A Program Based on Connectivism for Creating Personal Learning Environments to Develop EFL Prospective Teachers' Instructional Performance: A Case Study

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Abstract

The aim of this study was to design a program based on connectivism for creating personal learning environments (PLEs) to develop EFL prospective teachers' instructional performance. The study started with a review of literature and previous studies related to instructional performance; connectivism; and PLEs. The researcher designed two instruments; namely, a) an assessment form for prospective teachers' lesson plans, and b) an observation checklist for prospective teachers' lesson implementation competencies. The researcher then designed the study's proposed program. A group of 7 participants enrolled in 2nd year, general education, English Department, Faculty of Education, Ain Shams University (2019-2020) participated in the study. They were trained through the proposed program's tasks on creating PLEs, and on designing lesson plans and conducting lesson presentations in light of the connections within their PLEs. Data sources included documentation, observation, interviews, and physical artifacts in addition to the quantitative data concluded via administration of the study's instruments. The participants' scores on the pre and post-applications were statistically analyzed using z-test. In addition, a qualitative analysis of each case regarding their PLEs, PLPs, and PLNs was conducted. Both the quantitative

and the qualitative results revealed that connectivism-based PLEs were effective in developing EFL prospective teachers' instructional performance.

Keywords: Connectivism, personal learning environments (PLEs), prospective teachers, instructional performance

Introduction

Teachers have one of the most important nations' jobs, i.e. they create tomorrow's citizens and the future workforce. They are responsible for shaping characters. The classroom teacher is the most important school-related factor influencing student achievement. The role of the teachers became even more significant due to the current changes in teaching and learning resulting from the spread of the COVID-19 pandemic. Teachers now have greater responsibility since they have to keep students updated all the time, while students do not frequently attend classes as usual. Hence, it is crucial to prepare teachers so that they can perform their roles effectively.

Literature stresses the importance of EFL teacher preparation and that good quality teacher education programs should provide prospective teachers with the necessary knowledge, develop their competencies associated with teaching and learning, prepare prospective teachers to work in schools, and allow them to reflect on their teaching practices (Chong et

al., 2008; Elghotmy, 2012; Schelfhout et al., 2006). Hence, these programs should develop prospective teachers' instructional performance with its various elements in order to prepare them for their future careers.

There are different perspectives on the competencies, elements, or domains of EFL teacher instructional performance which should be demonstrated by teachers during teaching. Competencies refer to a combination of knowledge, skills, behavior, and attributes that allow for effective or enhanced job performance. In relation to teaching, a teacher should have a set of competencies to be effective and able to deal with the rapid changes in the educational context (Teachers' Council of Thailand, 2018).

According to Punongbayan and Bauyon (2015), teachers' instructional performance involves that teachers should first and foremost identify what the students need to know, understand, and do in conformity with the curriculum standards. Teachers should also collaboratively plan for instruction, select teaching materials, design learning activities, identify various learning opportunities for their students, use appropriate and varied assessment techniques, encourage students' questions, and give reasonable requirements and assignments. Punongbayan and Bauyon's perspective is somewhat general and it integrates

multiple and varied competencies to be demonstrated by teachers. Focusing on prospective teachers, Chong et al. (2008) refered to five pre-requisite pedagogical competencies for pre-service teachers namely, facilitation, assessment, management, preparation, and care and concern.

Literature on EFL teacher preparation refers to a paradigm shift from regular models of teacher preparation to technical models in which the teacher's content knowledge is just a part of his/her professional identity (Mushayikwa & Lubben, 2009). Hence, teaching effectiveness is not merely dependent on teacher's subject matter and pedagogical knowledge, but it includes the knowledge of using technologies in instruction (Margerum-Leys & Marx, 2002; Rahimi, 2015).

This calls for the need to employ modern theories which explain learning in modern times as well as teaching methods and strategies associated with these theories when designing teacher preparation programs. Connectivism is a theory proposed by Siemens (2005) and defended by Downes (2008). It was developed for understanding learning in the digital age. According to Siemens (2005), previous theories were developed in a time when information development was slow as compared to the digital era of today. In connectivism, learning is considered as a process of informal information exchange,

organized into networks and supported with electronic tools such as social networks (Yeh & Singhateh, 2013).

Connectivism is appropriate for digital natives (Rice, 2018) who were born and have grown up immersed in the current technological world (Prensky, 2001). Accordingly, they learn and think differently than previous generations (Prensky, 2001). Through teacher's guidance, learners can connect and collaborate with other learners, share, contribute, and generate ideas and information (Montebello, 2018) and hence personalizing their learning. Learning in this perspective occurs through practice, dialogue and interaction and it is based on the learners' interests and needs.

Based on the conceptual ideas of connectivism, it can be concluded that new technologies enable individuals to personalize the environment in which they learn through integrating learning networks, people, resources, and tools to meet their learning interests and needs. This results in the creation of a personal learning environment (PLE).

