WCES-2010

Bridging achievement gaps by "free" project based learning

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Abstract

Experiencing FPBL (Free Project Based Learning) can develop effective content delivery for both teachers and students. With FPBL where students are free to choose their own projects they become intrinsically more motivated and self-confident. In this research study two groups (control group and experiment group) of students are used and two exams are developed to evaluate the students' achievements. A remarkable difference in favor of experiment group was found. The results provide a starting point for educators and researchers seeking to assess new approaches to project-based learning.
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Keywords: Achievement gap; free project based learning (FPBL); learning; traditional learning(TL).

1. Introduction

Great changes have taken place in our life along with development of technology. Obviously, internet plays an important part in this. At this point the web-design courses become more important. Beginning with HTML courses, students get frightened of the course. This may be the issue with a vocational school student who is good at practical skills and not very successful at other issues. Therefore, new strategies in education are needed in order to attract those students attention.

1.1. Background

"Gaps in Education" is a common issue in these days among the researches. Gaps in most of the areas and gaps in the FPBL deals with the challenge of sustainable growth of learning capacity .With FPBL, the teacher-student relationship becomes mutually inclusive and with diversity it represents, becomes even a more attractive method for students. Gaps, which are defined as, have and have-nots; know and know-not's, are widening [United Nations Development Programme (UNDP), 1999; Malloch, 2000; James, 2000; Main, 2001; Dalsgaard, 2001; Cobb, 2002]. Project-based-learning (PBL) was suggested by many as promising pedagogical approach for teaching TPS (Albanese & Mitchell, 1993; Blumenfeld et al., 1991; Vernon & Blake, 1993; Williams & Williams, 1997). Project-based learning has a long historical background (Grant, 2002). It was first discussed in W. Kilpatrick's article "The Project Method", published in 1918 (Wrigley, 1998). PBL can be said to have emerged as a synthesis of John

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Dewey's and Kilpatrick's views on learning. Since, John Dewey's "problem solving" method began to resemble the traditional teaching method, W. Kilpatrick began to spread "The Project Method" (Oğuzkan, 1989).

PBL is a comprehensive approach designed to engage students in the investigation of authentic problems and it is based on teaching and learning within the class environment (Blumenfeld et al, 1991). According to the definitions found in PBL handbooks for teachers, projects are complex tasks, based on challenging questions or problems, that involve students in design, problem-solving, decision making, or investigative activities; give students the opportunity to work relatively autonomously over extended periods of time; and culminate in realistic products or presentations (Jones, Rasmussen, & Moffitt, 1997; Thomas, Mergendoller, & Michaelson, 1999). Another definition was that: It is an individual or group activity that lasts for a particular period of time, which results in a product, a demonstration or a performance (Moursund, 2001). According to Blumenfeld, et.al (1991), previous attempts at hands-on and discovery learning curricula failed to reach widespread acceptance because developers did not base their programs on "the complex nature of student motivation and knowledge required to engage in cognitively difficult work," nor did they give sufficient attention to students' point of view. On the other hand, other authors mention authenticity, constructivism, and the importance of learning "new basic skills" in attempting to describe the difference between PBL and prior models that involved projects (Diehl et al., 1999).

Closing the achievement gaps that separate the academic performance of various subgroups of students is a central goal of current education reform efforts nationwide. FPBL is a new strategy in the education world (WestEd, 2006). When children are allowed to choose what to explore, they become intrinsically motivated, more than happy to work hard and strive for the highest quality (Wolk, 1994).

1.2. Purpose

The basic aim of this research is to determine the effect of FPBL on learning outcomes in the web design lesson course of the 11th form of students'. Answers to the following questions were sought in the study:
- Is there a difference in academic achievements between the FPBL and TL?
- What are the opinions of students regarding to FPBL?

2. Method

2.1. Population

38 students from CTIVHS (Cengiz Topel Industrial Vocational High School) were involved in this research study. 19 students were used as control group and 19 students were used as experiment group.

2.2. Instrument

In order to assess the academic achievement of students, a teory test and an application test was developed for "Desgining a Basic Web Page Using Macromedia Dreamveaver 1". Thes tests are composed of 20 questions. The prepared tests was examined by 4 experts of the field, a test development expert and classroom teachers in terms of its validity and appropriateness to the student's level. To determine the reliability of the test, it was applied to the 11th grade of students was carried out in. The reliability of the test was calculated by the halving technique. In this method, the test was divided into two coequal halves, and odd and even numbered questions were evaluated separately; the correlation between the scores of students from both halves of the test was calculated. As this formula determines only the reliability of the half test, Spearman-Brown formula is used to determine the reliability of the whole test. As a result of the calculations, a coefficient figure of 0.82 reliability was calculated for the achievement test on the module "Desgining a Basic Web Page Using Macromedia Dreamveaver 1".

Some of the questions in the interview are:
1. What do you think about TL?
2. What do you think about FPBL?
3. What are the benefits of FPBL?

