Živorad M. Milenović[1]
University of Priština, Teacher Training Faculty in Prizren, Serbia

Biljana S. Jeremić
University of Novi Sad, Faculty of Education in Sombor, Serbia

Danijela M. Sudzilovski
University of Kragujevac, Faculty of Education in Užice, Serbia

Perceptions of Pre-Service Primary School Teachers Regarding the Application of Interactive Educational Software in Classroom Teaching[2]

Extended summary

The aim of the research is to determine the contribution of interactive educational software in classroom teaching. The aim of the research is to determine the contribution of interactive educational software in classroom teaching. The starting point of the research was the general assumption that the Interactive Educational Software in Classroom Teaching (IESCT) significantly contributes to the effectiveness of classroom teaching, learning and student participation in teaching, and also the specific assumption that this research will help isolate the components indicating the most common contributions of IESCT, as well as that a significant difference will be determined in student assessment of the contribution of IESCT, based on their academic achievement.

1 zivorad.milenovic@pr.ac.rs

The research was conducted in the second half of 2019, on a sample of 83 students attending the Classroom Teaching Study Programme at the Faculty of Education in Prizren (Republic of Serbia). The research used a combined instrument, namely the Interactive Educational Software in Classroom Teaching Scale (IESCT Scale). In addition to the general question on the students' academic achievement during studies, this instrument also consists of a 20-item scale with a 3-point scale of agreement intensity: 1) I agree; 2) I am not sure; and 3) I disagree. Some of the metric characteristics of the Scale were tested in the research itself by using factor analysis with Varimax rotation and Cronbach's alpha coefficient (Cronbach's alpha coefficient = .912).

Using the Guttman-Kaiser criterion, two main components with a characteristic root greater than one were obtained, explaining 88,100% of the total variance in total. (Table 2) The first component is determined by 18 items: 2, 9, 11, 13, 6, 18, 17, 1, 5, 12, 15, 8, 10, 16, 3, 74, 19 and 15; it accounts for 44.556% of the common variance; it was called Effectiveness of Teaching. The second component is determined by 2 items: 4 and 20; it accounts for 43.544% of the common variance; and it was called Individuality in Learning.

A statistically significant difference was found at the level of $p<.05$ in the results of 4 groups of students divided based on their achievements during studies, in their assessment of the importance of the IESCT (3; 79) = 3.499; p = .019. The actual difference between the mean values of the student groups indicates a medium influence (Eta = .117). (Table 4) Based on the data presented in Tables 5 and 6, it can be concluded that the subsequent comparisons using the Tukey's HSD test have shown that the mean values of group 1 (6.00-7.00): M = 45.3333; SD = 6.55235 and group 3 (8.01-9.00): M = 55.0000; SD = 6.92820 – were statistically significantly different. (Table 5) The data presented in Table 6 show that a significant difference in the IESCT significance scores at the level of $p <.05$ (p = .023) was found between the assessments of group 1 (6.00-7.00) and group 3 (8.01-9.00).

Generally speaking, students' achievement in the course of their studies significantly influences their opinions on the importance of implementing innovation in teaching. Their assessments of the importance and contribution of educational software in their own learning and participation in classes are also significantly different. According to the calculated mean values, the students with GPAs between 8.01 and 96.00 (M = 55.0000) have significantly more positive opinions of the importance of IESCT than the students with GPAs between 6.00 and 7.00 (M = 45.3333) (Table 5).

Factor analysis singled out two components: 1) teaching efficacy, and 2) individuality in learning. These components show, on the one hand, that the organization and implementation of teaching by using educational software would significantly contribute to improving the quality of teaching. It would also contribute to enhanced learning and greater student involvement in teaching. Educational software also significantly contributes to the greater individuality of students in teaching. In order to achieve this, students need to be able to use different educational software applications which contribute not only to more efficient learning, but also to the development of creative and inventive skills.

Based on the results of the research and the critical analyses presented in the paper, a need for the introduction of numerous innovations in the professional development of future

teachers in Serbia becomes apparent. This applies both to the modification of the classroom teaching study programmes, which currently do not include teaching contents related to the training of students for the application of educational software in teaching, and to their professional development during their teaching practice, which is mandatory in Serbia.

