Innovative Teaching Models in the System of University Education: Opportunities... pp. 49–61

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UDC 378.147:004.9
37.018.43:378

POSSIBILITY OF IMPROVING EDUCATIONAL ACTIVITIES AT UNIVERSITIES BY APPLYING INTEGRATIVE APPROACH WITHIN MULTIMEDIA PROGRAMMED TEACHING

Abstract: The strategic document determinants in the field of education and the results of research on the improvement of teaching using Information and Communications Technology (ICT) integrative approach and programmed instruction were the starting point for the theoretical consideration of the possibilities of raising the quality of university education. In order for the theoretical context of this idea to have a practical dimension, research was conducted to determine how students recognize the possibilities of improving university instruction using modern working models. The sample consisted of 111 BA (Bachelor of Arts) level students of the Faculty of Education. The methods applied in the research were the descriptive method and the scaling technique. The research results confirm that students recognize the need and importance of innovating in the teaching process and recognize the possibilities for raising its quality using ICT and innovative working models. The conclusion implies that multimedia programmed teaching in the context of an integrative approach to curriculum content is a good starting point for ensuring the quality of higher education. The above model has found its place in the modern concept of blended learning, so in this regard, further research could study its impact on the quality of students' knowledge and the possibility of combining with other models of teaching.

Keywords: integrated teaching, quality of higher education, multimedia programmed teaching, educational technology.

INTRODUCTION

In modern society, it is highly important to make the higher education system able to respond to numerous dynamic changes and technological advancement of society. Dobrota and Benković (2014) note that *teaching at higher education institutions in Serbia still relies on traditional 'ex-cathedra' methods and* the repeated use of one and the same approach in a particular subject will discourage students *to participate in the learning process.* The quality of higher education has long been in the focus of reform changes in order to provide more competitive

and efficient education for all and contribute to the development of cooperation among different European institutions. According to the *Standards and Guidelines for Quality Assurance in the European Higher Education Area* (2005), consistency in quality assurance in the European higher education area can be ensured by universal standards. Accordingly, the *Strategy for Education Development in Serbia* recognizes the higher education quality prerequisites in equalizing the training of future teachers, conducting classes in common subjects and mutual cooperation of teachers and students, providing knowledge and skills in accordance with the National Qualifications Framework and key competencies, which includes the ability to innovate, critical thinking, communication skills, the application of modern information technology, etc. (*Strategy for Education Development* ..., 2012).

Recent research on university teaching shows that students recognize the *programmed teaching* model as a possibility to improve the quality of educational activities (Kopas-Vukašinović, Golubović-Ilić & Cekić-Jovanović, 2017). By analyzing the 2020 (2012) Strategy for Education Development in Serbia and the 2017 Digital Competence Framework, the current researchers notice that there is a tendency for university teaching to be innovated using information technology (hereinafter referred to as IT) in order to provide students with the necessary digital competencies to work in the modern society. In accordance with the requirement that higher education curriculum reforms in Europe must be the key processes leading to a higher quality of education and individualized educational approaches (*The Bologna Process 2020 ...,* 2009), programmed teaching finds its place in contemporary university education through integration with modern information technology but also other models of educational work.

The advantage of programmed IT-supported teaching is reflected in that there is a two-way communication with students and a constant feedback on their achievements. Research has shown that most students recognize the importance of *feedback* within university teaching (Kopas-Vukašinović, Golubović-Ilić & Cekić-Jovanović, 2017) and that students, after processing each part of the curriculum, want to know at any time what they have learned, what they have not learned, where they have made a mistake and how to correct it.

If one considers the requirement that contemporary university education should involve students both in the evaluation of courses and *creating teaching processes* (Leisyte & Westerheijden, 2014), the current researchers find that this model allows students not only to choose contents while progressing at their own pace but also to affect them by changing, complementing, critically analyzing and distributing using social networks. In this way, a page of the multimedia programmed material becomes multidirectional and encourages students to determine their own way of learning, how long to stick to a part of the content or learn about it

more if they find it necessary. On that occasion, teaching is focused on a student–*the student is at the centre of learning*, which is one of the prerequisites and main ideas of the Bologna Process and the *Strategy for Education Development* (2012).