2.3. Procedure

First of all, two groups of students(Experiment and Control Groups) are supplied by theorical information about Web Developing Tool, Macromedia Dreamweaver. The two groups of students were provided with similar text material. They were given courses for 1 mounth about HTML and Dreamweaver Structures. The course was deliever as a TL. The duration of this education was 1 mounth (32 hours). After these, the students were taken to a written exam. Following this application, FPBL was delivered to the experiment group. In FPBL, students were wanted to choose their own project topics and encouraged to study in the areas that they are skillful (Some of the students projects can be seen in Figure1, Figure2, Figure3 and Figure4. They were allowed to their choose group friends and they were grouped in threes. According to this project title, the next mounths course was followed in parallel to these projects. All the students applications were done in the projects. For example in order to apply a Flash Button, the students applied this in their own projects. The control group was given the same course as TL. They hadn't any projects to apply the exercises. Two groups of students, all had another examination. These exam was an application exam. The students were given exams which contained predesigned web page printouts. The students applications were graded by help of a checklist. The students were assesed according to 20 skills (which were obtained during the courses). 3 skills of these skills were: Applying a Rollover Image in a Webpage, Creating a WebAlbum, Inserting a Flash Text in a Web Page.
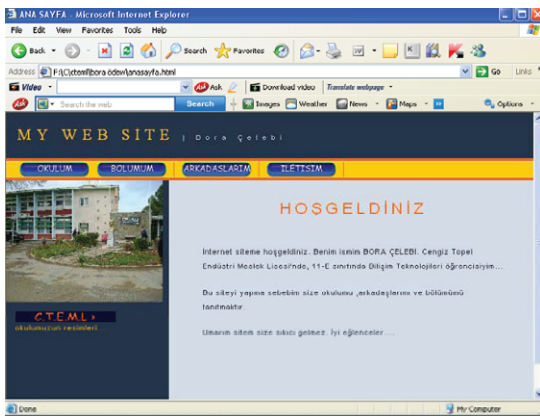

Figure1. Project of Student 1 (FPBL)
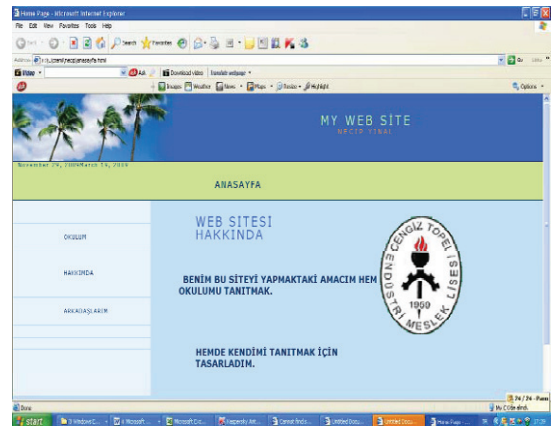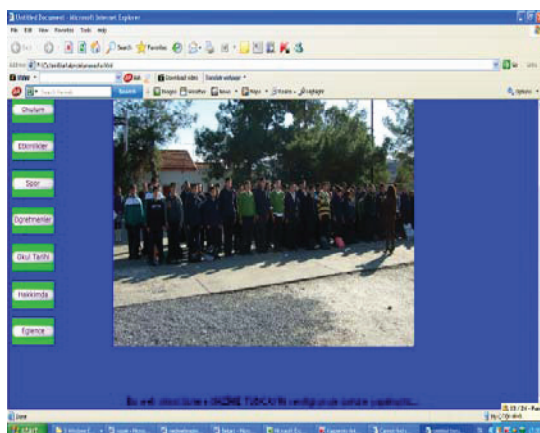

Figure 2. Project of Student 6 (FPBL)

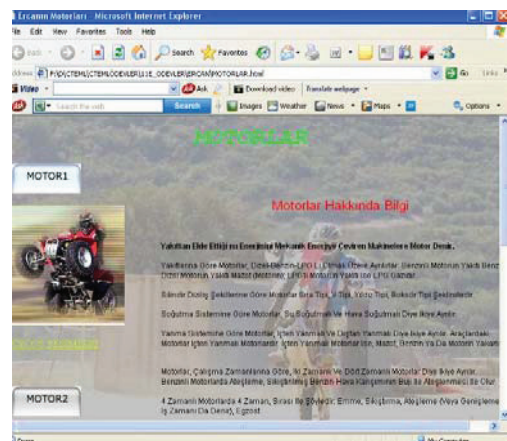Figure 3. Project of Student 10 (FPBL)

Figure 4. Project of Student 13 (FPBL)

2.4. Instrument

Two questionnaires (a theory test and an application test) were developed to examine the success scores of the students. In order to evaluate the items in the questionnaire and in the exams and experts evaluation (n = 15) was wanted. Experts group from education technologist evaluated the data gathering scale both individually and collaboratively. Under the suggestions of experts, necessary corrections were done to the draft form of the questionnaire. Hence, the content validity was maintained by the help of the educational technologist experts. All the experts' evaluations and suggestions are taken over the draft form of the questionnaires after the necessary corrections; the questionnaires were used to assess the students' progress.

