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USING WEB TECHNOLOGIES IN EFFECTIVE TEACHING OF MATHEMATICS AT UNIVERSITIES

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ИСПОЛЬЗОВАНИЕ ВЕБ-ТЕХНОЛОГИЙ В ЭФФЕКТИВНОМ ОБУЧЕНИИ МАТЕМАТИКЕ В ВУЗЕ

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Abstract. The article describes the role of web technologies in effective teaching of mathematics at universities. The advantages of the use of WebQuests are defined. This study aims to examine the effect of WebQuests used in instruction on students' academic achievements and the student and teacher opinions on WebQuests.

Аннотация. В статье рассмотрена роль веб-технологий в эффективном обучении математике в вузе. Выделены преимущества использования веб-квестов. Это исследование направлено на изучение влияния веб-квестов, используемых для достижения студентами запланированных академических результатов, а также на мнение студентов и преподавателей о веб-квестах.

Ключевые слова: информационные технологии, учебный процесс, веб-технологии, веб-квест.

Keywords: information technology, learning process, web technologies, WebQuest.

During the latter half of the 20th century, international thinking about education began to shift to a new paradigm. This shift was driven by an awareness of massive and ongoing social, economic and technological changes, and the exponentially increasing amount of human knowledge being generated as a result. International thinking began to seriously examine questions about the role and purposes of education in a world with an unprecedented degree of complexity, fluidity and uncertainty.

We define effective teaching as that which leads to improved student achievement using outcomes that matter to their future success. Defining effective teaching is not easy. Our research keeps coming back to this critical point: student progress is the yardstick by which teacher quality should be assessed. Ultimately, for a judgement about whether teaching is effective, to be seen as trustworthy, it must be checked against the progress being made by students.

This research is based on the important of Web Technologies in effective teaching of

mathematics at universities. The main objective of the article is analyzing the effect of WebQuests used in instruction on students' academic achievements and the student and teacher opinions on WebQuests. With this discussion, we would like to understand and clarify approaches of effective teaching of mathematics at universities.

In our view, in the present era, teaching- learning process in classroom is not limited to chalk and talk method, now a day, teaching method that lead to learning experiences through which learners try to obtain the specific objectives. In this effort a teacher uses various media like, audio, visual, single or multimedia package.

Today, society cannot do, for example, without Web Technologies. Integration of all spheres of life into the global information space guarantees effective interaction of people from the position of information exchange, prompt access to databases on the scale of the global information space, as well as meeting their needs for information services and products. In the period of transition to the information society, the problem of training professionals for the rapid perception and processing of a large amount of information, mastering modern methods of working with the studied material becomes especially urgent [1].

Web Technologies can be a powerful tool in exploring the nature of the world around us, including its technological systems. Web Technologies access to knowledge is one of the possibilities of information and communication technology that has tremendous impact on learning. The instructional Web Technologies have emerged in a variety of resources, and equipment, which can be used to supplement or complement the teachers' efforts in ensuring effective learning by students. [2]

In this article we present some examples of teacher approaches, classroom practices and skills that meet our criteria of being well-defined, implementable and linked to gains in student outcomes. Teachers may need to have clear understanding of why, when and how each of these practices can be effective, and exactly what it means to demonstrate them in a way that is optimal to promote students' learning.

As it is known, the power of Web Technologies lies in the fact that it is multi-sensory, stimulating the many senses of the audience. It is also interactive, enabling the end users of the application to control the content and flow of information. This has introduced important changes in the educational system and impact the way we communicate information to the learners. Today's students are much more media-centric than previous a generation, that's why the use of Web Technologies in classroom cannot be denied anymore. Using Web Technologies as a resource for teaching learning process is in more demand.

Web Technologies provide dynamic opportunities for instruction in math classrooms. Teachers can enhance the learning process and make concepts come alive through engaging and interactive media. Teachers may also offer additional supports to address the needs of all students and create customized learning experiences [3].

