# Outputs of the Subsystem for Secondary Education and the Labor Market in Republic of Macedonia

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Abstract: The comprehensive analysis of the Republic of Macedonia's educational system, and by that of the secondary education subsystem, implies a study of its structure by educational profiles, a qualitative analysis of the curriculums, an analysis of graduated secondary education students' acquired knowledge applicability, an analysis of their preparedness to enter the production process, an analysis of their preparedness to continue the education at the universities, etc. Of course, it is impossible to subject all these issues to analysis in one article, hence we will only analyze the harmonization of secondary education subsystem' output with the labor force by sectors and departments of operation and based on that analysis we will attempt to perceive the role of this subsystem within the overall development of Republic of Macedonia.

Keywords: labor market, sector of operations, secondary education subsystem

JEL Classification: I21, J21, J24

#### **1.Introduction**

A number of UNESCO analyses unambiguously indicate that, according to the current rate of new scientific discoveries, the quantum of knowledge at the time a baby is born will increase by four times until he/she obtains a university degree, authorizing us to forecast with a high degree of certainty a threefold increase by secondary education thereof. Furthermore, at the time a child reaches 50 years of age the quantum of knowledge as compared to the time of its birth will increase 62 times, with 97% of the scientific discoveries occurring after its birth. However incredible the humanity's capability to generate new knowledge by that dynamics in the long run may seem, even at half of these rates it becomes perfectly clear that the existing concept of secondary education does not offer a long-term sustainability. There from the logic compels us to ask: What direction should the educational system in general take - and especially the secondary education - in order to successfully counter the challenges of the new ages? A comprehensive analysis of the secondary education subsystem connotes:

- Secondary education subsystem's structure study by educational profiles;
- Qualitative analysis of the curriculums, whereby an impartial evaluation of the programs' used in the secondary vocational education level of adjustment to the needs of the labor market is necessary;
- An analysis of vocational education students' capability to be involved in manufacturing and service industries;
- An analysis of the graduated students' acquired knowledge applicability;
- An analysis of the graduated students' capability to continue to higher levels of education, as colleges and universities;
- An analysis of the harmonization of the secondary education subsystem's enrolling policy with the needs of the labor market.

Of course, these analyses require lots of time, space and resources; hence the following study will focus on the secondary education subsystem output's harmonization with the labor market.

### 2. The Secondary Education Subsystem Output and the Labor Market

A complete perception of the secondary education output's harmonization with the labor market needs is only possible by a comprehensive and continuous monitoring of the labor market which, of course, is an extended process demanding a lot of time and human resources. However, considering that the labor market needs reflect reactively well the number of employed in Republic of Macedonia by operative sectors, whereas the secondary education output offers an immediate insight to the number of graduated secondary education students, a simple comparison of the two indicators suffices to perceive the harmonization of the secondary education output with the labor market needs. Thereby we should also consider the fact that such a comparison doesn't illustrate the issue precisely, since certain operative sectors and departments employ people with different vocational training. Yet, the data is relevant for some types of education, because the training prevents competent employment outside the respective sectors, i.e. departments.

The data presented in the Tables 1 and 2 evidently indicates a continuous discrepancy between the secondary education system output and the structure of employed by operative sectors and departments in Republic of Macedonia. According to the data presented in Table 1, in the last six years only 15106 students completed vocational training in the health sector, which is 10.04% of the total number of graduated students in the studied period. It is an apparent hyper production of health sector personnel, especially if we consider the Table 2 data: these 15106 represent 46.18% of the total number of employees in the sector that covers the health and the welfare protection. There is no need to elaborate the meaning of this – it suffices to say that less than

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 $\frac{3}{4}$  of the employees in this sector are actually working in health protection, there from even if all employees are with vocational training, the last six years produced enough personnel to satisfy 60% of the needs in the near future. Similar conclusions may be drawn by studying the data concerning the agricultural, veterinarian, and forestry sectors. To wit, in the last six years 5948 students graduated in these sectors, making for 48.17% of the total number of employees in the sectors of agriculture, forestry, and fishery. Even if all employees in these sectors are with an adequate vocational training, it still points to a serious hyper production of personnel.

