The Eurasia Proceedings of
Educational & Social Sciences (EPESS)
ISSN: 2587-1730

The Eurasia Proceedings of Educational & Social Sciences (EPESS), 2015

Volume 2, Pages 74-80

ICEMST 2015: International Conference on Education in Mathematics, Science & Technology

PREFERENCE LEARNING STYLE IN MATHEMATICS: STUDENTS PERCEPTION

Sadri ALİJA
Faculty of Business and Economics,
SEEU, Tetovo, Macedonia

Halil SNOPÇE
Faculty of Contemporary Sciences and Technologies,
SEEU, Tetovo, Macedonia

ABSTRACT: Teaching is an ability of complex recognition which is not inborn, but it is a process which can be learned and improved during time. This is the reason why we always try to improve and develop our ability in offering the best qualitative teaching methods to students in our universities.

The aim of this research is to analyze some different aspects of student's preferences in learning mathematics, especially to analyze the preferences concerning the teaching style used by the teacher in the classroom.
In this paper we show the results obtained from a survey realized during the fall semester of 2014 - 2015 with students of two different faculties of the SEE-University, students from the Faculty of Contemporary Sciences and Technologies and Faculty of Business Economics.

The results obtained by this survey show that the method favored by the students is the non-traditional one with preference of 60.5%. In order to analyze student's preferences over different teaching methods versus some other factors, we have used cross tabulation. The results obtained in this paper show that the preferences of the female students, students with the GPA now between 7 and 8, students with MATH score in last semester with 6 (Satisfactory) tend in preference towards non-traditional methods.

Taking into consideration the nature of the subject of mathematics, the obtained results suggest that the teacher should increase his engagement in the subject using different practices and methods in the classroom in order to enhance the interest of the students for the subject.

Key words: mathematics, learning preferences, traditional, nontraditional, cross tabulation

INTRODUCTION

The effort of increasing the quality of teaching is a continuous process. In this context, the teachers are aware of the need to revise the teaching materials and methods in the subjects of the natural sciences. They are aware that these changes should include a much stronger emphasize of the new methods for applying the natural sciences in other fields, as well as the need for enrichment of the teaching methods.

It is a known fact that mathematics plays a crucial role in the establishment of a strong intellectual character. It influences the private, civil, and social life of an individual. Nevertheless, both in the past and nowadays, a lot of students are unsatisfied with the level of their knowledge of the subject. It becomes a barrier for achievement of good results.

One of the basic things which can offer improvement in achieving better results is the creation of new opportunities for learning. Students learn better if we offer them new space of learning. This can be done by using new methods and techniques which will create a new space of concrete and real learning.

- Selection and peer-review under responsibility of the Organizing Committee of the conference

*Corresponding author: Sadri ALİJA- icemstoffice@gmail.com

Another interesting fact that we want to emphasize is that the majority of teachers have the same style of presentation during lectures. They almost never use different models of teaching or different materials in order to connect the learning process with the field of interest of their students as well as their aims and requests.

Researchers have used different approaches in analyzing teaching methods used at Universities. They have noted very positive results in the case of working with students in small groups, in the case when students cooperate with each other and with their teachers, as well as in the case when students use internet for learning purposes.

In a study concerning the impact of different teaching methods for teaching mathematics done with students of business economics in the SEE-University, Iljazi and Alija (2010), have shown that the most acceptable method is working in small groups. The survey showed that when the above mentioned method was used, students increased their success, improved their class attendance, and interactivity between students increased. Another interesting impact of this method is that students worked more outside of the classroom. As a result of the studies realized by McCarthy and Anderson (2000) and Hinde and Kovac (2001), one can conclude that the best results during exams were achieved by students who used learning methods based on active cooperation between students, compared with students from the classes taught with the traditional methods of lecturing.

Goe's (2007) (2007) examination of teacher quality focuses on four categories of teacher quality indicators-teacher qualifications, teacher characteristics, teacher practices, and teacher effectiveness-which.

