friendly work place; b) necessity for flexible work schedule; c) development of decrees regulating support in respect to the needs of young parents. The research results of semi-structured interviews with the employers are presented following the method of text analysis described by Satu & Kyngas (2008), when deduction is applied for subcategories, categories and the main theme being provided.

The questions for the experts in the focus group were constructed to cover the topics related to career guidance and human resource (HR) specialists' experience with young parents looking for a job or seeking any guidance. The answers provided certain insights how the specialists support such employees or candidates in terms of information provision or career guidance, how they collect information about the family status and needs. The career guidance/HR specialists were asked to provide comments on the existing legislation and state provisions for young families with children in employment. The results obtained are presented according to the method of text analysis described by Satu & Kyngas (2008), when deduction is applied for subcategories, categories and the main theme being provided.

### **Research participants**

The planned research covers several stages, namely, (1) the analysis of literature, (2) the interview with young families, employers and career guidance/HR specialists, (3) the questionnaire-survey for young families, and (4) preparation of work-young family reconciliation model. The tables below

present certain characteristics of three qualitative research cases accomplished during the second stage:

1) 15 narrative-interviews with young families (both mother and father) were implemented in January-April, 2015. Research participants were selected according to the following criteria: parents under the age of 35; a family with a child (children) under the age of 12; both partners have experience in a professional realm, i.e., have already worked before children were born. The characteristics of the research participants are presented in the table below (see Table 1):

Table 1. The characteristics of young parents' as research participants

Code of interview participant	Age of parent		No. of children	Age of child/ children (from the youngest to the oldest)
	Mother	Father		
P1	33	33	2	7 years; 12 years
P2	34	35	1	7 years
P3	30	35	1	7 years
P4	35	33	1	8 years
P5	33	34	2	4 years; 6 years
P6	34	33	2	3 years; 5 years
P7	32	31	1	3 years
P8	29	28	1	0,5 years
P9	34	33	2	4 years; 6 years
P10	35	34	2	6 years; 11 years
P11	31	29	1	5 years
P12	32	32	2	6 years; 9 years
P13	32	32	3	4 months, 3 years, 6 years
P14	29	30	2	4 years; 6 years
P15	27	30	1	0,5 years

2) 14 interviews with the employers representing private and public sectors in different counties were implemented in February-April, 2015. The target group was compound by applying targeted selection method in non-probability sampling. The characteristics of research participants are presented in the table below (see Table 2):.

Table 2. The characteristics of employers' as research participants

Code of interview participants	Type of organisation/institution	Number of employees	Position of the interview participant
E1	Vocational school	155 persons	Director
E2	Catering institution	5 persons	Director
E3	University department	20 persons	Head of the department
E4	Preschool institution	38 persons	Head
E5	Pro-gymnasium	72 persons	Deputy director
E6	Lower secondary school	26 persons	Director
E7	Public limited liability company (raw material recycling)	582 persons	Personnel manager
E8	Transport company	20 persons	Director
E9	Transport and cargo transportation company	23 persons	Director
E10	Private limited company/Foreign Language centre	50 persons	Director
E11	Individual enterprise (photo services)	15 persons	Company owner
E12	Private limited liability company (production of blanks)	25 persons	Director
E13	Public institution/Health care institution department	8 persons	Head of the department
E14	Public institution (art area)	133 persons	Director

The focus group of 6 experts in career counselling was organized in September, 2015. The experts were selected according to their compliance to the goals of the research (see Table 3).

Table 3. The characteristics of the experts in career counselling

Code of interview participants	Type of organisation /institution	Position of the interview participant	Experience in career counselling field
CC1	University Career centre	Head	5
CC2	University Career centre	Specialist	3
CC3	Private kindergarten	HR	6
CC4	Lithuanian Labour Exchange, Youth Dpt.	Head	5
CC5	University Career centre	Head	11
CC6	Enterprise	HR	4

## Research results

The aim of the study is to present the common ground of the experiences of young parents and employers, and define the role of career counsellors in the process of family and work reconciliation.

### **Narratives' perspective**

The interviews with young families where both partners (mother and father) were involved have distinguished a big change in family models, as nowadays most of fathers (gender aspect) feel more pressure to contribute actively to family welfare and child care and this implies bigger stress due to the transformation from “Me” to “Father” or “Mother” (see Figure 1).

The major topic revealed while analysing the reconciliation of work and family in the narratives refers to experiences of multiple conflict that includes the following topics: *family influence on work-life, mother's inner conflict, searching for balance between work and family, time planning difficulties, challenges of coordinating different activities.*

The analysis of family situations demonstrates a vivid conflict related to the tension at work, longing for self-expression that is time-consuming and endangering family needs. When families discuss the needs of their children, the own needs are mentioned as well (P6): *First, it is your job where you spend the most of your day time - 50%, after the work you devote your evening time to your child – preparing homework together and/or doing other activities – reading a book, making some crafts – it is about 30 %, whereas 20% of time is devoted for communication with a child, doing household chores and maybe reading a book in the evening when a child is asleep (Family P6: husband 33 yrs., wife 34 yrs., son 5 yrs., daughter 3 yrs.).*

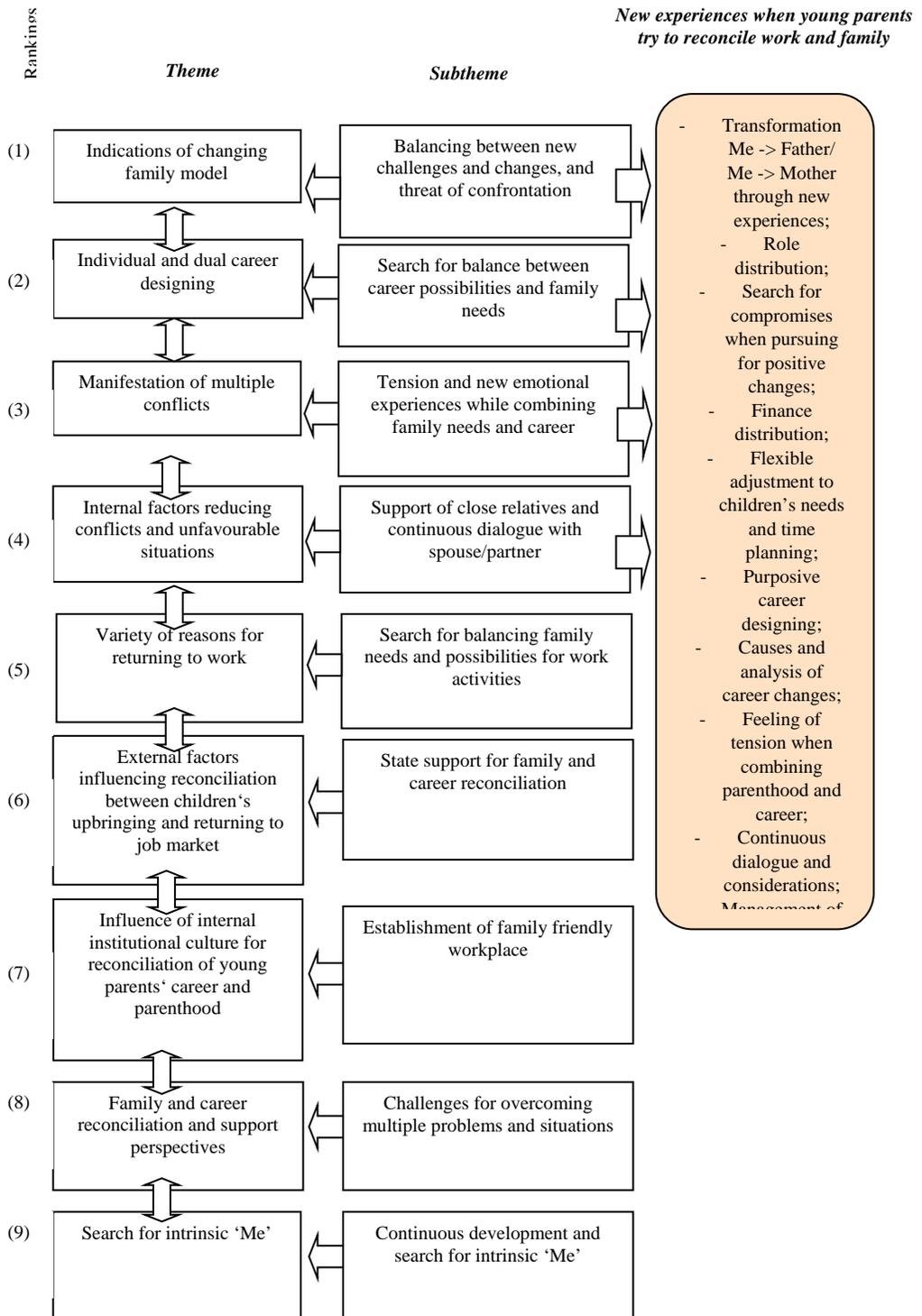


Figure 1. Narrative analysis of the interviews with young families

The experience of Family P13 demonstrates their endeavour to reconcile family and career. At the same time the family seeks to navigate and adjust to work situations trying to keep professional level, as well as staying a full-fledged family member. However, this attempt to combine the family and career needs at the maximum is stripping them off personal free time and possibilities to improve according to their personal desires: *I try to navigate between being a good professional and a good dad. You struggle, though being professional depends not only on your efforts, but also on your abilities and talents. You try to keep the balance and make some achievements at work, as well as to cater all the family members to make them all feel good. You sacrifice your own personal time to improve and learn in order to contribute to the family welfare (Family P13: husband 32 yrs., wife 32 yrs., son 6 yrs., son 3yrs., daughter 4 months).*

The example of Family P2 illustrates those mothers who decide to have their children and study or work at the same time. They definitely experience inner conflict of multiple parallel roles being a mother, a student or an employee. Several mothers articulate their doubts of such earlier decisions and when analysing their experiences conclude that maybe they better had to say „no“and devote more time to the family: *I somehow managed to juggle my work, studies and growing a baby, but I compare myself to other mothers who do not study or work, but devote those 2 years (of maternal leave) only to a baby, they are happy, relaxed and enjoy so many things that I could not afford. I probably should have said „No“(Family P2: husband 36 yrs., wife 34 yrs., daughter 7 yrs.).*

Therefore, the major issues refer to work and family/family and work conflict (Carlso et al., 2000; Ahman, 2008), as well as role conflict, personal inner conflict and family activity adjustment conflict. Besides that it has been noticed that young parents quite often intend to change their workplace, however, due to the inner conflict related to fear of losing financial stability, they usually suspend the change of workplace till children are more grown up.

### **Employers' perspective**

The analysis of interviews with the employers has revealed generally positive attitude towards employees with young children (see Table 4).

Table 4. The text analysis of the interviews with employers

Sub-category	Category	Main theme
Creation of flexible work schedule	Creation of family friendly environment for young families	Facilitation of favourable work conditions for young families
Type of activity is not favourable for schedule adjustments		
Leader's goodwill		
Expression of employees' needs		
Solution of emerging problems		
Supporting social relations		
Common family festivals and tours	Definition of formally regulated young family's situation	Review of young family's situation based on the social policy
Formalization of agreements and decisions		
Information provided by HR department and administration		
Officially undefined charter for young parents		
Regulations for maternity/paternity leave	State support	
State support and taxes		
Young family-partly-friendly or unfriendly work peculiarities	Coherence of work activities with young family needs	Coherence between career possibilities and work peculiarities
Family-friendly work peculiarities		
Focus on employee's abilities		
Internal culture of organization		
Formation of development possibilities and career	Employers' possibilities to contribute to various support forms for young families	Employers' position and search for solution for reconciliation of young employees' work and family needs
Employer's possibilities to establish close-to-work settings for employees' child/children care		
Collaboration among members of organization		
Work place unfitted for children		
Setting-up possibilities for employees to bring their child/children to workplace		

The employers most often discuss the issues related to allowances and validation of the needs of young families with the personnel office. The employers (E8, E9, E10, E13) state that they know the main aspects of giving allowances and additional days to young parents (mother's day and father's day) and coordinate these issues with their employees. They are trying to determine the needs of their employees and constantly inform them about the changes in the law system. A kindergarten establishment near the workplace could be considered as the most prominent initiative and support in order to help young families to get to work. District public limited company (E7) states that a kindergarten was established in the period of the project implementation. When looking for the opportunities of flexible work schedule, the employers say that such issues as employee's wishes and needs in regard to work schedules and future work results are discussed in the workplace. The school director (E5) states that they are trying not to plan morning classes when preparing the timetable or *<...to make some free day of the week, i.e. methodical day...>*. It is also notable that employers are willing to use various ICT tools in order to facilitate employees' situation when adjustments are to be made in the case of family problems related to a

child's illness (E10). This idea is supported by the head of the higher school department (E3) and the school director (E1) <...we have favourable conditions at the school as we can regulate workloads, the number of classes and the timetable. If this is service staff, working hours can also be regulated according to their needs, e.g., if a husband has to work longer, we change the work hours so that it would be more convenient for a family to deal with their problems...>. The employers also say that opportunities are created for young parents who have pre-school children to work part of the day. When discussing about support or help that employers' need in order to improve the quality of service, or support for young families who search for harmonization in this process, the employers expressed the potential need for external experts' support. Experts' consultations or even development of new work places would create the entire system assuring the help for young parents to accommodate new experiences, potential temporary challenges or difficulties through the transitional period.

### **Career counsellors' and human resource specialists' perspective**

Career counsellors and human resource specialists are expected to be those facilitators who actively participate in the process of searching balance between family and work (see Table 5).

Table 5. Categorization of career counsellors' and human resource specialists' approach to facilitation of family and work reconciliation

Theme	Subtheme
Pressure experienced by employees with small children	Pressure because of child/ children illness Intimidation of announcing about pregnancy Pressure felt by policy of higher education institution because of studies continuation Family status and gender discrimination
Development of career counselling services	Students at higher education institutions do not know about possibilities to consult with experts Job centre counsellors' benevolent attitude to young families Support groups at workplace The need for trainings about family and career reconciliation
Recommendations provided by career counsellors to employees	Preparation of candidates seeking for a job presenting questions and arguments concerning children Identification of personal needs Willingness to stay away of a job market for as short time as possible
Keeping a consistent system/order determining child-care support during maternity/paternity leave and later	Need and support for permanent legal system concerning children care and grow Legal possibilities for more flexible work relations Regulations for establishment of children care-room or care-centre at workplace Development of mother-child and father-child friendly culture in organizations Provision of high quality and purposive information for employers

The focus group discussion with the experts in career counselling and human resources focuses on the specific problem. Firstly, many employees

do not even know that there are professionals who could help them in this precise situation, when help is needed in order to find a balance. Secondly, it is very often that young parents do not know the latest updates of state legislation where the question of family and career is discussed, as well as updates of job market strategies. The experts provide information that some young parents might not be aware of their rights not to answer questions related to family status during job interviews, as there are only competences that should be evaluated. Therefore, as research results demonstrate, career counsellors and human resource specialists must be deeply aware of how individual (work<->family identity), work (counsellor, supervisor and/or organization support) and family (spouse, dual-career, dual-earner couple) factors are related collaborating for family and work facilitation.

### **Conclusion**

The interviews with young families where both partners (mother and father) were involved have distinguished that there is a big change in family models as nowadays most of parents feel more pressure to contribute actively to family welfare and child care and this implies bigger stress because of the transformation from “Me” to “Father” or “Mother”. The time pressure is related with different roles being constantly applied at the same time adjusting own and children needs. However, the research analysis where both partners were participating in the interview highlighted the need and importance of continuous dialogue between parents about diverse roles they play, though unfortunately this appeared to be quite a challenging issue.

The present research shows that employers are positive about young families; they want to develop a dialogue with employees and support them. Perceived importance of executive support and positive sense of organization towards young family needs allow forecasting smaller conflict within a family. When young and having children employees see an executive as understanding and supportive person, and workplace as flexible and friendly surrounding, less conflict regarding to work and family reconciliation is experienced.

The given context emphasizes clear need for the involvement of career counsellors and human resource specialists into the process of work and family conflict facilitation. Experts professionally playing an advocacy role for young and working families should try and find possibilities for presenting flexible schedules or work forms. Experts may also act as agents for government funders and policy makers when discussion about community-based support, accessible day-care, health services, enhanced parental life and career service possibilities appear.