Table 1. Regular Secondary Edu	1	1	1
	2006/07	2007/08	2008/09
High School (Gymnasium)	9357	9277	9081
Commerce, Economy, Legal, and	4549	4388	4271
Catering – Tourism			
Health Protection	2101	2457	2447
Electro-Technical	2142	1943	2052
Mechanics	2077	1718	1685
Agriculture, Veterinary, and Forestry	1092	1026	1077
Textile and Tanning	1147	938	794
Traffic Control and Automobile Technicians	550	561	611
Chemical – Technological	632	643	610
Personal Services	391	414	413
Art Education and Physical Training	358	319	338
Construction and Geodesy	302	305	303
Food Processing	406	371	204
Geology, Mining, and Metallurgy	171	130	144
Graphic Design	136	143	134
Wood Processing	218	67	46
Total	25629	24700	24210
	2009/10	2010/11	2011/12
		AUI0/11	
High School (Gymnasium)	9354	9230	9324
Commerce, Economy, Legal, and			
Commerce, Economy, Legal, and Catering – Tourism	9354 4912	9230 4607	9324 5315
Commerce, Economy, Legal, and Catering – Tourism Health Protection	9354 4912 2594	9230 4607 2669	9324 5315 2868
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical	9354 4912 2594 2039	9230 4607 2669 1922	9324 5315 2868 1951
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics	9354 4912 2594 2039 1535	9230 4607 2669 1922 1609	9324 5315 2868 1951 1549
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry	9354 4912 2594 2039 1535 950	9230 4607 2669 1922 1609 938	9324 5315 2868 1951 1549 865
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile	9354 4912 2594 2039 1535	9230 4607 2669 1922 1609	9324 5315 2868 1951 1549
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians	9354 4912 2594 2039 1535 950 802 815	9230 4607 2669 1922 1609 938 756 841	9324 5315 2868 1951 1549 865 635 719
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians Chemical – Technological	9354 4912 2594 2039 1535 950 802 815 664	9230 4607 2669 1922 1609 938 756 841 634	9324 5315 2868 1951 1549 865 635 719 726
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians Chemical – Technological Personal Services	9354 4912 2594 2039 1535 950 802 815 664 474	9230 4607 2669 1922 1609 938 756 841 634 522	9324 5315 2868 1951 1549 865 635 719 726 609
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians Chemical – Technological Personal Services Art Education and Physical Training	9354 4912 2594 2039 1535 950 802 815 664 474 400	9230 4607 2669 1922 1609 938 756 841 634 522 410	9324 5315 2868 1951 1549 865 635 719 726 609 430
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians Chemical – Technological Personal Services Art Education and Physical Training Construction and Geodesy	9354 4912 2594 2039 1535 950 802 815 664 474 400 375	9230 4607 2669 1922 1609 938 756 841 634 522 410 268	9324 5315 2868 1951 1549 865 635 719 726 609 430 318
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians Chemical – Technological Personal Services Art Education and Physical Training Construction and Geodesy Food Processing	9354 4912 2594 2039 1535 950 802 815 664 474 400 375 171	9230 4607 2669 1922 1609 938 756 841 634 522 410 268 167	9324 5315 2868 1951 1549 865 635 719 726 609 430 318 191
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians Chemical – Technological Personal Services Art Education and Physical Training Construction and Geodesy Food Processing Geology, Mining, and Metallurgy	9354 4912 2594 2039 1535 950 802 815 664 474 400 375 171 144	9230 4607 2669 1922 1609 938 756 841 634 522 410 268 167 134	9324 5315 2868 1951 1549 865 635 719 726 609 430 318 191 131
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians Chemical – Technological Personal Services Art Education and Physical Training Construction and Geodesy Food Processing Geology, Mining, and Metallurgy Graphic Design	9354 4912 2594 2039 1535 950 802 815 664 474 400 375 171 144 98	9230 4607 2669 1922 1609 938 756 841 634 522 410 268 167 134 118	9324           5315           2868           1951           1549           865           635           719           726           609           430           318           191           131           107
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians Chemical – Technological Personal Services Art Education and Physical Training Construction and Geodesy Food Processing Geology, Mining, and Metallurgy Graphic Design Wood Processing	9354 4912 2594 2039 1535 950 802 815 664 474 400 375 171 144 98 18	9230 4607 2669 1922 1609 938 756 841 634 522 410 268 167 134 118 17	9324 5315 2868 1951 1549 865 635 719 726 609 430 318 191 131 107 20
Commerce, Economy, Legal, and Catering – Tourism Health Protection Electro-Technical Mechanics Agriculture, Veterinary, and Forestry Textile and Tanning Traffic Control and Automobile Technicians Chemical – Technological Personal Services Art Education and Physical Training Construction and Geodesy Food Processing Geology, Mining, and Metallurgy Graphic Design	9354 4912 2594 2039 1535 950 802 815 664 474 400 375 171 144 98 18 25345	9230 4607 2669 1922 1609 938 756 841 634 522 410 268 167 134 118 17 24846	9324           5315           2868           1951           1549           865           635           719           726           609           430           318           191           131           107           20           25758

