Chapter 7
Producing Educational Videos: A Field-Based Implementation with PBL Methodology

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Introduction

Economy and society nowadays are oriented to the rapidly changing knowledge and strongly require individuals with problem-solving skills, teamwork, and self-learning capabilities (Lei 2010). Education at any level ought to support learners to acquire the 21-century skills, employing contemporary educational methods and strategies in the classroom. Traditional educational methods, especially in the area of technical–vocational Education, usually separate theory from practice. They tent to adopt a teacher-centered teaching model, using mainly lectures and well-structured laboratory exercises applying the different experiments and measurement techniques. Furthermore, exams remain the primary assessment tool for evaluating the students' performance competence and learning outcomes. Within this theoretical model of teaching and learning, students mainly receive information passively instead of holding an active role to knowledge acquisition process (Nandi et al. 2000).

The problem-based learning approach (henceforth PBL) on the other hand, usually as part of an integrated curriculum in teaching/learning sciences and technology, is student-centered. Thus, it places student in the center of the learning process. PBL methodology is strongly related to inquiry-based learning as well as with projects. Its history starts at the beginning of the 20th century with John Dewey and his famous "learning by doing" (Savery and Duffy 1995).

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An early attempt for a broader implementation started in the 1970s. Since then, the increasing use of digital technology made it easier than ever for students to gather information and to produce and share high-quality essays. At the same time, there is an increasing interest worldwide to implement new methods and strategies such as teamwork and projects in the classroom. Due to these novel trends, researchers have re-initiated to use PBL methodology in different subjects and study its dynamics and educational benefits.

In this paper, the results of an experiential type workshop, aiming to introducing the PBL methodology to teachers, are discussed. Teachers of vocational secondary education schools with various vocational specialties participated in the workshop gaining experience with the PBL method. The workshop was part of the LLP youYESdigital project (http://www.youyesdigital.eu), which was implemented in co-operation with partners from five (5) countries (Spain, Greece, Italy, Romania, and Turkey).

The evaluation at the end of the workshop offered interesting information concerning teachers' attitudes toward the PBL methodology, their willingness to exploit it in their classroom, as well as teachers' role within this methodological framework. Furthermore, data analysis provided with useful insights into participants' attitudes on educational video production as well as their evaluation of the workshop. Data collected from the implementation of the PBL methodology in the teachers' classrooms offered supplementary data concerning students' attitudes toward the method as well as its effectiveness.

The PBL Methodology

The PBL methodology is a student-oriented approach based on teamwork in order to solve authentic real-life problems utilizing activities that incorporate time for students to think, analyze, debate, and interpret (Becerre-Labra et al. 2012). Its initial implementation was made in 1841 at the Samford College in USA (Major 1998), and later, during the decade of 1920, Celestin Freinet introduced it in Europe (Clandfield and Sivell 1990). In 1960, PBL methodology was implemented in the innovative curricula in Health Sciences in North America (Savery 2006; Hillen et al. 2010). During this decade, medical education was characterized by the standards of intensive theoretical teaching of various subjects, followed by exhaustive practice in clinical cases in order to connect theory and practice.

The rapid scientific progress though in medicine, biotechnology, and information technology made the model inadequate, and the need for new experiential educational methods and techniques, included PBL methodology, emerged (Boud and Feletti 1997). In the decade of 1970, educational institutes in Europe started to use the method effectively (Clandfield and Sivell 1990). Nowadays, PBL methodology is continuously spreading and integrated successfully in many disciplines, including medicine, economy, biology, psychology, law, computer science, and engineering (Savery 2006; Eldy and Sulaiman 2013).

PBL methodology is considered to be grounded in the theories of knowledge construction (Fonteijn and Frerejean 2010), characterized by the experiential learning in small groups of students, and emphasizes to self-learning development techniques, to problem-solving approach, and to positive reinforcement of critical thinking (Barrows 2000; Imafuku et al. 2010). Teacher serves as a facilitator/mediator and a supporter to the students and does not interfere with the process neither expressing any opinion or prescriptive advice nor making steering questions. Instead, he/she poses questions to students regarding the outcome and asks for documentation of the solution. Figure 7.1 depicts the general function/structure of the methodology (Hmelo-Silver 2004; Lei 2010). Within this framework, abstraction and simulation of social experience, explanation of results, and understanding the conditions of knowledge applicability in real-world situations are promoted providing at the same time the experience of working in small groups to the students (Michel et al. 2012).

