

Full Length Research Paper

Project based learning in multi-grade class

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The purpose of this study is to evaluate project based learning in multi-grade classes. This study, based on a student-centered learning approach, aims to analyze students' and parents' interpretations. The study was done in a primary village school belonging to the Centre of Batman, already adapting multi-grade classes in their education system, in 2011 to 2012 academic years. The study was organized with the aid of qualitative research methods. 18 students of the 4th and 5th classes taking courses together and 8 parents participated in the study. They (students and parents) finally judged the applied project based learning activity favorably, signified their satisfaction at the end of the project and intended to further participate in a project based learning study.

Key words: Multi-grade class, project based learning, primary school.

INTRODUCTION

Project Based Learning (PBL) is an extensive approach allowing pupils to research a topic or a task at school, either individually or in groups where a wide range of different products emerge. In an approach of PBL, learners can ask questions during the research and while cooperating, they can also make assumptions, research, collect and analyze data, use technology produced goods and exchange thoughts (Krajcik et al., 1999). PBL helps students to develop tasks, imagine, plan and speculate. From a teacher's point of view, however, it is a training method that pays attention to the student and carries real life atmosphere into the class which helps to build a disciplined relation (Kalayci, 2008). Moreover, PBL results from several targets one sets to himself: the depiction of the targeted topic, realization of groups, final report quality and form of representation, working time and decision of checkpoints, criteria for evaluation and skills, data gathering, collecting and reporting, and finally the presentation of the project (Erdem and Akkoyunlu, 2002). There is no certain lesson to conduct the approach of PBL at schools. Students can work anywhere and anytime on their projects. The idea of this approach is to enable a child to live, even if his milieu is a small one. Useless knowledge does not take place in the training (Akgün, 2000; Yenice, 2003, cited in Saracaloğlu et al.,

2006). In this regard, since students do have a connection to real life and acquire even knowledge the results are referred to themselves. During the process, the students can act freely and take totally new decisions. But for all that, this situation increases their motivation which is geared to working and preventing questions of classroom management. It also creates a more equalized learning field for pupils who have prior formation and abilities (Solomon, 2003). PBL is in this respect, an ideal approach for multi-grade classes, especially in villages or country sides. Although, multi-grade classes have incompleteness in medium, supplies and technological equipment, it is still possible to operate with appropriate issues in specific places.

The choice of the subject is the most difficult and important stage in the approach. Therefore, the choice of subject deserves an adequate care. The elimination of an issue in this section, which builds the first stage of PBL, should be suitable for children, educational programmes and the lived-in society; otherwise it will be impossible to reach the intended target and the project will fail. Appropriate titles and themes can be found everywhere. Considering that it will be enough to know about the social environment of the children, their lifestyles, the current and past issues of the world, knowledge about the problems of students' parents and about the city, area or the land's problems they live in will be sufficient with the utmost probability (Çiftçi, 2006).

It is one of the most essential desires of each country

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to have more cultivated and qualitative citizens in an era of knowledge and sciences. To make education accessible for individuals is a basic requirement of a democratic land. In this respect, schools with multi-grade classes were opened in areas with few settlements to cover the requirements of citizens.

A multigrade class is a class where one teacher is responsible for more than one class or otherwise it refers to a group of two or more classes with one teacher giving lessons (Binbaşıoğlu, 1999; Köklü, 2000; Mason and Burns, 1996; Öztürk, 2007; Miller, 1991; Veenman, 1995). These are generally unified classes established by the non-availability of teacher, student and library (Mathot, 2001; cited in Nawab and Baig, 2011; Summak et al., 2011). Besides Turkey, the project is applied in other developing or already developed countries such as the United States, England, Finland, Greece, Spain, Columbia, Nicaragua, Peru, Australia, India, Philippines, Malaysia etc (Bilir, 2008; Fidan and Baykul, 1993; Little, 2001; Sağ et al., 2009).