Furthermore, according to the Table 1 data the number of students graduating from geological, metallurgical, and mining vocational schools tends to decrease, and that from 171 graduated students in the academic year of 2006/7, the number of graduated students in 2011/12 declined to 131. The latter data does not mean anything by itself, but a comparison thereof to Tables 1 and 3 data indicates a worrisome situation. To wit, the sector of mining and quarry

and the sectors of metal production and production of fabricated metal products apart from machines and equipment employed virtually constant number of workers in the period from 2004 - 2012. It declined from 16015 in 2004 to 13624 in 2008, only to grow steadily to 17059 employed in the studied sectors in 2012. Hence, assuming that only 70% of the studied operational departments and sector's employees are of that métier, the current dynamics of producing the necessary cadre will barely satisfy 40% of the needs. The situation in the food processing sector is similar, wherein during the last six years (with the exception of the last one) we notice a tendency of reduced number of students graduating from this vocation - falling below 200 - while at the same time Table 3 data indicates that the number of employees in the beverages and food production sector is in constant rise: from 12820 in 2004 to 16895 in 2012. Of course, not all employees are with the hereinabove vocational education, but even if assumed that only 70% of the employees are, than it is easy to reach a conclusion that the current dynamics of producing the necessary cadre will satisfy less than 65% of the needs.

The Table 1 data indicate that the number of students graduating from the textile and tanning vocational schools is constantly receding. Thus, in the academic 2006/7 1147 students completed this type of vocational training, while in 2011/12 the number fell to 635. This is a worrisome tendency, since the number of employees in the sectors of textile and clothes production and leather processing and a leather product in Republic of Macedonia in the period from 2004 to 2012 is constantly over 40000. Therefore, the textile industry cluster's remarks and its continuous demands for qualified workforce are justified (the cluster also complains on the quality of the vocational education).

With regards to the construction and geodesy vocations, Table 1 data indicate that through the last six years 1871 students graduated – an average of 312 students per year. On the other hand, Table 2 data shows that the construction sector employed 30795 people in 2004, the number of which fell to 23340 in 2010 and marked a constant growth in the next two years to reach the number of 27575 employees in 2012. The former data points out that the volume of cadre that the secondary education subsystem produces is not even remotely sufficient to meet the labor market's needs: providing for basic personnel reproduction requires at least twofold larger number of graduated students.

The hereinabove clearly elaborates the lack of correlation between the labor market's needs and the secondary education subsystem's output, but it seems that the situation is most concerning in the sector of production of furniture, wherein the number of employees grew from 3,092 in 2010 to 3,507 in 2012 (Statistical Yearbook of Republic of Macedonia, 2011 and 2012), while the total number of students graduating from the wood processing vocational schools in the same period is 55 (Table 1).

