

**Analysis of the implementation of vocational specialist studies for medical professions at the Faculty of  
Medical Sciences, University "Goce Delchev" - experiences and needs**

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## Introduction

University 'Goce Delcev' – Stip is one of the youngest and the most successful universities in the Republic of Macedonia, existing from 2007, with 13 faculties among which is the Faculty of Medical Sciences. The Faculty itself also consists of professional studies with duration of three years, where higher medical staff is being educated through several study programmes for: medical nurse – technician, laboratory technician, optometry and optics, and physiotherapists and prosthodontics. Designing educational programs to improve these interactions is a major goal of continuing professional development, and one approach for educational planners to effect desired changes is simulation-based education. Because simulation-based education affords an opportunity for educators to train health care professionals in environments that resemble clinical practice, this instructional method allows planners to integrate overarching priorities for improvement in health care practice with the training goals of individuals.<sup>1</sup> Despite an explosion of interest in improving safety and reducing error in health care, one important aspect of patient safety that has received little attention is a systematic approach to education and training for the whole health care workforce.<sup>2</sup>

Beside the first cycle of studies, the second cycle of studies is also present at our Faculty. In a competition with two other state universities in the Republic of Macedonia, the second cycles study programmes with a duration of one year exist at our Faculty and they offer in service training and specialization of health professionals in different areas. The second cycle of studies at the Faculty of Medical Sciences comprises the following accredited programmes divided into courses:

1. Graduated professional medical nurse, specialized in:
  - intensive care
  - gynaecology and obstetrics
  - operating-room nurse
  - nurse anaesthetist
  - family and visiting nurse

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<sup>1</sup> Alan W. Dow MD, MSHAE duardo Salas PhDPaul E. Mazmanian PhD, Improving quality in systems of care: Solving complicated challenges with simulation-based continuing professional development, *Journal of Continuing Education in the Health Professions*, Volume 32, Issue 4, pages 230–235, Autumn (Fall) 2012

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- mental health nurse
  - prevention of infectious and non-infectious diseases
2. Graduated professional laboratory technician in medical laboratory diagnostic specialized in:
    - transfusiology
    - biochemical laboratory
    - microbiological laboratory
    - sanitary-chemical laboratory
  3. Graduated professional physiotherapist specialized in:
    - reflexotherapy and acupressure
    - physical therapy
    - children rehabilitation and correction of corporal malformation

This paper aims at showing the rise and fall in students' interest, to determine for which courses there is most and least interest, from which part of the country we have the largest number of students, and to determine the number of specialized or graduated students in relation to the number of enrolled students. The analysis is made with an aim to determine whether the accredited study programmes of the second cycle of study at the Faculty of Medical Sciences at the University 'Goce Delcev' – Stip satisfy the requirements of the health workers concerning their need for continuous training (education) in respective areas.

### **Materials and methods**

The data for the previous three years which are analysed are taken from the universities services. In order to get a clear picture of the given tasks descriptive analysis is used. All data are processed statistically with a usage of statistical programme Statistics 7.0 for Windows.

### **Results and discussion**

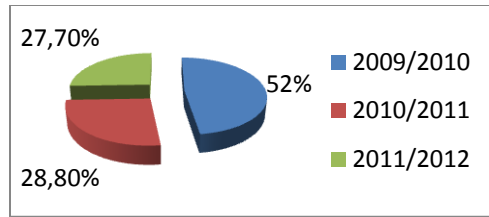
Data are shown in a table and they refer to:

- Number of students enrolled in courses in respective years of study,
- Number of students who have graduated on appropriate faculties or universities and
- Number of students who finished the second cycle of studies for different fields by years in relation to our enrolled students.

**Table 1.** Number of the enrolled students on the courses in the 2009/2010, 2010/2011 and 2011/2012 study year

<b>Students enrolled in academic years</b>	<b>2009/2010</b>	<b>2010/2011</b>	<b>2011/2012</b>
<b>1. Graduated professional medical nurse, specialized in:</b>			
- intensive care	3	4	1
- gynaecology and obstetrics	1	3	0
- operating-room nurse	2	4	2
- nurse anaesthetist	3	0	2
- family and visiting nurse	1	1	2
- mental health nurse	0	1	0
- prevention of infectious and non-infectious diseases	2	0	4
<b>2. Graduated professional laboratory technician in medical laboratory diagnostic specialized in :</b>			
- transfusiology	0	2	2
- biochemical laboratory	9	13	9
- sanitary-chemical laboratory	1	1	1
- microbiological laboratory	1	0	1
<b>3. Graduated professional physiotherapist, specializing in:</b>			
- reflexotherapy and acupressure	0	2	3
- kinesiotherapy	2	13	15
- children rehabilitation and correction of corporal malformation	0	1	12
<b>Total</b>	<b>25</b>	<b>45</b>	<b>54</b>