The following research stage, namely quantitative research on “Young families’ work and family reconciliation” is going to refer the

themes covering work and family conflict according to three dimensions (time, strain, behaviour), role distribution, reconciliation of family needs and work activities, track and development of professional activities, young families' support measures and elements.

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## **Pillows For A King – The Headrests Of Ancient Egypt And Tomb Kv 62**

*Jan Summers (Duffy)*

Many artifacts discovered in the tombs of ancient cultures are called exceptional finds and have rewritten history as we know it. Impressive artifacts seen in museums throughout the world may overshadow the smaller day-to-day ones. The Headrest, known mostly from the ancient Egyptians, was a simple design used to support the head during rest, sleep and death. It cannot however, be overshadowed or diminished in value when one considers it was necessary in life as well as in the all-important afterlife of ancient funerary cults.

Past research on this unusual artifact has enabled it to be called “a pillow for the head” as the headrest is discovered frequently in Egyptian burials, tombs and mastabas. It asks the question if they were used in daily life or only in a funerary context. The answer may come by delving into specific spiritual and religious aspects and the designs of ones from certain tombs, such as those recovered by Englishman Howard Carter and his discovery of tomb KV 62. The necessity to combine daily life with the all-important Egyptian afterlife is apparent. The question that comes to mind and is often asked, “were they actually used in life as well as in death”? The answer proves to be yes. Whether simple, intricate, plain or decorative, the true meaning to the ancient Egyptian and their purpose is explored in this paper.

In the early 20<sup>th</sup> century, the mysteries of a tomb deeply stirred public imagination with a lingering effect even today. The architecture and archaeology of a tomb numbered 62 in Egypt’s Valley of the Kings, situated precisely (25°44’8”N 32°36’04.8”E), was similarly dug and built as others of the same era, but smaller and lay in the main wadi of the Valley of the Kings. Discovered on November 4, 1922, the tomb consisted of steps leading to an entrance corridor, an antechamber, annex, burial chamber and treasury. The tomb held a young Pharaoh, Nebkheperura Tutankhamun, who died at age 19, reigning a few short years. Since that time, many have questioned the design, size, and uses of the 5,000+ artifacts found in that tomb. We now know that this tomb was not meant for the young Pharaoh due to the evidences of his hasty burial and most importantly, the fact that many of the

artifacts were clearly made for a woman, which includes many of the Headrests discussed in this paper.

The curiosity of the tomb has held current and is generally considered a topic that opened up public participation in Archaeology and Egyptology. Centered on the important, New Kingdom and its Eighteenth Dynasty (1,570-1,320 B.C.) we were introduced to famous historical names such as Tutankhamun, Akhenaten, Aye, Nefertiti, and Ankhesenamun. The powerful rulers of the Eighteenth Dynasty likely saw little security for their hidden tombs, having been plundered many times before their own burials. Priests had to move caches and mummies several times to new locations, causing the use of new massive nested coffins and sarcophagi. Aside from the Headrests, other unusual artifacts were discovered in KV 62. Each was meticulously catalogued and conserved *in situ* by artist and excavator, Howard Carter along with photographs by Harry Burton. To both their credit, we are able to see them today. This window into the past showed us never-before-seen golden thrones, cedar chests inlaid with silver, ivory and ebony, hunting bows, alabaster vases, stone vessels, jewelry, textiles, chariots, and three mummies.

A Headrest is made in a variety of materials, unique in shape, form and meaning and is considered strange to modern society. Discoveries of headrests in many tombs and burials would first answer the query of use with the fact that using one was considered essential to everyday life, sleeping well and most every ancient household possessed one. Naturally taken into the tomb at death, little is known of Middle Eastern and Egyptian bedroom furnishings with the exception of bedsteads and sleeping mats. Sitting and sleeping took place mostly on the floor on a reed mat or linen sheets and on a higher elevation or roof with the necessity for catching the night breeze, especially under one's neck. Simple headrests were made of perishable woods like sycamore, tamarisk or acacia, and were very simplistic in design. Materials such as earthenware, stone and ivory were also used. The early headrests appear to be a simplistic columnar style with solid block pedestals and a curved end for the head. Stone headrests were not uncommon and thought to be made solely for use in the afterlife and a tomb object only due the durability of the hard material perhaps not intended for everyday use.

Headrests were justly considered an important funerary object for the next life as we see from ancient religious texts. Texts saying, "sleep well" were not uncommonly written and the ancient Egyptian word for headrest (*wrs*) is related to the word *rs*, which means, "dream". The religious significance and the need to "raise one's head higher" became important while sleeping and even after death. For a funerary ceremony, the deceased's head would be raised or propped up on a headrest in the coffin or sarcophagus. The headrest was also known to be used in providing

protection against superstitions and dangers during the night sleep. We see images of the protective deity BES and others added to the headrest to protect the sleeper from bad dreams. Some headrests are placed close to the head of the mummy within the tomb, or either on top of the coffin, or within it to aid in the protection of the head from being severed from the body after death. The all too common threat of tomb robbers destroying the body of a mummy while looking for jewellery and gold was very real and considered a violent act. This belief is further confirmed by seeing the placement of a small metal amuletic headrest near coffins and mummy, being ritualistically symbolic and important.

Headrests were made both for men and women, which may account for the variations in height and size and design. The height of the headrest itself may not have been important, but was dependent on the length of the neck it held, male or female or child. On average most were six inches in height. Paintings from the tomb of Mena (TT 69) show a headrest along with a bed being carried into his tomb indicating the deceased would be using both in the afterlife. An Old Kingdom terracotta headrest is a clay model of a sleeping woman on her side, placing the concave part of the object just above the ear could provide some comfort. More elaborate ones are seen as far back as the Sixth Dynasty from a tomb near the pyramid of Tety in Saqqara. We know the Egyptians had textiles (linen) and feathers for pillows as well.

In the Theban tomb of Dynasty VI official, Wah, a wooden headrest contained a curious small disc shaped object made of a composite of resin, known as a *hypocephalus* pillow, undoubtedly used to cushion the head as it lay on the arc of the headrest. Showing necessity, but not comfortable without a pillow, resin and the soft padding of linen pads and cloths were at times used to make the headrest use pleasant. Pieces of rounded resin-type material have been found in several tombs, most likely for use as a headrest pillow. The *hypocephalus* pillow could have been an introduction to the common small pillow we know today.

The construction and design of a headrest was most important. A simple one begins as a basic carved alabaster, wood or stone piece, consisting of three parts. The pillow or arc, the uppermost part is where the head rests and most always is designed in the arc shape. The straight, fluted or columnar shaft supports the arc and had to be the strongest part of the construction. Resting on a rectangular base, it supports the entire structure. Sometimes the column shaft and base were inscribed or painted with the title and the name of the person whose head it held. If constructed comfort was a concern, is not something we can say or if it was even taken into consideration. One obvious advantage of using a headrest was that it allowed air circulation under the head between the shoulders and neck, important for living and sleeping in Egypt's hot climate. Sleeping on one's side could be

difficult on a headrest. The distance and height had to correspond correctly to the length of the shoulder and had to bridge the distance between the head and the surface of whatever one was lying on. Perhaps this made it more comfortable. Some Middle Kingdom mummies have been found lying on their left side with a headrest under the mummy mask.

Headrests are found in many cultures including areas of Africa from Ethiopia to Swaziland. The Japanese use headrests for consideration in the elaborately beaded and braided coiffure hairstyles of women and men. Avoiding the muss of an elaborate hairstyle, one would sleep on a headrest to preserve the coiffure. The Japanese Geisha rested their heads on curved wooden headrests for this reason, comfort being of no concern. In China, curved hard blocks of porcelain or stone materials are seen at a much lower height, making it easier for the neck to adapt just as it would on a small pillow. Chinese headrests were highly decorated with bright pictures of plants, animals and figures, as were the Egyptian ones with hieroglyphics, paintings and religious symbols.

Modern day arguments exist against the ancient use of a headrest and are based on impracticality and lack of comfort for a good night's sleep. We could substantiate this today with sleeping on one (or attempting to). Many believe this argument to be baseless and vary. Whatever opinion is taken, they were found in everyday life and in a death context in many cultures including ancient Egypt. It is interesting to note they are rarely seen or used in modern day Egypt. Whether for the necessity of "raising the head" or a strictly utilitarian one, some modern mortuaries today use a small headrest for deceased's head.

Descriptions of some of the headrests from the tomb KV62 will show the reasons and use of this artifact. One of the most photographed, unusual and published headrest found in Tutankhamun's tomb, Cairo Museum (No. JE620-20) measures H 29.1 cm; x L17.5 cm and is referred to as "Man and Lion Headrest", or "Shu". Carved in solid ivory, there appears to be a clear relation between this obviously symbolic headrest and the concept of the rising sun (the headrest being the horizon). The head of the deceased is associated with the sun and putting it on a headrest in the horizon would ensure resurrection. The assertion of raising one's head with a headrest would be completely necessary. In this one, the central column of the headrest forms the deity Shu, supporter of the heavens, and is joined in two pieces. Details of the figure show a headdress and kilt engraved and filled with a black pigment with a bluish hue. Suspended from the shoulders of the deity Shu, are protective amulets. Inscribed on the back of the figure Shu is a legend engraved in hieroglyphic script and filled in with black pigment. The base or pedestal of the headrest has two recumbent lions, each facing out, symbolical mountains of the East and West, carved "in the round" with

their manes, ribs and tail tuft engraved and filled in with black pigment. The lions represent the east and west horizons, the sun's daily course. The two pieces of the headrest are joined at the center of Shu's torso where a piece of wood is attached with gold nails. Shu is considered "the God of air" and used as a symbol of a heavenly deity. Also called Onuris, it supports the heavens, which rose up the sky. The legend tells of Shu bringing an end to chaos and his daughter Nut raised the sky by holding it up continually so it would not fall. He raised all the gods that had been created and Nut took possession making them into stars. It is an excellent interpretation of holding up one's head (as in similar spells in the Book of the Dead 166 & 55) and are interpreted as attributing the headrest to resurrection, the air necessary for life. An important and necessary funerary addition to the tomb, behind the figure of Shu is the hieroglyphic inscription: *"The good god, son of Amun, king of Upper and Lower Egypt, lord of the Two Lands, Nebkheperura [i.e. Tutankhamun], given life like Ra forever"*.

Many headrests are found of gilded wood in the Cairo Museum (JE620-24) and in plain designs and shapes, with no decorations or inscriptions. Covered with gesso and gold leaf, the headrest, found in the Antechamber of KV 62 amongst a jumbled pile in one of the glorious painted wooden chests had to be meticulously conserved. Two others, almost identical gilded headrests were found in the Annex of the tomb, but also in very poor condition not described here. Since the tomb's contents had obviously been re-arranged by robbers, the exact location of many objects is not known. It is thought, however, that this set of three gilded headrests might have been used with the three great gilded animal motif funerary beds, a necessary convenience for sleep.

The remaining headrests from this tomb described below, were all found in the Annex, although it is not believed that was their original position in the tomb, being left there by tomb robbers. They are all of the highest quality, funerary in design but so show signs of daily wear, although just who used them will remain a mystery.

A unique turquoise-blue glass headrest in the Cairo Museum (No. JE620-22) was found in a much-disintegrated condition with moisture and fungus apparent on the surface. The central column is octagonal shaped and made of two pieces of glass joined in the center by means of a square wooden dowel. Howard Carter felt it important to write to the former head of the Institute of Glass Technology at Sheffield University, Prof. W. E. S. Turner in order to attain further information. Evaluated as a glass composite, there was a fracture found in its stand and with the presence of air bubbles, a characteristic feature of ancient glass. Polishing and repair was clearly visible after careful inspection, but only on certain surfaces, which would lead one to believe it had been shaped by a mould, and then smoothed by

polishing with an abrasive. This beautiful headrest appears to be decorative showing little evidence of use.

A lapis lazuli dark blue colored faience headrest is made of glazed pottery. The joint on this piece is covered by a band of thin gold sheet. On this band is an interesting, rarely seen crosshatch pattern, filled with blue, red and lapis colors. At the center back and front are designs in turquoise blue glaze of the hieroglyphic cartouche of Tutankhamun, flanked by uraei. This is unusual and not seen in the others and appears to be made personally. We could imagine this detailed headrest made specifically for the young Pharaoh in life and shows sign of polishing and use.

A unique headrest found in the shape of a folding stool first appears as wood, but is entirely of carved ivory, and stained with red, green and black pigments. It is intricate in that the arc portion consists of three strings of seven small cubes of ivory, black and red alternating in color and attached to the ends of the pillow ending in the face of the god BES carved on the outside surface. Four folding legs end in duck heads grasping in their mouths the crossbar for supporting the weight. Egyptian ducks and geese were considered sacred by the ancient Egyptians, and appeared in much of their artwork, as did the god BES. Previously referred to as Bisu and Aha, BES was a dwarf god who was complex in meaning. He was thought to be the patron of childbirth and home as well as War, a curious combination but sometimes depicted with the young Horus to scare off evil spirits lurking around the birth chamber. For these reasons, it may be thought that this headrest could have belonged to the young Pharaoh and his wife, Ankhesenamun, for the birth of their children, the two stillborn female fetuses recently identified by DNA as his daughters.

A second glass headrest trimmed in gold with a speckled appearance is carved from a single piece of lapis colored glass has a curious history. The front is incised with the name of Tutankhamun in cartouche, filled with paste to highlight the cartouche. The edges of the curved pillow part are edged in gold. This particular headrest entered the Cairo Egyptian Museum collection in 1960 having previously been in the collection of King Farouk. It is said Howard Carter gave it to him in the 1920s, but the lack of documentation means we may never know where in the tomb it was found or its true provenance. It may have been left for a more valuable object by tomb robbers in the confusion.

The earlier mentioned tiny iron headrest is a unique interpretation of a full size headrest and its placement is totally symbolic. It is a tiny beaten iron amulet of a headrest found beneath the head of the young Pharaoh's mummy and behind his funerary mask, measuring L 4 cm x H 5.1cm.

Today, most headrests are in museums on exhibit and in the Egyptian Museum in Cairo, in a cabinet on the second floor. A recent visit to the

Cairo museum allowed me special permission to study, observe and acquire photographs of these headrests, bringing a surprising realization. The headrests seen up-close in the unlit dusty cases are much smaller than imagined. This alone allows one to realize that many of the KV 62 collection were indeed made for a young person and perhaps for personal use, a young Pharaoh or child about to embark out of his teen years.

In conclusion, finding unusual artifacts and objects of unknown personal use can be overwhelming to the discoverer. More impressive artifacts in museums today overshadow the day-to-day ones such as the Headrests, and smaller artifacts, though their importance is not diminished. The mostly unknown artisans of ancient Egypt are the ones to be praised and admired for these unique creations we view today in museums. Were they not the ones who designed and created these treasures? We know of only a few of these architects, artisans, and tomb builders, but do know that each used every available resource in their natural environment to design and craft objects for life and death for the ancient Egyptian culture.

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Jasper Amuletic Headrest (H: 1" (2.5cm) MMA-Acc. # 74.51.4458  
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## Understanding Light Art In A Multidisciplinary Context

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### Abstract

This paper argues that the making of art through the medium of light (Light Art – both artificial and solar), will continue to elevate human existence so long as its makers remain committed to illusion as opposed to the banality of the real. When an art form becomes obsessed with the real it loses sight of the central power of art – the power of making illusion. Light Art thrives in a multidisciplinary world of knowledge where artists understand that the “real” hides behind appearances. Under such a view we may combat singular interpretations in favor of multiple meanings. When we sacrifice a focus on illusion (so essential to art making) for the banality of the “real” world we venture into a kind of anti-art which I term “art-lite” – one of the many manifestations of weak art which proliferates in the art world today. On the side of Light Art as an art of illusion stand many important areas of study today. In this paper I point to several of these (physics, optical science, history, art history, poetics, computer science, mathematics, sociology and social criticism, digital studies, photography, skiagraphy, and aesthetics). This paper argues that Light Art can continue to play an elevating role in our lives due to the very nature of the multidisciplinary perspectives we deploy to challenge, understand, and complete it. The presence of these multiple and intersecting areas of analysis will continue to serve Light Art and place high demands on its makers – including the most important demand that Light Art, like all true art, be concerned with illusion ever avoiding the banalities of the real.

