Perceptions of Candidate Teachers about Concept of the Project

Journal of Gifted Education and Creativity, 1(1), 13-20

http://jgedc.org
DOI: 10.18200/JGEDC.2014110882

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Received: 13 November 2014 **Accepted:** 09 December 2014

Abstract
The aim of study is to investigate candidate teachers' metaphors about project concept in Turkey. Study group of research is 171 candidate teachers enrolled 2011-2012 educational terms one of the faculty of education in Turkey. Data was obtained from the candidate teachers' completion of the sentence "*Project is like ..., because ...*". For analysing the data quantitative and qualitative research methods were used. At the results of research, 79 different metaphors were determined about *Project* in which 9 conceptual categories. The most produced metaphors' categorizes that as a constantly developing (14 metaphors), as a being a useful (14 metaphors), as a need to effort (12 metaphors), as a leading the way and target (10 metaphors), as a need to harmony and collaboration (9 metaphors) respectively. Some regulations, at school of education for being accurate perception and positive attitude toward project, will provide effectively implementing of "scientific research project" which is important educational tools for gifted education.

Keywords
project, candidate teacher, metaphor

Project is a study that students do as individually or together with group to solve a problem. (Kubinova, Novatna & Litter, 1998, Korkmaz, 2004). W.H Kilpatrick firstly put forward the implementation of project concept in education. (Kilpatrick, 1918). Kilpatrick explained project is a as purposeful act. He developed project method for early childhood education. According to the interests of the child, he focuses on the discovery of environment by gaining experience. In this process, the teacher acts as guide role. Students, in a democratic environment as in J. Dewey's view, should find the opportunity to apply what they have learned. (Dewey, 1916; Tortop, 2012; Korkmaz, 2002; Korkmaz, 2004). Project-based learning (PBL) is seen as an instructional approach as a reflection of these ideas. The student makes a deep research on a topic in PBL. Project-based learning approach teaches students how to obtain information in the process, develop their science process skills, problem-solving skills, enables to transfer the information obtained by the student and do something in cooperation (Demirhan, 2002; Katz & Chard, 1989; McGrath, 2002; Diffily & Sasman; 2002). Many different applications of this learning approach are seen. At the basis of all, there are items such as student-centeredness, collaboration, building a relationship with real life.

Organizations that in public open areas students present their projects prepared in different disciplines is called science fair. At science fair, students' projects are evaluated by juries and appropriate ones are rewarded. (Grote, 1996; Bunderson & Anderson, 1996; Abernathy & Vineyard, 2001). The aim of science

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fairs is to enable students to comprehend the methods of scientific research and feel themselves like a scientist (Abenarty & Vineyard. 2001). The benefits of science fairs are teaching students new things, spending time with fun, improving their research skills, providing critical thinking, developing a positive attitude towards science. There are also some disadvantages of science fairs. These are: Students get sad at the end of the competition and get stressful; increase in their anxiety. (Grote, 1995b; Czerniak, 1996; Abernathy & Vineyard 2001; Balas, 2003; Bellipanni & Lilly, 1999; Bunderson & Anderson, 1996, Wang & Yang, 2003, Gomez, 2007, Kankelborg, 2005, Yayla & Uzun, 2008). But, science fairs have become a tradition in the West. Being a tradition it and taking part of at the science education culture, especially Sputnik space launch (1967) which is an important event in the history of science education, so this event speeded up countries to go to revisions in their science program. Education of the young scientist has started an important issue. At that time, it is seen that science programs that focused on training scientists were prepared in the United States. (Ataman, 1998; E. De Boer, 1991, cited: Demirbaş & Yağbasan, 2005). During this period, countries encouraged individuals with superior talent and potential to be scientists. One of the reflections in our country is the project of 'Scientist Training Group' by the Ministry of Education. (Demirbaş, 2001). Another important event is the opening of Science High Schools. The objectives of the foundation of these institutions are the stated in Science High School Regulations;