Placed in the context of multimedia and integrative approach, by the application of interactive educational and computer software, programmed teaching corresponds to the contemporary determinant of hybrid learning that is current and has been studied in recent years (Wang, Sun & Shi, 2018). It represents a combination of learning via the Internet, multimedia content and direct teaching (integrative approach, team-teaching, cooperative learning, etc.). The new system of programmed teaching based on the use of computers and connection between subjects enables the development of both key and transversal, digital competencies. It aims to make university teaching more progressive, more dynamic, more effective, more creative and more interesting without students being only passive observers and recipients of information.

In addition to this innovating of programmed teaching using IT, the analysis of the primary school curriculum contents that suggest teachers to achieve an integrated, thematic approach when planning and conducting classes by independent selection of coherent and compatible contents (*RS Official Gazette*, 2006, 46) concludes that this innovative model should be innovated and improved also by applying an integrative approach primarily since students, future teachers, need to be trained to implement an integrative approach in order for them to gain the necessary competencies for its successful application in primary schools.

Since curriculum content integration results in a higher quality of acquired knowledge, integrity, mutual (internal or external) connection of its parts which "are not self-sufficient and which function only as elements or subsystems of a unified system" (Spremić-Solaković, 2009: 404), the current researchers integrated and implemented the contents of the Methodology of teaching Science and Social Studies and the Methodology of teaching Fine Arts, thus enabling students to take on a different way to acquire and deepen their knowledge about the method of graphic works. Multimedia programmed teaching with third-year students of the undergraduate study program *Grade teacher* was implemented at the Faculty of Education, University of Kragujevac, Jagodina. On that occasion, through the integration of curriculum contents of the Methodology of teaching Science and Social Studies and the Methodology of teaching Fine Arts, students were allowed to individually study the multimedia programmed material related to the method of graphic works which was one of the common fields of these two subjects.

One of the ways to put the teaching process emphasis on the student is certainly the application of the graphic work method. The coherence characteristic of the graphic method essentially contributes to better understanding of curriculum content i.e. the functionality of teaching. As a highly effective form of transferring

necessary information, in its numerous forms, applicable on almost all curriculum contents, the graphic method enables the intensity of teaching, thus also covering the contents of the Methodology of teaching Science and Social Studies and the Methodology of teaching Fine Arts. The efficiency of the graphic method is reflected in the cost-effectiveness of achieving results which are in line with the core sense of education – to learn something or achieve the necessary level of knowledge with as low effort of teachers and students as possible, through the use of various specific methods.

Considering the degree of autonomy in work, graphic works encourage a high level of activity in the teaching process, especially when applying the direct graphic method of work. In cases when the teacher supports the oral presentation with content visualization (schematic representations, visualization of data or abstraction of laws and rules), drawing is a simple and direct methodical procedure to present the information more fully. In teaching, drawing is manifested as the instructive work of teachers and the independent work of students. The contents of this subject must always be presented as visual occurrences and phenomena (Loose, 2012). Visual subject matter in the focus of the class is directly illustrated or indirectly demonstrated by the teacher using a drawing, diagram or scheme by the method of graphic work and applying generalization so that students can transpose them in their own way in their artistic expression.

Based on previously considered theoretical starting points, we carried out a research focusing on the attitudes of the students of the Faculty of Education towards the ways and possibilities of improving university education.

METHODOLOGICAL FRAMEWORK OF RESEARCH

The objective of the research is *to determine whether and how students recognize the possibilities of improving teaching activities at the faculty using modern work models that would encourage their greater interactivity with curriculum contents, easier learning and adoption of higher-quality knowledge.*

Based on the determined objective of the research, the following research tasks have been concretized:

1. Examine students' attitudes about the characteristics of teaching that dominates the faculty.
2. Determine whether students consider the application of multimedia programmed teaching and integrative approach as a prerequisite for *greater interactivity* and *quality of acquired knowledge* in the teaching process.
3. Examine whether students recognize the benefits of *learning using multimedia programmed teaching in the context of an integrative approach to teaching.*

4. Determine whether there is a statistically significant difference in the attitudes of the respondents with regard to the independent variable defined as the *year of study* in this research.