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**Keywords:** Light, art, illusion, real, multidisciplinary

### Introduction

"Previously, men could be divided simply into the learned and the ignorant... But your specialist cannot be brought in under either of these two categories. He is not learned, for he is formally ignorant of all that does not enter into his specialty; but neither is he ignorant, because he is 'a scientist,' and

'knows' very well his own tiny portion of the universe. We shall have to say that he is a learned ignoramus, which is a very serious matter, as it implies that he is a person who is ignorant, not in the fashion of the ignorant man, but with all the petulance of one who is learned in his own special line" (Ortega y Gasset, 1932: 54).

"A man becomes creative, whether he is an artist or a scientist, when he finds a new unity in the variety of nature. He does so by finding a likeness between things which were not thought alike before, and this gives him a sense at the same time of richness and of understanding. ...We expect artists as well as scientists to be forward-looking, to fly in the face of what is established, and to create not what is acceptable but what will become accepted" (Bronowski, 1973, unpaginated).

Light as an artistic medium has a deep history which includes the first use of stained glass windows in buildings in the fourth century. One can argue that any use of light to enhance architectural effect is part of the long history of light art. In modern art Lazlo Moholy-Nagy's *Light Space Modulator* (1930, see: <https://www.youtube.com/watch?v=fNt39WJQqjg>) is considered to be the seminal work of light art in modernism. This electro-kinetic work consisted of moving metal and glass plates arranged with a rotating disk which produced fabulous shadow effects [alongside of coloured and white light]. The work functioned best in reduced light where shadows dominate (see Katenhusen in Gartner et. al., 2009:128-37). Modernism brought technology and electricity to the making of light art but works of art relying on light without electricity predate modernism and continue to this day.

Light Art thrives in a world where the "real" hides behind appearances which conspire to combat singular interpretations as meaning become multiple. Appearances so often play on light and the fact that the human eye is only partially equipped for the universe in which we live – a universe in which about ninety-six percent of matter and energy remain invisible to us. We are reminded of these fundamental aspects of existence at many junctures. Baudrillard noted that because of our distance from it (light years), we see the light of a star for many centuries after the star itself is dead (2000: 71). Indeed, the four percent of the universe we know as "reality" is the result of the amputation of all the anti-matter and energy which we can only speculate about in astrophysics. When it comes to light – we inhabit a very artful, appearance laden, and deceptive universe. All good art is illusion and helps us to understand the illusory nature of our world. Efforts to make

art out of light (both natural and artificial) can touch us on deeply emotive, epistemological and existential levels.

This essay examines art made by using light and points to the necessity of a transdisciplinary perspective to full understand its applications and implications.

Following a short discussion concerning how the human eye sees color, I examine how light can be made to make art works that participate in illusion as “art” must do. I then examine some failed efforts to make art with light – which often result from an over-reliance on the artificial light of technology. What results is not so much Light Art as it is *art-lite*. Next I move away from technology to examine artists who work with the sun and the importance of skiagraphy (the recording of shadows), to artistic efforts. This leads into a discussion of photography which almost always excluded from conversations concerning Light Art. I conclude that Light Art is diverse and like other forms of contemporary art is susceptible to both the productive and destructive applications of technology. While making this case I point to the many areas of study (physics, optical science, history, art history, poetics, computer science, mathematics, digital studies, photography, skiagraphy, and aesthetics) to name a few which come into play in fully appreciating Light Art.

### **Seeing Light and Color: Physics and Optical Science**

“If the world is what it is, where does the illusion of appearances come from?” (Baudrillard, 2006:94).

The first disciplines to help us engage with Light Art are physics and the optical sciences. The world visible to humans is one of light and shadows and in it our eyes are sensitive to a very narrow part of the electromagnetic spectrum. The visible light spectrum consists of wavelengths which range from 390 nanometers to 780 nanometers. [A nanometer (nm) is one billionth of a meter]. Specific wavelengths in the spectrum correspond to our perception of a specific color (red = 780 - 620 nm; orange = 620 - 597 nm; yellow = 597 - 577 nm; green = 577 - 492nm; blue = 492 - 455 nm; and violet = 465 - 390 nm). The color we see is not “in” the object but is produced by light bouncing off the surface of the object. The color we perceive has everything to do with a combination of psychological and physiological responses to this bouncing. Physics teaches us that, in a very real way, the objects in our world reflect us – our ability to see them in color. When light falls upon an object the electrons in the atoms of the object begin to vibrate which results in a light-wave which is perceptible to our eye. Color then is the light striking an object during its reflection (or transmission) to our eyes. The only scientific role played by the object in the color we see is that it contains atoms that are capable of absorbing one of more frequencies

of visible light. Thus, if an object absorbs all of the frequencies of visible light except for the frequency associated with red light, then the object will appear to us as red (Gage, 2002).

Transmitted light enters the eye striking the surface of the retina (which is lined with various light sensors shaped like rods and cones). The rods are sensitive to intensity of light and the cones sense color (there are three kinds of cones: red [sensitive also to orange, yellow and some green light]; green cones [sensitive also to some yellow and blue]; and blue sensitive cones. When light enters the retina a chemical process immediately sends an electrical impulse along nerves to the brain and we discern the “color of the object”. If the red and green cones both activate the brain combines them and understands that the object is yellow (Gage, 2002). Interestingly, it was not long after science understood this phenomenon that social thought devised dialectics.

Objects, which appear to give off an inner light, do not actually do so and each requires artful interpreters to operate on their behalf – this is one of the roles of the artist – the illusionist of light and color. If a light artist is to actually make art, that is, participate in illusion through their work, one of the ways they will do this is through the manipulation of reflection and refraction so that it appears to our eye that the color is actually within the object. This is among the principle strengths of van Gogh’s painting for example. Artists show us the poetic illusion of light in the object rather than the prosaic scientific facts of light. The poetic view of art (that understands light to emanate from objects) and the scientific understanding both play a role in helping us understand light art. We may tip our caps to physics while secretly holding firm with Van Gogh’s poetics! Art history is vital to our understanding of light art as is science.

### **The Double Edged Sword of Technology and Light Art**

Two impressively beautiful melding glass forms of life like dimensions stand before us in the Prague National Gallery: Zdenek Pesanek’s work “Torsos of Men and Women” (1936). The coloured glass vessels are illuminated from within by a curving white neo tube. On the exterior a less curvilinear tube runs the length of the back of one other neon tube illuminates the top and front of the figures. The effect is stunning and while the work is somewhat abstract we sense strongly what the sculptor wanted to communicate before we read the accompanying didactic text – the fragility of the human in a decade which would be remembered for its despair. Artificial Light Art pioneers such as the Pesanek illustrated the great attraction that artificial light has held for artists for almost a century. It is impossible for me to look at Pesanek’s work on display without thinking of his contemporary Siegfried Kracauer (sociologist and critic) who, at this

time, conceived of electricity and light as pure flows – part of a modernity’s machinic libidinality (Kracauer, 1960: 300 ff.). Long before Dan Flavin worked with fluorescent tubes Pesanek was using neon and other artificial media to make Light Art. He projected light using what he called a spectrophone and was asked by the organizers of the 1937 Paris World Fair to make two fountains of light using neon tubing. He was also hired by the Prague electric utility to make light sculptures. Among these were his “Torsos of Men and Women” – a work in which the illusion of movement is created by the electric circuitry alternating power to the light tubes. It is an unusual type of kinetic light work for its time that soon descended into the predictable in the hands of advertisers. Even Paris would endure the kinetic banality of the “Citröen” logo flashing on the Eiffel Tower from 1925-1934. Pesanek also made the popular abstract kinetic light sculpture which adorned the roof of Edison Power Station in Prague (1929-30).

Pesanek’s contribution was to show us an entirely new way to understand the formal qualities of Russian Constructivism in the shapes which merge to make the Edison sculpture. From its origins Light Art showed that it could be both interesting and artful by using artificial light and technology. Technology is however a double-edged sword for Light Art. While it can be used to deploy artificial light in artistic ways, it is also possible that the technology overwhelms the artwork producing neither illusion nor interest. Pesanek set Light Art on a higher course than it would always find itself. Before examining these failures it is important to look at some of the other successful (artful) uses of artificial light for making art.

Wolfgang Winter and Berthold Horbelt have recently shown us an interesting way to achieve artistic illusion in their work “Swingerclub” (2005). The museum goer interacts with the work by actually sitting on and swinging on the giant swing seat, attached to the ceiling by ropes [as with a children’s swing]. The “seat” of the “swing” is clear plastic containing bright blue and orange fluorescent tubes giving off a warm and inviting glow. It is obvious that the source of colored light in the swing seat is a common fluorescent tube – Winter and Horbelt understand that the context in which we experience color, as well as the color itself (warm, cold, neutral), has everything to do with how we *feel* a work of Light Art. This work is about feeling the warmth of swing and this is achieved by placing warm, inviting colors, inside the seat in an otherwise bleak exhibition room. While we know the source of the light intellectually – we still feel it as though it is a kind of warmth given off by the objects in this austere environment. Here we have art not because the artists have highlighted the science of light but rather, because they have focused on its most ancient poetry – the poetry of the warmth of the light from within. This is a kind of primitive based understanding of light that may well originate during the times in which we

lived in caves. Successful Light Art, like art in any media, seeks a poetic (as much as, or more, than techno-scientific) resolution of the world.

Light art, when it is truly artful, participates in illusion. Illusion is based on the fact that nothing means what it appears to mean: “there is a kind of inner absence of everything to itself – that is illusion” (Baudrillard, 1997:49). Dan Flavin probably has experienced this Baudrillardian thought more than any other artist working with light. Since the 1960’s one of Flavin’s favourite tricks has been to make our eye see colors which are not there – in this he plays a game of illusion with the science of seeing. Flavin’s “o.T.” (1969), placed two red fluorescent tubes horizontally (facing the viewer), along the top and bottom of a square frame. On the reverse side, facing away, a few feet from a white gallery corner, he placed a blue and yellow tube on the vertical arms of the frame. The result is a Light Art science lesson in that our cones perceive a green wall which is not there. In other works such as *Untitled* (1976) the artist uses white and yellow lights to make the blue exhibition space appear green. Flavin thus forces the entire context of the exhibition room into his art – including our changing perspective as we move around the art object. Not only does the viewer complete the work of art, as with all art, but in this case is made very aware of his her role as viewer / completer. Powerful Light Art displays interact with out understandings of epistemology and metaphysics.

Similarly, Bruce Nauman created a “Green Light Corridor” (1970) by positioning white fluorescent tubing above two white walls facing each other in close proximity. We can look down the corridor but it is too narrow for even the smallest person to pass though. This work creates the illusion of color by relying on the closeness of the two white surfaces. As the processes of reflection and refraction take place at high intensity the rods participate with the cones in our eyes to makes us see a pale green that is also not really there. As such, Light Art, can serve to highlight that color really is never “there” and allows the work of art to play with the illusion of appearances. The science of light is itself exposed as illusion in works such as these.

Projections enable Light Art to work outdoors where its impact can be visually stunning and evocative. Eric Orr in his “Landmark” (1991) used lasers aimed far into the night sky to make a permanent installation on the roof of a building in Landmark Square in Long Beach, California. The effect is not unlike Michael Ahern’s “Tribute in Light” memorial at the World Trade Centre site in New York. Others like artist Michael Snowdon have used projected light aimed at the sides of buildings to express political messages. In Snowdon’s case he expressed his feelings about the rise of Christian fundamentalism and its entry into North American politics. In one work called “No Jesus – For The Moral Majority” (1982) Snowdon projected a hologram to proclaim a “Jesus free area” in the city.

Light Art made with artificial light can use technology to participate in artistic illusion in a number of ways. Either by the power of the illusion created – or, as in Snowdon’s case, in the message conveyed. It is possible for the artist to command technology in the making of the work of Light Art. In other efforts, as in computer generated images, the art can become lost in the technological pursuit of the real. Here the art retreats (if not disappears) into technological circuits. This is the point at which Light Art disappears to be replaced by something better referred to as “art-lite” – art that is more about technology than art.

### **Art “Lite”**

“Appearances are turning against us, through the very technology we use to drive them out” (Baudrillard, 1999:129).

Not all artists working with light are successful masters of illusion. An unfortunate example of a failure is Rolf Waltz’s “Disturbing Familiarity Number 12” (1977). The work consists of three red, one blue, and one green rectangular aquarium, each connected to a pair of electric wires that conducts the electricity by which they are lit. Two of the aquariums are suspended slightly above the floor while the remaining three sit flat on the floor of the gallery. The problem with this work is that it moves away from illusion (seemingly at light speed), and the objects are indeed “disturbingly familiar” (quite ‘real’). The work is one of light passing through the liquid in these aquarium-like containers (which hold coloured water). The problem with the work is that we aren’t really experiencing artistic illusion but the banality of five aquariums with coloured water giving off different shades of transmitted light. How, precisely, is this work really all that different from the aquarium in my home (which has yellow tinted glass) through which the white light of its top passes? Well, my aquarium has fish in it. Waltz’s work eschews illusion for the banality of the real. By coming too close to the real it fails to fully participate in art’s illusory potential. Still, I must say on Waltz’s behalf, it is every bit as interesting as at least three-quarters of what we find today in contemporary art spaces – and that is, sadly and ironically for art, among the reasons it is there. When technology comes to play a large role in efforts to make art using light, as it has had a tendency to do in recent years, we see efforts to make Light Art pressed more and more into the service of the banality of the real than illusion which is art’s proper domain. In this way Light Art too plays its role in the emptiness of much contemporary art.

In a huge exhibition of exhibition of Light Art (2005) in and beyond the walls of the ZKM Contemporary Gallery in Karlsruhe (Germany), the curators proclaimed that with the advent of electricity man had achieved victory over night and the sun. Our new stars were said to be artificial ones which allow us to bask in paradises of artificial light (see Weibel, 2005: 1

ff.). Besides what this says about the ever closing gap between curatorial work and our general culture of advertising, it failed to understand that art is not art without illusion. If all an artist working with light achieves is a mirroring of the real, then everything is art – which means of course that nothing is particularly “art”. I think the curators at ZKM may simply have been afraid of the dark speaking as they do of “paradises of artificial light” which are really only a small part of the greater functional continuum of office towers which remain lit through the night (Weibel, 2005: 6-7). Pesanek, Flavin, and many others who deal in arts gold standard – illusion, understand this very well. ZKM on the other hand boasted, in its promotion of the artificial, that “Art has increasingly turned from the illusionary representation of natural light to the real application of artificial light” (Weibel, 2005: 5).

What we have when we sacrifice illusion for technology is not Light Art but merely “art-lite” that becomes immersive and interactive. Art-lite is a non-art that has moved away from art which created an illusion in space to dissolving into the real. Since the ancient Greeks discovered life sized sculpture and quickly tired of realism we have long known that realism is the death of art.

In Peter Keene’s “Raoul Hausmann Revisited” (1999-2004) we have the most strained and technologically diluted form of making art with light. Here programmed computer circuits randomly decide which colors and patterns to project onto the gallery wall. In such efforts we find the cold death of art in technology where the medium of light becomes part of the programmed performance of circuits. To his credit, despite the banality of the work, Keene reminds us where the role of technology and artificiality, without illusion, began – with Hausmann’s “Optophone” in the 1920’s (which turned sound waves into visible light). The Optophone was a technological interrogator of sound waves which made them speak in a language they did not know. If illusion is present in any of these works it is only in its negative sense – as a kind of virtual transparency. Here efforts to make art using light becomes merely – a joke played on itself, unknowingly, by it tipping over into the fractal (and today digital).

In recent years some artists have poked fun at examples of Light Art which lost their way into art-lite. Martin Boyce’s *We Are Resistant, We Dry Out in the Sun* (2004) ironically plays with the very problem of technology in creating a work that highlights the artificiality of our culture (at a time when the artificiality of our culture is rapidly becoming its most real aspect). In the work three rather pathetic indoor palm trees made of light tubes stand over two low quality lawn chairs mockingly. It is a purely artificial and ironic work of art targeting precisely the kind of artificial culture, and artificial art world, which would view it as a work of art.

Over the past fifteen years art-lite has come to the center of attention with computer generated images. These works which circulate along the networks and microchips of computers are no more “art” than the computer generated image can be said to be a photograph. This does not stop curators from calling these works art and photography. One way to distance ourselves from art-lite is to understand the problem of technology in relation to Light Art made using the actual light of the sun.

