THE POWERFUL LEARNING ENVIRONMENTS IN VOCATIONAL AND TECHNICAL SECONDARY EDUCATION IN TURKEY: TEACHERS' VIEWS[i]

Gündüz Güngör[ii]
Dr., Provincial Directorate
of Postal and Telegraph Corporation,
Mersin, Turkey

Abstract:

This research aims to determine the opinions of vocational high school teachers about the Powerful Learning Environment (PLE) approach in vocational and technical secondary education. This study, which was carried out with the qualitative research method, was designed with the phenomenological pattern. The participants of the research consist of 28 teachers. The data were obtained with a semi-structured interview form, and the descriptive analysis method was used in data analysis. According to the results of the research, the obstacles to creating a PLE in vocational and technical education are the theoretical weight of the course programs, work-orientedness in internship workplaces (rejection of the learning process) and outdated vocational field training program modules and workshop equipment. On the other hand, the suggestions for creating a PLE in vocational and technical education are using an on-the-job learning model and increasing the internship period, reducing the theoretical Intensity in the curriculum and emphasizing the practice and increasing teacher orientation, providing program, equipment and workshop materials suitable for technological development, constant communication and interaction between teacher-student-parent-internship employer, the establishment of commercial relations between vocational high schools and establishment of virtual companies in entrepreneurship clubs, meeting with industry representatives to adapt to the changing expectations of the post-pandemic industry and using the advantages of peer learning in vocational skills education.

Keywords: vocational education, powerful learning environment, teacher

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1. Introduction

The powerful learning environment approach (PLE) in vocational and technical education is generally a country-specific approach (Netherlands, Germany, Belgium etc.) applying Dual System. According to De Corte, the learning environment that provides the development of complex skills, a deep understanding and self-directed learning in parallel with the qualifications expected of the workforce is defined as a powerful learning environment (PLE) (Gerjets & Hesse, 2004). PLE approach is considered as a combination of self-regulated learning (Winne, 1995) and learning styles based on individual differences (Entwistle, 1992) approaches (Vermunt & Verloop, 1999).

PLE has some characteristic features. These are being an interesting and authentic learning environment, providing an opportunity for the development of the most important competencies, adaptive learning support offered by teachers, creating a positive and reliable learning community (Placklé et al., 2014; Placklé, 2015), being constructivist and cumulative, being original and understanding-based, collaborative, self-directed and goal-oriented (Merril, 2002; Gerjets & Hesse, 2004; Könings et al., 2005; Placklé et al., 2014). In addition, while creating a PLE in vocational education, it is necessary to establish a professional belonging, to determine the starting point of learning, to structure the learning process and to create adaptable flexible models (De Bruijin & Leeman, 2011). In this process, it is important to create a learning environment that will provide optimum learning for students. PLEs may be perceived differently by students and teachers. Here, to provide a PLE, teachers, students and designers must interact and exchange ideas (Könings et al., 2005). PLEs are learning environments with rich content, unique tasks, active, autonomous and collaborative learning, and where the program is organized according to the needs and capacities of individuals. The rich content and the presence of unique tasks in PLEs help the school to establish a bond with the external environment. In addition, teachers can increase students' learning skills, problem-solving skills and social relations skills by activating students in the construction of knowledge (Smeets, 2005).

In the 21st century, the effect of globalization and the information economy and the abundance of technological environments (social media, forums, etc.) negatively affect the permanence of the individual information obtained. This situation necessitates the practice of updating sustainable knowledge in individuals. In this context, it is important to consciously continue learning activities in vital areas outside of formal education institutions (Sze-yeng & Hussain, 2010). In a study on how people's learning process develops, it was stated that individuals primarily learn what makes sense to them, seek logic in learning tasks, and therefore learning and skill development should be structured in a problem-based learning manner. In addition, it is stated that individuals learn more when attainable goals are set as learning goals, and the positive emotional climate created in learning environments strengthens learning (Brandt, 1998).

Harmony and integration of knowledge, skills and behaviors are necessary for the development of vocational competence. Thus, by gaining analytical thinking skills, the

student needs to build a different mental model suitable for the new task given to him/her, and thus the development of knowledge, skills and behavior is provided. (Baartman & Bruijin, 2011). Vocational skill training is the most important factor in vocational-technical education. It is thought that creating a powerful learning environment in vocational skill training will also increase the quality of vocational and technical education. This study, it is aimed to examine the views of vocational high school teachers about the powerful learning environment approach in depth. For this purpose, the following sub-problems have been created.