For many reasons, especially cultural and geographic, there are many rural and spread settlement areas in Turkey. Thus, it appears that the population density in these areas is very low. It can be observed that 2 to 3 students participate in each class of the first school year. Since it is a high investment for the country's economy to engage a teacher in classes of up to 2 to 3 students, it is important to take classes that have to bring together all these areas. Although, the school's enrolment is sufficient, the lack of subject leads to the necessity of combining classes (Dursun, 2006; Köklü, 2000). After eight years of continuous education, the project, done in Turkey, in 1997, achieved its goals successfully and recommended that girls be involved in the primary boarding schools of the area. These applications are geared towards solving the problems in the system (Köksal, 2009). One of the solutions is concentrated on the closure of multigrade classes where it is more difficult to realize educational training activities. With these applications, many multigrade classes were closed as a consequence and students were sent to boarding schools or schools in bigger and reachable settlement areas. Because parents adopted opposite standpoints to boarding schools and financial problems during the application, the schools of multigrade classes were reopened. Instead of closing schools and applying multigrade classes, which will not solve the problem, the fact remains to improve and increase the quality of the applications (Şahin, 2003:168).

According to the data of 2005, there are 16379 multigrade classes out of 34782 primary schools in Turkey. While 587379 students acquire education in these classes, 27685 teachers of multigrade classes are engaged in these schools (MEB, 2005 cited in Öztürk, 2007). In schools containing multigrade classes, it is possible to find differently composed classes as follows (Table 1):

(*) If the number of students in group A is in classes higher, third year students can be included in group B.

(**) If the number of second and third year students is too high in a class, the fourth and fifth year students are taught with the help of building multigrade classes. Second and third year students are taught independently.

Even if multigrade classes generally emerge from necessity, scientifically texts about the topic mention very often multigrade classes and their diverse utilities. Besides all, while multigrade classes enable children of the village to acquire education without participating in applications of boarding schools, it leads to lack of teacher in their villages, on the other side. The communication in a small multigrade class between teacher-student and student-student creates a family atmosphere which is more natural and in a friendly way (Vincent, 1999). Students of different ages where communication is more important in these classes are developing essential skills of working independently on their own or at least working in groups (Akbaşı and Pilten, 1999; Kazu and Aslan, 2011; Köklü, 2000; Little, 2004; Miller, 1991; Mulryan-Kyne, 2004; Yildiz and Köksal, 2009).

McClelland, for example, illustrated that students of different ages in these classes do have positive attitudes, leading facilities, self-confidence and less aggressive behavior in contrast to students of traditional classes (Kadivar et al., 2005). Researchers have shown that despite the advantages, the applications of multi-grade classes have certain limits. They include: lack of application, sourcing, learning and teaching materials in the schools (Adanur, 2011; Aksoy, 2008; Gelebek, 2011; Özben, 2000; Sinmaz, 2009; Yılmaz, 2011), few support of parents, negative perspective of education, the negative influence of limited village life on the professionalism and social life of teachers. On one hand, classroom management, appropriate methods, finding techniques and creating learning spheres are difficulties that appear in multigrade classes (Bilir, 2008). In schools with multigrade class applications, however, the quality of schooling and teaching can be formed with qualitative teachers and teaching programmes. Teachers working in multigrade classes have to satisfy the needs of students more than teachers who are working in independent classes, because of their higher knowledge in children's progress and teaching strategies. In multigrade classes, the teaching planing, accomplishments, recording and evaluation and at least classroom management are more complex. Teaching programmes in multigrade classes, contrary to independent classes, are at the same time different in their types of application.

Several studies have been carried out, and different programmes were created in various periods in Turkey to have more impressive and profitable results in multigrade class applications. Since the primary school programme applied in Turkey in 2005 was different from any other programme before, it is necessary to apply the

Table 1. Facilities of multigrade classes in Turkey.

Number of teacher	Number of classroom	Number of section	Groups			
			I	II	III	IV
1	1	5	(1+2+3) +(4+5)			
2	2	5	(1+2+3)	(4+5)		
2*	2	5	(1+2)	(3+4+5)**		
3	3	5	1	(2+3)	(4+5)	
4	4	5	1	(2+3)	4	5
4**	4	5	1	2	3	(4+5)

Source: Uygur and Yelken (2010).

approaches and operations in multigrade classes. Therefore, the new type of programme has to be applied exceedingly in multigrade classes and understood by their teachers. According to the student-centered education programme of 2005, the students are not passive recipients of knowledge or the outside world. They are researchers, requesters and combiners of old and newly gained sources.