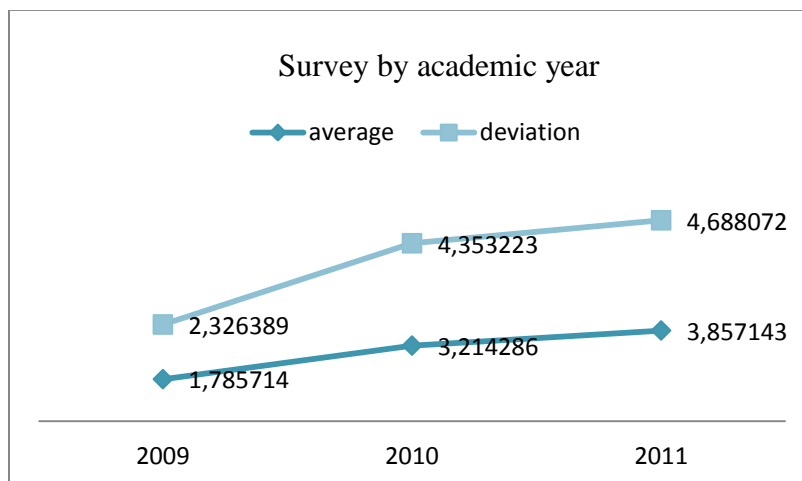
Of all students enrolled in the academic year 2009/2010 the study program for graduated professional laboratory technician for medical laboratory diagnostics, specialized for working in a biochemical laboratory has the greatest number of students - 13, or 52%, of the total number of students enrolled in that academic year. In the academic year 2010/2011 most students enrolled the study programs for graduated professional laboratory technicians for medical laboratory diagnostics, specialized for working in a biochemical laboratory, and for graduated professional physiotherapist, specialized in kinesiotherapy, i.e. 13 students, or 28,8%, of the total number of enrolled students in that academic year. In the academic year 2011/2012 the number of enrolled students was again greatest for the course graduated professional physiotherapist, specialized in kinesiotherapy, with the total number of 15, or 27,7%, out of the total number of enrolled students (Figure 1).



**Figure 1** Percentage of enrolled students at respective study programs for which students showed the greatest interest in respective years

Figure 2 is presenting the average of 1,78 student enrolled in the academic year 2009/2010 per course with standard deviation of 2,33; in academic year 2010/2011 3,21 student enrolled per course with standard deviation of 4,35; and in 2011/2012 academic year 3,85 students with standard deviation of 4,68, respectively.

By processing the data it can be concluded that students are least interested in enrolling the course for graduate professional nurses specializing in mental health, namely only in one academic year, 2010/2011, one student enrolled, or an average of 0.33 students per academic year. Student enrollment is constant for the course graduate professional laboratory technician for medical laboratory diagnostics, specializing in sanitary chemical laboratory, where there is one enrolled student every year. In the three academic years the courses with the same average enrollment of students, i.e. 1.33 enrolled students per year, are the study programs for graduate professional nurses, specializing in gynecology and obstetrics, graduate professional nurses, specializing in family and nursing sister, as well as the study program for graduated professional laboratory technician for medical laboratory diagnostics, specializing in transfusion. The largest deviations occur for the course graduate professional physiotherapist, specializing in kinesiotherapy where the standard deviation is 7.00, followed by the course graduate professional physiotherapist, specializing in rehabilitation of children and bodily deformity correction with a standard deviation of 6.65. On average most students show interest in the course for graduate professional laboratory technicians for medical laboratory diagnostics, specializing in biochemical laboratory, where on average during the three academic years 10.0 students enrolled with a standard deviation 2.31.



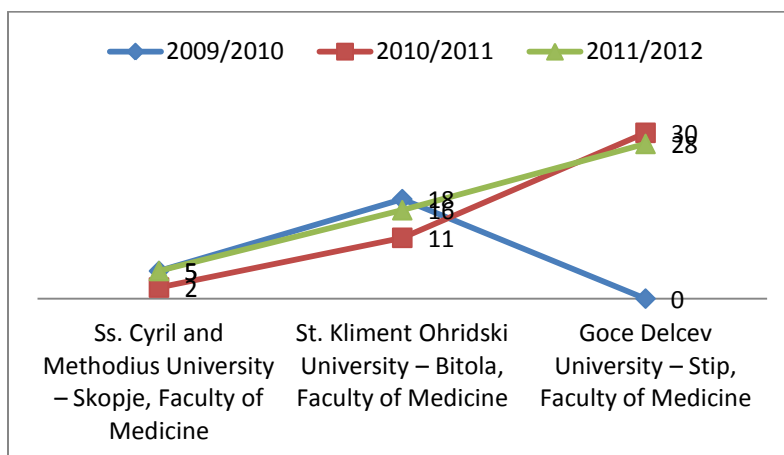
**Figure 2.** Survey per academic years. In the 2009/2010 academic year 1,78 student enrolled per course with a standard deviation of 2.33; in the 2010/2011 academic year 3,21 students enrolled per course with a standard deviation of 4.35, and in the 2011/2012 academic year 3,85 students enrolled with a standard deviation of 4.68.