## V. Solar Light Art and Skiagraphy

The sun is the ultimate readymade and while Duchamp did not work with it directly himself, light was a central concern of his art and its presentation. His works such as “Trap (1917) or “Given: 1. The Waterfall / 2. The Illuminating Gas” (1946-66) depend in specific ways for light to create shadows. In the case of “Trap”, like many of his works of the day [“The Bicycle Wheel” (1913) or “In Advance of the Broken Arm” (1915)], the works are positioned in such a way that shadows play a key role in their doubling. Duchamp’s concern and mastery of light added to his popularity among surrealists and he was given the task of laying out the 1938 *Exposition Internationale Du Surréalisme* at the Galerie Beaux-Arts in Paris at which “many objects appeared only in outline, glowed or moved in the semi-darkness” (Schwarz, 1970: 507). Indeed, one of the strengths of the ZKM show at Karlsruhe in 2005-2006 is that it documented the history of (artificial) Light Art as an important art of the 20<sup>th</sup> century (Weibel, 2005). However, by focusing on artificial light this show missed what for many is the best medium for making Light Art – the solar light of the sun.

The sun is the source of everything human and so, in a very poetic sense, all art is Light Art because everything we see is the art of light. Everything we know exists as fragments of light. Against the cold light of artificial art-lite, stands solar art – which includes the art of recording shadows (skiagraphy). While the flow is from elsewhere, there would be no becoming of light, or thought, because it is thanks to us that things become – we are the object against which light breaks (Baudrillard: 2004:100-01). Perhaps it is at sunrise and sunset or while watching the moon trace its course across the night sky that we come closest to our primitive state. We have watched this found object called the cosmos for a long time. One wonders how it would be possible to consider Light Art without considering the light that comes from the sun and bounces off the moon. It is a small step from there to arranging sticks (leaning against and supporting one another) to make a minimalist shadow work on a beach or using a camera to record “found” shadows on our walls.

Solar Light Art which, in its quest for illusion, works with shadows avoids the technological fate of what I have termed art-lite. Olafur Eliasson’s

“The Weather Project” (2003-04) is a master work of art in that it came as close as possible to bringing the sun into the gallery relying on light tubes and a reflecting screen. Few works of Light Art have ever come as close to this for capturing such a powerful fleeting glimpse of the essence of illusion that is necessary to art. The work is profoundly contemporary, set as it was in the vast space of the Tate Modern, and simultaneously profoundly primitive – the glass wall of the Tate serving as a large version of the small corridors of light our prehistoric ancestors used to channel the sun to the center of mounds such as those at New Grange (Ireland), or outside at Stonehenge, England. Eliasson is among those who remind us through his Light Art (even that which uses artificial light) that art relies on illusions which can touch on our origins as star gazers. In the end what are we but coagulations of star dust from the big bang looking out onto the cosmos in an act of self-reflection – star dust considering its own origins?

Fischer and Sjolen’s *Aleph* (2007) was a work of Light Art made using an array of automobile side-view mirrors to alter our awareness of an environment. Each mirror (which acts like an individual pixel on a computer screen) is micro-controlled to create an array of pixel-like reflections. According to the poet Borges “Aleph” was a point in space that contained all other points – to look into it one would see everything in the universe at once – it would be nothing but a blinding light. Aleph uses sunlight to display information from many angels at once. It is both a metaphor for contemporary multi-vocality and the ways in which our manifold systems of information do not take us any closer to the real – indeed, they move us further away from it in a kind of fractal world of information. The sciences of screens and the digital are important not only for the devolution of Light Art into “art-lite” but also for the next generation of truly illusory Light Art.

The artist Peter Erskine’s *Solar Tower* (2007) shows how solar panels are coming to be increasingly used to make works of art. This work, at the University of British Columbia in Canada, is part of the library. A vertical stack of stained glass solar panels themselves are part of the wind tower that ventilates the building. As in medieval churches the light [passing through the carefully placed panels] illuminates the interior in specific patterns which move with the sun. This work of art is an integral part of something designed to contribute to a more energy efficient environment. It is a striking example of how architecture can now include Light Art as part of both aesthetic and functional design requirements.

There are many other ways to use natural light to make art such as solar tattooing of the human skin or pyrographically burning wood using direct sunlight. A long overlooked form of art using sunlight and shadow is tracing such as the work of Brooklyn artist Ellis Gallagher (who signs himself Ellis G). Ellis is a former graffiti artist who now traces the shadows

of fire hydrants, stop signs, and once – an entire city block. At night, under the pale orange-yellow glow of the streetlights his work appears to be a shadow burned into the sidewalk. Ellis G's work is with us, as is most solar art, because of the camera – which is itself an instrument of a very important and almost always overlooked form of Light Art.

### **Photography as Light Art**

“The illusion of appearances is the vital illusion” (Baudrillard, 1994: 94).

Photography is the writing of light and shadows. It is a highly refined form of Light Art when the photographer understands natural light falling on objects. We are seduced by the object as light falls across it. Good photographers make themselves the prey of appearances. The end of photography comes when we seize hold of the object in “making” (via digitalization and computer manipulation), rather than “taking” the image. We have traveled far enough into an ironic reading of the world to know that it is the book that reads us, the television that watches us – why then do we not also seek to understand that it is the object (of photography) that seizes us?

Jean Baudrillard's photograph “Amsterdam” (1989) participates in a kind of natural Light Art which relies on technology (the camera) to record it. Here we have an image of a bicycle leaning against a railing over a Dutch canal seemingly basking in the warm, bright yellow light of the sun reflecting off of the water as would any person. Baudrillard understood, as did Balthus, that the object is indeed a very strange attractor – and as such, it at least shares in the power relationship with the subject photographer (who no longer holds all the power in this view). As in so many of his photographs which rely only on natural light this is a work that highlights the enigmaticalness and ultimate unknowability of the world.

### **Conclusion**

“Everything withdraws behind its own appearance” (Baudrillard, 1996:2).

Light Art, like all art today, is plural. It can use objects or do without them, and it is almost always concerned with the relationships among environment, space, and appearance. It can be minimalist, pop, op, conceptual, technological, photographic, cinematic and so on. While Light Art can be made with artificial light it is often at its best when dependent directly upon the sun. Light Art can deconstruct and de-familiarize or it can be reduced to advertising. Light artists must be very careful not to step into the realm of non-art, that is the “real”, where they can no longer act as the magical agents of the disappearance of the real (Baudrillard, 2005:96). So

long as Light Art keeps its distance from Truth and Reality it remains art. When it fails to do this, when it attempts to be more real than the real, it loses its art and art's most vital concern for the sacredness of appearances. As long as artists working with light remember that when we forsake illusion we forsake art, Light Art will persist in the face of its nemeses art-lite. Among the things that work to preserve and strengthen genuine Light Art as opposed to "art-lite" involve the way in which we require a multidisciplinary perspective to understand it. Both Light Art and its experience by viewers inside and beyond the walls of galleries, is indebted to many areas of study. In this short essay we have seen the importance of physics, optical science, history, art history, poetics, computer science, mathematics, sociology, digital studies, photography, skiagraphy, and aesthetics (to name but a few areas) which come into play in fully appreciating Light Art. Light Art can continue to play an elevating role in our lives due to the very nature of the multidisciplinary perspectives we deploy to challenge, understand, and complete it. The presence of these multiple and intersecting areas of analysis will continue to serve Light Art and place high demands on its makers – including the most important demand that Light Art, like all true art, be concerned with illusion ever eschewing the banalities of the real.

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# **The Impact Of A Post-Secondary Education Program On The Self-Efficacy And Future Orientation Of People With High-Functioning Autism**

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## **Abstract**

Higher education has significantly impacted the advancement of individuals in our society, including people with developmental disabilities. It affects employment, wages, and the ability to realize one's potential. One way of promoting the integration of young adults with disabilities in higher education is to develop individually tailored intervention programs. Some such programs have been developed to meet the academic needs of people with high functioning autism. The aim of the present study was to examine the impact of such an intervention program on the self-efficacy and future orientation of people with high functioning autism. Nineteen students diagnosed with high functioning autism (aged 23 to 28) participated in the program offered by the student service center. The aim of the program was to accommodate each student according to his or her individual needs; each student was assigned a personal mentor, who provided a continuous channel of communication and emotional support. The research participants completed the Self Efficacy-Assessment Questionnaire (Chen, Gully, & Eden, 2001) and the Future-Orientation Questionnaire (Nurmi, Poole, & Seginer, 1995) before and after the intervention. The results indicated clear improvement in both measures: self-efficacy and future orientation. The findings are discussed in terms of the sequence of psycho-educational interventions beginning in elementary and secondary school period, as well as other interventions designed for young adults with high functioning autism.

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**Keywords:** High-functioning autism; Psycho-educational interventions; Higher education; Self-efficacy; Future orientation

## **Introduction**

Higher education has significantly impacted the advancement of individuals in our society, including people with development disabilities. It

affects employment, wages, and the ability to realize one's potential (Schayeck, 2005). The perception of education for disabled people has changed over time, and it is now generally recognized that individuals with disabilities also need opportunities for higher education. This has led to the creation of a support system within higher education that provides individuals with disabilities with an equal opportunity to succeed despite their unique functional limitations. This approach is based on the principle of normalization, which holds that all individuals with disabilities should be able to conduct their lives as similarly as possible to the general population (Avisar, 2010). Against this background, institutions of higher education need to adapt their support system to the needs of students with disabilities. The integration of people with various disabilities may enable a change in social consciousness and in the economic situation of such individuals. This, in turn, will promote their acceptance by society as a whole, and their ability to live as independently as possible within the general population. According to David (2007), one way to enable the integration of young adults with disabilities in post-secondary education is to adapt intervention programs to the individual needs of each student.

Intervention programs for students with disabilities are offered in a variety of settings, including universities, colleges, and schools for vocational training for adults (Wille-Gregory, Graham, & Hughes, 1995). Intervention programs should provide people with disabilities with the support they need as they enter adulthood. Contact and participation with typical students can be expected to help people with disabilities develop positive interactions with the institutions; service providers can enhance support and increase these students' sense of independence, as well as their capabilities and future employment opportunities (Zafft, 2002). It is important that any intervention plan be tailored to the needs and interests of the student (Mooney, 1996). It must also be designed to ensure that the students do not feel inundated and unable to continue their studies (Halpern, 1994).

Some intervention programs have been designed for students with high functioning autism (HFA) in academic study programs. HFA is part of the wide spectrum of autistic disorders, which are among the extensive development disorders. HFA is characterized by pronounced social skills deficits, low communication abilities, and stereotyped behavior or compulsive activity in specific areas of interest (Rappaport, 2008). In addition, HFA is characterized by normal or higher-than-average intelligence (Cohen & Schreiber, 2013).

The number of students with HFA that participate in post-secondary education has increased considerably as a result of tailored intervention programs that provide social and behavioral support for high-functioning

autistic students, and enhance their self-efficacy (Barnhill, 2014). Self-efficacy is the most consistent predictor of academic success, and the only motivational variable that has a direct impact on that success (Bong & Clark, 1999). In addition, self-efficacy influences future orientation, because a person's belief in his or her abilities to create change enables actions in the present that affect future results (Bandura, 1995; Epel, Bandura, & Zimbardo, 1999; Shell & Husman, 2001; Zimbardo & Boyd, 1999).

The purpose of the present study was to examine the impact of an intervention program on the sense of self-efficacy and future orientation of people with HFA in post-secondary education. It was a short-term longitudinal study of the development of a sense of self-efficacy and future orientation among the students with high-functioning autism during the time they participated in an intervention program that was designed to provide them with support during their academic studies at a university from July through October 2014.

### **High-Functioning Autism**

HFA is part of the wide spectrum of autistic disorders, which are characterized by pronounced social skills deficits, communication struggles, and stereotyped behaviors with obsessive interests (Rapport, 2008). In some cases, people on the spectrum also experience other limitations, such as poor motor skills and coordination and organizational weaknesses (Comyn, Lynch, & Stevenson, 2001). A diagnosis of HFA implies a qualitative impairment in social contacts, expressed by at least two of the following: deficiencies in complex and nonverbal behaviors, such as eye contact, facial expressions, body postures, and gestures to regulate social interactions; poor social development relative to peers; disinterest in shared spontaneous pleasures, interests, or achievements with others; and lack of expression of social or emotional reciprocity. Another criterion includes patterns of behaviors, interests, activities, and repetitions characterized by rigid stereotypes, expressed by at least one of the following: preoccupation with a stereotypical pattern of one or more specific areas of interest that exceeds normal practice in intensity or focus; inflexible adherence, strikingly unique routines, or rituals; repetitive physical movements, and constant preoccupation with objects and parts. The disorder causes significant clinical abnormalities in social functioning, employment, and other important areas. HFA is characterized by average or higher intelligence and cognitive abilities. The distinctive mark of the syndrome and the characteristic that makes it unique are the unusual interests that people with HFA have (Cohen & Schreiber, 2013).

Many researchers have focused on HFA and its prevalence in the population. However, inconsistent findings on this subject have resulted in

uncertainty. This has been attributed to numerous reasons, such as different methods of diagnosis, residential environments, and age at of diagnosis (Metz, 2013). Several studies have indicated a lower rate of girls than boys with HFA, but recent publications have suggested possible under-diagnosis among girls and women (Author, 2014). In recent years, there has been a significant increase in the diagnosis of autism in general, and HFA in particular. This can be attributed to more widespread professional knowledge, as well as greater public access to information on the subject (Comyn, Lynch, & Stevenson, 2001).

### **Self-Efficacy**

Self-efficacy is belief in one's ability to perform a task, the ability to raise one's own motivation, and the cognitive ability to perform a task and take the necessary action to control the course of its implementation. Such beliefs arise from thoughts and feelings about one's ability. These beliefs are inconsistent; they change before, during, and after the person performs a task.

According to Bandura (1997), the process of developing a sense of self-efficacy includes sub-processes of self-awareness, recalling previous experiences, controlling, comparing and contrasting, reasoning, judgment, and transfer, followed by a self-evaluation of how one thinks, feels, and operates. This process contributes significantly to the motivation to achieve (Katz, 2002).

An indication of self-efficacy in terms of at least two main indices is considered a basis for planning the treatment and teaching. One is a self-efficacy that depends on a specific situation. This is a person's judgment of his or her capacity to deal with a specific situation. The second is a general trait self-efficacy, which refers to all the activities of people. This concept is similar to concepts such as self-esteem or self-perception, which are generally considered as common personality traits. Although self-efficacy is a concept related to a specific behavior, it may also apply to different behaviors in similar situations (Bandura, 1997).

According to Bandura (1986, 1997), the process of acquiring self-efficacy is gradual and requires ongoing development. It is based on processing information from four sources: (a) past success; (b) behavioral models; (c) realistic verbal persuasion; and (d) physiological and psychological stimulation. Any new contribution to self-efficacy combines with and strengthens it. Past success or authentic experiences of control have the strongest influence on the development of self-efficacy. Such experiences increase the likelihood of a sense of self-efficacy, while failures might reduce it. The second source that informs the process, behavioral models, derives from experiences of observation or imitation. When individuals

observe behavioral models and imitate them successfully, their self-efficacy increases. If such an attempt at imitation fails, the individual's self-efficacy will decline. The third source is realistic verbal persuasion by another person that one is capable of performing the given task successfully. The power of persuasion depends on the credibility, knowledge, and power of persuasion of that person. Verbal persuasion is also liable to decrease one's self-efficacy. Finally, physiological and psychological stimulation – sweating, heart palpitations, anxiety, stress, and tension – also inform the process of developing self-efficacy. These sensations are often perceived as indicators of fear of failure or a sense of inability and incompetence. Similarly, the individual's mood also affects self-efficacy. Optimism strengthens self-efficacy, but negativism weakens it.

One's sense of self-efficacy is derived from cumulative knowledge of cognitive processes or knowledge about the information sources mentioned above. In addition, according to research based on social cognitive theory, the experience of others and verbal persuasion may have greater impact than individual past experience does, depending on the person (Zeldin & Pajares, 1999). According to Schunk (1997), self-efficacy can change as a result of working on tasks and skills.

### **Self-efficacy and academic achievement**

Academic self-efficacy is associated with significantly greater academic achievement and behavior (Marsh, 2007; Marsh & Craven, 1997). It is based primarily on comparison of one's own academic ability with the perceived capabilities of peers (Marsh, Byrne, & Yeung, 1999; Marsh & Parker, 1984). Although knowledge and cognitive skills are necessary for academic achievement, they are not enough. Even when students know what to do, they often find it difficult to invest effort in fulfilling the complex requirements of the task. This may be related to the individual's belief in his or her ability to act effectively in order to achieve goals or face challenging situations (Bandura, 1997).