We have now discussed that the Web Technologies bring learning to life. Educators can bring videos, animations, interesting movies and other media into their learning process to help our students develop skills and understandings. And it can help to motivate and excite our students about their learning. Web Technologies create additional opportunities for learners to see and interact with mathematical concepts. Students can explore and make discoveries with games, simulations and digital tools. It seems as if educators are striving to get an Internet connection in their classroom these days. The most common rationale for this movement is to provide students passive access to valuable information. Traditionally, most universities have used libraries as a main source of access and still do.

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More recently, universities have discovered Web Technologies as a source which obviously breaks away from traditionalism. Web Technologies, unlike any other medium before it, are interactive and accessible to a great deal of people at once. Web technologies have the ability to provide endless amounts of information that can be used to motivate students to conduct investigations on any given topic. As an interactive tool for learning, teachers can use the Internet to stimulate creative thought and guide students to develop critical thinking in their "quest" for knowledge.

By this study, we decided to find the solution for this question- How does a teacher tame the nature of Web Technologies to provide students with a beneficial learning environment? Due to our research, we can find the solution for this dilemma, which is called a WebQuest. A WebQuest was developed in 1995 by Bernie Dodge of San Diego State University. Simply put, a WebQuest is an inquiry-based activity where students are given a task and provided with access to on-line resources to help them complete the task. It is an ideal way to deliver a lesson over the web. WebQuests are discovery learning tools; they are usually used to either begin or finish a unit of study. When creating a WebQuest, it is beneficial to be able to make our own web pages. But, it is not necessary. Teachers have delivered fantastic WebQuests in hard copy format.

Thus, the use of Web Technologies in the educational process plays a key role in the formation of the cognitive independence of modern students. So, in the classroom, for example, in mathematics, students can use web-quest technology to make their activities interactive. In practice, a WebQuest is a didactic system; it is probably the most talked-about and widely used Web-based activities in today's classrooms. "With many research projects," Letkeman told Education World, "students feel that they are sucking up information and regurgitating it onto paper for no other reason than to get a good grade [3].

In modern conditions, WebQuests give students a task that allows them to use their imagination and problem-solving skills. The answers are not predefined and therefore must be discovered or created. Students must use their own creative-thinking and problem-solving skills to find solutions to problems.

"WebQuests are also a wonderful way of capturing students' imagination and allowing them to explore in a guided, meaningful manner," added Letkeman, a resource-based learning consultant for the Tisdale School Division in Saskatchewan, Canada. "Communication, group work, problem solving, and critical and creative thinking skills are becoming far more important in today's world than having students memorize predetermined content." "WebQuests allow students to explore issues and find their own answers," he added. "Particularly with controversial issues — such as pollution, gambling, and nuclear waste disposal -- students must do more than memorize information. They must process the information in meaningful ways and reach moral and ethical decisions guided by facts" [4].

The adaptive dimension, the ability to make adjustments in educational programs to accommodate students' diverse learning needs, is also an important characteristic of WebQuests, according to Letkeman. "With WebQuests, special needs students can be given predetermined roles that are very important and make them feel part of the group," he said. "Advanced students can explore further and do more than is required. The interest this type of project generates makes that a reality, rather than a fantasy!" "A well-planned WebQuest," Faro told Education World, "has guidance for students, a creative end project with room for flexibility, and links that help answer questions and positively add to the project. A strong WebQuest is designed for students to work independently, allowing the teacher to be a facilitator in students' learning rather than the sole dispenser of knowledge" [5].

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This work transfers students from the category of the object of educational activity to the category of the subject, increases the motivation for the process of "obtaining" knowledge, allows them to be held accountable for the results of this work. A WebQuest is an interesting wandering on the Internet, implying queries in various search engines, obtaining a fairly large amount of information, analyzing it and further demonstrating it. It is a method for working in micro groups, developing leadership and competitiveness.

According to our research, the six building blocks of a WebQuest are defined:

The introduction orients students and captures their interest.