While teachers take on the roles of guide, students are self-responsible for their knowledge gained through schooling. The students of multigrade classes very often work together in teams. The possession of student skills such as teamwork, study groups, acceptance of responsibility and self determination in multigrade classes simplifies the application of student-centered approaches in class. One of these approaches is project based learning in multigrade classes, which can be easily adopted. To contrive ways and means is an aim of multigrade classes. Therefore, the goal of this research is to analyze a student-centered learning approach, an application of project based learning in multigrade classes, and to evaluate the perspectives of students and their parents. The following research questions are asked:

1. What is the attitude of students concerning a project based learning approach?

- How did you feel when you heard of the project?
- What are the difficulties the students of multigrade classes encounter during the project based learning?
- What are the sources and types of information that students of multigrade classes get?
- What are the feelings and considerations concerning project based learning of students in multigrade classes?
- Would you like to participate again in this kind of study? Why?

2. What are the observations and opinions of parents regarding the students during the accomplishment of project based learning?

- What kind of changes (in regard to their children) can parents observe during the project based learning application?
- How are the feelings and considerations of parents regarding the solutions of project based learning?

- Do you want your children to participate again in this kind of study? Why?

MATERIALS AND METHODS

The study seeks to examine the perceptions and opinions of students in multigrade classes and their parents regarding project based learning. The research was conducted by using a case study method. According to Yin (1984) (cited in Özçelik and Yildirim, 2002), a case study is a qualitative research method aimed at investigating a contemporary phenomenon within its real-life context when boundaries between phenomenon and context are not clearly evident, and in which multiple sources of evidence are used. The study was conducted at a primary school of a village belonging to Batman.

This school is trying to educate with multigrade classes. The combination of the classes are 1 to 3 and 4 to 5. The study was carried out in the second group (4 to 5) in social studies (topic: "Our living environment"). The class has 18 participants composed of 9 female and 9 male students. The education of the topic "Our living environment" was carried out for 3 weeks by the students of the PBL class. The performance before and during the accomplishment can be resumed as thus:

1. First of all, the students in working groups were taught about the accomplishment of PBL and its procedures.
2. Afterwards, the students watched a presentation named "Do you want to become a researcher?" and the procedure was taught step by step.
3. Topics were decided together with students keeping environmental conditions in mind. Three topics were defined: the representation of the village, Batman, the village they live in, and the cultural values of the village. The students were divided into three groups. The tasks within in the groups were arranged after fields of knowledge.

Students participated in this study using cameras and additionally, PowerPoint slides were used to teach them.

1. Students collected information on their researches, made conversations and arranged excursions.
2. After the termination of the tasks and after finishing preparations for the presentation, the needed media were asserted. Thereafter the tasks were presented to classmates and their families.

Instruments

Data were collected by interview technique. Interview is an effective method to obtain information concerning individual methods, atti-

tudes, complaints, feelings and believes (Yıldırım and Şimşek, 2008). To define the opinions of students concerning multigrade classes in project-based learning, a conversation form of 3 open questions for the opinions of parents and 5 for those of the students were prepared. In this conversation method, the researcher prepares the questions beforehand, but allows during the conversation their reformulation and discussion (Ekiz, 2009). During the preparation of the questions, opinions of experts concerning the medium of evaluation were first referred to. In addition, the opinions of experts were taken into consideration, and the last corrections were made. The conversations with the students and parents in the group were accomplished and videotaped.

Data analysis

After the interviews, a descriptive analysis technique was used to resolve the data. The results concerning the approach can be organized after topics, or they can take the questions used during the observations into consideration. It is important to bring the opinions of the individuals veritable in direct quotations (Yıldırım and Şimşek, 2008). The conclusion results from already prepared topics. The questions concerning the interviews were taken into consideration during the draft, and the main arguments in the statements were analyzed with the help of frequency values. Moreover, abbreviations were used to demonstrate students and parents (S:1, S:2, S:3...P:1, P:2) in several illustrations.