## **3.**Structure of Employees Changes by Operative Sectors, with a Special Study of the Sector of Education

The previous studies showed an evident discordance between the labor market and the secondary education subsystem's output. A possible reason for discordance is the change of the structure of employees by operational sectors in republic of Macedonia, i.e. the increase of employment within certain sectors on one hand, and the secondary education subsystem's inertness on the other - the failure to follow the labor market changes thereof. However, the Table 2 data shows that the 15.21% growth of employment – from 411723 in 2004 to 474368 in 2012 - is to a large extent based on the growth in:

- The sectors of wholesale and retail trade; motor vehicles and motorcycles maintenance and real estate activities, and that from 67893 employed in 2004 to 89064 in 2012, which is a 31.18% increase;
- The sectors of public administration and defense, mandatory welfare insurance, education and activities within the health and welfare protection, wherein the total number of employed raised from 97496 in 2004 to 112783 in 2012, marking an increase of 15.68%;
- The sectors of expert, scientific and technical activities; administrative and auxiliary services and other services, and that from 15311 employees in 2004 to 36656 in 2012 an increase of 139.41%.

The herein above denotes that in the period from 2004 to 2012 the overall increase in the number of employed amounts to 62645 people, whereupon the overall increase in the number of employees in the abovementioned sectors raised from 180700 in 2004 to 238503 in 2012 or 57803 people, which is an increase of 32%. We may also observe that the abovementioned sectors participate with a staggering 92.27% in the overall growth of employment. The Table 2 data indicate that in the same period a significant raise in the number of employees occurred in the sectors of transport, storage, information and communications, and in the sector of accommodation and catering services - 6534, while the other sectors marked a minimal growth, stagnation or decline in the number of employees. The meaning of this does not require a special analysis: it suffices to mention that such trends in the change of number of employed by sectors do not tend towards the desired restructuring of the Macedonian as an economy based on knowledge.