Science High Schools curriculum intend to;

> *prepare students with a high level of intelligence and abilities in the fields of science and mathematics for higher education in the field of mathematics and science, b) provide highly qualified scientists needed in the fields of science and mathematics, c) direct students to search, prepare the environment and conditions for those interested in scientific and technological developments and new discoveries, d) educate individuals who can use new technologies, produce new knowledge and prepare projects, e) enable students to make scientific research, learn a foreign language that will help them follow scientific and technological developments (Ministry of Education, Science High School Regulations, 2006).*

In 1968, The Scientific and Technological Research Council of Turkey (STRCT, called TÜBİTAK) organized the first of Secondary School Students Project Study in Ankara, capital of Turkey. The part of the speech of Ferit Saner who Minister of Republic of Turkey Ministry of National Education for that period is important to show the purpose of the science project competitions. *'To bring in the desire and habit of investigation* and *research to wider and younger generations in the level secondary school; to help creative power's emergence as a piece by methodical and technical study should be regarded as the most accurate way in the field of the science (STRCT, 2012.)*

At present, STRCT Secondary School Students' Project Study at which scientific research projects prepared in 10 scientific categories by secondary school students are competed, continue under the 12 district organizations in the region in Turkey. Some encouragements are offered to students for their participation. During junior high school in 2006, a science fair called "This is my work" at which projects in the fields of science and mathematics prepared by the students are competed, began (Tortop, 2013b, STRCT, 2013).

In the basic aims of the science fairs aiming to improve the quality of science education and to make students feel themselves as "young scientist", fulfil a very important function both in our country and in the world. However, some negative motivations (school advertising, the expectation of school administration) of teachers who advise students while preparing scientific research projects, also appear to be some negative reflections on young scientists. (Tortop, 2013a). Ignoring of the main objective of science project competitions cause that while students are expected to improve the ability of scientific research, sub-dimensions such as usefulness and originality come forward in the project. (Tortop, 2014a) As seen in studies in developed countries, taking into account the skills of the use of "scientific method" in the evaluation of projects that participate in competitions is an indication that they are on the right way in training of young scientists. (Potter, 2009; Tortop, 2014a). All of these factors require us to focus on teachers who advise them in project-based learning applications and science fairs. How do teachers perceive the project?, or during the pre-service teachers training, what kind of a perception of project is gain to the pre-service teachers?, to reveal this situation is very important for countries' education policies about the training of the young scientists.

In Turkey in Science and Arts Centers (SAC) where gifted students are educated, studies are carried out on the basis of project-based learning. SAC's last part of training program is the step of project production (Republic of Turkey Ministry of National Education (RTMNE), SAC Directive, 2007). At SACs support training is given to gifted students. Moreover, the attitude and perception on project-based

learning approach of the teacher who works at the gifted student's formal education school, is very important. During the application of scientific research projects done by individually or group, students should be in harmony and co-operation with teachers at SAC and at their formal school. (Kunt, 2012)

In addition, in Turkey high schools such as social sciences high schools and science high schools aiming to train scientists encourage students to do scientific research projects and to participate in project competitions. (RTMNE, Science High School Regulations, 2006). That students who will be educated in these science high schools have the ability to do scientific research projects from the lower-level education stages is very important for training of the young scientists.

There are many methods at revealing our perceptions. One of them is metaphors created about the concepts. Metaphors are mental models which allow people to see a phenomenon from another phenomenon (Saban, 2008). Saban (2004) explains this with an example; for example when we say "the teacher is like a compass", the features of compass are ascribed to the teacher. So, we have used a metaphor. These three elements are similar (the teacher), simulated (the compass) and characteristics of stimulated (the direction finder). Recently, many studies on metaphors have been found in educational research. These studies are metaphors about students, teachers, principals, knowledge, teaching and school (Inbar, 1996; Bozlk, 2002; Saban, 2004, 2008; McEwan, 2007). Thanks to individuals to reveal information they have acquired through their own experiences, this research method presented to the methodology of scientific research with the effect of phenomenology which E. Husserl put forward, contributes to improve a more appropriate perspective about "personal reality" by not accepting the items as they are in educational processes but revealing the individuals' own perceptions. (Bas and Akturan, 2008).