PLE is an emerging learning concept associated with connectivism. According to Torres Kompen et al. (2015), PLEs are technologically-based environments created by learners. "A PLE may be described as the set of tools, data sources, connections, and activities that each person commonly uses in

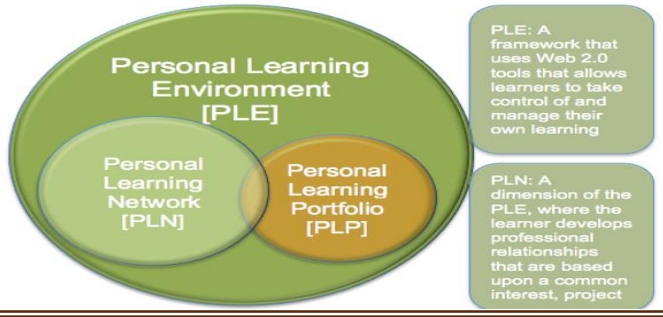
order to learn" (Torres Kompen et al., 2015, p. 120). For Siemens (2007), PLE is a collection of tools, brought together under the conceptual notion of openness, interoperability, and learner control. Therefore, learners are required to use a personalized portal to organize multiple tools and resources in one central location to create their PLEs, such as iGoogle, Netvibes, or even on their mobile devices (Tu et al., 2012).

Two concepts associated with PLEs are personal learning network (PLN) and personal learning portfolio (PLP). Cormier (2010) discussed that PLEs are the ecologies within which PLNs operate. Personal learning network (PLN) mainly focuses on human interaction in a social aspect while PLE has a broader sense that encompasses tools, resources, in addition to people (PLN) in fusing both physical and virtual worlds. A personal learning network (PLN) is a group of experts and colleagues that an individual exchanges professional information with on a regular basis (NEA Member Benefits Corporation, n.d.). For instance, prospective teachers can receive information from those they trust, like their educators, and at the same time find new colleagues to exchange ideas with via various communities and platforms (virtual or physical). A PLN reduces issues of isolation as learners are free and willing to increase

their circle of academic contacts and connections. This generates a way of life-long learning (Montebello, 2018).

The term personal learning portfolio (PLP) refers to the digital or electronic version of what a learner profile demonstrates (Montebello, 2018). The personal learning portfolio should portray three aspects of a learner's academic profile: (a) a proper reflection of the real academic experiences that the learner came across like the different courses, topics, content, assessments and curriculum; (b) the development processes or experiences that the learner went through; and (c) a portrayal of the learner's academic potentials, aptitudes, and competencies. In this sense, the PLP does not involve the simple collection of learner artifacts and assessment results. The "portfolio" here represents the variety and extent of the learner's interests and needs (Montebello, 2018). Figure 1, adopted from Morrison (2013), illustrates the relation between PLE, PLN, and PLP.

Figure 1
Anatomy of a PLE (Morrison, 2013).



PLE, as a methodology and a concept associated with connectivism, has been demonstrated to empower students to make their learning more personal and relevant to their needs and interests. Several studies based on this concept have been conducted such as the study of Lu (2017), Marín-Díaz et al. (2017), and Tu et al. (2012).

Statement of the Problem

English Department prospective teachers in Egypt demonstrate a weak instructional performance with regard to their microteaching presentations as well as their ability to design lesson plans. This could be referred to the weaknesses associated with the preparation programs of these prospective teachers in terms of the lack of integrating theory and practice, the insufficiency of time allocated for practical elements, and the teaching method and assessment techniques employed by these programs which demonstrate weak integration of modern technology. Several studies support this conclusion giving reasons behind such a situation.

According to Albhnsawy and Aliweh's study (2016), student-teachers at the Faculty of Education, Tanta University in Egypt seemed to lack the basic skills of teaching in the digital era. The study pointed out that various studies conducted in Egypt showed that there is a gap in teacher preparation

programs. Therefore, it is imperative to integrate various models of technology in order to promote prospective teachers' abilities.

Elghotmy (2012) discussed that EFL pre-service teachers at Shebin Elkom Faculty of Education felt they had not had enough practices before starting their practicum in schools. Furthermore, the studies of Eldib (2003), Elokda (2005), and Mostafa (2005) pinpointed that pre-service teachers' instructional performance is in great need of development. In their preparation programs, pre-service teachers rarely practice pair or group work. They also lack confidence which affects their teaching performance. These studies recommend using new approaches and techniques to develop pre-service teachers' instructional performance.

The researcher believed that there is an urgent need to develop the instructional performance of prospective teachers at the Faculty of Education, English Department, Ain Shams University through a program that attempted to overcome the weaknesses in their current preparation programs. The current instructional performance of these prospective teachers is characterized by weakness and this is demonstrated in their microteaching presentations, where the researcher is their teacher, as well as their lesson plans.