Table 2: Employed in Republic of Macedonia by Sectors				
Operational sector	2004	Year 4 2005 2006		
Agriculture, Forestry and Fishery	15574	12227	11883	
Mining and Quarry	1880	2099	2731	
Manufacturing Industry <sup>1)</sup>	109572	106179	104970	
Supply with Electric Power, Gas,				
Steam and Air Conditioning	8494	8112	8344	
Supply with Water; Removal of				
Waste Water, Waste Management,	8546	8021	8072	
and activities related to environment	0540	6021	0072	
preservation				
Construction	30795	28731	27546	
Wholesale and Retail Trade; Motor	((()))	710/0		
Vehicles and Motorcycles	66624	71860	72576	
Maintenance Transport, Storage, Information,				
Communications <sup>2)</sup>	30084	31234	30724	
Accommodation and catering				
Services	11905	12892	13040	
Finances and Insurance	6765	6458	6479	
Real Estate	1269	1276	1425	
Expert, Scientific, and Technical	0,		1.20	
Activities; Administrative and	11806	13277	16535	
Auxiliary Services <sup>3)</sup>				
Public Administration and Defense,	36244	37206	38526	
Mandatory Health Insurance	30244	37206	38320	
Education	30391	30690	31559	
Health and Welfare Protection	30861	30373	33235	
Art, Entertainment, Recreation	7408	7405	7446	
Other services	3505	2991	2893	
Total	411723	411031	417984	
Operational sector		Year		
<u>^</u>	2007	2008	2009	
Agriculture, Forestry and Fishery	12703	12972	13848	
Mining and Quarry	2751	3373	3420	
Manufacturing Industry <sup>1)</sup>	109164	103902	101097	
Supply with Electric Power, Gas,	8117	8161	7749	
Steam and Air Conditioning Supply with Water; Removal of				
Waste Water, Waste Management,				
and activities related to environment	8079	8920	8437	
preservation				
Construction	26307	25333	24574	
Wholesale and Retail Trade; Motor				
Vehicles and Motorcycles	76750	75855	73234	
Maintenance				
Transport, Storage, Information,	33239	30683	30038	
Communications <sup>2)</sup>	33239	30083	30038	
Accommodation and catering	13040	13265	13668	
<u> </u>	13010	15205		
Services				
Finances and Insurance	7110	8413	8229	
Finances and Insurance Real Estate	7110 1552	8413 1105	8229 805	
Finances and Insurance Real Estate Expert, Scientific, and Technical	1552	1105	805	
Finances and Insurance Real Estate Expert, Scientific, and Technical Activities; Administrative and				
Finances and Insurance Real Estate Expert, Scientific, and Technical Activities; Administrative and Auxiliary Services <sup>3)</sup>	1552	1105	805	
Finances and Insurance         Real Estate         Expert, Scientific, and Technical         Activities; Administrative and         Auxiliary Services <sup>3)</sup> Public Administration and Defense,	1552	1105	805	
Finances and InsuranceReal EstateExpert, Scientific, and TechnicalActivities; Administrative andAuxiliary Services <sup>3)</sup> Public Administration and Defense,Mandatory Health Insurance	1552 20125 39053	1105           23071           41377	805 21145 42328	
Finances and Insurance Real Estate Expert, Scientific, and Technical Activities; Administrative and Auxiliary Services <sup>3)</sup> Public Administration and Defense, Mandatory Health Insurance Education	1552 20125 39053 32134	1105           23071           41377           33548	805 21145 42328 34085	
Finances and InsuranceReal EstateExpert, Scientific, and TechnicalActivities; Administrative andAuxiliary Services <sup>3)</sup> Public Administration and Defense,Mandatory Health InsuranceEducationHealth and Welfare Protection	1552 20125 39053 32134 31809	1105           23071           41377           33548           32788	805 21145 42328 34085 32058	
Finances and Insurance         Real Estate         Expert, Scientific, and Technical         Activities; Administrative and         Auxiliary Services <sup>3)</sup> Public Administration and Defense,         Mandatory Health Insurance         Education         Health and Welfare Protection         Art, Entertainment, Recreation	1552           20125           39053           32134           31809           7358	1105           23071           41377           33548           32788           7879	805 21145 42328 34085 32058 7498	
Finances and Insurance         Real Estate         Expert, Scientific, and Technical         Activities; Administrative and         Auxiliary Services <sup>3)</sup> Public Administration and Defense,         Mandatory Health Insurance         Education         Health and Welfare Protection         Art, Entertainment, Recreation         Other services	1552           20125           39053           32134           31809           7358           4750	1105           23071           41377           33548           32788           7879           4213	805           21145           42328           34085           32058           7498           4340	
Finances and InsuranceReal EstateExpert, Scientific, and TechnicalActivities; Administrative andAuxiliary Services <sup>3)</sup> Public Administration and Defense,Mandatory Health InsuranceEducationHealth and Welfare ProtectionArt, Entertainment, RecreationOther servicesTotal	1552           20125           39053           32134           31809           7358	1105           23071           41377           33548           32788           7879           4213           434858	805 21145 42328 34085 32058 7498	
Finances and Insurance         Real Estate         Expert, Scientific, and Technical         Activities; Administrative and         Auxiliary Services <sup>3)</sup> Public Administration and Defense,         Mandatory Health Insurance         Education         Health and Welfare Protection         Art, Entertainment, Recreation         Other services	1552           20125           39053           32134           31809           7358           4750           434041	1105 23071 41377 33548 32788 7879 4213 434858 Year	805           21145           42328           34085           32058           7498           4340           426553	
Finances and InsuranceReal EstateExpert, Scientific, and TechnicalActivities; Administrative andAuxiliary Services <sup>3)</sup> Public Administration and Defense,Mandatory Health InsuranceEducationHealth and Welfare ProtectionArt, Entertainment, RecreationOther servicesTotal	1552           20125           39053           32134           31809           7358           4750	1105           23071           41377           33548           32788           7879           4213           434858	805           21145           42328           34085           32058           7498           4340	

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Mining and Quarry	3697	3989	4382			
Manufacturing Industry <sup>1)</sup>	98950	98581	98752			
Supply with Electric Power, Gas, Steam and Air Conditioning	7716	7711	7833			
Supply with Water; Removal of Waste Water, Waste Management, and activities related to environment preservation	8392	8555	9024			
Construction	23340	26106	27575			
Wholesale and Retail Trade; Motor Vehicles and Motorcycles Maintenance	77010	83679	87064			
Transport, Storage, Information, Communications <sup>2)</sup>	33362	38573	40756			
Accommodation and catering Services	13988	16267	18359			
Finances and Insurance	8404	8513	8843			
Real Estate	1566	1714	2000			
Expert, Scientific, and Technical Activities; Administrative and Auxiliary Services <sup>3)</sup>	24558	27102	30302			
Public Administration and Defense, Mandatory Health Insurance	42474	43258	44006			
Education	35193	36099	36002			
Health and Welfare Protection	31200	32505	32775			
Art, Entertainment, Recreation	7648	7375	7986			
Other services	5374	6452	6354			
Total	435048	458873	474368			
Source: Statistical Yearbook of Republic of Macedonia						
1) 751 1 / 11'1' ' /		1	1 1			