Johnson and Johnson (1986) defend the idea that the so called 'cooperative learning' has a positive effect, not just on the students performance, but it also affects positively the students motivation, socialization in the classroom, their confidence that they can learn, and their attitude toward the subject in general.Concerning the methods of learning via internet (known as online learning), Woo and Kimmick (2000) concluded that students who use this method are more stimulated to learn. This happened even in the cases when there were no big differences in learning methods.
In a study with the title "Traditional versus Non-Traditional Teaching", realized by Johsnon and Dasgupta (2005), one can find that the total percentage of students who prefer the non-traditional method versus the traditional one (lecturing), is significantly bigger.
Many of the current researchers find that educators need to claim greater instructional responsibility (Hansson, 2010) and devise means to become more effective in teaching mathematical constructs in order for students to truly develop conceptual mathematical knowledge (Desoete, Roeyers, & Buysse, 2001; Powell & Kalina, 2009). As societal expectations of students‟ mathematical knowledge evolve, so too should teaching strategies.
It is a known fact that the educational process is not static, but it is evolving through time. Especially nowadays, it is a process in evolution and it is changed depending on the way how the students learn, how they accept the information and in general, how they leave and work. It is the process in evaluation also because of the influence of new technologies. This requires changes in the teaching methods, the offering of information, the content of the course, the presentation of new ideas etc. These changes should be on the direction of refitting of the teaching and learning process in most eligible way and style for the students. This is necessary for the students in order to make them adaptable to the new trade markets in the future.
On the other hand, we must take care for the situations when students may become the victims of using the different teaching methods. In such cases, the teacher must take into the consideration the students' needs and perspectives; otherwise all the given effort from the teacher would be purposeless. This is the reason of doing this research, with which we want to have a clear image of the most preferable teaching method of our students. Also we want to have the information of the most preferable factors concerning the teaching style used from the teachers.
Students that enroll in the faculty of contemporary sciences and technologies (CST Faculty), and in the faculty of business economics (BE Faculty) at the SEE-University in Tetovo, come from different high schools, and consequently have different background knowledge in mathematics. By this research we wish to detect which teaching methods are preferred by our students. This information is very important for the teachers in order to improve their teaching methods and skills in future.

METHODS

In this study the population consists of students from CST faculty and BE faculty of the SEE-University. During the fall semester of the academic year 2014-2015 we surveyed 124 randomly chosen students from second year. The math class for these students was obligatory for that semester, but also they had another obligatory math course in the previous semester.
The questionnaire consisted of questions concerning some important data about the students, as well as questions concerning the teaching and learning methods used in the math class that the students took that semester. The purpose of the survey was to detect which teaching method is preferred the most by our students. Also we wanted to detect the method in which students prefer to receive information concerning materials, content of the syllabus, the method of assignment etc.

In order to get a clear illustration concerning the interpretation of the gathered data, making conclusions and decisions, we have used the Statistical Analysis Software SPSS.
At the beginning we analyzed some elements from the descriptive statistics concerning some characteristics of the students, and then we continued with an analysis concerning the most preferred teaching method depending on some of these characteristics.
Since the obtained results show that part of the students prefer the traditional method of teaching and the preferences of the other part tend toward the non-traditional methods, for analyzing the obtained data in this research we have used Cross Tabulations. This is done with the purpose to get clearer picture for this issue. By Cross tabulations we can detect the preferences of our students versus some other characteristics.

RESULTS AND DISCUSSION

From the processed data we can see that the gender distribution of the surveyed students is as follows: 61.29 % of them are male and 38.71 % female. The GPA distribution of the students is as follows: at the time of the survey 17.74% of the students had a GPA between 6 and 7, 28.23% of the surveyed students had a GPA between 7 and 8, 29.84% between 8 and 9, and 24.19% had a GPA greater than 9. Concerning the grades received in the math course which they took the previous semester the percentage distribution is as follows: 11.29% of the students failed the course (they received a grade 5), 25.81% of them received grade 6 (Satisfactory), 15.32% grade 7 (Good), 12.10% grade 8 (Very Good), 17.74% grade 9 (Excellent), and 17.74% grade 10 (Outstanding).

Concerning the class attendance for the math course they took the previous semester we have the following results: 62.10% of the students attended all lectures (they didn't miss any lecture), 37.10% of the students missed only a few hours, and 0.81% often missed lectures.