The task describes the activity's end product.

The process explains strategies students should use to complete the task.

The resources are the Web sites students will use to complete the task.

The evaluation measures the results of the activity.

The conclusion sums up the activity and encourages students to reflect on its process and results.

Here six reasons, which allow teachers, use WebQuests, who want to create successful teaching and develop mathematical capability. In the process of using WebQuests, its' content should:

1. begin a unit as an anticipatory set;
2. conclude a unit as a summation;
3. as a collaborative activity in which students create a cooperative learning;
4. teach students how to be independent thinkers since most of the problems encountered in a WebQuest are real-world problems;
5. increase competency in the use of technology.

From all of the above, we can make the following conclusions:

The outcome for WebQuests is usually a product, in most cases, in form of a written, oral report or multimedia presentation. An effective assessment tool to evaluate a product of a WebQuest is a rubric. Rubrics help make the teacher's expectations clear for students. Ideally, rubrics can be created collaboratively with students' input.

Effective WebQuests have a built in mechanism for student reflections. To receive feedback, we can survey our students about their experience, or have the students send us an e-mail sharing their thoughts.

Here some useful resources for teachers of mathematics, who want to create successful teaching by effective Web Technologies. Teachers of mathematics can find over 250 original WebQuests from following web sites:

Language Arts Web Quests.

Math Web Quests — 50 math web quests to help teachers of mathematics with Math in computer lab.

Science Web Quests.

Social Studies Web Quests — Largest collection of Web Quests.

Early Childhood Web Quests — Over 30. Perfect for younger students.

What's A Web Quest, You Ask?

WebQuest Maker.

WebQuest Direct — The World's Largest Searchable Directory of WebQuest Reviews.

WebQuest Portal — News and views about the WebQuest model, a constructivist lesson format used widely around the world.

In addition to the abovementioned information, Web Technology is an increasingly influential

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factor in education. Computers and mobile phones are used in developing and developed countries both to complement established education practices and develop new ways of learning such as online education. This gives students the opportunity to choose what they are interested in learning. Web Technology offers powerful learning tools that demand new skills and understandings of students, including WebQuests, and provides new ways to engage students, such as Virtual learning environments.

Based on our research's findings, it seems that Web Technology facilitates mastering basic skills of a student by means of drill and practice. It helps in problem solving by means of learning by doing, understanding abstract concepts, provide enhanced access for teachers and students in remote locations, facilitate individualized and cooperative learning, helps in management and administration of classroom activities and learning content, and simulate real life problem handling environments.

In turn, Web technology is intended to improve education over what it would be without technology. In our research, we have found some of the claimed benefits are listed below:

- Easy-to-access course materials. Educators can post the course material on mathematics or important information on a course website, which means students, can study at a time and location they prefer and can obtain the study material very quickly.

- Student motivation. Computer-based instruction can give instant feedback to students and explain correct answers. Moreover, a computer is patient and nonjudgmental, which can give the student motivation to continue learning.

- Wide participation. Learning material can be used for long distance learning and are accessible to a wider audience.

- Improved student writing. It is convenient for students to edit their written work on word processors, which can, in turn, improve the quality of their writing.

- As a motivational techniques to keep students on task [6].

For conclusion, in a few words, we can say that activities by Web Technology encourage students to work in groups, express their knowledge in multiple ways, solve problems, revise their own work, and construct knowledge. The advantages of integrating Web Technology in the classroom are many. Through participation in multimedia activities, students can learn:

Real-world skills related to technology;
The value of teamwork;
Effective collaboration techniques;
The impact and importance of different Web Technologies;
The challenges of communicating to different audiences;
How to present information in compelling ways;
Techniques for synthesizing and analyzing complex content;
The significance of presentation and speaking skills;
How to accept and provide constructive feedback;
How to express their ideas creatively.

