Enhancing Educational Processes: Contemporary Communication in Web Design Teaching

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Abstract – Learning is a positive permanent change in behavior occurs through an effective teaching process. Centre of effective teaching and learning are the teacher, and they should be fully equipped for this duty. The paper examines the innovative teaching methods for effective teaching and learning in web design course.

Key words: web design, IT, innovation, teaching methods, teaching trends and innovative teaching method, action research.

I. INTRODUCTION

Education is a veritable instrument for effecting positive change in citizens' behavior, inculcating the correct type of values, attitudes, communication skills, and life-long skills, as well as raising intellectual capital for national sustainable development. In the 21st century, information and knowledge stand out as very important and vital elements of advancement in an information era. These goals are attainable through effective classroom interaction between the teacher and the learner through the process of teaching and learning. Teaching, which is the primary function of a teacher, entails giving instruction and imparting knowledge, facts, skills, attitudes, interests, and aptitudes [1]. The teacher imparts to the learner through the process of teaching. The teaching is an activity, consisting of a set of conscious and deliberate actions and programmes planned and directed towards inducing learning. The product of these efforts is learning. Learning as a concept has varied definitions due to various theories of learning that define it from different perspectives. Learning is the positive, permanent change in behavior due to experience and practice gained that enables the learner to face later situations differently. According to Ambrose et al learning is "a process that leads to change, which occurs as a result of experience and increases the potential for improved performance and future learning" [2]. The change in the learner may happen at the level of knowledge, attitude, or behavior. As a result of learning, learners come to see concepts, ideas, and the world differently. Quality teaching is that transforms students' perceptions and the way they go about applying their knowledge to real-world problems. Many researchers applied Teaching techniques to assess their effects.

The research revealed that many students need to absorb the course content to the expected level if the teaching is traditional [3]. Hence, improving the existing teaching-learning methods and teaching with new innovative methods has become imperative. The use of innovative teaching methods by teachers also helps to enhance the performance of students of diversity [4]. Technology[1] and its rapid progress create an intellectual environment where each student can progress depending on their intellectual abilities, motivation, and knowledge. The research (Ganyaupfu, 2013) about the teacher-student interactive method shows that direct teaching efficiently transfers knowledge, but more is needed for deeper understanding, problem-solving, and creativity. The focus of innovative education is based on the trust that every student can learn and be successful in life. [5] Claimed that innovative teaching methods provide more experience and help students tackle work-related problems. [6] identifies five components of effective teaching: knowledge of the subject matter, ability to help students with their work, presenting subject matter appropriately, motivating students to excel, and firmness/fairness in preparing marking guides and grading examinations. The quality of education can only be enhanced by the adoption of innovative teaching practices in order to make the content rest as well as to motivate the learners. In addition, teachers should consider themselves facilitators, guides, and co-learners in the education process. The world of modern living and modern science implies a free exchange of ideas, thoughts, and communication without limits and restrictions. Free thought expressed publicly and through electronic communication systems will enable the rapid

[1] Technology is the science of ways of working in any work process.

progress of science and e-society. The paper examines effective teaching and learning, teaching methods, teaching techniques, teaching strategy, trends in teaching methods, innovative methods and applicability in teaching, conclusions, and recommendations. In this paper, we share our research findings on the use of non-traditional ways of teaching and learning, which can support colleagues in other secondary schools and colleges to move towards less traditional teaching.

II. ACTION RESEARCH

Action research is an approach to educational research commonly used by educational practitioners and professionals to examine and ultimately improve their pedagogy and practice. In this way, action research represents an extension of the reflection and critical self-reflection that the teacher applies daily in his classroom.

In a traditional textbook, the text carries the main semantic load, accompanied by illustrations (pictures, diagrams, tables, etc.). The clear advantage of e-books is that they are accompanied by text with sound and video. Multimedia[2] means presenting educational material in an exciting, dynamic form and engineering structures, devices, and elements - as moving three-dimensional objects, thus fully revealing their design and principle of operation.

Action research offers one route to more intentional, substantive, and critical thinking that can be documented and analyzed to improve educator practice. Action research generates knowledge around research in practical educational contexts and enables educators to learn through their activities.

A. Defining the research question

In the daily educational process, many questions often arise from teachers and students regarding how students could learn better. In this research, the goal is to show the progress of students in terms of interaction during class if modern communication using Information technology - IT technology is applied in teaching. Activity and interaction are highlighted as an important part of research when teaching through classical education lessons about education in which the focus is placed on the use of modern IT technology for communication during classes.