Keywords: e-learning, educational software, software implementation, individuality in learning, innovative learning models.

References

- Anderson, J. & McCusker, M. (2019). Make the Eigenvalue Problem Resonate with Our Students. *PRIMUS*, 29 (6), 625–644.

- Bartholomew, S., McGraw, T., Fauber, D., Charlesworth, J. & Weitlauf, J. (2020). Reducing Water Waste through Data-Driven Irrigation Practices. *Technology and Engineering Teacher*, 79 (4), 21–25.

- Gojkov Rajić, A., Šafranj, J. (2019). Mišljenje studenata o primeni MOODLE platforme za učenje stranog jezika struke. [Students' Opinion on the Application of the MOODLE Platform for Learning a Foreign Language for their Profession]. *Inovacije u nastavi*, 32 (2), 135–150.

- Đukić Mirzajanc, M. (2019). Efektivnost učenja Nemačkog jezika na platformi Mudl. [The Effectiveness of Learning German on the Moodle Platform]. *Inovacije u nastavi*, 32 (3), 130–150.

- Kopcha, T., Rieber, L. & Walker, B. (2016). Understanding University Faculty Perceptions about Innovation in Teaching and Technology. *British Journal of Educational Technology*, 47 (5), 945–957.

- Cheng, L. & Leong, S. (2017). Educational Affordances and Learning Design in Music Software Development. *Technology, Pedagogy and Education*, 26 (4), 395–407.

- Hwang, M. (2018). Graph Processing Using SAP HANA: A Teaching Case. *E-Journal of Business Education and Scholarship of Teaching*, 12 (2), 155–165.

- Koparan, T. (2019). Examination of the Dynamic Software-Supported Learning Environment in Data Analysis. *International Journal of Mathematical Education in Science and Technology*, 50 (2), 277–291.

- Magdas, I. & Bontea, T. (2011). Developing Digital Competences Using Educational Software. *A Pedagogical Research, Acta Didactica Napocensia*, 4 (4), 31–48.

- Marić, M., Branković, N. i Rodić Lukić, V. (2018). Budući učitelji i vaspitači između tendencije ka prilagođavanju i sklonosti prema inoviranju [Future Teachers and Preschool Teachers Between the Tendency to Adapt and the Tendency to Innovate]. *Inovacije u nastavi*, 31 (3), 61–73.

- Miljković, B., Žižović, M. (2018). Model IBT 3D tehnologije u sistemu dualnog obrazovanja [Model of IBT 3D Technology in the Dual Education System]. *Inovacije u nastavi*, 31 (4), 129–144.

- Olasina, G. (2019). Human and Social Factors Affecting the Decision of Students to Accept E-Learning. *Interactive Learning Environments*, 27 (3), 363-376.

- Ovesni, K., Stanojević, J. i Radović, V. (2019). Informaciono-komunikacione tehnologije u usavršavanju nastavnika srednjih stručnih škola [Information and Communication Technologies in the Development of Secondary Vocational School Teachers]. *Inovacije u nastavi*, 32 (3), 61–73.

- Pecanac, R., Jeremic, B. & Milenovic, Z. (2016). Digital Media in the Teaching of Music Education. *The New Educational Review*, 43 (1), 236–247.

- Quinlan, J. (2016). Mathematicians' Perspectives on the Utility of Software. *International Journal for Technology in Mathematics Education*, 23 (3), 103–109.

- Stanković, Z. (2017). Metodički modeli nastave primenom obrazovnih softvera [Methodological Models of Teaching With the Use of Educational Software]. *Godišnjak Pedagoškog fakulteta u Vranju [Yearbook of the Faculty of Education in Vranje]*, 8 (2), 237–252.

- Trbojevic, A., Jeremic, B. & Milenovic, Z. (2015). Multimedia approach to the development of social concepts in class teaching – a view from the students' perspective. *Teme*, 39 (3), 867–885.

- Wang, Y., Liu, X. & Zhang, Z. (2018). An Overview of e-Learning in China: History, Challenges and Opportunities, Research in Comparative and International Education, 13 (1), 195–210.

- Zsoldos Marchis, I. (2014). How In-Service Teachers Develop Electronic Lessons. *Acta Didactica Napocensia*, 7 (2), 61–67.