It is thought that this research with all its aspects will provide an important contribution to literature review. In this research, it is aimed to determine the pre-service teachers' metaphors on the concept of project. In addition, the answers of following questions have been searched:

- What are the metaphors of pre-service teachers on the concept of project?
- How many different categories could the metaphors of pre-service teachers on the concept of project be collected?

Method

In the research, phenomenography one of qualitative research methods was used. In this method, perception and events are put forward in a holistic and realistic manner in their natural environment (Yıldırım & Şimşek, 2005). In this study, the metaphors of pre-service teachers about the concept of project was tried to determine.

Participants

The participants of the research are the pre-service teachers in 2011-2012 academic years in a faculty of education in Turkey. In determining the group and the department; elective courses such as project-based learning practices in the field of teacher training have been taken into consideration. Moreover, 1st classes weren't included in the study group as their teaching profession wasn't at certain level. The survey was applied to 171 prospective teachers determined by a simple random sampling method (Büyüköztürk et al., 2011). Table 1 presents the demographic data of the participating teachers.

Table 1. Demographic characteristics of participant candidate teachers

		f	**%**
Gender			
	Male	66	38.6
	Female	105	61.4
Department			
	Mathematics	51	29.8
	Science and Technology	47	27.4
	Classroom	73	42.7
Total		171	100,0

As it is seen in Table 1, the participating teachers, 64.4% were female and 35.5% were male.

Data Collection

All prospective teachers in study group were asked to complete the sentence *"the project is…..like, because…"* to determine their metaphors about the Project. Also, demographic information of pre-service

teachers was obtained. These sentences are the data source of research.

Data Analysis

In the first stage, prospective teachers' metaphors about the project were analysed by two researchers. 87 working papers; empty papers, one paper having no metaphor, papers in which metaphor were produced more than one, papers having no consistency between the metaphor and the sentence were marked to remove from the research. Then the papers with metaphors were listed after they were numbered. In the second stage, similar metaphors (thought that is subject of metaphor and attributed to the metaphor) were grouped. In the third stage, two researchers categorized grouped metaphors by giving names to them. During this process, it was paid attention to the compromise of experts. In the fourth stage, produced and categorized metaphors were tabulated. Moreover, metaphor groups were shown by prospective teachers' sentences included metaphors.

Validity and Reliability

In the research, that taking a detailed questionnaire survey records, accurate and comprehensive information got from the participants during the research reporting process and quotations without having no addition can be shown as measures to improve the validity of the research. (Yıldırım & Şimşek; 2005). With respect to the reliability of the study, two experts were asked whether the metaphors represent the conceptual categories or not and experts and researchers' number of reviews, consensus and dissent were determined. A consensus (reliability) at the level of 94% was determined.

Results

In this section, the participating prospective teachers' metaphors on the concept of " Project" are given in the tables. Quotations from the sentences related to created metaphors were taken. Participant candidate teachers' metaphors were collected in nine categories.

Table 1. Candidate teachers' metaphors for the concept of the project

Categories	Metaphors	Frequency of Different Metaphors	Total of Frequency Metaphors
Project as Constantly Developing	Mobile phone, living organism, human (2), metabolism, imagination, kids, tree (5), child, rain, gulf, baby, education, roofless houses,	14	19
Project as Useful	Money, light, key (3), school, theatre (2), sun, medicine, firebrand, food, rain, science, life, chess, food	14	17
Project as Requiring Effort	Mathematics (2), logic, load (2), love, handwriting, child, sportsmanship, military, mountain (2), child, torture	12	15
Project as Requiring Harmony and Cooperation	Song, competition, puzzle (4) fire, bridge, football team, food, human body, social group	9	12
Project as Leading and Guiding	Book, father, lighthouse, guide, road map, compass (2), ticket, lantern, tip, door	10	11
Project as Requiring Originality	People, art, food, shopping, snowflakes, song	6	6
Project as Requiring Gradualness	Ladder (3), mountain, road, university entrance exam, home	5	7
Project As Requiring Renewal	Wax, hair, cloth, chewing gum, ball-point pen	5	5
Project As Requiring Care and Attention	Hunting, dominoes, my dear, mathematics	4	4
Total		79	96

