

CASE STUDIES AND BEST PRACTICES IN GREECE

Erasmus+ KA2 project: “REACT - Creation of a Collaborative Environment in e-classrooms”

Intellectual Output 2 “Creation of a set of innovative activities, tools and educational collaborative methods adapted to a virtual classroom curriculum”

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"Development of a digital collaborative learning environment based on the Problem Based Learning and a Learning Management System (Moodle) for the development of critical thinking skills in Primary Education"

INTRODUCTION

Introduction of REACT Case study of best practices.

The modern lifestyle and the complexity of the situations that people meet at their personal and their learning environment, are making problem solving part of their daily routine. In the educational process, there is the phenomenon where students are able to solve typical problems but cannot apply their knowledge in new ones (Hollingworth & McLoughlin 2001;2005). Hence, the need for the creation of learning environments that utilize ill-structured problems is needed so as to support students in order to develop their skills in solving problems. This research is aiming to create an environment for the development of problem-solving skills in first grade (primary) education. For the objectives of this research, it is chosen the educational method of Problem Based Learning (PBL) which uses ill-structured problems and aims in teaching of problem-solving skills (Elliott & Kennedy, 2006; Lohman & Finkelstein, 2002; Savin-Baden, 2000; Visser, 2002). At the same time, it is utilized a tool of a technology-supported environment called Learning Management System (LMS) and this tool is Moodle, which can support collaborative activities that promote critical thinking and problem solving (West&West, 2009). Therefore, it is necessary to incorporate educational strategies and techniques which can improve efficiently and effectively the learning practice of the students and their critical thinking (Mandernach, 2006). In this respect, present thesis is aiming to implement and evaluate an educational scenario synchronized with PBL and supported by a Learning Management System which is called Moodle, for the development of critical thinking skills in first grade (primary) education.

OVERVIEW

Background information about the educational institute, its teachers, trainers, as well as leaners. Information about the used and applied LMS and all other training methods applied while implementing inclusive and collaborative training, etc.

A new dimension of learning requires the use of technology in teaching, forcing the creation of an innovative conceptual framework around specific aspects of learning, such as e-learning (Anderson, 2008). Despite conflicting or even diverse views on the definition of e-learning and the frequent identification of the term with that of distance learning (Moore, DicksonDeane & Galyen, 2011), e-learning refers to the intentional use of online information and communication through technological means for the purpose of learning and teaching (Naidu, 2006). However, harmonizing technology with pedagogical theories that are well supported in e-learning is a major challenge that needs to be addressed (Deepwell & Syson, 2006).

For this reason, the development of environments and educational interventions that support Technology-enhanced Learning (TEL) is increasingly established as a new way of education that comes to facilitate the learning process (Samson, 2008). Thus, traditional teaching is being transformed into a digital educational environment, but one that takes into account many parameters to achieve learning by combining information delivery with multimedia (Kanninen, 2009). However, the volume of information sources and the rapidly changing conditions in all aspects of life make critical thinking skills of great importance. According to Gough (1991), the teaching of critical thinking skills is perhaps the most important in the information age.

Critical thinking is an active process that focuses more deeply on the than basic acquisition and simple memorization of information (University of Mayland, 2006; Jones, Hoffman, Moore, Ratcliff, Tibbetts & Click, 1995). This creates a need for the creation of learning environments that support learners to develop critical thinking skills.

This case study attempts to implement and evaluate an educational scenario using Project Based - Learning and supported by a Learning Management System, namely Moodle, for the development of critical thinking skills in primary education.

In this research, the current study focuses on critical thinking skills related to problem solving. Critical thinking skills related to problem solving are the beginning of the development of critical thinking. In order for an individual to think critically, he or she must first learn general problem-solving skills and be able to use knowledge on new bases (Sulaiman, 2011).

In the international literature, learning management systems (LMS) are mainly referred to as Learning Management Systems, Virtual Learning Environments and Course Management Systems.

In this research, the use of a Learning Management Systems (LMS) was chosen, which has tools ideal for the active participation of learners both individually and collaboratively (Crook et al., 2008).

The Moodle tool was chosen to be used in education because:

1. It is a particularly attractive technological tool.
2. It can support communication and collaboration practices.
3. It enables collaboration, learning, communication, sharing and interaction.
4. Involves collaboration, communication and evaluation.
5. Provides an environment whose characteristics match the characteristics of the PBL educational method.
6. Provides a collaborative workspace that can support a wide variety of critical thinking exercises.

7. It supports the needs of users to organize ideas, to engage team members through comments and questions for the group conclusion of the final result.

Therefore, this research utilizes the implementation and evaluation of an educational scenario using PBL and supported by a Learning Management System, namely Moodle, for the development of critical thinking skills in primary education.

APPROACH

Explain solutions applied to resolve problems what regards creation and/or development of eClassroom which are inclusive and collaborative. Methods applied to boost collaboration and inclusiveness into the class, etc.

The research utilizes the implementation and evaluation of an educational scenario using PBL and supported by a Learning Management System, namely Moodle, for the development of critical thinking skills in primary education.

For this purpose, an experimental procedure was designed and implemented in the school year 2015-2016, which was applied to the students of the 5th grade and concerned the Flexible Zone lesson. Visits were made to 5 schools in Greece and the students were given the test papers, then 2 groups of 20 students each were selected, which after a statistical test, were found to be equivalent in terms of critical thinking skills.

One group was used as a control group and another as an experimental group. At control group, the learners with the help of LMS tool, Moodle and discussion teaching model tried to solve the problem of Internet security.

In the experimental group, the learners with the help of the LMS tool, Moodle and the PBL teaching method were asked to solve the illstructured problem of Internet security.