Research methods, procedures and instruments:

The research used the descriptive method and the scaling technique. For the purpose of this research, a five-point Likert-type scale of attitudes intended for students was designed. The respondents filled out the scale online through the Google Form which was publicly available through the link published on the website of the Faculty of Education in Jagodina during the 2017/2018 school year.

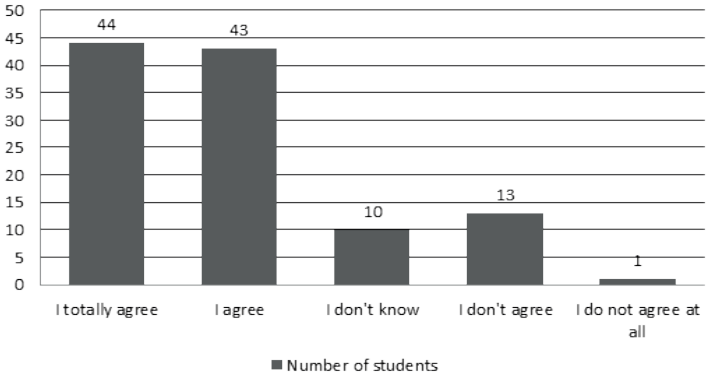
Research sample:

A suitable sample was selected for the purposes of this research – students of the second and third year of undergraduate studies from the Faculty of Education, University of Kragujevac, Grade teacher profile (N = 111).

RESEARCH RESULTS WITH DISCUSSION

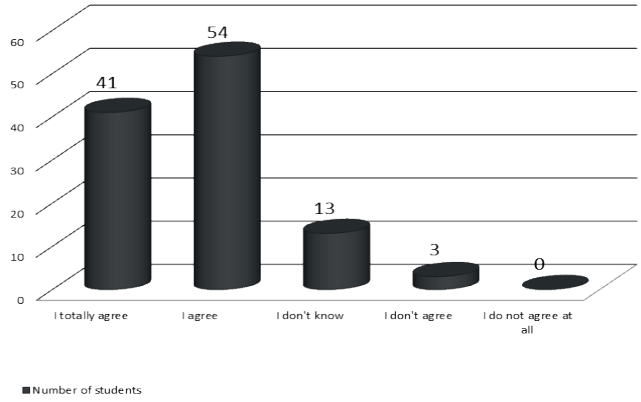
In the first research task, the current researchers tried to learn about the attitudes of students on the characteristics of teaching dominating the faculty. On this occasion, the current researchers started from the statement *When the teacher uses frontal instruction, he/she does not encourage students to act and think about the contents being processed as the students only passively listen*. The answers that were received in this research on this occasion are shown in Graph 1. The descriptive indicators point to the fact that most students, 87 respondents (78.36%), agree with the above statement, 10 respondents have a neutral attitude, and 14 students (12.8%) believe that the frontal form of work can stimulate activity and thinking.

Graph 1. Distribution of respondents' answers to the statement that *frontal instruction does not encourage students to act and think since they only listen passively*.



Since the teaching process needs to be transferred from the teachers and curriculum content to the student and the quality of knowledge and skills acquired during education, frontal instruction can achieve its advantages within university teaching if innovated and combined with other teaching models of work. In order to further substantiate this claim, in the context of the first research task the current researchers also considered the answers of the students regarding the statements that *in the course of university teaching, it is important to put the students in the centre of attention and shift the focus from teaching to learning*. The descriptive indicators in Graph 2 show that 95 respondents (85.58%) have a positive attitude, 2.7% of respondents consider it unnecessary, while 13 students have a neutral attitude on this issue.