Category 1. Project as Constantly Developing

There are 14 metaphors in this category. The project should have the property of constantly development according to prospective teachers. There is development in the nature of the project. Quotes from prospective teachers' (PT) examples of metaphors are as follows;

Project is like a tree. The tree gets stronger by branching out (CandidateTeacher85). Project is like a mobile phone. Because, the mobile phone constantly improves with new model (CandidateTeacher5). Project is like a roofless house, because you build a new flour on the roofless house (CandidateTeacher 80).

Category 2. Project as Useful

There are 14 metaphors in this category. Pre-service teachers perceive the project as useful. Quotes from prospective teachers' examples of metaphors are as follows;

Project is like chess, because chess allows you to develop strategies (CandidateTeacher 89). Project is like rain, because rain gives life (CandidateTeacher79). Project is like a firebrand, because firebrand gives light in the darkness (CandidateTeacher63). Project is like medicine, because medicine heals (CandidateTeacher 89).

Category 3. Project as Requiring Effort

There are 12 metaphors in this category. Prospective teachers perceive the project as requiring labour. Quotes from prospective teachers' examples of metaphors are as follows;

Project is like torture; because of torture students hate their lives (CandidateTeacher71). Project is like a mountain, because it needs effort to reach the summit (CandidateTeacher60). Project is like Math, because it needs to study hard endlessly (CandidateTeacher29). Project is like handwriting, because without effort you cannot achieve anything (CandidateTeacher26).

Category 4. Project as Requiring Harmony and Cooperation

There are 9 metaphors in this category. Prospective teachers in their metaphors perceive the project as something to be done with the cooperation and team. Quotes from prospective teachers' examples of metaphors are as follows;

Project is like a puzzle, because all parts of it need to complete each other. There must not be any missing parts (CandidateTeacher47). Project is like a human body. Because, the human body requires the systems to work regularly (CandidateTeacher81). Project is like a football team, because everyone should do their best to achieve the goal (CandidateTeacher61).

Category 5. Project as Leading and Guiding

There are 10 metaphors in this category. Prospective teachers see the project as leading and guiding. Quotes from prospective teachers' examples of metaphors are as follows;

Project is like a lighthouse, because it shows our way (CandidateTeacher33). Project is like a father, because he gives you confidence and shows roads (CandidateTeacher15). Project is like a compass, because it keeps us where we're going (CandidateTeacher 30). Project is like a ticket, because it leads to the target location (CandidateTeacher75).

Category 6. Project as Requiring Originality

There are 6 metaphors in this category. Prospective teachers perceive the project as something that requires a difference and originality. Quotes from pre-service teachers' examples of metaphors are as follows;

Project is a work of art, because work of art requires creativity, talent, originality (CandidateTeacher 12). Project is like a snowflake, because though each one seems to be the same they have their own unique structures (CandidateTeacher 45).

Category 7. Project as Requiring Gradualness

There are 5 metaphors in this category. In this category, prospective teachers put forward their metaphors on the progressivity of the project. Quotes from prospective teachers' examples of metaphors are as follows;

Project is like a university entrance exam, because there are certain steps of it (CandidateTeacher11). Project is like a ladder, because you advance step by step and reach the end (CandidateTeacher77). Project is like a ladder, because it advances step by step (CandidateTeacher9). Project is like a road, because it has steps (CandidateTeacher88)

Category 8. Project as Requiring Renewal

There are 5 metaphors in this category. In this category, prospective teachers put forward their metaphors on the requiring renewal structure of the project. Quotes from prospective teachers' examples of metaphors are as follows;

Project is like a cloth, because it is always refreshed (CandidateTeacher70). The project is like hair, because the hair is worn as it gets longer, hair at the bottom is always alive, projects lose their values as the new ones

are produced (CandidateTeacher48). Project is like chewing gum, after chewing a long time, you need a new one (CandidateTeacher44).