B. Strategy for overcoming the problem and implementing the planned activities

One professor is involved in conducting the research, and the students in Secondary Municipal Technical School - SOTU "Gjorgi Naumov" - Bitola from the third (third) year, aged 16-17, are included as respondents. The total number of students is 66, of which 13 are girls, and 53 are boys. The examination was conducted at the beginning of the school year, in the period from mid-September to the end of October. It was made based on two classes, with 33 students each, who are from the same major - "Electrical technician for computer technology and automation" in the subject "Editing of web pages" with a representation of two hours per week, during which the thematic unit of IT technologies was processed HyperText Markup Language)-HTML." [7] Most teachers are eager to embrace new technologies because they have seen the excitement and motivation of their students increase when they do. With technological standards becoming an integral part of student's education, teachers are more enthusiastic than ever to learn new technologies and methods. During the teaching, the course of progress was monitored about the interaction of the students during the lesson. Below are shown how the planned activities were carried out.

C. First method for teaching class

First, a lesson was conducted in which the traditional approach to learning of the students prevailed. Each student was assigned written material for the lessons taught in that approach while the research on this way of holding a lesson lasted. The introduction of the lesson started by asking questions from the previous lesson. Since the research focuses on measuring interactivity, four questions were asked in this case.

TABLE I. RECALL THE PREVIOUS LESSON – WITH SHORT ORAL QUESTIONS

	1 question	**2 question**	**3 question**	**4 question**
Reported	14	22	18	20
Answered	2	2	2	2

A written record was kept for each activity of the students. The method of practical work was

[2] Information for the perception of which we use multiple senses at the same time because they use different media through which they are spread (set consisting of text, sound, graphics, video and animations)

implemented so that the students were assigned a task containing elements of the new subject. Each student creates a solution to the task.

TABLE II. TASK IMPLEMENTED THROUGH WRITTEN FORM

	Task
Reply sent	46
Correct answer	30

Again, the direction is set towards measuring interactivity so that each student who successfully or partially solves the given task is recorded in written form. In the previously described way, two classes were held, which resulted in poor results according to the measurements of interaction and knowledge of the students.

D. A second method for a lesson

We receive the largest number of impressions of reality with the sense of sight.

When it comes to the implementation of teaching and the application of visual teaching aids[3], both static (slides, photos, drawings, maps) and dynamic (film, tutorial[4]) teaching aids are applicable.

Therefore, the next method on which the research was carried out is visual teaching aids, where the use of computer applications[5] led this method to achieve greater interest and interaction among students and acquire high-quality knowledge. The planned activities were carried out through an interactive presentation shown on a projector. The lesson's introduction started with a tutorial on how to use a simple computer application, through which short questions were asked to recall the concepts from the previous lesson.

• Reminder from a previous lesson – with questions through an interactive presentation

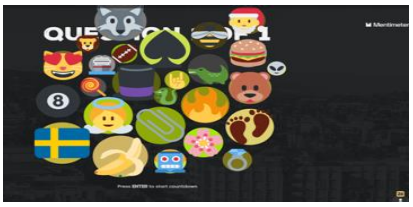

Figure 1. Start of the interactive presentation

[3] Visibility is one of the components of the learning system, which can help students better assimilate the material studied at a higher level.
[4] method of knowledge transfer and can be used as part of the learning process.
[5] a type of software that allows a user to do one or more things

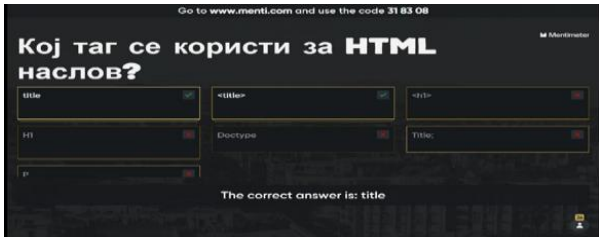

Figure 2. Question and answer display

Figure 3. Correct answers according to speed

Through the application, the students were asked several questions, which they answered in real-time. At the same time, an electronic record was kept in the application itself so that the results of the student's answers were directly monitored in the presentation shown on a projector. On average, a large part of the present students gave an answer to each of the questions asked.