It is recognized that Web Technologies provides a learning environment that is self-paced, learner-controlled and individualized. Web Technology is now permeating the educational system as a tool for effective teaching and learning. With Web Technology, the communication of information can be done in a more effective manner and it can be an effective instructional medium for delivering information [7].

Finally, it may be concluded, Web Technology is being used more not only in administrative duties in education but also in the instruction of students. Multimedia access to knowledge is one of

the possibilities of information and communication technology that has tremendous impact on learning. The instructional media have emerged in a variety of resources, and equipment, which can be used to supplement or complement the teachers' efforts in ensuring effective learning by students.

Based on this research's findings, we can sum up, that Web Technology in effective teaching of mathematics at universities provides a technology based constructivist learning environment where students are able to solve a problem by means of self explorations, collaboration and active participation. Simulations, models and media rich study materials like still and animated graphics, video and audio integrated in a structured manner facilitate the learning of new knowledge much more effectively. The interactive nature of Web Technology provides the classroom to enhance traditional "chalk-and-talk" method of teaching with more flexibility to learners to adapt to individual learning strategy. It enables both the educators and learners to work together in an informal setting. The role of educators and learners are extended. Furthermore, it encourages and enhances peer learning as well as individual creativity and innovation.

References:

1. Geiger, V. (2009). Learning mathematics with technology from a social perspective: a study of secondary students'individual and collaborative practices in a technologically rich mathematics classroom.

2. Baki, A., & Güveli, E. (2008). Evaluation of a web based mathematics teaching material on the subject of functions. *Computers & Education*, *51*(2), 854-863. https://doi.org/10.1016/j.compedu.2007.09.003

3. Emmungil, L., & Geban, O. (2010). Effect of constructed web-supported instruction on achievement related to educational statistics. *Procedia-Social and Behavioral Sciences*, *9*, 1347-1351. https://doi.org/10.1016/j.sbspro.2010.12.332

4. Creating a WebQuest. It's Easier Than You Think. https://clck.ru/SnpeC

5. Gaskill, M., McNulty, A., & Brooks, D. W. (2006). Learning from webquests. *Journal of Science Education and Technology*, *15*(2), 133-136. https://doi.org/10.1007/s10956-006-9005-7

6. Patel, C. (2013). Use of multimedia technology in teaching and learning communication skill: An analysis. *International Journal of Advancements in Research & Technology*, *2*(7), 116-123. https://doi.org/10.7763/IJIET.2012.V2.181

7. Malik, S., & Agarwal, A. (2012). Use of multimedia as a new educational technology tool-A study. *International Journal of Information and Education Technology*, *2*(5), 468.

Список литературы:

1. Geiger V. Learning mathematics with technology from a social perspective: a study of secondary students'individual and collaborative practices in a technologically rich mathematics classroom. 2008.

2. Baki A., Güveli E. Evaluation of a web based mathematics teaching material on the subject of functions // Computers & Education. 2008. V. 51. №2. P. 854-863. https://doi.org/10.1016/j.compedu.2007.09.003

3. Emmungil L., Geban O. Effect of constructed web-supported instruction on achievement related to educational statistics // Procedia-Social and Behavioral Sciences. 2010. V. 9. P. 1347-1351. https://doi.org/10.1016/j.sbspro.2010.12.332

4. Creating a WebQuest. It's Easier Than You Think. https://clck.ru/SnpeC

5. Gaskill M., McNulty A., Brooks D. W. Learning from webquests // Journal of Science

Education and Technology. 2006. V. 15. №2. P. 133-136. https://doi.org/10.1007/s10956-006-9005-7

6. Patel C. Use of multimedia technology in teaching and learning communication skill: An analysis // International Journal of Advancements in Research & Technology. 2013. V. 2. №7. P. 116-123.

7. Malik S., Agarwal A. Use of multimedia as a new educational technology tool-A study // International Journal of Information and Education Technology. 2012. V. 2. №5. P. 468. https://doi.org/10.7763/IJIET.2012.V2.181

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