Research on academic self-efficacy has revealed that it influences the student's motivation: a greater sense of competence is accompanied by greater motivation for learning (Bandura, 1997). Bong & Clark (1999) and Pajares & Schunk (1999) also found that self-efficacy is the most consistent predictor of academic behavior and academic success. It is the only motivational variable that has a direct impact on academic results. According to the researchers, this suggests that academic self-efficacy is a specific, stand-alone component, and therefore beliefs that relate specifically to the task in question are good predictors of performance.

In addition, Kurtz-Costes and Schneider (1994) found that the relationship between self-efficacy and adaptive coping with learning

difficulties is closely associated with academic progress. Other research has indicated a link between self-efficacy and feelings that students experience. Pleasant emotions such as joy and pride correlated positively with positive academic self-image; unpleasant emotions such as anxiety and anger correlated negatively (Goetz, Frenzel, Hall, & Pekrun, 2008; Goetz, Pekrun, Hall, & Haag, 2006). Promoting self-efficacy and learning skills has been shown to contribute to academic ability by generating a meta-cognitive change in the individual's beliefs about his or her ability to change (Katz, 2009).

In his discussion of the process of developing self-efficacy for educational tasks, Schunk (1991) claimed that students find it easier to prepare for short-term, specific objectives than those that are long term and more general, and this strengthens their assessment of their ability. Thus easy goals may contribute to the development of academic efficacy, leading to success in challenging assignments, as well. In addition, Schunk also found that teaching strategies can contribute to academic self-efficacy when instructors set goals that are neither too easy nor too difficult for the students (Mart, 2011; Schunk, 1991). Moreover, success has been shown to contribute to self-efficacy. Therefore, successful task completion reassures individuals of their ability to perform other tasks, leading to their willingness to invest the necessary effort. Success in one activity also affects self-efficacy regarding others, and helps strengthen personality traits such as self-esteem (Katz, 2009).

Other studies have indicated a positive relationship between self-efficacy and perception of the future. People who believe in their abilities to create change can envision the impact of their actions on future results. Accordingly, they feel committed to shape their future (Bandura, 1995; Zimbardo & Boyd, 1999; Epel et al., 1999; Shell & Husman, 2001).

### **Future Orientation**

Future orientation refers to all the thoughts, feelings, and concerns with which humans interact subjectively with their perceptions of their future. Future orientation is reflected in how the individual makes plans, sets goals, and avoids unwanted situations (Seginer & Mahajna, 2003). In addition, future orientation reflects how people foresee future, including their expectations, preparations, and general feelings about the future (De Volder & Lens, 1982; Seginer, 1988; Shell & Husman, 2001).

Future orientation can be divided into one's future course of life and existential domains. According to Seginer (2001), future life course refers to hopes and concerns about the future, including education, military service, work, and career. Existential domains involve concerns and hopes of self, others, and society. It is important to note that the orientation toward the

future life course is active and directed towards specific goals, but the existential domains are passive. Self-direction is towards defined future goals, compared with the existential domains, which relate to the future passively and are expressed in hopes and fears of the future (Seginer, 2001).

Researchers of future orientation have constructed a developmental model of the future orientation based on three components: (a) motivation, (b) cognitive representation, and (c) behavioral representation (Seginer, 2000; Seginer, Vermulst, & Shoyer, 2004). Motivation increases people's interest in investing effort. In addition, the motivational component drives a person to aim for the future, and define long- and short-term tasks. Cognitive representation allows people to consider future issues and develop expectations along a sequence of time in the future time, expressing both hopes and concerns about the future (Seginer, 1998, 2001; Seginer, Vermulst, & Shoyer, 2004). These components stimulate the behavioral representation, which includes two variables: (a) an information search, examination of future possibilities and their adjustment to the individual; and (b) commitment to a chosen goal and persistence in achieving it (Seginer & Mahajna, 2003).

Consideration of the future begins in childhood and continues throughout life. It gains momentum in adolescence and early adulthood, when important decisions are made (Nurmi, 1991; Nurmi et al., 1995). Adolescents are confronted with the developmental task of finding their own paths to adulthood. Their view of the future is shaped by both external and internal factors (Seginer, 2001, 2003). Through interaction with significant others, the adolescent creates subjective images of his or her future interests, expectations, and plans. In addition, this future image is influenced by psychological factors, such as the adolescent's social development and self-esteem (Nurmi, 1991; Shoyer, 2006).

Adolescent development is affected by the choice of the environment and the people with whom one communicates, along with society's demands and opportunities (Crockett & Bingham, 2000). Thus, future orientation is an ongoing interactive process in three spheres – cultural and social, family environment, and the self – which inform the effort of adolescents to develop plans and objectives and organize their path into the future (Seginer & Halabi-Kheir, 1998).

### **Future orientation and academic education**

As discussed earlier, future orientation persists throughout life. In adulthood, positive future orientation is essential to students in dealing with the tasks and challenges that life presents (Finzi-Dottan & Sharon Garty, 2010). This stage of development is often characterized by academic studies alongside work and family life. In addition, because of these other

obligations, people are more likely to base their decisions of whether to pursue studies or work on their assessment of how the different options will contribute to their lives in the future. Accordingly, young adult students can be expected to evaluate the advantages and disadvantages of different options relative to the time and energy they require. Based on this comparison, they choose activities that they deem more rewarding rather than those that require more effort and are less rewarding (Horstmanshof & Zimitat, 2003). Against this background, many young adults pursue higher education as an investment in the future, based on the belief that the time and effort required will lead to achievement of their goals (Frymier & Shulman, 1995). Future orientation is an important factor in a student's academic achievements (Epel et al., 1999). Young adults with an unstable future orientation and a lack of optimism are liable to drop out of school and have low academic achievements (Simons, Vansteenkiste, Lens, & Lacante, 2004). Horstmanshof and Zimitat (2003) found that the older a student is, the better his or her future orientation; as they mature, students develop more future-focused capabilities, as well as better time management skills and greater independence.

### **Intervention Programs**

In the modern era, higher education has become increasingly important; it has a direct impact on the advancement of the individual in society. The acquisition of higher education may increase the chances of employment and higher wages. It also provides tools with which to maximize one's personal abilities (Schayeck, 2005). Education is key to the advancement of individuals in society (Yaacobi, 2003). This strongly suggests that people with disabilities also need a higher education. Nevertheless, little research has been done on this subject. A number of developments that affect people with disabilities make it all the more important for them to participate in post-secondary education; these include integration of people with disabilities in the community and culture, changes in social awareness, economic changes, and changes in the world of work. Moreover, accelerated technological development is enabling people with disabilities to live relatively independently and to participate in all aspects of life, including employment (David, 2007). Gajar (1998) found that higher education is the key to improving the ability of these people to secure suitable employment. He claimed that adults with special needs are mature enough to address the challenges of higher education. In Israel, as in other countries, several programs have been designed to enable people with disabilities to acquire an education, but little research has been published on this subject.

These programs allow people with special needs the opportunity to experience post-secondary education. With the support of their parents and professionals, working in collaboration with teaching staff, these students can be successful. These arrangements also give young adults with disabilities an opportunity to integrate and form friendships with peers who do not have disabilities. Such programs offer many benefits, primarily because they facilitate the participants' transition into adulthood, by means of interaction with students without disabilities, participation in social and recreational activities, development of relationships with different service providers in the institutions, a sense of independence and capability, and better employment opportunities in the future (Zafft, 2002).

Post-secondary education programs for young adults with disabilities are offered in different settings, including universities, colleges, vocational training centers, and adult schools (Wille-Gregory, Graham, & Hughes, 1995). The program must be effective so that the students do not feel inundated and unable to continue. In addition, the students with disabilities need to learn the skills necessary for dealing with social and academic challenges. Participation requires self-determination and self-esteem; towards this end, students with disabilities should be given the opportunity to select the career directions most interesting to them (Halpern, 1994). It is also important that they choose programs that are consistent with their interests and needs (Mooney, 1996).

The number of students with disabilities, including HFA, who pursue higher education has grown significantly. Therefore it is necessary that these programs have support centers to provide students with social and educational support during their years of study. Teaching students with HFA is a challenge, because the disability is not always apparent. Professors and other students may not always be aware of the disability. Nevertheless, these students must be allowed special accommodations, both physical and instructional, in order to enhance their learning experience (Barnhill, 2014).

### **Approaches to Intervention Programs for People with HFA**

Young adults diagnosed with autism, their families and professionals face the challenge of finding the treatment or intervention that is best suited to their special needs. Despite the many studies conducted in the field and the increasing understanding of autism spectrum disorders, there is no clear-cut conclusion regarding the best intervention.

When institutions for post-secondary education began to accept students with HFA, they did so on the basis of the students' academic ability and the funding they received for serving these students. The leaders of these institutions believed that their student support centers, which dealt with other disabilities, would be able to assist and guide students diagnosed with HFA.

However, it emerged that these students needed a completely different type of support than that required by students with other disabilities. In addition, they also required support in the social and behavioral realms, which the existing student centers could not provide.

In order to become more effective for students with HFA, support centers must recognize the additional adjustments to be made for each student, according to his or her individual needs. In addition, the support centers must understand the importance of assigning a mentor to each student, to provide a continuous channel of communication and emotional support.

Most of the intervention programs available today are based on Skinner's behavioral theory. These are psycho-educational programs that aim to change behavior and teach the participants life skills, for the purpose of improving their learning functions (Mills & Marchant, 2011). Several intensive behavioral treatment (IBT) plans have been developed according to this theory. Such programs are constructed specifically and intensively for each individual, with the purpose of changing his or her patterns. Empirical studies have indicated that such interventions are very effective (Leaf, Taubman, McEachin, Leaf, & Tsuji, 2011).

The aim of the present study was to examine the impact of an intervention program for students with HFA participating in post-secondary studies in a university in Israel on their sense of self-efficacy and their future orientation. The research was based on the growing body of knowledge reviewed earlier in this article. The students participated in an intensive mentor-based intervention program, aimed at providing communication and emotional support. The research hypothesis was that this intervention would positively affect their self-efficacy and their future orientation.

## **Methodology**

### **The Research Population and Research Procedure**

The research sample was comprised of 19 students, aged 23 to 28. Four of the participants were women; the others were men. All had been formally diagnosed with autism spectrum disorder (ASD) and high functioning.

In addition to their studies, the students took part in an intensive intervention program operated by the university's Center for Student Services. The intervention program, overseen by project managers, was designed to assist students in developing social interaction and communication skills by providing them with emotional support. In addition, the dean's office provided academic support to those who needed it. The students who participated in the project shared university-provided housing (dormitories) with their mentors. Students and mentors were expected to

participate in social and skill-building activities together at least three times a week. In the event that a student and mentor did not reside in shared housing, they were expected to work on social skill-building activities at least four times a week. The activities and topics that were addressed varied with the specific needs of the students. In general, these activities addressed communication skills, social interaction, and the like.

Project coordinators provided additional support by meeting with each student and his or her mentor on a weekly basis, to address any questions, comments, or concerns. The project managers, who met with each student once a semester to review expectations and progress, maintained an "open-door policy," so that they were also available to students whenever needed, throughout the semester. In addition, once a month all project participants, including students, mentors, coordinators, and managers met to facilitate positive interactions among all. In addition, workshops were held throughout the year to enhance the students' life skills, including relationship building, personal communication, and daily living skills. Lectures by psychologists were also offered; they were based on areas of interest, as per student requests, in order to help the students develop positive coping skills to address daily life experiences.

For the purpose of the study, the participants completed the same questionnaires twice, pre and post the intervention period (first in July and again in October 2014).

## **Research Tools**

### **Self-Efficacy Assessment Questionnaire**

The Self-Efficacy Assessment Questionnaire (NGSE) (Chen, Gully, and Eden, 2001) was designed to examine the self-efficacy of adults who have cognitive disorders by means of self-report. The respondents are asked to rate their agreement with eight statements on a three-point scale, where 1 indicates "not at all," 2, "to a moderate extent," and 3, "very much." The Hebrew version of the questionnaire, which we used, has been found to have high predictive validity (Chen, Gully, & Eden, 2001).

### **Future Orientation Questionnaire**

The Future Orientation Questionnaire (Seginer, Nurmi, & Poole, 1999) was designed to test motivational, cognitive and behavioral aspects of future orientation regarding various subjects. The questionnaire was customized for a population of adults with cognitive disorders. It is divided into two parts: the first part is comprised of 11 items representing hopes and 11 items representing the respondent's concerns about his or her future; the second part consists of 12 questions about the respondent's studies and 10 about his or her future employment. The questionnaire covers motivational,

cognitive, and behavioral aspects of the two main spheres of their future life: education and employment. The motivation aspect refers to anticipation and self-esteem; the cognitive aspect refers to thoughts about the future; and the behavioral aspect addresses elements of self-inquiry and commitment.

On this questionnaire, the respondents are asked to answer each question on a scale of ranging from 1 ("not at all") to 3 ("very much"). A score of 1 indicates a future orientation that is not active and 3 indicates active future orientation. This questionnaire has been widely used as a valid structure, based on the correlation of future orientation with optimism and pessimism, as well as academic achievements (Seginer, Vermulst, & Shoyer, 2004).

## Results

We hypothesized that the intervention would positively affect both dependent measures, self-efficacy and sense of future orientation. Indeed, the results of the self-report questionnaires indicated higher levels of self-efficacy and future orientation in the second measurement (after the intervention program) compared with the first one. We tested the hypothesis using analysis of variance (repeated measures ANOVA). The test results are presented in Table 1.

Table 1 Future Orientation and Self-Efficacy

	Measurement before intervention program ( <i>N</i> = 19)		Measurement after intervention program ( <i>N</i> = 19)		$F_{(1,18)}$	<i>P</i>	<i>Eta</i> <sup>2</sup>
	M	SD	M	SD			
Self-efficacy	2.35	0.28	2.44	0.22	4.297	.05	0.002
Future orientation	2.18	0.27	2.34	0.23	6.858	.01	0.276

As Table 1 indicates, a significant difference was found between the self-efficacy scores measured in July and those measured in October,  $F(1,18) = 4.297$ ,  $p < .05$ . As hypothesized, a significant difference was also found between the future orientation score measured in July and that measured in October,  $F(1,18) = 6.858$ ,  $p < .01$ . However, no interaction was found between the two variables.

## Discussion and Conclusion

The results of the present study indicated that an intervention program for students diagnosed with HFA contributed significantly in terms of two major variables, self-efficacy and future orientation. The research hypothesis was that an appropriate intervention should lead to improvement in both dependent measures, and the results confirmed this.

The results of previous research in the field of self-efficacy have suggested that HFA students need a completely different type of support than that provided to students with other disabilities. In particular, young adult students with HFA require social and behavioral support. Such support is best provided by a mentor who is in regular contact with the student, in order to continuously promote communication and emotional abilities (Mills & Marchant, 2011). The present research confirmed the importance and effectivity of an intervention program tailored to the needs of students diagnosed with HFA, in order to increase their self-efficacy. Such tailoring requires further investigation.

Bandura (1997) defined perceived self-efficacy as a personal judgment of one's own ability to organize and execute courses of action in order to attain designated goals. A strong relationship between self-efficacy and adaptive coping with learning difficulties has been found to be strongly associated with academic progress (Kurtz-Costes & Schneider, 1994). Bong and Clark (1999) found self-efficacy to be the most consistent predictor of academic success, and the only motivational variable that had a direct impact on that success. Thus, an increase in self-efficacy over time should help promote academic success and realization of one's potential.

The research hypothesis that an intervention program tailored to the needs of students diagnosed with HFA would increase their sense of future orientation was also confirmed. Future orientation is related to how a person makes plans, sets goals, and avoids unwanted situations; it refers to all the individual's thoughts and concerns about the future (Seginer & Mahajna, 2003). In the context of academic studies, future orientation encourages students to undertake tasks and challenges (Finzi-Dottan & Sharon-Garty, 2010). Young adults pursue higher education as an investment, based on belief that the time and effort required will bring them closer to their goals (Frymier & Shulman, 1995). Students with unstable future orientation and lack of optimism can be expected to have difficulty maintaining a grade average and may drop out of their study program (Simons et al., 2004). The results of the present study are consistent with those of Zafft (2002), which indicated that intervention programs enable students with disabilities.