In particular, all trainees were asked the following topic:

"Safer Internet Day promotes not only a safer Internet but the creation of a better Internet, to which we can all contribute. So this year's motto is: "Play your part for a better internet!".

In particular, they were asked to implement the following exercises:

- What is the problem?
- What are the main risks of the internet?
- What are the measures to protect against the risks of the internet?
- What can we do to avoid/cope with the risks of internet risks?
- Write a short report on the most important internet risk you choose.
- Work together to identify the highlights of the reports you have created.

- Write a short paragraph on the main points about safe internet surfing.
- Create a poster with a short poem and pictures about internet risks.

The trainees were encouraged and motivated on issues related to safe Internet browsing, while the primary objective was to develop critical thinking skills.

The online lesson on safe surfing on the Internet is an introductory one and aims to inform and challenge students about the use of the Internet. The course is delivered to students through a Learning Management System (LMS) platform.

The design was carried out based on two different educational scenarios for the control and experimental groups. In particular, the control group was taught using the discussion teaching model. The experimental group followed the phases of the PBL instructional scenario.

The control group's training scenario consists of the following phases:

- Phase 1: Orientation
- Phase 1: Exploration
- Phase 1: Closure

The educational scenario of the experimental group consists of the following phases:

- Phase 1: Identification of the problem
- Phase 1: Analysis of the problem
- Phase 3: Gathering information
- Phase 4: Synthesis
- Phase 5: Publication of results
- Phase 6: Reflection

Participants

The participants of the study were students, who were attending the fifth grade. The selection of this particular sample was made in order to facilitate the research process and ensure its reliability. Grade 5 students were selected in order to be able to better respond to the vocabulary of the research tools and the researcher's instructions. It was taken for granted that at this age reading skills and oral comprehension (understanding and carrying out oral instructions) are fully developed.

RESULTS

The main findings are presented. If it is possible, information in facts, numbers, etc.

At this point, the results of the experimental procedure implemented are presented in detail. The objective that has been set, which concerns the implementation and evaluation of an educational scenario based on PBL and supported by a Learning Management System, namely Moodle, for the development of critical thinking skills in primary education. Based on the

results obtained, it is possible to give an answer to the 1st research question concerning the profile of the students of the 5th grade in terms of their relationship with the basic tools of the Internet.

The largest percentage of the sample has the following characteristics:

- They use the Internet a lot.
- They have a good relationship with the basic internet tools (facebook, twitter, youtube, msn, google earth, blogs, wikis, wikipedia, instagram, skype), but uses them rarely.
- They have not used facebook, twitter and Wikipedia/Wikipedia.
- They have used youtube, Google Earth and Skype.
- They like the basic internet tools (facebook, twitter, youtube, msn, google earth, blogs, wikis, wikipedia, instagram) and find them easy to use.
- Do not have a page on facebook or twitter or other social networks.
- They have no connection to blogs/blogs, such as his school's blog.
- They find websites very easy to use but use them infrequently.
- They use 1-3 websites, mainly for personal/fun reasons.
- Believe that a website should include news about children, but that they are not interested in reading the opinions of other age peers online.
- Do not have their own website.

CONCLUSIONS

Conclusions are presented. Conclusions should be short and informative.

The final conclusions drawn from this research are listed below:

- **Development of critical thinking skills through the combination of a LMS tool, Moodle and PBL.**

The combination of technology, specifically the Moodle tool with the PBL educational method helps primary learners to develop critical thinking skills, specifically identifying and explaining a problem, drawing conclusions, evaluating arguments/proposals and interpreting ideas. In the present study, it was observed that learners were more easily able to identify the problem, analyze it, organize and synthesize information better, reflect on newly acquired knowledge and finally evaluate personal and collaborative effort.

- **Cooperation helps to develop critical thinking skills**

The results of the research showed that critical thinking skills are developed more when individuals collaborate. This can be demonstrated because in the experimental group, in which collaboration of learners is dominant, there is a greater increase in critical thinking skills than in the control group, in which individuals work individually. Development of ill-structured problem solving through PBL. According to the literature, the application of the PBL training method enhances the solving of ill-structured problems. However, the ill-

structured problem as dictated by the PBL training method should be less predetermined in order for trainees to focus on clarifying the information for problem identification.

- **Appropriate design of a Moodle tool**

The design of a Moodle tool should focus on both the PBL features and the appearance of the tool in order to be attractive to learners of such an age as primary learners. Also, the activities should be designed in such a way that there is a diversity and a continuous flow between them so that learners have a motivation and a continuous engagement with the tool. By having diversity, the interest of the learners will remain constant.

- **Easy assessment of learners through the Moodle tool.**

Technology plays an important role. In particular in the Moodle tools it is possible to record in a simple way all the output of the activities of the learners during the learning process. In this way, the teacher is able to analyse and evaluate the work of the learners.

PROPOSALS FOR FURTHER STUDY AND RESEARCH

- Need to apply the educational scenario to other levels of education for the reason that learners need to develop their critical thinking skills in order to examine a problem-situation from different perspectives and to be able to communicate effectively with others in order to find solutions to complex problems (Paul & Elder, 2007)
- Apply this educational scenario in other e-learning and distance learning environments (LAMs, Blackboard, Sakai, ATutor, Open e Class) or in Web 2.0 tools in order to determine whether they are suitable and to note the advantages or some disadvantages compared to the application of this scenario in a Moodle environment.
- Finally, critical thinking is often linked to the concept of creativity. Creativity can function as a complement to critical thinking (Bleedorn, 1993). Thus, it is proposed that the present research can be applied to the PBL training scenario to examine critical thinking alongside creative thinking. This can be achieved because according to Sulainman (2011) PBL improves students' creative thinking.

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