**Table 2** Number of enrolled students who have completed their respective colleges or universities

<b>Enrolled students in academic years</b>	<b>2009/2010</b>	<b>2010/2011</b>	<b>2011/2012</b>
Ss. Cyril and Methodius University – Skopje, Faculty of Medicine	5	2	5
St. Kliment Ohridski University – Bitola, Faculty of Medicine	18	11	16
Goce Delcev University – Stip, Faculty of Medical science	0	30	28
Ss. Cyril and Methodius University – Skopje, Natural Science and Mathematics – Chemistry – Biochemistry – physiological department	1	0	0
Ss. Cyril and Methodius University – Skopje, Natural Science and Mathematics – Chemistry – analytical department	0	1	0
Ss. Cyril and Methodius University – Skopje, Natural Science and Mathematics – Biology	0	0	2
Ss. Cyril and Methodius University – Skopje, Faculty of Physical Education	0	0	1
Medical college – Pleven, Higher Medical institute-Pleven	1	0	0
Faculty of Public Health and Sport, R. of Bulgaria	0	0	1
Medical college – Sofia, R. of Bulgaria			1
Tetovo State University, Faculty of Medical Science	/	1	
<b>Total</b>	<b>25</b>	<b>45</b>	<b>54</b>

The data presented in Table 2 provide an opportunity to realize which students and from which faculty, or university show the greatest interest for enrolling in the second cycle of studies at the Faculty of Medical Sciences. In the academic year 2009/2010 the highest interest was shown by students who graduated at Higher Medical School at the University of St. Kliment Ohridski in Bitola where a total number of 18 students or 72% was enrolled. The number of students enrolled from this university in the next years slightly decreases, which is not a significant difference when summarizing the data. Because of this the deviation or variation in respect to the first year is low and amounts to 3.60. In the academic year 2010/2011 the highest number enrolled is from their parent university, the Faculty of Medical Sciences at the University Goce Delchev who graduated relevant vocational studies. Their number is 30 or 66.66% of the total number of enrolled students. In the academic year 2011/2012 the number of enrolled students from the parent university is 28 or 51.85%, which also shows a decreasing tendency in the number of enrolled students who graduated from the parent university. For these reasons the deviations are large, i.e. the variations in the number of students enrolled per year in relation to the initial year reach 16 (Figure 3). An additional number of students from other universities come, but the number of enrolled students varies slightly during the three academic years.

**Figure 3.** Number of enrolled students in respective years from different universities



**Table 3.** Number of students who completed the second cycle of education, i.e. who are specialized in respective disciplines per years.

Graduated students in the second cycle in academic years	2011	2012
1. Graduated professional medical nurse, specialized in :		
- intensive care	1	2
- gynaecology and obstetrics	1	0
- operating-room nurse	0	2
- nurse anaesthetist	1	0
- family and visiting nurse	1	1
- mental health nurse	0	0
- prevention of infectious and non-infectious diseases	2	0
2. Graduated professional laboratory technician in medical laboratory diagnostics specialized in :		
- transfusionist	0	2
- biochemical laboratory	0	2
- sanitary-chemical laboratory	0	0
- microbiological laboratory	0	0
3. Graduated professional physiotherapist, specialized in:		
- reflexotherapy and acupressure	0	0
- kinesiotherapy	1	0
- children rehabilitation and correction of corporal malformation	0	0
<b>Total</b>	<b>7</b>	<b>9</b>

Table 3 gives an insight into graduated or specialized students in 2011 and 2012. In 2011 a total number of seven students specialized, and in 2012 a total of nine students. The courses graduate professional nurse specializing in mental health, graduated professional laboratory technician for medical laboratory diagnostics, specialized for biochemical laboratory, graduated professional laboratory technician for medical laboratory diagnostics, specialized for microbiology laboratory, graduated professional physiotherapist, specialized for reflexotherapy and acupuncture, and graduate professional physiotherapist, specialized for children rehabilitation and correction of corporal malformation are courses that had no students specializing in any of the previous years, i.e. out of the total number of students enrolled in current academic years none of the students succeeded in defending their specialist theses. Compared to other courses, the greatest number of students specialized for the course for graduated professional nurses, specializing in intensive care, or a total number of three students, or 1.5 students per year. 22.85% of the total number of students enrolled in 2009/2010 and 2010/2011 school year specialized.

### **Conclusions**

These analyses provide a more complete insight into the actual situation in the functioning of the second cycle of studies at the Faculty of Medical Sciences at University Goce Delchev. The discussion presented previously shows that these curricula for the education of senior medical staff within the second cycle of studies exist for more than three years. From year to year the interest increases which indicates that these professionals find their place in the health system of the Republic of Macedonia. The need for medical professionals who specialize in different areas leads to an increased interest in specific study programs, and the acquired knowledge, competencies and skills are used in everyday practice. Based on the results of this analysis, as well as on the needs in the health sector, the new study programs should be introduced that will even better meet the requirements of a modern healthcare system.



## References

1. Alan W. Dow MD, MSHAE duardo Salas PhD Paul E. Mazmanian PhD, Improving quality in systems of care: Solving complicated challenges with simulation-based continuing professional development, *Journal of Continuing Education in the Health Professions*, Volume 32, Issue 4, pages 230–235, Autumn (Fall) 2012
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