1) What are the reasons that prevent creating a powerful learning environment in vocational education according to teachers' views?
2) What should be done to create a powerful learning environment in vocational education according to teachers' views?

2. Material and Methods

The qualitative research method was used in this study. As the research design, the phenomenological approach was preferred. The phenomenological approach is concerned with how people experience the phenomena they encounter in life, how they define that phenomenon, how they feel about the phenomenon and how they judge it. Experiences come to the fore in the in-depth interviews. In this framework, phenomenology aims to derive in-depth meaning from everyday experiences (Patton, 2002). Maximum variation sampling, one of the purposive sampling methods, was used in the study. The purpose of maximum variation sampling is "*to create a relatively small sample group and to reflect at the maximum level the demographic diversity of the individuals whose opinions and experiences regarding the problem investigated in this sample will be consulted*" (Yıldırım & Şimşek, 2013, p.136).

2.1. Participants
The participants of the research consist of 28 teachers from different branches working in a vocational high school in Ankara. A semi-structured interview form developed by the researcher was used as a data collection tool, and the interviews were conducted online, not face-to-face, due to the pandemic conditions (Skype and Zoom).

Table 1: Codes and Branches of Participants

Codes	Branches
TDE1	Turkish Language and Literature
MAT2	Mathematics
ELK3	Electrical-Electronic Technologies
MOB4	Furniture Technologies
MAT5	Mathematics
MAT6	Mathematics
MOB7	Furniture Technologies
COG8	Geography
ELK9	Electrical-Electronic Technologies

BLSM10	Information Technologies
FIZ11	Physics
BLSM12	Information Technologies
BLSM13	Information Technologies
TDE14	Turkish Language and Literature
FIZ15	Physics
ELK16	Electrical-Electronic Technologies
MAK18	Machine Technologies
ELK20	Electrical-Electronic Technologies
ELK21	Electrical-Electronic Technologies
MAK22	Machine Technologies
MET23	Metal Technologies
BLSM24	Information Technologies
ELK25	Electrical-Electronic Technologies
ELK26	Electrical-Electronic Technologies
BLSM27	Information Technologies
MET28	Metal Technologies

2.2. Data Analysis

In the analysis of the data, the descriptive analysis method was used considering the research sub-problems. The findings obtained in this framework are reported under the themes of obstacles encountered in creating a PLE in vocational education and suggestions for creating a PLE in vocational education. Examples of questions asked to the participants are: What are the factors that prevent quality learning in vocational high school students? What should be done to ensure quality learning? What are the factors hindering quality learning in workshop and workplace internship practices? What should be done to increase this quality? The statements of the participants were given in quotation marks to increase the validity of the research. The inclusion of participant descriptions increases the validity (Yıldırım & Şimşek, 2013). In addition, the member checking method (Lincoln & Guba, 1985) was used and the transcripts were sent to the participants via e-mail and their approval was obtained.

3. Findings

3.1. Barriers to Creating a Powerful Learning Environment
3.1.1. The Intensity of Theoretical Courses in the Curriculum
Teachers think that students who prefer vocational and technical education generally have low academic achievement, which causes them to have difficulties in theory-based basic courses. In addition, it is stated that the perception of continuous failure negatively affects student motivation.

> "*The curriculum should be diluted. The curriculum, which is suitable for science and Anatolian high school students, is too intense for vocational high schools. It will be more beneficial to organize the program according to the level of the student.*" (TDE1)

"First of all, the emphasis should be on practical rather than theoretical education. Vocational high school students have a serious lack of motivation. Most come just to get a high school diploma. If the on-the-job training model becomes widespread, students will also feel concretely the reasons for coming to school." (BLSM12)

3.1.2. Work-Oriented Approach in Internship Workplaces (Rejection of the Learning Process)

Teachers think that in workplaces where internships take place, students are employed according to workplace expectations and that the employer is not included in the vocational skills training process. This situation causes the internships to go beyond their purpose and the learning process is rejected by both the student and the employer.