 The data on publishing, printing, and reproduction of recorded materials for the period from 2004 until 2009 and the data on printing and reproduction of recorded materials for the period 2010 – 2012 are not included in the Manufacturing Industry data, but in the Transport, Storage and, Information and Communications, which resulted from the application of the new National Classification of Operations that the State Bureau of Statistics uses since the beginning of 2011.

 2) The data on the sectors of Transport, Storage and, Information and Communications are presented collectively, since the application of the new National Classification of Operations prevents separation of the data for the period 2004 – 2009, when the data on the telecommunications and postal services were arranged and presented collectively...

The data on Expert, Scientific, and Technical Activities;
 Administrative and Auxiliary Services for the period 2004 – 2009 are also presented collectively.

Table 4 studies the structure of the higher education in Republic of Macedonia as a prerequisite to a development of an economy based on knowledge, indicating that the higher education's output is far from the desired condition. However, the hereinabove indicates a similar situation to the secondary education's output, an evident discordance with the labor market's need, that is. As previously stated, a detailed analysis of the secondary education's output requires a lot of time, space, and resources; hence the following surveys will offer a collective study only of the elementary, secondary, and higher education subsystems' cadre potentials as opposed to the number of educational institutions, the number of classes, and the number of pupils and students.

<b>Table 3:</b> Participation of Specific Operational Departments in
the Sector of Manufacturing Industry

	Year			
<b>Department of Operations</b>	2004	2005	2006	
Production of Food and Beverages	12820	13150	11849	
Production of Textile	7849	6291	5314	
Production of Clothes	31872	34534	35070	
Production of Leather and Leather	4508	4429	5345	
Products	4508	4429	5545	
Production of Metals	5581	5745	5972	
Production of Fabricated Metal				
Products	8554	7889	8031	
(except machines and equipment)				
Total Manufacturing Industry	109572	106179	104970	
		Year		
Department of Operations	2007	2008	2009	
Production of Food and Beverages	11810	13206	11945	
Production of Textile	5292	4535	4362	
Production of Clothes	38556	35638	35376	
Production of Leather and Leather	5735	4645	5769	
Products				
Production of Metals	6281	6228	5550	
Production of Fabricated Metal				
Products	8022	7124	7394	
(except machines and equipment)				
Total Manufacturing Industry	109164 103902 10109			
		Year		
Department of Operations	2010	2011	2012	
Production of Food and Beverages	13566	16627	16985	
Production of Textile	3714	3158	2712	
Production of Clothes	34680	32525	33360	
Production of Leather and Leather	5628	4154	4803	
Products				
Production of Metals	5755	6537	6217	
Production of Fabricated Metal	(00.4		(1(0)	
Products	6894	6454	6460	
(except machines and equipment)	000 70	00501	00772	
Total Manufacturing Industry	98950	98581	98752	
Source: Statistical Yearbook of R	epublic of	Macedoni	a	

The Table 5 data informs that the continuous rise of the number of employed within the Republic of Macedonia's educational system stems from the increased employment of teaching cadre, while the number of administrative technical employees (other personnel) remains virtually constant. This is an expected trend, considering the expansion of private and state-owned higher educational institutions. Yet, the Table 6 data indicates that the dynamics of employment within the higher education does not coincide with the dynamics of establishing higher education institutions. Thus, in the academic year of 2006/07 57011 students attended the 44 existing higher education institutions that employed a total of 2413 professors and associates, only to continue rising in the following period to reach 102 in the academic 2011/12, serving 58747 students and employing 3120 professors and associates. The significance of these numbers asks for no additional elaboration, short of considering that 3120 professors and associates realize over 450 study programs (see Table 1), but it is evident that the drastic increase in the number of employees in Republic of Macedonia's educational system was not induced by the employment of administrative - technical personnel and the outburst of higher education institutions.