RESULTS AND INTERPRETATION

This chapter treats the responses of students to the questions prepared by experts and their answers in a hundred frequency rate. Furthermore, more than one answer of students to only one question was also considered in this analysis.

Results of the first sub-problems and comments

How did you feel when you have heard of the realization of a project based learning working for students?

Students mostly (f.14) answered to this open question that they were very nervous at the first moment, while 9 students expressed their pleasure (Table 2). The same students explained their curiosity about the procedure. While a group of students admitted fears, most of them signified their belief in its realization. The fact that students never participated in this kind of studies led to their excitement at the same time. This new and different accomplishment causes students to rejoice. That the project makes a part of the students afraid is again a reason for their misery and sorrowfulness. Some of the students' responses to this question are listed as follows:

*When I heard of the project for the first time, I became very nervous and thought about it (S.4);
I was very excited and happy. I thought we would succeed (S.5);*

*I was very happy when our teacher told us about it (S.10);
When I heard of the project, I was happy. I was interested in the project and thought about the realization (S.8);
I was afraid. I thought we will never make it (S.6);
I was very nervous and thought about the realization of the project (S.2);
I was very happy. I was very nervous (S.11);
I was very happy (S.15).*

Did students of multigrade classes encounter any difficulties during the project based learning? If yes, what were they?

The students did not encounter any difficulties (f.9), but half of them remarked that they had some difficulties as the results in Table 3 illustrate. While some students had problems preparing their presentations (f.5) and difficulties during the preparations (f.4), 4 further students remarked their difficulties during the research. While 2 students mentioned the bad weather conditions, 4 students pointed out their difficulties presenting the resolutions in front of their parents caused by nervousness. That half of the students did not encounter any difficulties during the project results in the choice of the topics where living environment and school conditions were kept in mind. However, students remarking their difficulties in preparing a presentation and having difficulties during the presentation have never presented in front of their parents. The preparations of their first PowerPoint presentations were the cause.

Some of the answers of students to this question are:

*I have not encountered difficulties (S.3).
I have not encountered any difficulties because my mother and my father helped me (S.1).
I have not encountered any difficulties. We made everything easily (S.12).
We had difficulties in some points because we did not know how to prepare a presentation (S.9).
Bad weather conditions were the reasons for our difficulties (S.4).*

Which sources and types of information did students get during PBL in multigrade classes?

The analysis of Table 4 shows that the students (f.13) referred to their school teachers during the PBL to obtain information, but their parents were the persons they mostly referred to. The students also remarked that they did not only accept the help of their teachers and parents, but also of other persons (neighbors, brothers and sisters, grandparents, aunts and the mayor of the village). 4 students explained that they made use of the internet and 3 students remarked that they were never in need of help. The reason why students mostly needed help of

Table 2. Frequency values and students' feeling about the project.

Topic: feelings and opinions about the project	f
Subtopics	
Excited	14
Curious	10
Happy	9
Planned	6
Afraid	6
Not do it	5

Table 3. Frequency values and students' opinions about difficulties encountered during PBL.

Topic: Encountered difficulties during PBL	f
Subtopics	
I have not encountered any difficulties	9
I had some difficulties.	9
I had difficulties preparing the presentation.	5
We had difficulties during the presentation.	4
We had difficulties during the research.	4
We had difficulties because of bad weather conditions.	2

Table 4. Frequency values and sources of information gained.

Topic: gained information sources during PBL	f
Subtopics	
From my teacher.	13
From my parents	12
Different persons	10
From the internet	4
Not accept anyone's help.	3

Table 5. Frequency values and students' feeling and thought concerning PBL.

Topic: feelings and thoughts concerning PBL	f
Subtopics	
Very happy.	18
Excited	13
Proud.	6

their teachers and families are the limitations of other information sources in the village.

Some responses of students to the question were:

We accepted the help of our teacher during the preparation of the project (S.16).