"Training programs prepared for internship places cannot be provided to a large extent. The reason is that workplaces do not fully cover the programs prepared because they do production, maintenance and repair on certain subjects, and it is necessary to harmonize the expected learnings in internship studies with businesses." (ELK3)

"First of all, the places where students do internships do not coincide with their learning goals. Most of the time, students do jobs that have nothing to do with the essence of the job (cleaning, etc.) like newly recruited apprentices." (BLSM12)

"Before the internship places are determined, their suitability for the student should be investigated. In internship applications, students take part in jobs that are not suitable for their fields, or there is not a sufficiently formal working environment in the workplace." (FIZ15)

3.1.3. Outdated Vocational Field Training Program Modules and Workshop Equipment

Teachers think that the programs and materials used in vocational skills training are outdated compared to the developing technology. This situation negatively affects the quality of vocational education.

"As you know, the information to be taught is constantly renewed according to the constantly developing technology. The courses and programs we talked about two years ago are not used now. The most important thing is the curiosity and desire of the student. Lack of these ends quality learning." (BLSM13)

"For vocational high schools, first of all, the experimental sets should be improved and lessons should be taught in the model of learning by doing." (ELK20)

3.2 Suggestions for Creating a Powerful Learning Environment

3.2.1. Using On-the-Job Learning Model and Increasing the Internship Period

It has been emphasized that the dominant factor in increasing the quality of vocational and technical education is skill training and therefore internships are very important. It has been suggested that internships should start from the 10th grade and that the education system should be switched to an on-the-job learning model.

> "*The majority of the courses in vocational high schools should be applied in practice. Applied education positively affects curiosity and motivation in a learning activity. I believe that it will be beneficial to pay attention to this in new training programs to be implemented.*" (MOB7)

> "*On the job training is the most effective method. Teachers' and students' practical work should be increased.*" (ELK3)

> "*I think that the internship training given in only 12 classes is insufficient. Starting from the 10th grade, going to an internship, even if it is one day a week, contributes to the students*" (MAT6)

3.2.2. Reducing the Theoretical Intensity in the Curriculum and Emphasizing the Practice and Increasing Teacher Orientation

Teachers think that the education programs applied to vocational high school students are academically heavy and should be lightened. It was emphasized that the application weight should be increased (workshop courses and internship periods increased) and that the teacher should be guided in this process.

> "*Vocational high schools should include much more application opportunities and less theoretical knowledge. Students should work with an understanding of the importance of on-the-job training. I think teachers should also adapt to the conditions of the time and be a guide during the application.*" (BLSM 12)

> "*When academic infrastructure is required in practice, students lose interest in the course. The course contents should be included in the module booklets, free from theoretical content.*" (ELK21)

3.2.3. Providing Program, Equipment and Workshop Materials Suitable for Technological Development

According to the teachers, the use of technological opportunities during the lesson affects learning positively. Similarly (Könnigs et al., 2005) emphasized that creating a strong learning environment in vocational education is related to creating a learning environment that will provide optimum learning for students.

"*Visual video lectures with interactive whiteboards increase students' interest in the lesson. Making question solutions electronically with smart pens has positive effects on students' enthusiasm for learning.*" (MAT6)

"*Our module booklets are full of insufficient or out-of-date content, especially for rapidly changing professions. The contents of some module booklets contain too much and heavy theoretical information.*" (ELK 21)

3.2.4. Constant Communication and Interaction Between Teacher-Student-Parent-Internship Employer

It has been stated by teachers that communication and cooperation between stakeholders are important to create a PLE healthily.

"*For more qualified businesses, the characteristics that businesses look for in students should be determined. Training should be provided on this subject throughout the academic year. Students should be equipped with the required qualifications for workplaces and this awareness should be gained to students.*" (BLSM10)

"*Teachers should be able to predict the interests, needs and expectations of students, cooperation with parents and workplaces is also important, I think more protocols should be signed with qualified workplaces.*" (ELK 9)

"*Employers have a lot of expectations from students. They see the student as inadequate. However, workplaces, where internships are made, are also training places. Master teachers should make up for the deficiencies of the students. Therefore, a meeting should be held by inviting all master teachers to the school.*" (MET 28)

3.2.5. Establishment of Commercial Relations between Vocational High Schools and Establishment of Virtual Companies in Entrepreneurship Clubs under the Control of School Management and Ensuring the Assignment of Students Here

Teachers argue that commercial skills are also important in terms of professional skills. For this reason, they suggested the establishment of virtual companies under the control of school management to create a PLE.