The present findings call attention to the sequence from psycho-educational interventions during the school period to interventions for designed for young adults with HFA who participate in post-secondary studies. Camarena and Sarigiani (2009) found that adolescents with HFA and their parents had clear intentions regarding post-secondary education, but also expressed significant concerns about the ability of post-secondary educational institutions to meet the needs of these young adults. Their analysis indicated that although vocational centers, colleges, and universities have much work to do in this area, families and schools must also play a role

in preparing these students for post-secondary education. Previous research on the successful adjustment of young adults with learning disabilities in institutions of higher education found that those who were doing well possessed awareness, acceptance, and understanding of their disability, but did not see their disability as defining their identity (Spekman, Goldberg, & Herman, 1992).

### **Limitations of this Study and Future Research**

The present research was conducted in one specific university; therefore it is hard to generalize the results. A growing number of universities and colleges are encouraging young adults with high-functioning autism to participate in post-secondary education, and empowering them by means of intervention programs tailored to their needs. Further studies on intervention programs and their implementation could enable the inclusion of a larger number of students in such research, and produce a more valid reflection of the strengths of people with HFA. Such research could also contribute to increased effectiveness of the intervention programs. Future research should be long term, include investigation of pre-academic programs, and compare the long-term outcomes of different models of intervention.

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# Adsorption Of Heavy Metals Onto Wastewater Treatment Plant Sludge

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## Abstract

Heavy metals containing wastewater can cause serious environmental pollution problems for aquatic life. Adsorption is a well-established technique for pollutants removal and activated carbon is a widely used adsorbent material. However, use of activated carbon can be expensive due to the regeneration required and losses in the application processes. Biosorption is a recent technology used to remove heavy metal ions from aqueous solutions. In recent years investigators have studied inexpensive alternative materials for removal of heavy metal from wastewaters. Significant amount of waste sludge is produced in the industrial and municipal waste water treatment plant. Waste sludge disposal is one of the most important problems in the world. The waste activated sludge provides an excellent opportunity for removal of heavy metals by biosorption because of its availability and free use. Usage of the waste sludge as biosorbent was evaluated in this study.

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**Keywords:** Biosorption, Heavy metals, Waste Biosludge

## Introduction

Heavy metals in the wastewater effluents cause serious environmental problems in water body and soil and it has been a great motivation for the increasing number of research on effluent treatment processes (Buema et al., 2013). Heavy metals, which are called trace elements, may negatively affect the soil ecology, agricultural production or quality, and ground water quality (Nazir et al., 2015). The ultimate source of the body trace elements is generally rocks and concentration of trace elements is varying by rock type in the area.

Metal ions can be incorporated into food chains and accumulated in aquatic organisms to a level that affects their physiological state. Due to the trace heavy metals such as Zn, Cu and Fe play a biochemical role in the life processes of all aquatic plants and animals, they are essential in the aquatic environment (Saeed and Shaker, 2008).

The main sources of heavy metals contamination of drinking water are industrial wastes and agriculture activities. Additionally, the old pipe systems in some areas have another source from the corrosion of water pipes (Salem et al., 2000). Pollution of the aquatic environment by heavy metals has been considered a major threat to the aquatic organisms (Saeed and Shaker, 2008). The disposal of wastewater effluents containing heavy metals is related to a great number of industrial processes, such as: electroplating, chemical manufacture, leather tanning, oil refining, mining and mineral processing (Hammamni et al., 2007).

Heavy metals are highly accumulated in sediments than water (Saeed and Shaker, 2008; Hamed, 1998; Nguyena et al. 2005) and they are non-biodegradable. Heavy metals tend to accumulate in organs of aquatic organisms and transfer to consumers, leading to various health problems (Celekli and Bozkurt, 2011; Kumar et al., 2011; Nuhoglu and Oguz, 2003; Salem et al., 2000). Some heavy metals tend to accumulate different organs of fish, for example; the concentration of heavy metals in fish gills and liver is much higher than that in muscles (Saeed and Shaker, 2008; Jobling, 1995).

Because of the serious problem in water environment, heavy metals should be removed from the effluents wastewater. Although, the conventional treatment methods such as chemical precipitations, filtration, ion exchange, evaporation, reverse osmosis, solvent extraction, electrochemical and membrane technologies are widely used for heavy metal separation, these methods are either inefficient or expensive when the water contains trace amounts of heavy metals. Many researchers have been investigated new methods to remove heavy metals in wastewaters (Kumar et al., 2011). Among these process, adsorption is the most widely method to remove heavy metals from water contain trace concentrations of heavy metals.

The activated carbon has been widely used to remove heavy metals from wastewater and waters (Kadirvelu et al. 2001; Karnib et al., 2014; Kobya et al., 2005). Due to the high cost of activated carbon, the application of waste materials has been much attention in last decades (Aslan et al., 2016).

### **Municipal Wastewater Treatment Plants (WWTP)**

Most of the WWTPs contain anaerobic, aerobic and anoxic stages to remove organic and inorganic compounds (mechanical/primary treatment is not considered). A biological treatment process is carried out by microorganisms in suspension or attached to media to remove biodegradable organic material, nitrogen compounds and phosphorous in the wastewaters. Part of the organic material is oxidized to carbon dioxide and other end

products. The remainder of organic materials is converted to microorganisms.

A yield coefficient (Y) of heterotrophic and autotrophic bacteria were proposed between as 0.30–0.58 mg VSS/mg COD (Sykes, 1975; Tchobanoglous et al., 2004) and 0.02–0.12 mg VSS/mg NH<sub>3</sub>-N (Aslan and Gurbuz, 2011; Eckenfelder, 1989; Tchobanoglous et al., 2004).

Significant amount of waste sludge was produced in the WWTP. Dry solids sewage sludge production was about 9 millions tonnes in 2005 (Laurent et al., 2010). The waste sludge management is one of the most important environmental problems in Turkey. After dewatering, dry waste sludge, which contains about 60–70% water, is transferred to a landfill site or incinerated. Landfill deposition increases the costs for the treatment plant because sludge management can reach 60% of total operation costs, even though its volume accounts for only 1–2% of the total volume of treated effluent (Alexandre et al., 2015).

Activated sludge mixture contains mainly floc forming bacteria and protozoa (Jianlong et al., 2000). Bacterial cells (the general empirical formula is C<sub>5</sub>H<sub>7</sub>O<sub>2</sub>N) are highly complex structures containing a variety of carbohydrates, proteins, fats, and nucleic acids, some with very high molecular weights (Rittmann and McCarty, 2001). Bacterial cell walls contain acidic functional groups. Cationic pollutants like heavy metals could be adsorbed onto the walls of cell (Ginn and Fein, 2008). The protozoa are unicellular, motile and relatively large eucaryotic cells that lack cell walls. Bacteria and protozoa can adsorb components through their outer membranes (Jianlong et al., 2000). Comparing with other types of biosorbents, dried sludge of WWTP represents a low cost, easily available and well sedimenting material with a large specific surface area which is suitable for the removal of toxic metals (Remenarova et al., 2012).

In recent years, waste sludge is applied as adsorbent to remove heavy metals in the wastewater. This novel approach is considered as competitive, effective, and cheap (Nuhoglu and Ogus, 2003). Experimental results indicated that it could be successfully applicable dried sludge of wastewater treatment plant for heavy metal adsorption in water solution (Table 1).

Table 1. Heavy metal biosorption onto waste sludge

Heavy metals	$q_e$ (mg heavy metal/g adsorbent)	References
$Cr^{6+}$	86.2	
$Cd^{2+}$	37.3	Ozdemir et al. (2003)
$Cu^{2+}$	32.6	
$Cd^{2+}$	157	Pagnanelli et al. (2009)
$Pb^{2+}$	30.2	
$Cd^{2+}$	57.3	Remenarova et al. (2012)
$Zn^{2+}$	35.2	
$Zn^{2+}$	17.86	Yang et al. (2010)
$Cu^{2+}$	18.9	
$Cd^{2+}$	28.1	
$Zn^{2+}$	15.7	Hammami et al. (2007)
$Ni^{2+}$	8.8	
$Pb^{2+}$	143	
$Cd^{2+}$	107.6	Laurent et al. (2010)
$Cu^{2+}$	156	Pamukoglu and Kargi (2006)
$Zn^{2+}$	82	Kargi and Cikla (2006)
$Zn^{2+}$	5.9	Bux et al. (1999)
$Cu^{2+}$	294	Gulnaz et al., (2005)
$Cu^{2+}$	87.7	Wang et al. (2006)
$Pb^{2+}$	131.6	
$Cu^{2+}$	18.4	
$Cd^{2+}$	9.6	Ong et al. (2013)
$Ni^{2+}$	18.6	

The dead cell contains organic and inorganic matters and experimental results indicated that organic and inorganic compounds such as organic matter,  $NH_4-N$ ,  $Ca^{2+}$  and  $Mg^{2+}$  are released from the cell into the water solution (Aslan et al., 2016; Aslan and Topcu, 2015; Laurent et al., 2010). Temperature and pHs of the solution affect the concentrations of released compounds in the water.

## Conclusion

Wastewater sludge disposal is a big problem in the world. Land application, land filling and incineration are widely applied for sludge disposal. However, these methods cause various environmental problems. Laboratory studies indicated that waste sludge after drying successfully applied for heavy metal removal.

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## **Total Joint Arthroplasty In Patients With Liver Cirrhosis: A Systematic Review**

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### **Abstract**

**Background:** Total hip arthroplasties (THAs) and total knee arthroplasties (TKAs) have proven themselves as effective surgical procedures. As a result, the number of such procedures performed is increasing. It is also likely that more cirrhotic patients will undergo THA or TKA.

**Purpose:** We performed a systematic review to assess periprosthetic joint complications, infections, mortality, and the outcome of total joint arthroplasties in patients diagnosed with cirrhosis.

**Material and Methods:** We researched Medline, EMBASE, and Cochrane databases to identify eligible prospective studies. This yielded 346 unique articles. 27 of these articles fit the inclusion criteria, and 7 articles remained eligible after in-depth reading. Demographic characteristics, adverse events, and clinical outcomes were manually extracted from the selected studies.

**Results:** The 7 studies included a total of 2724 TJA of which 1276 were THA and 1448 were THK. 3 studies provided data on the severity of cirrhosis using Child-Turcotte-Pugh. 4.7 % of perioperative complications occurred in class A, 50% in class B, and 100% in class C with a mortality rate of 66.6%. 5 studies provided data on short term (30 days) mortality after TJA. Therefore, these studies showed that mortality in patients with cirrhosis, undergoing TJA, is greater than in noncirrhotic patients (1.13% vs 0.17%). The rate of infection varied from 3.1% to 22% in cirrhotic patients and 0.7% to 1.4% in non-cirrhotic patients.

**Conclusion:** This present systematic review shows that total joint arthroplasty surgery of patients with cirrhosis results in increased postoperative morbidity and mortality compared to similar surgeries for non-cirrhotic patients.

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**Keywords:** Arthroplasty, cirrhosis, complications

## **Introduction**

Liver Cirrhosis is the common end stage of all chronic liver diseases. It is characterized by an irreversible diffuse fibrosis and the formation of nodules after hepatocellular necrosis. Chronic viral infections, especially the hepatitis B virus (HBV) and the hepatitis C virus (HCV), are among the important etiologies of cirrhosis. Excessive alcohol consumption, which is a major cause of osteonecrosis of the femoral head, also plays an important role in the development of cirrhosis. With the increasing prevalence of these conditions and improved survival associated with modern medical care, surgeons are increasingly treating patients with concomitant liver cirrhosis (Pramoosinsup, 2002; Sung, 1997).

Total hip arthroplasties (THAs) and total knee arthroplasties (TKAs) have proven themselves as effective surgical procedures. As a result, the number of these joint arthroplasties performed is increasing. It is also likely that more patients with cirrhosis will undergo THA or TKA. For patient care and economic reasons, there has been an increasing interest in identifying risk factors for complications and poor outcomes, especially in cirrhotic individuals with portal hypertension, hyperdynamic circulation, coagulopathy, and acquired immune deficiencies (Paxton et al., 2010). However, there is little information in literature about the results of joint arthroplasty in patients with liver cirrhosis. In general, these studies performed on small case series agreed that patients with cirrhosis had higher rates of periprosthetic joint infections and increased rate of hospitalization. However, there was limited evaluation of risk factors.

Cirrhotic patients undergoing surgical procedures (especially orthopedic surgery) are at a greater risk of complications and mortality than patients without liver cirrhosis. Based on this fact, we performed a systematic review to assess periprosthetic joint complications, including infections, length of hospitalization, hospital readmission rates, mortality, and the outcome of total joint arthroplasties in groups of patients diagnosed with liver cirrhosis.

## **I.**

### **Material and Methods**

Before commencing a comprehensive literature review for relevant studies, certain eligibility criteria were defined. Papers dealing with patients with liver cirrhosis, regardless of etiology and which were diagnosed before undergoing a total joint arthroplasty intervention, were considered eligible for inclusion in the present study. Experimental or animal studies, case reports, letters to editors, papers containing less than 10 subjects, papers with no specified follow up time or papers dealing with cirrhotic patients

undergoing a surgical intervention other than knee or hip arthroplasty were excluded.

Two independent reviewers performed a systematic query of the literature available on Medline, EMBASE, and Cochrane databases to identify articles containing the keywords and Boolean operators: “hip replacement,” “osteoarthritis,” “total joint arthroplasty,” and “cirroshis.” There was no limitation on language or publication status.

The research was performed in March 2016, and all studies published prior to that date were considered and reviewed. In addition to this primary literature research, we performed a secondary research by scrutinizing all references cited in the articles retrieved from the primary research and identified additional studies of interest. Each reviewer was compartmentalized, such that they were not aware of the others' determination.

The initial combined searches with the aforementioned keywords yielded 346 unique articles. Articles whose titles indicated that they were irrelevant to the topic in question were eliminated. The abstracts of the remaining articles were subsequently reviewed independently. Articles that did not meet the inclusion criteria on the basis of the information contained in the title and abstract were eliminated. Therefore, this amounted to 319 articles. The abstracts of the remaining 27 articles were determined to meet the inclusion criteria by at least one reviewer, and the corresponding full text was again reviewed independently. After reviewing the full text, 21 articles were eliminated unanimously by both authors because they failed to meet the inclusion criteria. The remaining 6 articles from the primary search were retained. At each phase of the review, if one author selected an article, it was moved on to the next phase. In the final phase of review (full text), there was no disagreement regarding which article should be ultimately included. Finally, we performed a manual search for the works included in the reference lists of the articles selected for in-depth analysis. Furthermore, there was 1 additional article identified in this secondary research that met the inclusion criteria. Figure 1 shows the flowchart corresponding to the article selection process.

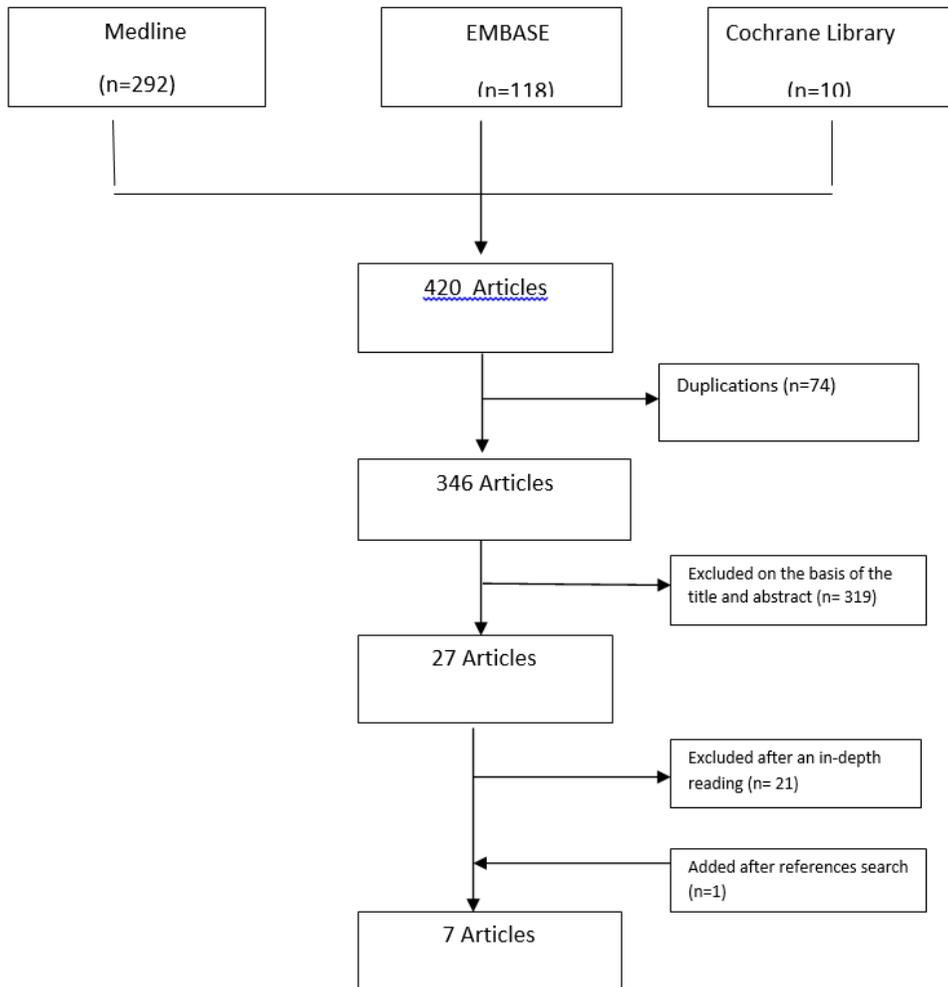


Figure 1. Flow chart of articles included

Study quality was assessed by considering controls for bias, confounding, and chance within each study as suggested by the MOOSE group for meta-analysis of observational studies (Stroup et al., 2000). Although some rudimentary statistical analyses were used, no study used logistic regression to control confounding factors. No blinding was used, and no controls for selection bias were present in controlling the sample population.