The basic stages of the methodology are as follows (Hmelo-Silver 2004; Lei 2010):

1. Description of the problem (usually an interdisciplinary and not strictly structured problem).
2. Discussion among students, creating assumptions based on their existing knowledge (problem's identification).
3. Collection of information and useful material (search) for the possible solution.
4. Evaluation of the information collected and efforts to solve the problem based on the existing and the new knowledge as well (implementation).
5. Questioning, criticism, feedback, and repetition of stages 2–5 depended on the correctness and appropriateness of the solution.

Furthermore, problem solving is a fundamental scientific activity as it is related to individual and social levels and constitutes an expression of the development of creative thinking (Becerre-Labra et al. 2012).

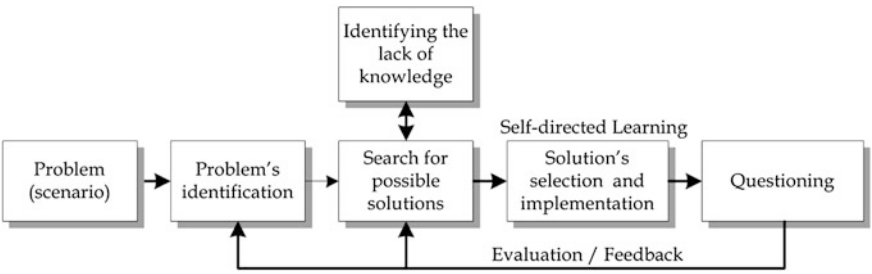

Fig. 7.1 Schematic function of the PBL methodology

Methodology

Twenty (20) teachers of vocational secondary education schools with various vocational specialties voluntarily participated to a 12-h experiential workshop (three 4-h sessions). All of them were in-service vocational secondary education teachers and had at least ten (10) years teaching experience. None of the teachers were familiar with the PBL methodology, but some of them were familiar with the project method. All of the teachers were sufficiently using computers and were certified on basic ITC skills, but none of them had used the MovieMaker software to create videos.

The workshop was held in the Computers and Educational Technology Laboratory of the University of Patras (Department of Primary Education—http://www.cetl.upatras.gr) with twenty personal computers. It was supported by four experienced instructors. The participating teachers could work individually or in small groups depending on the workshop's phase, the progress, and their personal needs. The first session involved the acquaintance of the participants, a short introduction to the general framework and the objectives of the workshop, a short presentation of the tools to be used, and the identification of the problem. All the tool guides were set up on the computers in order for the participants to have direct access at any time needed. During the second and third sessions, participants were asked to work in small groups of five in order to construct an educational video about green economy or sustainable development using the MovieMaker software. Each instructor was responsible for supporting one group. The PBL methodology was implemented according to the aforementioned stages (Fig. 7.1). The final phase of the workshop was devoted to video presentations and discussion about the PBL methodology, the experience gained by the participants during the workshop concerning the PBL methodology, the perceived effectiveness of the method, and the teachers' willingness to use it in their classroom.

Special efforts were paid for the evaluation of the whole procedure regarding the methodology effectiveness, the role of the instructor, the role of the tools used, the participants' experiences, the educational benefits raised (Marcangelo et al. 2009; Gibbon and Marcangelo 2012). At the end of the workshop, the participants were asked to fill out an anonymous questionnaire in order to evaluate the whole procedure. The questionnaire consisted of the closed-type questions (Likert scale: 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree) and open-ended ones focused on both the strong and weak points of the workshop and suggestions to improve it as well: "This workshop could be improved by…," "Could you note the strongest and the weakest point of the workshop?" The questionnaire used in the study was piloted tested on 6 responders (3 teachers of vocational secondary education schools and 3 students) and revised on the basis of the subsequent data analysis. None of the responders neither receive the final version of the questionnaire nor participate in the workshop. Data from the pilot test were analyzed and controlled for reliability and collinearity. Finally, a

Table 7.1 The questions (Q1–Q17) for the evaluation of the procedure

Questions:	Scale: 1 = strongly disagree – 5 = strongly agree
Q1: The instructor communicated ideas and concepts clearly	
Q2: The instructor explained the material in an interesting manner	
Q3: The instructor was well-organized	
Q4: The instructor encourage participation	
Q5: The pace of the course/workshop was good	
Q6: The instructor provided guidance to the students when needed	
Q7: The instructor gave me immediately helpful feedback	
Q8: The instructor made me feel free to ask questions	
Q9: The objectives for each session was stated clearly at the beginning of each session	
Q10: This course met my expectations	
Q11: There were no problems with laboratory setting and equipment used	
Q12: The instructor's conduct was never influenced by students' personal characteristics, such as gender, ethnicity or cultural background	
Q13: The effectiveness of the methodology used met high level standards	
Q14: The instructor never intimidated or embarrassed students	
Q15: The instructor was able to give alternative explanations when needed	
Q16: I feel that I grasped very well this topic (PBL methodology)	
Q17: I feel that PBL methodology is very useful for my future work in the school	

multiple regression was performed in order to remove items with low betas (Cohen et al. 2007). The five-point Likert scale questions that were included in the final version of the questionnaire are presented in Table 7.1.