Graph 2. Distribution of respondents' answers to the statement that *in the course of university teaching it is important to put the students in the centre of attention.*

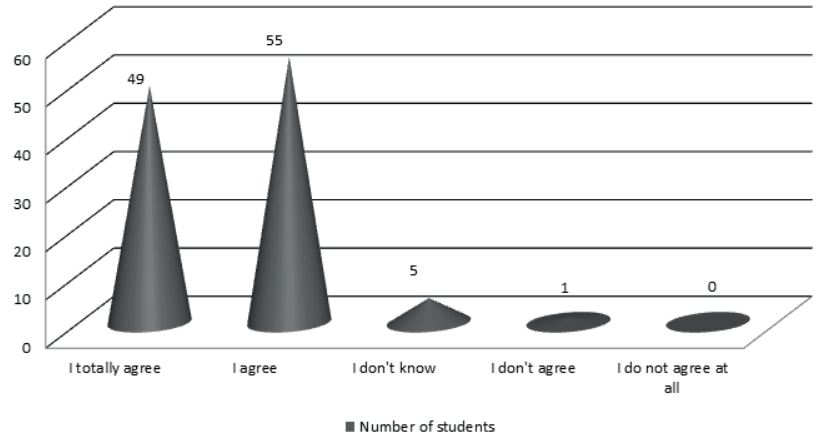


The above-presented results are supported by the median which in this case has a value of 2.50. Student-centred learning is an instructional approach in which students influence the content, activities, materials, and pace of learning. The SCL approach involves such techniques as substituting active learning experiences for lectures, assigning open-ended problems and problems requiring critical or creative thinking that cannot be solved by following text examples, involving students in simulations and role plays, and using self-paced and/or cooperative (team-based) learning (Collins & O'Brien, 2003).

Students should be given the opportunity to work with teachers to plan, create, comment on and distribute curriculum content, and to adopt the material according to their interests, abilities and previous knowledge. The attitude of the students regarding the previous issue corresponds to the idea given in the strategic documents (*Strategy*, 2012, *Bologna*) that refers to Student-centered learning.

The second research task is performed through several assertions. Based on the answers shown in Graph 3, we note that 104 respondents (93.69%) have a positive attitude, 4.5% of respondents have a neutral attitude, while only one student disagrees with the claim that multimedia within the programmed teaching provides an interactive relationship of students and contents.

Graph 3. Distribution of respondents' answers to the statement *Multimedia within the programmed teaching allows for the interactive role of students.*



Multimedia contributes to a more comprehensive problem examination, which is also important from the aspect of an integrative approach. The role of students becomes interactive as they are active participants in the teaching process who, by their actions, select multimedia sources of knowledge and create their own way and method of acquiring knowledge through the diverse material and joint activities with teachers.

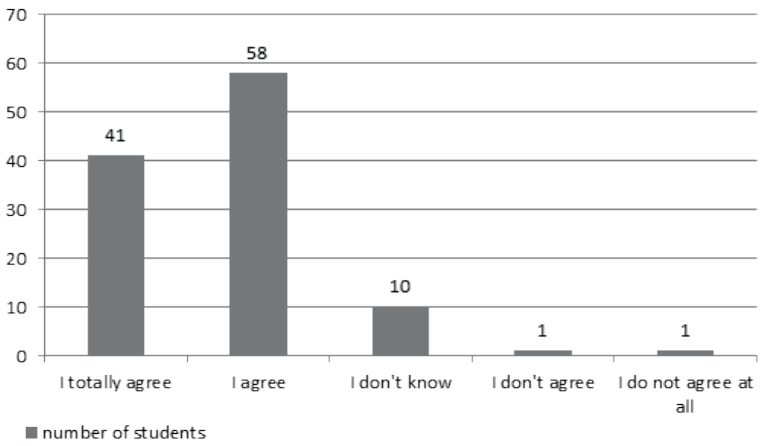
Similarly, Table 1 illustrates students' responses to the statement that *the application of multimedia programmed teaching in the context of an integrative approach contributes to the easier understanding of materials and influences the increase in the acquired knowledge quality.* Descriptive indicators show that the absolute majority of students, 100% of respondents, have a positive attitude and believe that the implementation of this teaching model enables easier understanding of materials and gaining higher-quality knowledge. These results are fully in line with the results of the research that dealt with the programmed teaching and confirmed that this model of work has its advantages and that its application within certain teaching subjects positively affects the quality of the acquired knowledge (Terzić & Miljanović, 2009; Županec, Miljanović & Pribićević, 2013).