Category 9. Project as Requiring Care and Attention

There are 4 metaphors in this category. In this category, prospective teachers put forward their metaphors on the requiring care and attention sides of the project. Quotes from prospective teachers' examples of metaphors are as follows;

Project is like hunting, because it requires constant attention and observation (CandidateTeacher 27). Project is like dominoes, because everything might return to beginning because of a slightest mistake (CandidateTeacher32). Project is like a lover, because lovers always need care (CandidateTeacher57). Project is like Math, because those who are interested in Math, do it well (CandidateTeacher69).

Discussion and Conclusion

In the research, it is tried to determine that how prospective teachers perceive the project which is indispensable in today's educational programs. In the research, that 171 prospective teachers' 87 metaphors which do not provide the appropriate criteria are removed from the study is thought-provoking.

As a result, metaphors (constantly developing, useful, requiring effort, requiring harmony and cooperation, leading and guiding, requiring originality, requiring gradualness, requiring renewal, requiring care and attention) occurred in nine categories.

A high number of metaphors occurred in developing, requiring effort, requiring harmony and cooperation, leading and guiding categories. In particular, there is also a prospective teacher describing requiring effort as torture. The fact that the project requires effort is seen in view of teachers who participate as a mentor in project competitions organized at the level of primary and secondary school. Science teachers have negative attitudes towards mentorship for the competitions because it requires time and effort (Tortop, 2013a, Tortop, 2013b; Tortop, 2014b).

Determining of the teachers' attitudes towards the science fair and the teachers' perceptions about the concept of project is very important issue in terms of educational practices. Teachers who guide students in competitions which roles can't be denied in the process of project preparation (Cook, 2003). Teachers' attitudes towards project competitions and the reasons of them should be investigated (Tortop, 2013c).

The project which is used as an alternative evaluation tool in the educational program of many countries must be identified correctly by prospective teachers in undergraduate period. The fact that the project which is done in cooperation with team, include objectives, originality and benefit, should be perceived correctly by prospective teachers (Potter, 2009; Grote, 1996; Bunderson & Anderson, 1996; Abernathy & Vineyard, 2001). Many of the features of the project mentioned in the literature were perceived correctly

In the research, it is seen that prospective teachers, in their perceptions about the concept of project, created many metaphors in the category of the project as requiring harmony and cooperation. Projects can be done in a group or individually. But in any case, people engaged in the project must cooperate with some individuals, institutions and organizations in the process of making the project. In his research, Tortop (2013a) determined that just 4 projects in 18 projects chosen for the exhibition of the region in a national project competition, cooperated with institutions and organizations. Teachers stated that there should be cooperation. However, teachers didn't guide students in project making process. In this respect, to strengthen prospective teachers' perceptions of the project should be done in cooperation and harmony is important.

Suggestions

Prospective teachers and students should comprehend project-based learning model by which scientists generate scientific knowledge in primary and secondary school and even pre-school period. In prospective teachers' perceptions of the concept of the project, the courses about project-based learning applications and the applications they will do during bachelor's education are effective. In this regard, instructors of these courses should approach this issue meticulously and do appropriate counselling for the effective use of this instructional tool in university. That prospective teacher's perception on scientific research projects is right and positive will affect the training of the young scientists.

Bringing up the new generations who correctly perceive the concept of project which is at every stage of our lives today and see the solutions of the problems methodologically, will enable us to be hopeful for the future. This situation should guide us to train teachers much more carefully.

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