After the completion of the workshop, the participating teachers were urged to implement the PBL methodology in their classroom. Afterward, five (5) of them implemented the methodology in a course with some of their students (integrating it into their classroom activities), for 4 days at a total of 8 teaching hours (2 teaching hours per day). Twenty-seven (27) students, aged from 15 to 20 years, attending vocational secondary education schools, studying at sectors such as economy, administration services, technological applications, agronomy, and food industry, participated. Students were asked to work in small groups in order to construct a video about green economy or sustainable development relative to their specialty. Special attention was paid to ensure the homogeneity of the timetable, the activities, the material used, and the evaluation of the implementation with students. The guides used (Creating a Youtube account, Subtitles—Subtitles Workshop Soft, Add

subtitles to a video file, Uploading videos to youtube, Making a video with MovieMaker) were the same guides created and used during the teachers' workshop.

Students worked according to the PBL methodology stages as these are presented in Fig. 7.1. Teachers tried to implement the method in the way they experienced it during the experiential workshop. At the end, students were called to answer an anonymous questionnaire (absolutely similar to that of the teachers) in order to evaluate the whole procedure. A few open-ended and ranking questions supplemented the questionnaire. The open-ended questions were focused on both the strong and weak points of the workshop, while the ranking questions dealt with the knowledge acquired by the participants: "Could you report the strongest and the weakest point of the workshop?" "What did you learn? Please write down three topics (hierarchically) that you learnt during this course." They were also invited to comment on their experience with the PBL methodology, as well as to report what they have learnt during their work on creating educational videos.

This study explores the PBL methodology efficiency within a secondary vocational education framework. The study's main goal was to examine both students' and teachers' field evaluation of PBL methodology on typical school settings. The key research questions concern the following: (1) to what degree the apprehension of PBL methodology may result to integrate to teachers' this knowledge to their future work, (2) to what extent do instructors' competence enhances the acquisition of PBL proficiency, and (3) to what degree the PBL methodology implementation had an effect on the students' work.

Findings

Teachers' Evaluation

After the completion of the workshop, participants (teachers) were asked to fill out an evaluation questionnaire, which composed of 17 five-point Likert scale questions ranging from one (1—strongly disagree) to five (5—strongly agree). The questionnaire appeared to have an acceptable internal consistency, $\alpha = 0.88$. All scale items appeared to be worthy of retention, and the highest alpha value would come from deleting item 17 (*Apply knowledge acquired in the seminar to future work at school*). The removal of the specific item would lead to an increase of alpha by 0.01. Inter-item correlations were high (lower $r = 0.4$). Frequency distributions are presented in Table 7.2.

A preliminary analysis involved testing whether there was a statistically significant correlation between teacher's beliefs about the skills acquired in the workshop and the methodology used by the instructors. Thus, separate Kendall's correlation coefficients were calculated. The selection of Kendall's tau rank correlation coefficient was mainly based on the fact that our data set had a large number of tied ranks (Field 2009). The statistical analysis resulted in significant positive correlation between teacher's beliefs about the skills acquired in the