2.5. Data Analysis

Descriptive statistics were used to analyze and to report the data gained from the questionnaire. For data analysis, SPSS 16.0 was used. The mean and standard deviations of the questionnaire items were calculated.

3. Results and Discussion

After providing students with necessary terminological knowledge, the FPBL and TL strategies were applied in two groups. According to the student scores and according to the student interviews, results were driven. Their results were very interesting. The results of the theory exam was very different than the results of the application exam. The application exam scores of the experiment group students were comparatively higher than the application exam results of the control group students.

3.1. Scores

The application exam results of the experiment group (M= 9.05) was higher than the theory exam results(M=7.84). However, the application exam results of the control group (M= 6.11) was lower than the theory exam results(M=6.84) (See Table1).

Table 1. t-tests

	N	M	S	sd	t	p
Theory Exam Scores						
Experiment Group	19	7.84	1,608	18	1,747	0,98
Control grubu	19	6.84	1,803			
Application Exam Scores						
Experiment Group	19	9,05	,848	18	7,223	0,00
Control Group	19	6,11	1,629			
Control Group						
TE	19	6,84	1,608	18	1,472	0,158
FPBL	19	6,11	0,848			
Experiment Group Scores						
Theory Exam	19	7,84	1,608	18	1,845	0,01
Applicatiom Exam	19	9,05	0,848			

3.2. Scores Graph

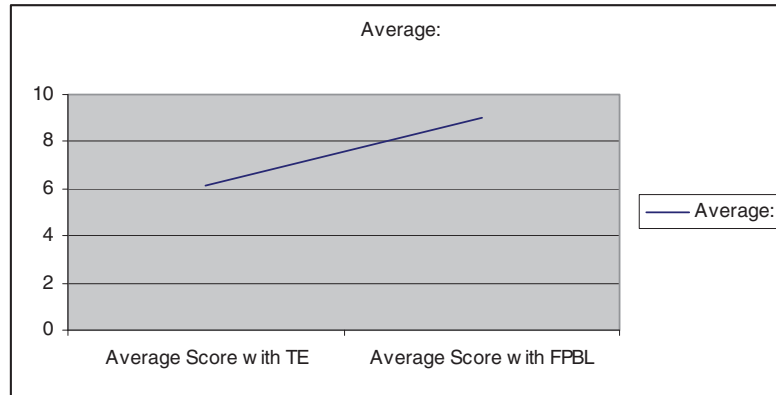The trend of scores of FPBL is higher than the trend of the TE (see Figure 5).

Figure 5. Scores Graph

3.3. Interviews

The student scores at the end of the two weeks course were very interesting. "What are the opinion of students regarding the project-based learning approach applied in web-design lessons? Most common answers of the students obtained as a result of these interviews are presented in Table 2.

Table 2. Students' Comments

Student's Comments about TL	Frequency
"Boring"	5
"Nothing different"	6
"Something we get used to"	10
" It was good"	6
"Old fashioned"	5
"not interesting"	3
"we do this often"	3
Student's Comments about FPBL	
"It made learning entertaining and enjoyable"	4
"It provided meaningful learning"	5
" It provided extensive learning experience".	2
"It increased achievement"	2
"project-based learning should be applied in every course"	6
"developed selfconfidence"	3
"increased motivation"	2
"enabled learning"	5
"increased our Marks"	2
"It made me feel that I am controlling how I will learn"	5
"I have find lots of interesting information about the issue"	3

Students mostly gave the answers: "It made learning entertaining and enjoyable" and "It provided meaningful and retention of learning". Students emphasized some other points as "It increased rapport and collaboration, provided extensive learning experience, provided learning by means of researching, facilitated learning, made individual learning possible". "It increased achievement, developed self confidence, increased motivation, ensured taking responsibility in learning, enabled learning possible by doing". These are among the opinions put forward by the students concerning project-based learning. Evenmore, a student has supported this positive opinion by stating that "project-based learning should be applied in every course".

4. Conclusions

Students are evaluated on the basis of their projects, rather than on the comparatively narrow rubrics defined by FPBL exams is often more meaningful to them. It is a successful approach to instruction for a variety of reasons, its proponents say. For one thing, it helps students retain the information they learn. Lecture approaches don't lead to long-term retention. However, with FPBL students are encouraged to explore their own interests and to make connections to the world beyond school.

Because FPBL is filled with active and engaged learning, it inspires students to obtain a deeper knowledge of the subjects they're studying. Research also indicates that students are more likely to retain the knowledge gained through FPBL far more readily than through TL. The difference was a meaningful difference. The FPBL method proved to be a good and successful method on application exams. These suggests that FPBL can be a bridge to achievement gaps in the education.

5. Recommendations

An action plan should be made to fulfil the necessities of FPBL activities. Such a plan should access the following:
- Dissemination of information related to FPBL and seminars in schools.
- Assistance of teachers in creating and teaching FPBL course subjects.
- Management and coordination of FPBL at respective institutions.
- Designing FPBL webpage.

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