The outcomes, design and (in many cases) the study population of each study, were too heterogeneous to compare directly even with random effects models. To remedy this, we used data from individual studies to generate statistics. In cases where the data in some of the studies were similar, we pooled together the results and statistics which were generated. To test the hypotheses within each individual study that the findings were

independent of etiology versus the alternative that they were related, the Chi square test with Yates correction or the Fisher's exact test was used. These statistics were calculated using Java stat two-way contingency table analyses.

## Results

In total, 27 full-text studies were retrieved. Of these, 7 studies were eligible for inclusion in the systematic review (Figure 1). Three studies were designed as case control investigations, and four were cohort studies. Two studies were published in 2003 and 2005, while the remaining 5 were published between 2010 and 2014.

Table 1 summarizes the characteristics of the included studies. The 7 studies included for final analysis included an aggregated total of 2724 total joint arthroplasty (TJA). Out of it, 1276 were the total hip arthroplasty (THA) and 1448 were the total knee arthroplasty (THK). There were 1376 males and 1341 females with a mean age of  $60.57 \pm 7.27$  years. Follow-up ranged from 1 to 52 months.

Table 1. Descriptive Characteristics of Component Studies

Study Country	Publication date	Cases	Type of study	Age	Gender	FU (months)	Type of surgery: number
Deleuran et al., Denmark	2014	363	Case Control	66	196 M/167 F	12	THA: 211 TKA: 152
Hsieh et al., Taiwan	2003	45	Chort	$55.2 \pm 10.3$	29 M/9 F	24	THA: 45
Tibieri et al., USA	2014	115	Case Control	62.9	59 M/65 F	52	THA: 60 TKA: 55
Shirley et al., USA	2014	2109	Case Control	$66.2 \pm 12.6$	1018 M/1091 F	6	THA: 1018 TKA: 1091
Young-Wan et al., South Korea	2007	30	Cohort	60 (15-63)	26 M/4 F	1	THA: 30
Hsieh et al., Taiwan	2010	33	Cohort	47 (29-73)	24 M/9 F	36	THA: 33
Cohen et al., USA	2005	29	Case Control	$66.7 \pm 10.7$	24 M/5 F	1	THA: 19 TKA: 10

Abbreviations: THA, total hip arthroplasty; TKA, total knee arthroplasty; FU, follow-up; M, male; F, female.

Table 2. Postoperative Complications

Study	Types of complications	Follow up (days)	Rate of complication	
			Cirrhotic patience	Noncirrhotic patience
Cohen et al.	Cardiovascular events deep Venous thrombosis renal failure Pulmonary embolus systemic Infection Joint dislocation Deepi nfection Intra-articular bleeding Hematoma	90	20.7% (6)	3.23% (3)
Deleuran et al.	Infection Liver failure Acute renal failure Venous thromboembolism Cardiovascular disease Hip dislocation Mechanical complications	30	19.0% (69)	10% (10915)
Tibieri et al.	Urinary tract infection Acute renal failure Gastrointestinal hemorrhage Surgical complications (infection, dislocation, reoperation, revision)	30	25.0% (29)	4% (5)
Hsieh et al.	Pneumonia Wound infection Acute renal failure Bleeding oesophageal varices Urinary tract infection Peritonitis Septicaemia of unknown cause Deteriorating encephalopathy Congestive heart failure Stroke	30	26.7% (12)	
Young-Wan et al.	Wound infection Operative site bleeding Coagulopathy Encephalopathy Gastrointestinal bleeding Pneumonia	30	26.7% (8)	

A total of 3 (Hsieh et al., 2003; Moon et al., 2007; Cohen, Te HS & Levitsky, 2005) studies provided data on the severity of cirrhosis using the Child-Turcotte-Pugh (CTP) scoring system with a total of 104 cases. Liver cirrhosis severity was assessed using the CTP scoring system. 68 (70.7%) was the score for A, 30 (31%) was the score for B, and 6 (6.3%) was the score for C. Consequently, 26 (27.0%) of the 104 patients had one or more perioperative complications. Perioperative complications occurred in 7 (4.7%) of 68 [class A cirrhotics], 13 (50%) of 26 [class B], and 6 (100%) out

of 6 [class C]. Thus, among class C cirrhotic patients, the perioperative complications over 30 days was 100% and mortality rate was 66.6% (4 out of 6). Using Chi square statistical test, we searched for a possible association between the severity of cirrhosis and the appearance of perioperative complications. However, we found that decompensated cirrhosis (Child-Turcotte-Pugh B or C) is statistically associated with perioperative complications (P value <0.0001).

We identified 5 (Deleuran et al., 2015; Tiberi et al., 2014; Jiang, Schairer & Bozic, 2014; Moon et al., 2007; Cohen, Te HS & Levitsky, 2005) studies that reported the incidence of deep prosthetic infection after TJA surgery. These studies showed large variations in their study methodology. In particular, the follow-up period varied greatly among them. One study investigated the incidence of deep prosthetic infection in the first 90 days postoperatively, reporting incidence estimates of 4% (Tiberi et al., 2014). Another study (Deleuran et al., 2015) reported, for the first year, an estimate of 3.1% vs. 1.4% in noncirrhotic patience. Furthermore, one study (Jiang, Schairer & Bozic, 2014) showed that the rate of periprosthetic joint infections within 6 months of TJA was greater among patients with liver cirrhosis. 3.7% vs 0.7% HR 5.4 was for patients without hip fracture who underwent THA. Also, 2.7 vs. 0.8 HR 3.3 was for patients who underwent TKA. However, the difference was most pronounced for patients undergoing THAs to treat hip fractures 6.3% vs 1.1% HR 5.8. Only 2 studies, which had a lower number of subjects, provided estimates for time periods of up to and beyond 1 year of 22.2% (Hsieh et al., 2010) and 1.18% (Cohen, Te HS & Levitsky, 2005).

**Table 3.** Intraoperative Blood loss and Operation Frequency: Variables compared in Patients with and without Liver Cirrhosis

	Blood loss (P value)	Operative time (P value)
Cohen et al. USA	0.024*	0.014*
Young-Wan et al. South Korea	0.71	0.27
Hsieh et al. Taiwan	0.041*	0.08

\*significant statistical association

According to the type of anesthesia, 3 studies (Deleuran et al., 2015; Hsieh et al., 2003; Cohen, Te HS & Levitsky, 2005) with a combined number of cases of 437 provided data regarding this data. 34% (149) of the interventions were performed in spinal anesthesia and 66% (288) in general.

Regarding mortality, 5 studies (Deleuran et al., 2015; Hsieh et al., 2003; Tiberi et al., 2014; Jiang, Schairer & Bozic, 2014; Cohen, Te HS & Levitsky, 2005) provided data on short term (30 days) mortality after TJA.

Meta-analysis showed that mortality in patients with cirrhosis, undergoing TJA, is greater than in noncirrhotic patients (1.13% vs 0.17%). The most frequent causes of death reported were liver failure and hepatic encephalopathy, pulmonary edema, pulmonary embolism, renal failure and cardiac arrest. We analyzed these data using Chi square test, and we found a significant association between mortality and the presence of liver cirrhosis: P value <0.001, with an OR: 6.76 at a 95% IC (4.679 to 9.793).

## Discussion

Previously published studies have reported a high perioperative risk in patients with liver cirrhosis undergoing general surgery, such as elective abdominal surgery (Aranha, Sontag & Greenlee, 1982; Garrison et al., 1984; Lehnert & Herfarth, 1993; Mansour et al., 1997), thoracotomy (Ueda et al., 1994), and trauma operations (Demetriades et al., 2004; Tinkoff et al., 1990). However, little information is available on clinical outcomes following orthopedic surgery in this group of patients. Ziser et al, in their retrospective review of 733 cirrhotic patients undergoing any type of surgical procedure, reported a perioperative total complication rate of 30.1%. Also, they noted that patients undergoing major orthopedic procedures including hip surgery, spine fusions and operations for long bone fractures had a substantially higher perioperative complication rate than patients undergoing non-orthopedic surgery (Ziser et al., 1999).

The results of this systematic review show that total joint arthroplasty surgery of patients with cirrhosis resulted in increased postoperative morbidity and mortality compared to similar surgeries for non-cirrhotic patients.

CTP score was shown to be predictive of postoperative morbidity and mortality in these patients. Patients with CTP A or B cirrhosis were shown to undergo TJA surgery with slightly increased morbidity and mortality compared to non-cirrhotic patients. However, those who had CTP grade C cirrhosis had a very high risk of postoperative death. Literature on orthopaedic surgery in cirrhotic patients is scarce. Quality assessment of the studies showed that studies with the highest level of evidence often did not provide data on the severity of cirrhosis expressed in CTP scores. Therefore, only morbidity and mortality rates for patients with cirrhosis compared to non-cirrhotic patients could be extracted from the literature. Studies that provided clinical data on CTP were retrospective, limited in sample size, and prone to patient selection, resulting in lower levels of evidence. All these studies, however, did show worse outcomes for patients with more severe cirrhosis. Future studies should focus on risk assessment for TJA surgical procedures related to MELD or CTP scores of patients to improve decision-making and patient counseling.

Two of the reviewed articles assessed the role of elective/emergent interventions as a risk factor for possible complications in patients with liver cirrhosis. Therefore, Cohen et al investigated the operative risk of hip and knee arthroplasties in cirrhotic population. However, they found that the poor prognosis of cirrhotic patients was mainly attributable to those patients receiving emergency surgery. They concluded that the mortality occurred only in the emergency group. Also, comparing the elective and emergency groups for hip arthroplasties, authors demonstrated significantly more blood transfusions and estimated operative blood loss, longer operative time and length of hospital stay, more complications, and liver decompensation in the emergency group. In addition to this study, Shirley and co found out that hip fractures, solved by emergency intervention, were more common in patients with liver cirrhosis. In addition, they found a higher risk of periprosthetic joint infections in cirrhotic patients with fractures and therefore a higher readmission rate in this study group.

We acknowledge several limitations of this study. First, the insufficient literature data on this subject. It is known that in cirrhotic patients, portal hypertension, hyperdynamic circulation, and acquired immune deficiency are associated with an increased risk of complications after abdominal surgery (Hsieh et al., 2010). Notwithstanding, little data exists on orthopaedic surgery. Second, any study that investigated the outcomes of an orthopaedic procedure that was not an arthroplasty was excluded. As a result, published knowledge concerning certain subset of orthopedic procedures was not included in the final review. Third, due to the substantial heterogeneity of the included studies in terms of reported outcome measures, patient population, stratification of patient factors, follow-up intervals, and study design, it was not possible to perform rigorous quantitative analyses such as a meta-analysis. Fourth, different orthopedic procedures were not equally represented in literature, with 3 included studies performed only on patients undergoing TKA and 4 studies evaluating the outcomes of either TKA or THA.

It is known that orthopedic surgeons are reluctant to perform arthroplasties in patients with cirrhosis, who have a high risk of postoperative complications (Deleurean et al., 2016). However, we believe that this study will provide a novel and important insight into the current state of available literature concerning the rate of perioperative complication after THAs and TKAs in patients with cirrhosis of the liver.

## **Conclusion**

In conclusion, the results of this systematic review and meta-analysis show that total joint arthroplasty surgery for patients with cirrhosis resulted in

increased postoperative morbidity and mortality compared to similar surgery for non-cirrhotic patients.

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# Private Higher Education In Latvia: Funding And Quality Assurance

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## Abstract

In today's globalizing world the importance of education as an important factor of the development of economy and society in general is increasingly growing. Investing in education now becomes essential for the creation of a long-term economic growth potential and an adequate respond to technological and demographic changes that have a transformative impact on labor markets and employment. The important component of the higher education systems of many countries is formed by private higher education institutions, although in each case they have national specifics. On the one hand, private education has been recognized as such, on the other hand it has not been fully determined yet what place it should occupy as a private actor. The answer to this question largely depends on the ideology and specific policy in the reforms of individual countries.

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**Keywords:** Private higher education, funding, quality assurance

## Introduction

In recent years, the issues of education have been actively discussed not only at national levels but also at the world level. Today, the problems in education are studied by such international organizations as UNESCO, Organization for Economic Cooperation and Development (OECD), the World Bank, WTO and others. It is perfectly obvious that investment in education and economic growth are inextricably linked.

Recently the problems of balance between individual and social meaning of education have also been actively discussed: whether higher education is a “public good” or it only serves the needs of upward social mobility and material well-being of an individual. Central to the debate remains the question of determining the optimum relationship of public and private funding of higher education. A significant proportion of private funding of education is provided by private educational institutions (Zaretskaya S., 2005).

Today private higher education institutions undergo difficulties inherent in the entire system of education. The development of the private higher education sector is heavily reliant on the financial stability of a private education institution which guarantees the opportunity to receive a quality education. It so happened that private higher education institutions (HEI) in the vast majority of cases operate at the expense of funds paid by students for tuition. In recent years, the demographic decline has occurred in many countries, which has played a significant role in reducing the demand for private education. Some programs have ceased to recruit the necessary number of students; some private HEI were closed or were subjected to a merge or integration with other private HEI.

The second problem facing private HEI today is related to the issues of quality assurance of education. If a HEI has been accredited by the state, it means it is responsible for the quality of provided education. However, practice shows that the introduction of strict licensing standards and mandatory accreditation often puts the public sector of higher education in more favorable conditions. Often external experts “take” public HEI as a standard and evaluate private HEI in terms of indicators obtained in state HEI and programs. And yet can private educational institutions ensure conditions for quality specialist education with available financial resources?

Today in order to hold positions and retain their place in the system of education private HEI need to exert more effort and search for a policy based on the development of those fundamental advantages that they possess. The external conditions in which they operate are also vitally important. The leading subject of the social policy in the sphere of education is the state. The processes taking place in the educational space of high school are largely determined by its actions. If the state is unable to provide funding of education in sufficient volumes, it should create conditions favorable to the development of higher educational institutions of all forms of ownership.

Unfortunately, private higher education sector continues to be relatively invisible within public debates of higher education, and within the higher education research literature. This article attempts to address the problems of financial security of private HEI in Latvia in terms of their impact on processes and quality assurance of education.

**The goal of research** - based on the analysis of the private higher education system in Latvia to determine measures which will ensure the financial sustainability of HEI which in turn will ensure the quality of education.

**The objectives of research** - to achieve the set goal of research the following objectives have been identified:

- to consider the specifics of private education and its distinction from public education;
- to conduct the analysis of the status of the private higher education system in Latvia;
- to identify the main financial strategies for the sustainable development of higher educational institutions in Latvia.

The **object of research** – the system of private higher education in Latvia.

### **Features of private education**

Private higher education is both an old and a new reality. Many of the earliest universities established were non-governmental initiatives. Even when founded by royal or papal decree, these were normally autonomous institutions from a material and organizational point of view. Many of the earliest universities were established by the Catholic Church and could be regarded in many ways as private institutions. However, those universities were not fully 'private' in the way the term is currently understood. They had a public orientation and were significantly controlled by religious and secular authorities.