I mostly accepted the help of my teacher. If my teacher has not helped, I could not have finished the project.

Afterwards, my mother, my father and our neighbors helped sometimes (S.13)

I accepted the help of my mother, my aunt and grandfather (S.7).

I accepted the help of my brother. We did a research on the internet (S.1).

I did not accept anyone's help. I did everything on my own (S.11).

How was their feeling like and what did the students of multigrade classes think about the application of PBL at the end?

Table 5 shows that students remarked that they were happy and excited after the process of PBL; in addition, 6 students also pointed out their pride. This kind of activity which involved families of students observing and sharing their children's success can be considered as factors of happiness and self-confidence on students.

Some of the responses to the question were:

It is pleasant to work together with friends and help each other. We are happy. (S.17)

I felt very good, and it was very amusing. I was also happy that my mother and my sister came (S.14).

I was very excited previously, and I was happy after the presentation. (S.8)

Presenting the project in front of my family made me happy. (S. 4)

We have realized a very good project, and I am happy about it. (S.6)

I was very happy when I presented the project. I was very excited. I felt like waking up from a dream. (S.13)

I liked everything. We liked the spectatorship of my mother and our neighbors enormously. It was a lot of fun (S. 10).

Do you want to do the project again? Why?

As the analysis points out (Table 6), all students remarked their will to do the project again. 8 of them made it clear that they really want to do it. The answers to the question "Why do you want to do the project again?" were mostly for doing the project and having fun. 8 students mentioned that they learned new things and liked the project. This is the reason why students presented their presentations in front of their parents and to do the procedure successfully.

Responses of students to the question were:

Yes, I want to do it again. Would you be so kind to do that? (addressing the teacher) (S.4).

I really liked the project. I was very good. Yes, I would like to do it. It helped us enormously (S.14).

Yes, I want to do it because it was very amusing and a lot

Table 6. Frequency values and students' opinion of doing a second project.

Topic: Opinions on doing a second project	f
Subtopics	
Want to.	10
Really want to.	8
Like	12
Funny	10
Learned many new things.	8
Very good.	8

Table 7. Frequency values and changes in students during PBL.

Topic: Changes in students observed during PBL	f
Subtopics	
Excited.	6
Willing and energetic.	6
Self-confident.	4
Responsible-minded.	2

of fun. We were very happy. To conduct a presentation in front of my parents was very significant (S.7). I really want to do it, because it was a lot of fun. We want to realize the project again (S.9). Yes, I really want to do. I was very happy. I have learned new things. I am excited (S.18). I really want to do the project because it entails learning new things (S.5)

Results and opinions concerning the second problem

What are the changes of students whose parents observed during the PBL application?

The analysis (Table 7) shows that parents observed excitement and will of students during the PBL application. 4 of them remarked that their children worked self-confident. After the observation of the parents, the students were more interested, excited and willing, so project based learning was a positive motivation.

Answers to this question were:

He was very nervous during the preparations. He told us that he was waiting eagerly for the presentations every day. He took a great interest in the project (P.8). He had a deep interest when he started the workings on the project. He prepared each stage willingly, and told us about it. He was always interested in our opinions and asked what he can improve (P.3). During their preparations, our children were excited and curious. He did his homework with great pleasure (P.4)

Our children were very excited during the project work. They worked willingly and eagerly. They started to see themselves as men and answered in a self-confident way that they are doing a project when we asked for their work (P.1).

I saw the first time that he started to do his homework without saying it and before evening (P.6.)

How did you feel at the end when your children presented the results of their project works?

The analysis of Table 8 points out that all parents were satisfied observing the success of their children and happiness in presenting their works. Parents mostly answered that they were very proud and deeply touched, and even happy while especially 4 of them remarked that their children's belief in themselves raised enormously. This project led to the result that parents became very satisfied about project work of their children and attached importance to the presentations conducted in front of them.

Answers concerning this question were:

I was deeply touched and believed in his success. I noticed his self-development, and the rising self-confidence and this made me believe in my child, too (P.1)

I felt very happy. I did not expect such a good work from my children. While they were presenting, I noticed some skills that led to success later on (P.2).