"*Entrepreneurship clubs should be established in schools and positions at the desired job levels in a business should be carried out by students. By establishing a virtual company network between vocational high schools, ties should be strengthened by mutual product or service purchases of these companies. The activities of the students in this virtual company should be recorded. Existing companies should be able to see these records when entering a job.*" (BLSM 10)

3.2.6. Meeting with Industry Representatives to Adapt to the Changing Expectations of the Post-Pandemic Industry

One participant, who mentioned the importance of communication between stakeholders in vocational education, emphasized that it is important to adapt to changing job and professions or sector expectations after the pandemic era.

> *"New professions or professions that will emerge after the pandemic, professions that are likely to disappear, should be identified, training curricula and professions within the scope should be reviewed, and it is necessary to be prepared. While this preparation is being made, the shape of the industry should be determined by taking the opinions of the sector representatives."* (ELK21)

3.2.7. Using the Advantages of Peer Learning in Vocational Skills Education

One participant stated that peer learning is one of the methods used in skill training and communication between peers is also important in this context.

> *"Students imitate each other in personal skills and technological curiosity. The professional skill that a student sees from his/her friend makes him/her have a positive opinion for that student. This shows the importance of social relations between students."* (BLSM 24)

4. Conclusion

According to the research findings, teachers generally discussed the conditions for creating a PLE in Turkish conditions, together with the on-the-job training model. In this context, they agree that the content of the education programs is not suitable for the level of the students. The theoretical focus of the education program in vocational high schools also negatively affects the academic success of students. Cheang, So, Zhan & Tsoi, (2017) emphasizes that learning tasks should be given by the cognitive level of the student while creating the PLE. On the other hand, providing peer learning in vocational skills training will provide an opportunity to use communication and interaction between students in terms of learning tasks. Heil (2019) states that peer support encourages students in the learning process. Teachers suggested that the practice hours should be increased and the beginning of the internship should be reduced to lower classes such as the 10th or 11th grade. Considering that the PLE approach is the Germany-Netherlands centered dual system approach, it can be stated that the on-the-job training model suggestion is similar to the dual-system approach. Rejection of the learning process is an important problem in workplaces where internships take place. This situation can be solved with a qualified communication network to be established between the school and internship employers. As a result of the research, the dimensions of ensuring communication and cooperation between student-teacher-parent-internship employer, meeting industry expectations by adapting to the developing technology, renewing educational materials and other equipment, and being a supportive teacher are related to the adaptive teaching-learning

support dimension (Placklé, 2014; Heil, 2019) of PLE. On the other hand, the establishment of virtual companies under the control of school management to increase the commercial skills and entrepreneurship characteristics of students also indicates the need to create a PLE reinforced with educational technologies. Gerjets & Hesse (2004) emphasized that the use of educational technologies in line with the purposes of education, updating the knowledge of the individual through self-directed learning activities during the time spent outside of school, and using internet networks and technological opportunities while doing this will carry PLEs outside the boundaries of the school.

The quality of the bond that vocational and technical secondary education institutions will establish with their internal and external stakeholders can be associated with the creation of a PLE. Smeets (2005) stated that a PLE is an important factor in the relationship to be established between the school and the external environment. It is also stated that one of the characteristics of being an effective school is to have a PLE (Hofman & Hofman, 2011). The proposal to be ready for the changing expectations of the industry and the demand for professional skills, which may change after the pandemic process, will also be provided by the interaction of the school and the external environment. However, it is stated that the change in companies is faster than in schools due to competitive conditions and technological developments. For this reason, the importance of school-environment communication has been emphasized (Van der Meer, Van den Toren & Lie, 2017).

In this research, although the current structure of the Turkish vocational and technical education system is not a dual system, the opinions of teachers about the PLE approach in vocational education point towards a dual-system structure through the on-the-job learning model. Since the structure of Vocational and Technical Education Centers (VTEC) is similar to the on-the-job learning model (Dual System) in Turkey, it can be recommended to research the PLE approach in VTECs.

Conflict of Interest Statement
The authors declare no conflicts of interests.

About the Author
Gündüz Güngör has a PhD degree in the field of Educational Administration Supervision Planning and Economics. He has been working in the area of educational management, leadership, vocational and technical education, and sociology of education. He has publications in various academic journals in these areas.

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