Table 1. Distribution of respondents' answers to the statement that the application of integrative teaching affects the quality of acquired knowledge.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	I totally agree	62	55.86	55.86	55.86
	I agree	49	44.14	44.14	100.0
	I do not know	0	0.0	0.0	100.0
	I do not agree	0	0.0	0.0	100.0
	I do not agree at all	0	0.0	0.0	100.0
Total		111	100.0	100.0	

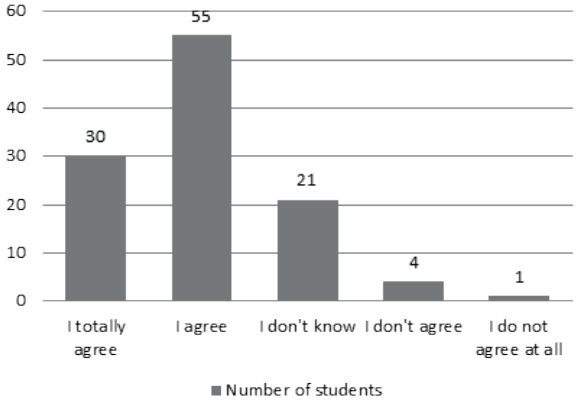
On the other hand, the research results (Corlu, Capraro & Çorlu, 2015; Singh & Gopalkrishnan, 2017, etc.) confirm that the application of an integrative approach to teaching enables better understanding of content, examining problems from different angles and aspects, developing habits to consider the phenomena, processes and relationships in the environment in a deeper and more comprehensive way, and see the world surrounding us in a unique way. In this regard, within the same research task, we asked students whether *Integration of contents of different teaching subjects enables more successful acquisition of high-quality and practically applicable knowledge*. The answers presented in Graph 4 suggest that the vast majority of respondents, 99 (89.18%) of them, have a positive attitude, while the number of students who have opted for a neutral attitude is 10 or 9% of the total sample, and that the results are compatible with the previously mentioned results of the study on integrative teaching and its impact on the quality of knowledge.

Graph 4. Distribution of respondents' answers in relation to the statement that *Content integration enables more successful acquisition of quality knowledge*.



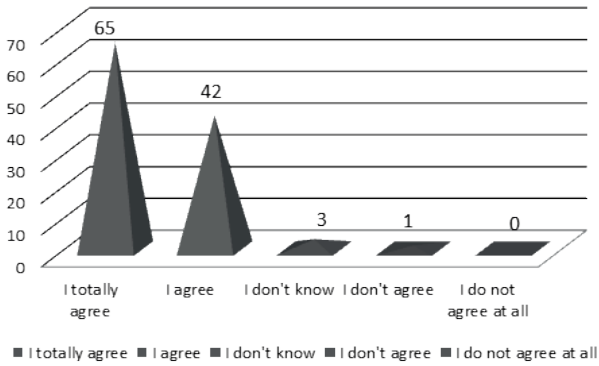
Within the third research task, the advantages of applying multimedia programmed teaching in the context of an integrative model of work were first considered through students' attitudes about whether *the use of IT in teaching has advantages in terms of individualization of teaching*. The answers we have obtained (Graph 5) show that the majority of students 75.54% (85 respondents) has a positive attitude, 21 (18.91%) students do not know the answer to this question and 5 respondents (4.5%) consider that this method of work does not encourage teaching individualization.

Graph 5. Distribution of respondents' answers to the statement *The use of IT in teaching has advantages regarding the individualization of teaching.*



The previous results are also complemented by the data the current researchers obtained within the following question (Graph 6). The results unambiguously show that most students, as many as 96.4% of them, have a positive attitude, 2.7% (3 respondents) have a neutral attitude, and only one student does not agree with the above statement.

Graph 6. Distribution of answers to the question of whether *it is important for students to master the curriculum content at their own pace in the way that best suits them.*



The fact is that the potential of the multimedia programmed material is great, that is, its content, the information it offers, can be used in a manner suitable to individual sensibilities, abilities, previous knowledge and interests of students. What is imposed as another key advantage of this teaching system that could find its place in university education is certainly the adjustment of the learning process to the specific needs of students, that is, greater individualization of teaching.