First of all, seeing them preparing and presenting their project to us and also the developments made me feel very happy (P.7).

I was happy and proud about the success of accomplishing his tasks (P.4).

Do you think that your children should participate again in this kind of project? Why?

According to the analysis shown in Table 9, it is obvious that most parents accepted second participation of their children in PBL. The most important aspect is the voluntary working of the children. The parents remarked that they were proud to see the students' results at the end of the PBL and were happy about it. In addition, they also mentioned that all the aspects mentioned in Table 9 led to their positive answers to PBL.

Answers to this question were:

We want them to participate in project of this type. We are happy about the positive effects of PBL on our children, which means their voluntary working (P.5)

I want him to participate. He carried out his duties without being bored. I noticed that his learning skills raised (P.6).

We do want them to participate again because their self-

Table 8. Frequency values and opinions regarding the work of student after PBL.

Topic: opinions concerning the works of students after PBL	
Subtopics	f
Very proud.	5
Believed in the success of my child.	4
Deeply touched	4
Very happy.	4

Table 9. Frequency values and opinions about participation in PBL.

Topic: Opinions about a participation in PBL	
Subtopics	f
We want.	8
Worked willingly.	6
Self-confidence raised.	4
Noticed their responsibility.	3
Happy	3

confidence raised enormously. We did not put pressure on them to do their work. They tried to find information and learn themselves. Therefore, we recognized their will to prepare and work with pleasure (P.3).

We want it because these kinds of projects are not only good to acquire knowledge, but also to develop social skills and to enhance their sense of responsibility (P.2).

DISCUSSION AND CONCLUSION

After the application of three weeks, the results of the meeting with 18 students participating in the project and 8 parents are listed below:

Interviews made with students

When the students first heard of their participation in PBL, they mostly replied in excitement (f.14), curiosity (f.10) and happiness (f.9).

According to the question whether students encountered any difficulties during PBL, half of the students (f.9) remarked that they did not encounter any problems and the other half (f.9) answered that they had a few problems. The most difficult hurdle during the project was the preparation (f.5) and the presentation (f.4). Furthermore, the students mostly mentioned their acceptance of their teacher's help (f.13) and their parents (f.12).

At the end of the project, the students remarked their feelings and opinions which were positive in all. Yildirim

(2007) argues that the most important thing at the end of a project work is the gaining of new information, the development of new tasks and its recognition by other people.

According to the questions whether the students would like to participate again in PBL, they all agreed. That implies that the students really liked it and had lots of fun during PBL. After the applications, Yildirim (2007) explains that students were willing to participate again in PBL to acquire new and different knowledge, to have fun and to have better results. Bartscher et al. (1995)'s project motivations and findings about working issues correspond to those of Gültekin (2007), Memişoğlu (2008) and Ersoy (2006) and Penuel et al. (1999). They all consider that PBL is enjoyable.

Interviews made with parents

Parents remarked that they could observe positive changes of students during PBL. They noticed that their children were mostly excited (f.6), willing and eager (f.6). They are parallel to the studies of Liu and Hsiou (2001), Meyer et al. (1997), Şahin (2009), Toci (2000) who argue that PBL has positive effects on the motivation of students.

In addition, the parents mentioned their observations concerning the results of the projects, and the presentation styles of their children. Most of them were very proud viewing their children's work (f.5), deeply touched (f.4), and very happy about it (f.4).

All parents want their children to participate in such a project because children are doing their home works without parental pressure (f.6), their self-confidence is rising (f.4) and they learn to bear responsibility (f.3).

Gültekin's (2006) researches point out that PBL strengthens self-confidence of students and helps them to carry out responsibility. Moreover, Aladağ (2005), Coşkun (2004), Thomas (2000), Wolk (1994) and Glover (1993) argued that teaching with the help of PBL has a positive effect on students who were uninterested and unwilling. These opinions correspond to the results of the study. The main points of the results are that teachers referring to PBL strategies should also take multigrade classes and the conditions at schools into consideration. It is recommended that PBL must be included into educational activities and, to share it with the school and its environments.

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