On the questionnaire there was a question whether the student generally seeks help from their instructor during lectures; 85.48% of the students have answered that they have asked for help. On the other hand 14.52% answered that they never asked for help.

Another interesting question on the questionnaire asked students to self-evaluate their skills in mathematics using grades from 1-10. The average for this question was 7.48.

The obtained results are represented in table 1.

Table 1: Description of Sample

Characteristic		**Percent**
Gender	Male	61.29
	Female	38.71
Average Student Math Skill Rating: Scale: 1 to 10 (# of students)		7.48
Success GPA until now: (# of students)	Between 6 and 7	17.74
	Between 7 and 8	28.23
	Between 8 and 9	29.84
	Above 9	24.19
MATH scores from the previous semester: (# of students)	5 (Failing)	11.29
	6 (Satisfactory)	25.81
	7 (Good)	15.32
	8 (Very Good)	12.10
	9 (Excellent)	17.74
	10 (Outstanding)	17.74
Student generally seeks help from the instructors in classes taken:	Yes	85.48
	No	14.52
Attendance of students during the previous semester: (# of students)	I have not missed any hour	62.10
	I was absent a few times	37.10
	I was often absent	0.81
Total		100.00

Concerning the most preferred teaching method, the answers of the students are distributed as follows: 60.48% of the students have answered that they prefer non-traditional methods. (The methods where students are divided into small groups, methods that encourage students to participate in discussions, the method of distance learning using IT technologies, learning based on using a special computer software etc.). On the other hand just 39.52% of the students have answered that they prefer the traditional method of learning.

In order to get a detailed picture concerning students preferences over teaching methods in math classes versus some other characteristics, we have used a Cross tabulation of these characteristics. The obtained results are represented in table 2.

Table 2: Students Preferring Traditional And Non-Traditional Approaches By Some Characteristic

		Traditional	Nontraditional	Total
Gender	Male	46.1%	53.9%	**100.0%**
	Female	29.2%	70.8%	**100.0%**
GPA at present: (# of students)	Between 6 and 7	36.4%	63.6%	**100.0%**
	Between 7 and 8	31.4%	68.6%	**100.0%**
	Between 8 and 9	48.6%	51.4%	**100.0%**
	Above 9	40.0%	60.0%	**100.0%**
MATH grade from the previous semester: (# of students)	5 (Failing)	35.7%	64.3%	**100.0%**
	6 (Satisfactory)	25.0%	75.0%	**100.0%**
	7 (Good0	47.4%	52.6%	**100.0%**
	8 (Very Good)	40.0%	60.0%	**100.0%**
	9 (Excellent)	59.1%	40.9%	**100.0%**
	10 (Outstanding)	36.4%	63.6%	**100.0%**
Attendance of students for the previous semester: (# of students)	I have not missed any hour	40.3%	59.7%	**100.0%**
	I was absent a few times	39.1%	60.9%	**100.0%**
	I was often absent	50.0%	50.0%	**100.0%**
Average Student Math Skills Rating: Scale: 1 to 10 (# of students)	2	50.0%	50.0%	**100.0%**
	4	16.7%	83.3%	**100.0%**
	5	25.0%	75.0%	**100.0%**
	6	26.1%	73.9%	**100.0%**
	7	42.9%	57.1%	**100.0%**
	8	44.8%	55.2%	**100.0%**
	9	51.9%	48.1%	**100.0%**
	10	33.3%	66.7%	**100.0%**
Student generally seeks help from the instructors in classes taken:	Yes	43.4%	56.6%	**100.0%**
	No	16.7%	83.3%	**100.0%**
Total		**39.5%**	**60.5%**	**100.0%**

From the table given above one can see that the non-traditional method of teaching is preferred more by students with the following characteristics: female students, students with a GPA between 7 and 8, students who have received a satisfactory grade (grade 6) for the class they took the previous semester, students who have evaluated their math skills with the grade 4, students who are not asking for help from the lecturer, students who were absent during the math lectures only few times during the previous semester.