In the last decades higher education has been experiencing a notable growth of the private sector worldwide. There are several important reasons explaining this global expansion of private higher education. 1. One of the major reasons has been the growing role of market forces due to the crisis of the welfare state in the 70's and 80's, which severely reduced the capabilities of governments to finance higher education. 2. Higher education has been increasingly placed under pressure to become more adaptable and responsive to social and economic needs. Private institutions are expected to demonstrate greater adaptability and competitiveness that may enhance the external efficiency of the higher education system. 3. The pressure for greater responsiveness has become even more significant due to the global trends towards mass higher education. Even in countries with low per capita income, the aim to enrol higher and higher proportions of the younger cohorts has claimed a higher priority in national policy agendas.

Thus, from the mid-1980s the majority of national systems of higher education encountered two contradictory trends: the growing demand for educational services from the society on the one hand, and the reduction of budget funds allocated by the society for the development of these systems on the other hand. Initially private HEI reclaimed the niches not occupied by public HEI, exhibiting a high innovation activity at that. It is not without reason that most private HEI are of humanitarian and economic specialization. Today all these niches have been reclaimed as the system of

public education also refocused on training of economists, lawyers, psychologists and other specialists in demand.

So what do we mean today by private higher education and how it differs from the public one? The research conducted under the auspices of UNESCO marks the following four dimensions clarifying the notion of “private” in higher education (Gilani et al., 2007):

(1) Source of funding. How are the expenditures of the higher education institution funded?

(2) Ownership. Who owns the institutions? That is, who has the right to the residual profit?

(3) Autonomy. The quantum of academic and administrative autonomy granted to the institution.

(4) For-profit or not. To what extent is the institution seeking profits (regardless of its formal legal definition)?

### **Private higher education institutions in Latvia**

The system of higher education in Latvia consists of two subsystems: public and private education. Regardless of the legal status their activities are regulated on the basis of the Constitution of the Republic of Latvia, the Law on education, the Law on scientific activity, the Law on institutions of higher education and other normative acts and constitutions of corresponding higher education institutions.

According to Article 3 of the Law “On Institutions of Higher Education” higher education institutions are institutions of higher education and science, which carry out academic and professional training programs, and are engaged in science, research and artistic creation (Latvian Law on Institutions of Higher Education; stay in force 1995, December 1.). Higher education institutions may be established by the State as well as by other legal and natural persons. Established by private individuals higher education institutions and colleges are commercial enterprises or establishments, which operate according to the Commercial Law and the Law on Associations and Foundation.

Higher education institutions are financed by their founders. The financial resources of public higher education institutions (HEI) are formed by the state budget funds and by other income earned by HEI in the implementation of activities laid down in their constitutions as objectives. The founder of a HEI provides financial means necessary for the continuous activity of the HEI, including implementation of certain set goals, and exercises control over the spending. A HEI is entitled to obtain and use donations and gifts from banks and other credit institutions as well as organizations and individuals. A HEI is entitled to obtain and use loans from

banks and other credit institutions. The structure of the financial resources of a HEI is determined by its Senate.

Legislation regulates the cooperation of HEI with public agencies with a view to harmonize the autonomy of HEI with the interests of the society and the state.

In the academic year 2015/2016, 17 public and 14 private HEIs functioned in Latvia, where they enrolled 57,027 and 16,477 students respectively (private HEI enrolled 22.42% of all students).

Table 1. The number of students enrolled in Latvian HEI and colleges  
Source: Ministry of Education and Science, Republic of Latvia (2009-2014)

	2009/10 ac.year	2010/11 ac.year	2011/12 ac.year	2012/13 ac.year	2013/14 ac.year	2014/15a.c.year	2015/16 ac.year
<i>Public higher educational institutions and colleges</i>							
<i>Public HEI</i>	70688	66332	62084	61624	58462	56723	57027
<i>Including fee-paying education</i>	41558	35971	32009	31557	28619	26824	26920
<i>Public colleges</i>	7005	6957	7080	7088	6948	6733	6599
<i>Including fee-paying education</i>	1957	2273	2409	2361	2300	1968	1882
<i>Private HEI and colleges</i>							
<i>Private HEI</i>	29372	25575	22634	20120	18502	17223	16477
<i>Including state-funded places</i>	25	287	122	60	55	58	49
<i>Private colleges</i>	5490	4918	5237	5642	5751	5202	4179
<i>Total numbers</i>							
<i>Total number of students</i>	112555	103782	97035	94474	89663	85881	84282
<i>Including fee-paying education</i>	78352	68450	62167	59620	55117	51159	49401
<i>Including the proportion of fee-paying education in %</i>	70	66	64	63	61	60	59

The analysis of statistics allows drawing a conclusion that the market of higher education in Latvia developed steadily in its both sectors - public and private. However, its development was influenced by global as well as local factors, which led to a decrease in the number of students enrolled. In particular, a sharp decline in the birth rate in the early 1990s produced “a demographic depression” when 20 years passed, which led to a decrease in the number of prospective students. The aging of the population, migration of potential students to other countries and Latvia’s accession to the Bologna Declaration also negatively affected the development of the higher education market in Latvia as it opened the borders and made it possible to study abroad.

Table 2. Private higher education institutions in Latvia

	HEI	Legal status	Degrees of education				Number of students	
			Bachelor’s program		Master’s program			Doctoral program
			academic	vocational	academic	vocational		
<u>1</u>	<u>BSA</u>	<u>Ltd.</u>					<u>2670</u>	
<u>2</u>	<u>BAT</u>	<u>Ltd.</u>					<u>4181</u>	
<u>3</u>	<u>EKA</u>	<u>Ltd.</u>					<u>1001</u>	
<u>4</u>	<u>ISMA</u>	<u>Ltd.</u>					<u>1341</u>	
<u>5</u>	<u>RSEBAA</u>	<u>Ltd.</u>					<u>2766</u>	
<u>6</u>	<u>TSI</u>	<u>Stock company</u>					<u>2595</u>	
<u>7</u>	<u>REA</u>	<u>Foundation</u>					<u>501</u>	
<u>8</u>	<u>RAI</u>	<u>Stock company</u>					<u>425</u>	
<u>9</u>	<u>RJA</u>	<u>Ltd.</u>					<u>448</u>	
<u>10</u>	<u>ETA*</u>	<u>Ltd.</u>					<u>197</u>	
<u>11</u>	<u>SPPA</u>	<u>Ltd.</u>					<u>58</u>	
<u>12</u>	<u>LKrA</u>	<u>Ltd</u>					<u>141</u>	
<u>13</u>	<u>RARZI</u>	<u>Foundation</u>					<u>89</u>	
<u>14</u>	<u>LA</u>	<u>Foundation</u>					<u>52</u>	

\* - state accredited up to 17.12.2015. Source: developed by the authors

Among the 14 private HEI in Latvia, 11 HEI are commercial companies with the right to make and distribute profit, 10 HEI have the status of limited liability companies and 1 is a joint stock company. 3 HEI are registered as non-profit institutions, without the right to earn a profit.

### **Funding of higher education in Latvia**

In modern conditions the funding of education is provided according to several models. The choice of a model depends on the level of the economic development of state, social parities in access to quality education,

the public attitude to education, existing historical traditions, and the importance of segments of education for the state.

In practice the following several models of the funding of education have developed:

- the model based on public funding;
- the model based on crediting the education of a borrower;
- the model based on the provision of educational loans within the frames of target state programs;
- the model based on private funding;
- the mixed model (e.g., public-private partnership).

In Latvia currently the mixed model predominates, which combines public and private funding. In both cases, additional sources of finance are the EU funds and other income (e.g., from the lease of property, publishing activity, etc.).

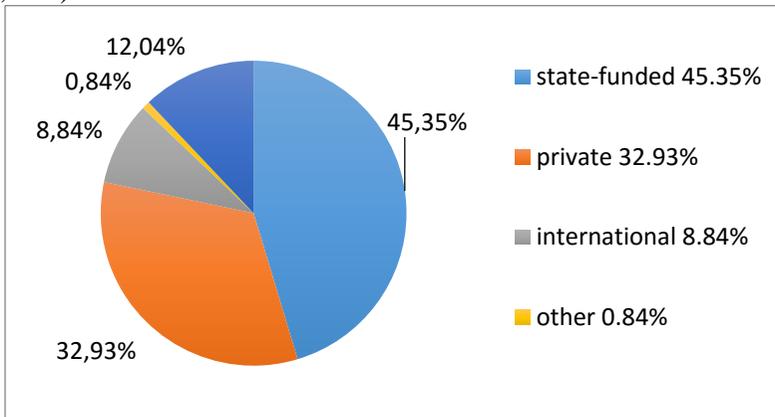


Figure 1 Funding of higher education in Latvia according to the sources of 2009 (in %).  
Source: Ministry of Education and Science, Republic of Latvia (2009-2014)

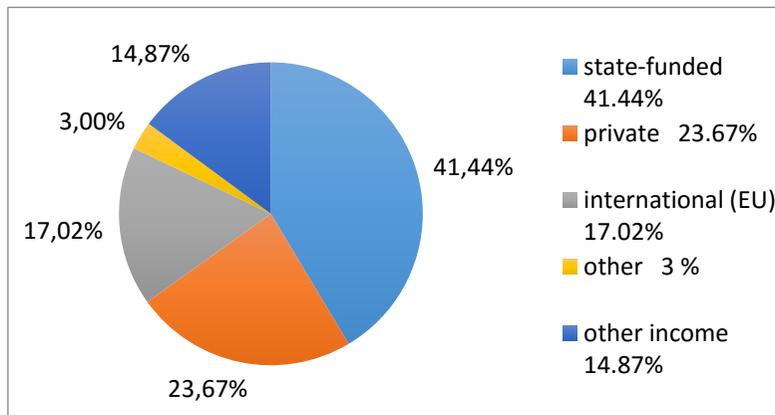


Figure 2 Funding of higher education in Latvia according to the sources of 2014 (in %).  
Source: Ministry of Education and Science, Republic of Latvia (2009-2014)

The largest share of education funding is provided by the state, but its specific weight in the system of education is decreasing. The same trend is characteristic of private funding. This is due to two main reasons: the demographic decline and the decrease in the solvency of general public. The upward trend is characteristic of two items of income: international funding and other income. These trends can be explained by the improvement of the efficiency of educational institutions and increasing possibilities of using the European funds.

However, the comparative analysis of funding in the public and private sectors shows a steady downward trend in the income of the private sector. This leads to a decrease in private HEI financial stability, which negatively affects the conditions necessary for provision of quality specialist education and training. The amount of funds allocated per student in public HEI is much higher than that in private HEI.

Table 3. Higher education funding in Latvia (million EUR)

	2009	2010	2011	2012	2013	2014
<i>Public HEI and colleges</i>	227.66	266.22	267.22	273.2	*	260.1
<i>Private HEI and colleges</i>	42.83	39.98	37.42	38.0	*	33.1
<i>Funding of higher education, in total</i>	270.49	306.20	304.64	311.2	*	293.2
<i>% of GDP</i>	1.4 %	1.5 %	1.5 %	1.4 %	*	1.2%

\*no information published. Source: Ministry of Education and Science, Republic of Latvia (2009-2014)

In this connection the need to establish a mechanism and conditions ensuring the financial sustainability of private HEI for provision of quality education is urgent.

### **Financial aspects of the quality education**

At the present stage of development of the higher education system in Latvia one of the main priorities is the assurance of the quality of education. On the one hand, this tendency is explained by the increase of the degree of HEI autonomy in European countries. On the other hand, the government requires a larger extent of accountability of HEI because of the need to achieve national goals. This feature of public administration is often seen as the development of “valuation” role of the state.

One of the important aspects of quality assurance in higher education is its financial component. “Standards and Guidelines for Quality Assurance in the European Higher Education Area”, developed by the European Association for Quality Assurance in Higher Education ENQA, specify that

educational institutions should ensure the availability of adequate and affordable learning resources and student support services relevant to educational goals.

Among the criteria for assessment of the quality of education the regulations of the Cabinet of Ministers of the Republic of Latvia № 668 “Regulations of accreditation of higher educational institutions, colleges and study directions” determine the continuum of sustainable development, including information on the size, justification and sources of funding (public budget funding, revenues from tuition fees, scientific research financing, other financing); Other important aspects are whether the development plans of a HEI or college include a financial perspective program, whether the annual internal self-evaluation of further development of a HEI is conducted including academic resources, material and technical resources and financial security.

The required quality of education can be provided by a proper amount of financial resources. The adequacy of funding is characterized by several criteria: its amount should allow providing favorable conditions for the implementation of educational standards, and maintaining a stable and efficient financial and economic activity of a HEI in the competitive business environment. The achievement of these criteria will make it possible to solve several problems: on the one hand, to fulfill the demand of the society for education and training of highly skilled professionals, on the other hand, to recover the costs of their training, but this is a market challenge.

In 2010 the European Consortium for Accreditation published a debatable article in which ECA member expert group raised the issue about the current biased attitude to private HEI during accreditation and quality assurance procedures (Dittrich & Weck-Hannemann, 2010). In the result of the conducted investigation recommendations were developed for national accreditation and quality assurance agencies. The conclusions made by ECA, were as follows:

In almost all European countries private higher education institutions form a considerable part of the Higher Education sector. But despite this in almost all countries the ECA members are confronted with the existence of (a considerable number of) private higher education institutions. The rules for evaluating or accrediting them or their programmes in general are not different from those for public higher education institutions, and there doesn't seem to be a legal need to do so. But due to the special situation of the private ones, some specific risks can be identified. One of them, serious risk is caused by the necessity of the private higher education institutions in spending their money. This problem exists and might be more risky in those circumstances where owners want a short term return on their investments. For example, the quantity and quality of the staff, especially in those

circumstances where staff consists of “flying faculty”: the flexibility due to the changing number of students often leads to very small contracts, which gives a problem for the coherence in courses and programmes. Other specific category of risk is the possible lack of financial possibilities to achieve the level of education and research that is needed.

Thus, summarizing the above, we can conclude that financial aspects of quality assurance stand for providing the necessary amount of financial resources for achievement of strategic objectives on the one hand and for the target expenditure of funds in the amount necessary for achievement of the key performance indicators characteristic of quality education on the other hand.

Currently, there is no uniform method of budgeting income and expenses of an educational institution, which may be applied to both public and private educational institutions. This is due to the differences in legislation governing the financial activities of public and private HEI. A uniform policy would allow achieving transparency and comparability of the information on funding and spending on educational goals of HEI with any form of ownership. Thus, private HEI would be motivated to invest not only in the events ensuring the profitability, but also in increasing the quality component of the educational process.

## **Conclusion**

Private education occupies a stable place in the system of higher education. Nowadays there are serious prospects for raising the prestige of private higher educational institutions that would meet the most stringent requirements and provide conditions for quality education. The content of educational activities in both public and private institutions of higher education is governed by the state standard and controlled through licensing procedures, certification and accreditation. HEI can and must decide independently many issues for improving the quality of education. However, there are problems, which can be solved solely by the state and its policies, since the state is a leading subject of social policy in the education system.

The function of the state is to create flexible conditions and incentives for higher educational institutions of all forms of ownership, but not to be a tool in the competition between HEI. The factors of such flexible incentives should include the development of public regulations for the system of education which would define their educational processes and funding.

The economic decline in Latvia does not allow to significantly increase the public funding of higher education, but allows creating the conditions that would encourage private business to actively participate in this process. In recent years, the idea of the need for cooperation and

participation in the development of higher education of all interested parties is gaining momentum. If education is necessary not only to the individual but also to both public and private sector, then the costs should be divided not only between the government, students and their families. These costs should be shared also by local authorities, business community and non-governmental organizations. Higher educational institutions have more chances to survive by drawing funds from all these sources, not focusing on only one. Among the additional funding sources may be the increase of income from rendered services, contracting with private companies, and involving employers and graduates in funding higher education.

The enabling environment can also be created by a flexible application of taxation system. The funding of education is the investment in the intellectual capital of the state and it would be only proper to release it from taxation. Education could be substantially assisted in the cases when, for instance, a company finances the student internship and this financing is exempt from tax. The proposed measures would expand the funding base of education, allow students to quickly enter the professional environment and contribute to reducing the youth unemployment.

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