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Classes Supported by Digital Technologies: the Application of the Blog as a Virtual Tool in Biology Teaching

Extended summary

Innovations in technology are rapid and workers' roles in the virtual environment have changed. Due to the great need to educate professionals who need to adapt quickly, the modernization of teaching is gaining momentum. Education is undergoing fast changes owing to an increase of network communities based on technology. Blog is one of the internet tools that can be effectively implemented in education. A blog is an internet platform that brings together textual, audio, and video content in one place. The contents of the blog are arranged in reverse chronological order, from the most current to the oldest, which makes it extremely clear. This platform enables two-way (Web 2.0) communication, so that users can exchange information almost synchronously.

The aim of the research is to experimentally test the effects of the application of the blog in biology teaching on student achievement in relation to traditional teaching and to evaluate the attitudes of first-grade high school students (15-16 years of age) towards the characteristics of the blog. In relation to the research goal, tasks have been formulated for its operationalization: 1. To determine whether there is a statistically significant difference in the achievement of biology students on the final test between students of the group that used the blog in processing the teaching topic Basics of Cytology in the first grade of high school and students of the group that covered the same teaching topic by means of traditional teaching. 2. To determine which features of the blog are most important to students.

The research used an experimental model with parallel groups, an experimental (E group) that used a blog in learning the content of biology, and a control (C group) that implemented teaching in the traditional way.

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The sample consisted of 171 students, with 85 students of a high school in Šabac in the experimental group and 86 students of a high school in Novi Sad in the control group.

The instruments used in the research are: pre-test (applied at the beginning of the research, before the introduction of the innovative teaching model, which equalizes the E and C groups), post-test (applied for both groups after the introduction of the innovative teaching model in E groups), and an assessment scale by means of which students evaluated different characteristics of the blog.

For data processing on the pre-test and post-test, a t-test with a significance threshold of $p < .05$ was used. Data on the progress of the E and C group students on the pre-test and the post-test were processed by a combined analysis of variance (ANOVA). When processing the data on the characteristics of the blog, the arithmetic mean of the points on a scale of 1 (not important) - 4 (very important) was calculated.

Research results: The analysis of the results showed that there is a statistically significant difference in the achievement of the E and C groups on the post-test and this difference is in favor of the experimental group. In the post-test as a whole, the students of Group E achieved an average of 78.15 points, and the students of Group C 69.20 points. The results also indicate that students consider as most important the features of the blog that directly help them in learning. The obtained results showed that the most important characteristic for students is "The blog allows me to see complex biological processes on video". In addition to this, the blog feature that „allows students to see pictures and diagrams“ is also very important because visualization can be a powerful tool of intuition, playing a key role in transforming the ways in which students think about the domain of science.

The characteristics that "with the help of a blog they can effectively learn the material at home", or "at a time when it suits them" are also highly valued. The least important feature of a blog, according to students, is that "the blog allows them to check their knowledge from home, through comments with other students", and then the feature that "the blog encourages them to express their opinions through comments, without fear of other students ridiculing them". Although least valued by students, these characteristics must be viewed in the context of other characteristics listed.

Conclusions and pedagogical implications: The results obtained in this research indicate that blogs significantly contribute to an improved achievement of students who use them in learning biology. Therefore, their application should be much more represented in teaching practice in Serbia. Also, the results indicate that different characteristics of the blog are important to students, but that the characteristics that directly facilitate their mastering of the material (pictures, schemes, videos, comfort of learning from home, etc.) and when creating content on the blog should be given special attention.

The use of the blog in teaching brings about several questions. How to use the available technology? Is there a will to share information with other teachers teaching the same or different subjects, educational institutions, parents, and relevant social institutions? We hope that some future research will provide answers to these questions in order to complete the picture of the use of digital technologies in teaching and give a more detailed insight into the advantages and disadvantages of their use in teaching.

Keywords: teaching biology, ICT in teaching, blog in teaching

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