Concerning the students opinions about the importance of solving homework, taking quizzes, having lectures in the computer labs and posting the lecture materials on LIBRI (Learning Management System, the online software offered in the SEE-University), the percentage of confirmative answers are 87.10% , 77.42%, 60.48%, and 98.39% respectively. Concerning students preferences over taking notes during class versus just listening to the lecture, the preference for the former is 75%. Regarding the way of taking notes, students prefer the most to take notes directly from the white board on which the teacher writes using a marker. The percentage of this preference was 76.61%.

Taking into the consideration the fact that nowadays using the internet has become an indispensable tool of learning, and due to the fact that SEE University offers very good conditions for IT communication and IT learning, we asked a question concerning this issue as well. The obtained answer was that 88.71% of surveyed students use internet every day. Among different activities that they are performing via internet, 91.25% of the students declared that they use internet for finding information and learning materials.

We want to emphasize an interesting fact, namely 79.03% of the students have the opinion that having a free discussion during class which is not connected with the course topic, as well as having fun or hearing a joke during a particular part of the lesson, has a positive effect on achieving the learning objectives. The obtained results are given in table 3.

Table 3: Students Opinion Concerning Some Characteristics Of Learning Mathematics

Characteristic		**Percent**
The opinion concerning the positive effect of doing homework	No	12.90
	Yes	87.10
The opinion concerning the positive effect of quizzes	No	22.58
	Yes	77.42
The opinion concerning the positive effect of having lessons in computer labs	No	39.52
	Yes	60.48
The opinion concerning the positive effect of delivering materials in LIBRI	No	1.61
	Yes	98.39
The opinion concerning the positive effect of discussion and hearing a joke during the lessons	No	20.97
	Yes	79.03
Using internet	Every day	88.71
	1 to 4 times during the week	8.06
	1 to 3 times during the month	0.81
	Rarely than once per month	1.61
The preferences of taking notes during class	Taking notes during lesson	75.00
	Having prepared notes at the beginning of the lesson.	10.48
	Having online prepared notes on internet	8.06
	It's not important	6.45
The preferences concerning the lecturing method used by the lecturer	Writing on the white board by marker	76.61
	Using slides prepared before the lesson	5.65
	Writing with pencil on a S-BORD	3.23
	A combination of above mentioned cases. Please specify!	6.45
	It's not important for me.	8.06
Total		**100.00**

In order to check these characteristics depending on students who prefer the traditional methods versus students who prefer the non-traditional methods, cross tabulation analysis gives detailed results shown in table 4.

Table 4: Students Preferring Traditional And Non-Traditional Approaches By Some Characteristic

		TEACHSTYLE		
		Traditional	Nontraditional	Total
The opinion concerning the positive effect of doing home work	No	31.25	68.75	100.00
	Yes	40.74	59.26	100.00
The opinion concerning the positive effect of quizzes	No	35.71	64.29	100.00
	Yes	40.63	59.38	100.00
The opinion concerning the positive effect of having lessons in computer labs	No	28.57	71.43	100.00
	Yes	46.67	53.33	100.00
The opinion concerning the positive effect of delivering materials in LIBRI	No	100.00	0.00	100.00
	Yes	38.52	61.48	100.00

The opinion concerning the positive effect of discussions and hearing a joke during class	No	30.77	69.23	100.00
	Yes	41.84	58.16	100.00
Using internet	Every day	37.27	62.73	100.00
	1 to 4 times during the week	50.00	50.00	100.00
	1 to 3 times during the month	100.00	0.00	100.00
	Rarely than once per month	100.00	0.00	100.00
The preferences of taking notes during class	Taking notes during the lessons	37.63	62.37	100.00
	Having prepared notes at the beginning of the lesson.	38.46	61.54	100.00
	Having notes on internet	50.00	50.00	100.00
	It's not important	50.00	50.00	100.00
The preferences concerning the lecturing method applied from the lecturer	Writing on the white board with marker	38.95	61.05	100.00
	Using prepared slides before the lesson	42.86	57.14	100.00
	Writing with pencil on the S-BORD	42.00	58.00	100.00
	A combination of above mentioned cases. Please specify!	25.00	75.00	100.00
	It's not important for me.	70.00	30.00	100.00
Total		**39.52**	**60.48**	**100.00**

From the table, one can see that the non-traditional method is preferred more by students who have declared that doing homework, having quizzes, having lessons in computer labs and hearing jokes during class has no positive effect for learning.