Table 7.2 Frequency distributions—teachers (Q01–Q17)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Q01	0 (0.0 %)	0 (0.0 %)	1 (5.0 %)	7 (35.0 %)	12 (60.0 %)	20 (100 %)
Q02	0 (0.0 %)	0 (0.0 %)	1 (5.0 %)	13 (65.0 %)	6 (30.0 %)	20 (100 %)
Q03	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	8 (40.0 %)	12 (60.0 %)	20 (100 %)
Q04	0 (0.0 %)	0 (0.0 %)	1 (5.0 %)	3 (15.0 %)	16 (80.0 %)	20 (100 %)
Q05	0 (0.0 %)	0 (0.0 %)	2 (10.0 %)	9 (45.0 %)	9 (45.0 %)	20 (100 %)
Q06	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	3 (15.0 %)	17 (85.0 %)	20 (100 %)
Q07	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	2 (10.0 %)	18 (90.0 %)	20 (100 %)
Q08	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	20 (100 %)	20 (100 %)
Q09	0 (0.0 %)	0 (0.0 %)	1 (5.0 %)	4 (20.0 %)	15 (75.0 %)	20 (100 %)
Q10	0 (0.0 %)	0 (0.0 %)	1 (5.0 %)	12 (60.0 %)	7 (35.0 %)	20 (100 %)
Q11	0 (0.0 %)	0 (0.0 %)	1 (5.0 %)	6 (30.0 %)	13 (65.0 %)	20 (100 %)
Q12	0 (0.0 %)	0 (0.0 %)	1 (5.3 %)	4 (21.0 %)	14 (73.7 %)	19 (100 %)
Q13	0 (0.0 %)	0 (0.0 %)	1 (5.0 %)	7 (35.0 %)	12 (60.0 %)	20 (100 %)
Q14	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	2 (10.0 %)	18 (90.0 %)	20 (100 %)
Q15	0 (0.0 %)	0 (0.0 %)	1 (5.0 %)	6 (30.0 %)	13 (65.0 %)	20 (100 %)
Q16	0 (0.0 %)	0 (0.0 %)	1 (5.0 %)	8 (40.0 %)	11 (55.0 %)	20 (100 %)
Q17	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	6 (30.0 %)	14 (70.0 %)	20 (100 %)

workshop and the instructors' abilities to use clear messages and instructions [$\tau(18) = 0.55$; $p < 0.05$], instructors' abilities to use software tools adequately [$\tau(18) = 0.47$; $p < 0.05$], instructors' abilities to make the objectives clear [$\tau(18) = 0.48$; $p < 0.05$], and instructors' abilities to use efficiently the PBL methodology [$\tau(18) = 0.46$; $p < 0.05$].

In order to examine the relationship between how did the instructors reciprocate to the educational needs of the participants (Q6) and the adequacy of feedback to participants (Q7), the data were analyzed using a χ^2 test of independence. The results of the analysis indicate the statistically significant relationship between the variables [$\chi^2(1) = 12.6$; $n = 20$; $p < 0.01$]. The effect size is considered moderate [$\varphi = 0.79$; $p < 0.01$] (Cohen et al. 2007).

The evaluation of the PBL methodology, as recorded in the data, was extremely positive, since the 65 % of the participants were fully satisfied with the effectiveness of the method. The effectiveness of the methodology (Q13) was analyzed using a chi-square goodness-of-fit test. The analysis revealed statistically significant differences in the responses of participants [χ^2 (2) = 10.9; $n = 20$; $p < 0.01$]. High levels of satisfaction of the participants in the survey were also recorded in the question of how clear was the purpose of the workshop (Q9). The analysis provided with statistically significant differences between the responses [χ^2 (2) = 16.3; $n = 20$; $p < 0.001$], since 95 % of the participants chose answers 4 (agree) and 5 (strongly agree).

The statistical analysis of the variables related to the first research question are under our opinion, of a particular research interest. They actually link, in a sense,

the effectiveness of the PBL methodology with the participants' intention to apply the knowledge acquired in the workshop to future work at school. The majority of the participants considered that the workshop covered their expectations [χ^2 (2) = 9.1; n = 20; $p < 0.05$], as high as the 95 % of respondents replied in question (Q10) "agree" and "strongly agree." In fact, it appeared that they fully comprehend the objectives of the workshop (Q13). The results of the analysis indicate statistically significant differences in the responses [χ^2 (2) = 10.1; n = 20; $p < 0.05$], with 35 % of respondents to reply "agree," while 60 % respond "strongly agree." It should be noted at this point that most of the participants seem willing to implement this methodology in their everyday teaching practice (Q17). The results of the "goodness-of-fit" analysis in the specific question showed significant differences between the responses [χ^2 (1) = 10.1; n = 20; $p < 0.05$].

In order to investigate the correlation between the effectiveness of the methodology used and both the degree that participants' understood the PBL methodology and their intention to apply this knowledge in the future to their teaching process, a Spearman correlation coefficient was calculated (Field 2009). The analysis revealed statistically significant correlation between both the efficiency of the methodology and participants' understanding of the PBL methodology [r_s (18) = 0.47; $p < 0.05$], and the effectiveness of methodology and their intention to implement [r_s (18) = 0.47; $p < 0.05$]. The correlations in both cases were positive. The effect size is considered moderate (Cohen et al. 2007).