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 Table 4: Participation of Selected Sectors in the Total Number of Employed

Public Administration and Defense, Mandatory Health Insurance362443720638Participation in Percents of the Sector of Operations in the Total Number of Education8,809,059Participation in Percents of the Sector of Operations in the Total Number of Employed303913069031Participation in Percents of the Sector of Operations in the Total Number of Employed7,387,477Participation in Percents of the Sector of Operations in the Total Number of Employed308613037333Participation in Percents of the Sector of Operations in the Total Number of Employed7,507,397Participation in Percents of the Sector of Operations in the Total Number of Employed974969826910Participation in Percents of the Sector of Operations in the Total Number of Employed23,6723,9124Participation in Percents of the Sector of Operations in the Total Number of Employed23,6723,9124Participation in Percents of the Sector of Operations in the Total Number of Employed23,6723,9124A Total Number of Employed41172341103141Sector of OperationsSector of OperationsYear34	006           3526           9,21           1559           7,55           3235           7,95           3320           4,72
Public Administration and Defense, Mandatory Health Insurance362443720638Participation in Percents of the Sector of Operations in the Total Number of Education303913069031Participation in Percents of the Sector of Operations in the Total Number of Education303913069031Participation in Percents of the Sector of Operations in the Total Number of Employed7,387,477Participation in Percents of the Sector of Operations in the Total Number of Employed308613037333Participation in Percents of the Sector of Operations in the Total Number of Employed7,507,397Participation in Percents of the Sector of Operations in the Total Number of Employed7,507,397Construction30861303733333Participation in Percents of the Sector of Operations in the Total Number of Employed974969826910Participation in Percents of the Sector of Operations in the Total Number of Employed23,6723,9124Participation in Percents of the Sector of Operations in the Total Number of Employed23,6723,9124A Total Number of Employed41172341103141Sector of OperationsYearYear	3526 9,21 1559 7,55 3235 7,95 3320
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Employed	5,43
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A Total Number of Employed 435048 458873 47	4368

Considering the hereinabove, logic imposes the question: what did induce the drastic increase in the number of

employees in Republic of Macedonia's educational system? The Table 7 data reveals that by number of schools, classes, students and teachers the situation within the specialized elementary and secondary schools and the elementary schools for adults is virtually constant through the studied period, meaning that the noted changes did not derive from this educational system's subsystem.

 Table 5: The structure of the employees of the Republic of Macedonia's educational system

Year	2004	2005	2006
Teaching cadre <sup>1)</sup>	22356	22842	23955
Other personnel	8035	7858	7604
Total	30391	30690	31559
Year	2007	2008	2009
Teaching cadre <sup>1)</sup>	24263	25306	26581
Other personnel	7871	8242	7504
Total	32134	33548	34085
Year	2010	2011	2012
Teaching cadre <sup>1)</sup>	26737	27590	28045
Other personnel	8456	8509	7957
Total	35193	36099	36002

Source: Statistical Yearbook of Republic of Macedonia 1) The data on the teaching cadre has been obtained as a total of the employed in respective subsystems, whereby the data on the full-time employees is used as relevant for the higher education, since some of the private universities present the visiting professors and the associates employed at the stateowned universities as their own full-time professors and associates

Table 6: Number of faculties, students, professors and

		associate	es	
Year	Faculties	Students	Professors	Associates
2003/0 4	35	46637	1354	986
2004/0 5	33	49364	1405	1109
2005/0 6	44	48238	1411	1062
2006/0 7	44	57011	1439	974
2007/0 8	75	64254	1594	1193
2008/0 9	94	63437	1723	1411
2009/1 0	98	57894	1693	1241
2010/1 1	122	63250	1804	1251
2011/1 2	102	58747	1837	1283
Source:	Statistical Y	earbook of	Republic of	Macedonia

However, the Table 8 data indicates that through the reviewed period, the number of teachers in the elementary education increased from 13791 in the academic year of 2003/04 to 17233 in 2011/12 that is 3442 newly employed teachers. At the same time, the number of students decreased from 229584 in 2003/04 to 197859 in 2011/12, while the number of classes increased from 9974 to 10685, meaning