During the explanation, the main movement through the lesson is dictated by the presentation, which is complemented by short interactive questions throughout the lesson. The main concepts defined in the current lesson's objectives were primarily presented using the brainstorming technique and answering short questions.

• Interaction with – brainstorming

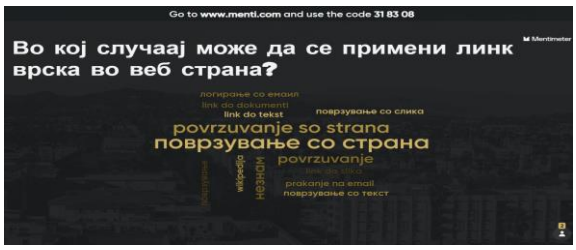

Figure 4. Question and answer display

The technique was carried out through the computer application, where questions were asked about a particular element that was the subject of study in the lesson, and each student had the opportunity to give a variety of opinions about its meaning, use, etc., thus, to a large extent, the students were active in the hour.

The method of practical work was implemented so that the students were assigned a task containing elements of the new subject. For this purpose, the students were given instructions for using a computer application through which the task should be solved, which created an individual way of working among the students. After the students finished solving the task, they sent their answers, and through the application, the students could immediately see if they had made a mistake in any part of the task.

• Task carried out in electronic form

Figure 5. Display a partially correct answer

The records[6] of the achieved results of the students' solutions were displayed through the application on a projector, where everyone could see the correct answer to the task. The student's involvement in this activity was at a high level. In the previously described way, two classes were held, which resulted in very good results according to the measurements of interaction and knowledge of the students.

E. A third way for a lesson

The learning process can be seen from a very entertaining aspect so that learning will be turned into a game, characteristic of games as an integral element in the learning process. Games are ideal in teaching because the basis of the lesson is based on play. In this way, the planned activities were carried out through the students' group work so that the students were divided into groups at the beginning of the lesson. Group work will allow each member to engage in the assigned activity and contribute to the group's progress to achieve better results [8]. The teaching included the use of an interactive presentation that was shown on a projector. Since, in this way, the emphasis was placed on introducing games into the learning process, the lesson began by pointing out instructions for using a simple computer game, which we used to recall the concepts from the previous lesson.

Each group was assigned a clue according to which they created a mind map in real-time so that their every activity was kept an electronic record directly in the application itself. The results of each group were followed by the interactive presentation, which was shown on a projector.

• Reminder from a previous lesson with a game – mind map.

Figure 6. Correctly answered mind map

Organizing learning as a competition encouraged motivation to achieve better results among students. Visible progress motivates students by showing them how far they have come and where they need to go. Involvement in the assigned activity was at a high level. The results of the groups' answers were directly monitored during the presentation. It allowed the students to increase their activity more and more during the lesson.

After the main concepts outlined in the objectives of the current lesson were highlighted and explained, another short game followed ed, for which the students were instructed on the game's rules. The game comprises cubes placed in a matrix, where half of the cubes contain HTML elements while the other half contains an explanation of those elements. The task of the game was to find the matching pairs. Upon joining the computer game, each group received a matrix with all the dice, in which the arrangement of the dice was placed in a different, undefined order. With great concentration, the students focused on their problems for the group to achieve a better result in the shortest possible time.

[6] keeping records of persons or conditions.

• Game interaction – matrix

Figure 7. Correctly completed game die

The game proved very effective because it notified the students in real time when a mistake was made, thus achieving the effect of learning from mistakes. In this activity, all groups completed the game, and there was maximum interaction among the students, monitored electronically through the computer game application.

The method of practical work was carried out through a computer game - a puzzle so that each group was electronically assigned a task containing elements of the new subject. By joining the computer game, the students were given the same task, but the puzzle pieces were placed in a different order in each group.

- A task carried out through a game – a puzzle

Figure 8. Start a puzzle task/game

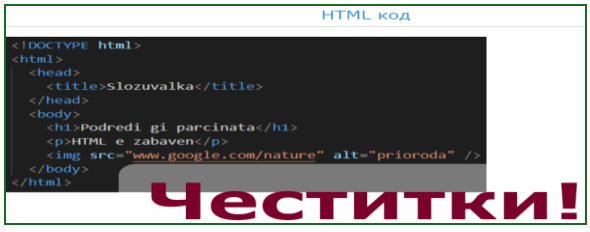

Figure 9. Correctly completed puzzle

The results of the students were shown in the interactive presentation. The game proved very effective because it notified the students of a mistake made in real-time. In this activity, there was maximum interaction among the students, although not all of them managed to assemble the puzzle successfully. In the previously described way, two classes were held, which, according to the measurements of interaction and knowledge of the students, resulted in very good results.