Teachers' answers to the open-ended questions grouped and are categorized according to their meaning (Bogdan and Bilken 1982). They considered as strong aspects of the workshop the teamwork, the supporting role of the instructors, the experience of the new method, the interactive and pleasant environment, but they asked for more time to work, more tools to create and edit the videos, and more technical help in the use of the tools.

Students' Evaluation

Students after the completion of the 8-h course were also asked to fill out an evaluation questionnaire, which composed of 17 five-point Likert scale questions ranging from one (1—strongly disagree) to five (5—strongly agree). The questionnaire appeared to have an acceptable internal consistency, $\alpha = 0.84$. All scale items appeared to be worthy of retention, and the highest alpha value would come from deleting item 10 ("This course met my expectations"). The removal of the specific item would lead to an increase of alpha by 0.01. Frequency distributions per question are presented in Table 7.3.

The first analysis concentrated on examining whether participating students' beliefs about the skills acquired in the course (Q16) display any significant correlations with the teachers' approach. A Kendall's rank correlation was employed for measuring the strength of dependence between the variables. The statistical analysis resulted in significant positive correlations between students' beliefs about the skills

Table 7.3 Frequency distributions—students (Q01–Q17)

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
Q01	0 (0.0 %)	0 (0.0 %)	2 (7.4 %)	11 (40.7 %)	14 (51.9 %)	27 (100 %)
Q02	0 (0.0 %)	0 (0.0 %)	1 (3.7 %)	16 (59.3 %)	10 (37.0 %)	27 (100 %)
Q03	0 (0.0 %)	0 (0.0 %)	2 (7.4 %)	13 (48.1 %)	12 (44.4 %)	27 (100 %)
Q04	0 (0.0 %)	0 (0.0 %)	1 (3.7 %)	8 (29.6 %)	18 (66.7 %)	27 (100 %)
Q05	0 (0.0 %)	0 (0.0 %)	2 (7.4 %)	12 (44.4 %)	13 (48.1 %)	27 (100 %)
Q06	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	4 (14.8 %)	23 (85.2 %)	27 (100 %)
Q07	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	4 (14.8 %)	23 (85.2 %)	27 (100 %)
Q08	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	27 (100 %)	27 (100 %)
Q09	0 (0.0 %)	0 (0.0 %)	2 (7.4 %)	9 (33.3 %)	16 (59.3 %)	27 (100 %)
Q10	0 (0.0 %)	0 (0.0 %)	1 (3.7 %)	16 (59.3 %)	10 (37.0 %)	27 (100 %)
Q11	0 (0.0 %)	0 (0.0 %)	2 (7.4 %)	9 (33.3 %)	16 (59.3 %)	27 (100 %)
Q12	0 (0.0 %)	0 (0.0 %)	1 (3.7 %)	7 (25.9 %)	19 (70.4 %)	27 (100 %)
Q13	0 (0.0 %)	0 (0.0 %)	1 (3.7 %)	11 (40.7 %)	15 (55.6 %)	27 (100 %)
Q14	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	2 (7.4 %)	25 (92.6 %)	27 (100 %)
Q15	0 (0.0 %)	0 (0.0 %)	2 (7.4 %)	10 (37.0 %)	15 (55.6 %)	27 (100 %)
Q16	0 (0.0 %)	0 (0.0 %)	3 (11.1 %)	12 (44.4 %)	12 (44.4 %)	27 (100 %)
Q17	0 (0.0 %)	0 (0.0 %)	0 (0.0 %)	9 (33.3 %)	18 (66.7 %)	27 (100 %)

acquired in the course and the instructors' abilities to make the objectives clear [$\tau(25) = 0.52$; $p < 0.01$], and the teacher's willingness to encourage participation [$\tau(25) = 0.49$; $p < 0.01$].

A second analysis replicated the results obtained in the teacher's evaluation on the workshop. Results indicated that there was a statistically significant relationship between the educational needs of the participating students (Q6) and the adequacy of feedback to participants (Q7) [$\chi^2(1) = 4.61$; $n = 27$; $p < 0.05$]. The effect size is considered moderate [$\varphi = 0.41$; $p < 0.05$] (Cohen et al. 2007).

As Table 7.3 shows, students held a positive view on the effectiveness of the methodology (Q13). Actually, the analysis revealed the statistically significant differences in the participants' responses [χ^2 (2) = 11.56; $n = 27$; $p < 0.005$]. Pursuing this topic further, we search for presumable significant correlations between the effectiveness of the methodology used (PBL methodology) (Q13) and students' intention to work with this method at school in the future (Q17). The outcome of the analysis clearly shows a significant positive correlation [$\tau(25) = 0.68$; $p < 0.001$].