CONCLUSIONS AND RECOMMENDATIONS

Using the results of this research one can create a clearer and more detailed picture concerning students' perspectives on math courses. So, the information about the student's perspectives concerning the most preferred style of teaching has the aim to improve the learning process and the achievement of better results.

From the research one can see that a bigger percentage of students (60.48%) prefer the non-traditional method versus the traditional one. Another conclusion is that the female students, students with a GPA between 7 and 8, students with grade 6 (Satisfactory) for the math course they took the previous semester, students who have evaluated their math skills with the grade 4, students who do not seek help from the teacher, students who have missed class few times during the last semester prefer the non-traditional method compared with their counterparts who have different preferences.

On the other hand, one can see that students who have answered that solving homework, doing quizzes, having lectures in the computer labs and having free discussion or hearing jokes during class are not very useful for achieving the learning objectives, prefer non-traditional teaching versus the traditional method compared with their counterparts who have different preferences.

75% of students prefer taking notes during class compared with the traditional way of listening. The bigger percentage of them prefers the non-traditional method versus the traditional one. Even more, 76.61% of students prefer to attend lessons where teachers write notes on the white board compared with other forms. The bigger percentage of these students prefers more the non-traditional method.

However, from the obtained data one can see that there are a considerable percentage of students, whose preference tends toward the traditional method. This percentage is 39.52%. Therefore, taking into consideration the nature of the subject, the teacher should have bigger engagement in achieving the learning objectives using different practices and methods. This is very important in order to have a positive influence on the students and make mathematics more attractive for them.

The basic purpose of the lecturers (teachers), Universities and society in general, is the enhancement of students learning. We hope that the results from the study shown in this research will help in the direction of enhancement of the quality of education of new generations.

The enhancement of the quality of students learning is the final purpose. So, we hope that the results of this research are an important step into the right direction.

REFERENCES

Desoete, A., Roeyers, H., & Buysse, A. (2001). Metacognition and mathematical problem solving in Grade 3. Journal of Learning Disabilities, 34 (5), 435-449.

Goe, L. (2007). The link between teacher quality and student outcomes: A research synthesis. Washington, DC:National Comprehensive Center for Teacher Quality. Retrieved February 27, 2008, from http://www.ncctq.org/publications/LinkBetweenTQandStudentOutcomes.pdf

Hansson, Å. (2010). Instructional responsibility in mathematics education: modeling classroom teaching using Swedish data. Educational Studies In Mathematics, 75(2), 171-189.

Hinde, R. J. and Kovac, J. (2001), "Student Active Learning Methods in Physical Chemistry," *Journal of Chemical Education*, 78(1), 93-99.

Iljazi, T. and Alija, S. (2010). Teaching in small groups motivates learning. In *Volume Six, Number Two, pp. 153-170*. SEEU REVIEW, Tetovo, Mcedonia.

Johnson, H.D. and N. Dasgupta (2005), "Traditional versus Non-Traditional Teaching: Perspectives of Students in Introductory Statistics Classes," Journal of Statistics Education, 13 (2)

Johnson, R. T., and Johnson, D. W. (1986), "Action Research: Cooperative Learning in the Science Classroom," *Science and Children*, 24(2), 31-32.

Kerman, S. (1979). "*Teacher Expectations and Student Achievement*." *Phi Delta Kappan*

McCarthy, J. P. and Anderson, L. (2000), "Active Learning Techniques versus Traditional Teaching Styles: Two Experiments from History and Political Science," *Innovative Higher Education*, 24(4), 279-94.

Powell, K., & Kalina, C. (2009). Cognitive and social constructivism: Developing tools for an effective classroom. Education, 130(2), 241-250.

Woo, M. A., and Kimmick, J. V. (2000), "Comparison of Internet versus Lecture Instructional Methods for Teaching Nursing Research," *Journal of Professional Nursing*, 16(3), 132-39.