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that the average number of students per class fell from 23 students in 2003/04 to 19 students in 2011/12.

	elementa	ary beneoic	, for additio	
Year	Schools	Classes	Students	Teachers
2003/04	63	242	1909	362
2004/05	65	264	2213	412
2005/06	65	277	2261	429
2006/07	67	278	2512	464
2007/08	64	257	1848	390
2008/09	64	259	1886	410
2009/10	61	267	1824	392
2010/11	60	263	1848	392
2011/12	59	264	1678	394
Source: St	tatistical Ye	arbook of	Republic of	Macedonia

 
 Table 7: Vocational elementary and secondary schools and elementary schools for adults

**Table 8:** Schools, classes, students and teachers in the

 elementary education

elementary education				
Year	Schools	Classes	Students	Teachers
2003/04	1012	9974	229584	13791
2004/05	1010	9920	223879	13970
2005/06	1006	10823	236186	14917
2006/07	1000	10775	228207	15106
2007/08	997	10713	220833	15691
2008/09	991	10713	215078	16205
2009/10	990	10622	208980	16403
2010/11	990	10567	201914	16946
2011/12	986	10685	197859	17233
Sour	rce: Statisti	cal Yearbo	ok of Reput	olic of
		Macedoni	a	

This indicator should at the least concern the educational authorities, since according to Article 41, paragraphs 4 and 5 of the Law on Elementary Education, the number of students in a class should range from 24 to 34, wherein a class could be formed with fewer students upon an approval by the founder(s). At first glance it may seem that the disproportion resulted from the transformation of the eight-year elementary education to a nine-year one, but it is not so. To wit, there were no significant changes to the curriculum and to the weekly fund of lessons, thus the increase of 24.96% in the number of engaged teachers is not justified - even more so if considered that the transition to a nine-year elementary education increased the number of classes by 7.13% and therefore the increase in number of engaged teachers should be congruous. Regarding the secondary education subsystem, the Table 9 data indicates a continual growth in the number of classes cumulatively reaching 12.43% as opposed to - the irregular trend notwithstanding - a cumulative decline in the number of students of 2.88%. On the other hand, the number of engaged teachers marked a growth of 28.42%, which should result in improvement of the secondary education subsystem, since the average number of students of 30 per class in 2004 declined to 26 per class in 2011/12. This is in accordance with Article 28, paragraph 2 of the Law on Secondary Education stipulating that the number of students composing a class in public schools should not be below 25 or over 34.

Table 9:	Schools,	classes,	students	and	teachers in the	
	Se	econdary	<i>i</i> educatio	on		

Year	Schools	Classes	Students	Teachers
2003/04	96	3082	93791	5863
2004/05	100	3134	94053	5946
2005/06	101	3184	93908	6136
2006/07	104	3219	93763	6280
2007/08	107	3237	92753	6438
2008/09	110	3295	93164	6832
2009/10	110	3398	94284	7008
2010/11	114	3441	92848	7197
2011/12	113	3465	91167	7298
Source: Statistical Yearbook of Republic of				
Macedonia				

## 4. Conclusion

The previous study indicated the evident discordance between the secondary education output and the labor market's needs, as well as the inadequate dynamics of employment in respective subsystems of the Republic of Macedonia's educational system. The overcoming of this situation is only possible with a comprehensive reform of the educational system, particularly focusing on:

- Qualitative analysis of the curriculums, whereby an impartial evaluation of the vocational secondary education's curriculums compliance to the labor market's needs is necessary, as well as a projection of their development to the benefit of building an economy based on knowledge;
- Studying of the secondary education subsystem by educational profiles, which should result in restructuring of the secondary education subsystem, i.e. The network of secondary schools and its adjustment to the labor market's needs;
- Change in enrollment policy in secondary education and making it in the function to the needs of society;
- Amendments to the educational system's admission policy, with a special review of the detected situation within the secondary education subsystem, and
- Revising the network of higher education institutions and consistent application of the legislative acts and bylaws regulating the higher education.

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## **Author Profile**



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