F. Initial and final survey results

The following shows the results of the anonymous survey that was conducted before the changes from the action research were introduced, that is, before the introduction of modern methods of communication in teaching, as well as the results of the survey that was conducted after the application of modern methods of communication using IT technology in teaching.

- How often are you interactive during the lesson?

Figure 10. Through the frontal way(left) Through a new way(right)

- How often do you have the opportunity to express your opinion, ask, or discuss during the lesson?

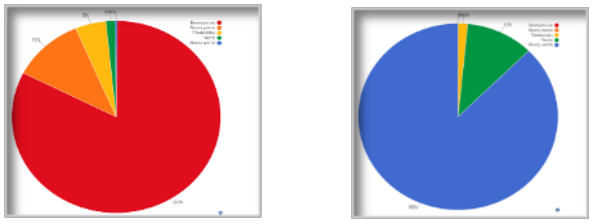

Figure 11. Before changes (left) After changes (right)

- How much do you think you are using your facilities?

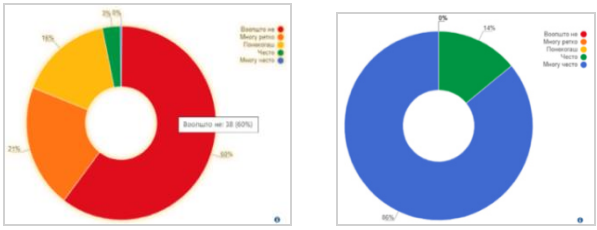

Figure 12. Before changes (left) After changes (right)

- Do you think you are learning other additional skills in addition to the material provided for the lesson?

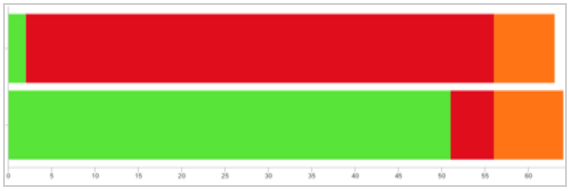

Figure 13. Before changes and after changes

- Does cooperation between students improve?

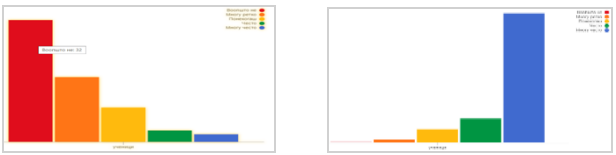

Figure 14. Through the frontal way Through the new way

From the results, we can see that the introduction of modern methods of communication in teaching has a positive effect on the students according to the comparison made at the beginning and end of the measurement.

III. REFLECTION

The process of reflection, as one of the most important parts of the action research process, is of crucial importance for developing the professionalism of teachers because learning from own and shared experience is the most effective. The objectives of the research question have been achieved, as it has been confirmed that by applying modern methods using IT technology in teaching, a much greater interaction, involvement, and cooperation of students was achieved during the lessons, as well as an increase in the achieved knowledge at the end of the current a lesson. The positive experience from this action research is a motive for me to introduce some of the mentioned modern methods in my practice, and I recommend that this way of conducting a lesson be accepted by other professors. Before that, it can be concluded that this research led to adopting the desired change and, thus, to the problem's solution. This research was helpful in creating new experiences, gaining knowledge, and learning exciting and modern methods of communication that can be applied in teaching.

IV. CONCLUSION

Education pedagogy has undergone many changes during the last two decades. Many institutes are still following traditional teaching methods; however, several institutes have adopted innovative approaches to teaching and learning. Teachers play a vital role in students' success, so the teacher must take a step towards accepting modern teaching methods. In short, the inclusion of contemporary teaching methods at this time is necessary because it opposes the idea of traditional forms of repetition and memorization of the curriculum for the education of students. To develop decision-making skills, problem-solving skills, and critical thinking ability, modern teaching methods are paramount. Finally, to provide quality education, there should be a combination of a qualified teacher and innovative teaching methods. Innovation is a continuous process, and faculty members are applying innovative ways to enhance the quality of education to develop creativity, empower people, and ultimately achieve the human development index of our country.

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