By calculating the statistical significance of differences in the attitudes of the respondents with respect to the independent variable *year of study* attended by the students at the Faculty, we have come to the following results: Since the research data were gathered according to the model of a five-point Likert scale of attitudes, thus originating from an ordinal measurement scale, and that there were two groups of respondents, we considered that the *Mann–Whitney U test* was the most adequate for testing the zero hypothesis and calculating the statistical significance of differences in the attitudes of the respondents with regard to the independent variable that was defined as the year of study of respondents at the Faculty. Namely, when it comes to the year of study as an independent variable, the value of significance in all assertions, except for one, is greater than 0.05 ($p>0.05$), which means that the difference is not statistically significant, that is, the zero hypothesis is proven and there is no statistically significant difference in most attitudes with regard to the year of study of the respondents.

The exception is the attitude *The application of multimedia programmed teaching in the context of an integrative approach affects the motivation of students to learn*, in which there is a statistically significant difference. The level of significance in this case is less than 0.05 ($p<0.05$) and from Table 2 it can be concluded that the difference in the obtained values for the attitude is statistically significant since there is 95% probability that the difference in the attitudes of the respondents in relation to the year of study they attend at the Faculty of Education is statistically significant, and that in 95% of cases there is a systemic factor or some kind of regularity that leads to this difference.

Table 2. Mann-Whitney Test

Test Statistics[a]				
	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Application of multimedia programmed teaching in the context of an integrative approach affects the increase in the motivation of students to learn	3110.500	8363.500	-2.019	.043

Given the third-year students had the opportunity to directly use multimedia programmed material for processing the integrated contents of the Methodology of teaching Science and Social Studies and the Methodology of teaching Fine Arts related to the method of graphic works, it is in these direct experiences that we can look for the reasons for the existence of statistically significant differences. Contact with interactive multimedia content influenced students' motivation for learning as they gained certain knowledge and skills through their own activities and problem solving, which increased their motivation. The application of these innovative models in a multimedia environment has certainly increased the level of active participation of students in their own education and learning process. In this way, their subject position has been improved through independent decision-making, curriculum design, taking responsibility for their own education and active participation in teaching through solving specific problems. Objective knowledge of one's own results acts as a motivation.

CONCLUSION

Research has shown that innovative teaching models are one of the basic prerequisites for university education quality. The Bologna process insists on adapting the university to the immediate needs of the society and European higher education institutions face great challenges in understanding the essence of education and its role in the contemporary society (Bodroški Sparios, 2015: 410). The proposed teaching system implies an integrative approach, practical application of knowledge, use of modern IT, as well as adaptation of content and process to the needs of students and society.

In order to check the theoretical findings and further develop professional practices, students' attitudes about the possibilities and conditions for improving teaching activities at universities are important. Their attitudes were examined with the aim of determining whether and *how students recognize the possibilities of improving teaching activities at the faculty using modern work models that would encourage greater interactivity with teaching content, easier learning and acquisition of higher-quality knowledge*. The research results confirm that students recognize the shortcomings of the frontal instruction that dominates the faculty as it does not inspire them to be active in a sufficient manner. Students have a positive attitude in relation to the assertion that the focus of teaching should be put to learning, and that the student should be at the centre of learning. The results further showed that students recognize the importance of multimedia content in terms of their interactivity. Most students also see multimedia programmed teaching and teaching content integration as ways to easily understand the material and adopt high-quality and practically applicable knowledge. Most students

recognize the benefits of applying multimedia programmed teaching in the context of an integrative approach to teaching related to teaching individualization. They agree that it allows them to individualize the pace of progress and to select the source of knowledge and learning flow according to their own interests. It is also significant that the statistically significant difference in the attitudes of the respondents with regard to the independent variable that has been defined herein as the year of study exists only when it comes to students' motivation to learn.

The presented results point to the conclusion that the students' attitudes are at the same time their expectations from teachers in educational activities. In order to improve university education, these issues should be the starting point for further activities of university institutions and open up new dilemmas and opportunities. In this regard, it would be necessary to organize an experimental research with parallel groups in such a way that one group listens to a certain number of lectures in a traditional, usual manner, and the other group participates in lectures organized in a modern way – using an integrated approach within multimedia programmed teaching. In this way, if statistics were confirmed, new opportunities and ideas for further study of this issue and improvement of university education would be opened.

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