Students' answers of the open-ended questions, as well as their statements in the discussion at the end of the procedure, acknowledges some interesting key points regarding the PBL methodology. Summing up their opinions, it may be concluded that of most importance for them were their teamwork experience, the responsibilities sharing, the supporting and non-guiding role of the teacher, the sense of expressing themselves freely during working, the use of social media to share their work, the feeling of creation, and the pleasant environment during working and

learning. Moreover, they enjoyed the opportunity for discussion about the planning of their work, argumentation about the scenario and the content of their video, planning stages and details for their work, presenting and supporting their product in front of their classmates explaining to them why they choose the specific content (about green economy or sustainable development), and what kind of information they decided to share with them.

At the same time, they ask for more time to work as well as for more and alternative ICT tools. They supported that they learnt new things about video editing using MovieMaker, techniques of searching, and downloaded information, images, and video. But, working on their video they formulated knowledge about green economy and/or sustainable development (ideas, methods, applications, related jobs, and related projects) according to their perspective.

Differences Between Students' and Teachers' Evaluation

Data obtained from both students and teachers–trainees were further analyzed nonparametrically to compare presumable differences between the two independent groups. In view of the skewed distribution of scores, a Mann–Whitney U test was used to evaluate whether attitudes toward PBL methodology differ based on group. Not any statistically significant differences on attitudes toward PBL methodology between students and teachers–trainees derived. It can be concluded therefore that the evaluation of the PBL methodology, as indicated from the abovementioned results concerning participants' satisfaction from the effectiveness of the method, was extremely positive, for both groups. They link the perceived effectiveness of the PBL methodology with their intention to implement this methodology in their everyday teaching and learning practice, respectively.

Conclusions

In this paper, PBL methodology was used for the construction of educational video by teachers and students. Teachers with various vocational specialties were participated in an experiential workshop, gaining experience with the method, and successively invited to implement acquired skills in their school settings. Taking into consideration that PBL methodology is based on the collaborative solving process of real-world problems and inherently is student-oriented, and the following conclusions resulted.

The conclusions derived from the analysis of the participants' answers (teachers and students) regarding the evaluation of the research methodology used and the research questions are as follows:

- The participating teachers were acquainted to PBL technology, and they seemed inclined to apply it at their teaching practice. These results can be correlated with the effectiveness of the methodology applied, since among them a significant positive statistical correlation was found. It should be noted at this point, that the analysis revealed the effectiveness of the PBL methodology, as perceived by the teachers, is significantly associated with instructors' efficacy for meeting the educational goals. Moreover, due to the fact that PBL itself is student-oriented, participants took an active part in the learning process, since the knowledge acquisition was driven by their own personal educational needs and their prior knowledge.
- The participating teachers evaluated the presence of instructors during the seminar as helpful and compatible with the PBL methodology. The active participation of the teachers was encouraged by the instructors who were considered adequate for the project they undertook. Results indicate a substantial positive effect of instructors' role in the process, on the grounds that they managed to make the educational objectives clear and provide the adequate feedback at all phases.
- Teachers were satisfied by their participation in the workshop, and the vast majority of them noted that their expectations were met.
- It is important to notice that the statistical analysis of the student's data replicated the results derived from the analysis of the teachers' data concerning the extent to which instructors' competence enhances the acquisition of PBL proficiency as well as the extent to which the apprehension of PBL methodology results to integrate this knowledge to teachers' and students' future work.
- PBL methodology implementation seemed to have a positive effect on the students. The approach used proved to be an attractive learning novelty for students, triggering their creativity and facilitating the expression of their ideas. Video production using the MovieMaker software was considered as an easy process, and all of them achieved this goal. All of them were informed about notions and topics concerning green skills, green economy, or sustainable development, validating the educational effectiveness of the method.
- Both quantitative and qualitative data analyses indicated that the two groups (teachers and students) shared positive perceptions toward the PBL methodology.

In conclusion, utilizing PBL methodology in the classroom offers opportunities for developing skills such as flexible knowledge, effective problem-solving skills, and collaboration skills as well as intrinsic motivation. It is important to notice that further longitudinal research is considered necessary in order to determine whether PBL methodology can be effectively applied to teaching practice, in various fields of Greek educational reality, where students will be able to build up their knowledge via active ways of action and self-motivation.

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