Aim of the Study

To address the study problem and the associated weaknesses, this study aimed to design a program based on connectivism for creating PLEs to develop English Department prospective teachers' instructional performance.

Research Questions

The study was guided by the following questions:

How can a program based on connectivism for creating PLEs be deigned to develop EFL prospective teachers' instructional performance?

Sub-questions:

1- What are the instructional performance competencies necessary for EFL prospective teachers?

2- What are the bases for designing a program based on connectivism for creating PLEs to develop EFL prospective teachers' instructional performance?

3- What are the tasks that can be accomplished through the program based on connectivism for creating PLEs to develop EFL prospective teachers' instructional performance?

4- How far is the program based on connectivism for creating PLEs effective in developing EFL prospective teachers' instructional performance?

Method

Research Design

The study followed the case study research design. The current study investigated the creation of personal learning environments (PLEs) by 7 participants. Case study design was appropriate because the researcher intended to examine each single participant's PLE and the creation process involved. Since PLEs are highly personal, it was more beneficial for the researcher to analyze participants' PLEs individually through describing cases and their personal experiences involved rather that introducing a general analysis of all the participants. To analyze the data, quantitative along with qualitative analysis were both needed so that the development of the participants' instructional performance could be investigated through the quantitative method and the experiences and perspectives of the participants and their creation of PLEs would further be explored through qualitative method.

Participants and Settings

A group of English major students enrolled in 2^{nd} year, general education, English Department, Faculty of Education, Ain Shams University (2019-2020) were invited to participate in this case study through briefing them about the nature of the study and what they were required to do in case of participation.

Seven students were interested in the idea and volunteered to participate in the study. The study was conducted in the Faculty of Education, microteaching lab where the participants studied their microteaching course.

Instruments

1- **The Assessment Form for Prospective Teachers' Lesson Plans**. This assessment form was designed by the researcher in order to assess the lesson plans prepared by the participants. The assessment form includes nine assessment criteria / competencies associated with the main domain of designing lesson plans.

2- **The Observation Checklist for Prospective Teachers' lesson Implementation Competencies**. This observation checklist was designed by the researcher in order to assess the microteaching lesson presentations conducted by the participants'. The observation checklist includes the main domain of lesson implementation and 28 prospective teachers' basic and sub-competencies: Introduction (4 sub-competencies), instruction (12 sub-competencies), using appropriate classroom management techniques (4 sub-competencies), and wrap up and integration of classroom assessment techniques (cats) (4 sub-competencies).

Data Sources

Data sources included documentation, observation, interviews, and physical artifacts in addition to the quantitative data concluded via administration of the study's instruments.

Implementation

Implementation of the study program lasted for two and a half months. The number of sessions where the researcher and participants met face-to-face was eight sessions. However, it was quite difficult to determine the exact number of hours for the whole program since much of the participants' work was accomplished personally outside the classroom settings. In addition, participants communicated online to share their knowledge and ask for each other's feedback on their work. The time of online communication is also difficult to determine.

The program focused on learning through connecting different information sources, and different ideas and opinions. This was achieved through the creation of the personal learning environments (PLEs) by each participant who then connected and shared with colleagues and others through the course of the program. Participants were guided by the researcher on how to create a PLE on their mobile devices. To start, they added different digital tools to their PLEs such as Facebook, mobile Apps, digital dictionaries, etc. depending on their personal

preferences for learning. However, some tools were necessary to add in order to achieve the program's aims, such as YouTube and Google search. Another element that was developed is personal learning environment (PLN) which resulted from the participants' connections with teachers, colleagues, and others. Participants also created personal learning portfolios (PLPs) which reflected their specific academic achievements, development, interests, experiences throughout the course, as well as their academic potentials and competencies. These contents were added according to the participants' preferences.

Based on the personal learning tasks accomplished through the PLE tools and the communication that took place among the participants and the researcher, the participants conducted microteaching presentations to apply the knowledge acquired. Each of the stages of lesson planning and implementation (designing a lesson plan, introduction, instruction, classroom management, and wrap up) were practiced separately so that the participants could create a well-designed lesson plan and conduct an effective microteaching presentation of a whole lesson by the end of the program.

Assessment of the participants' instructional performance development through the program took the following forms:

- Pre and post-assessment of the participants' instructional performance before and after administration of the program through conducting a microteaching presentation of an English lesson as well as designing a lesson plan.
- Formative assessment that included assessment of the participants' microteaching presentations conducted during the program both by the researcher and other participants, self-assessment, and assessment through personal learning portfolios (PLPs).

Quantitative Results

The fourth research question reads:

How far is the program based on connectivism for creating PLEs effective in developing EFL prospective teachers' instructional performance?

This question guided the researcher to achieve the aim of this study. To answer this question, the study hypotheses were formed. Results will be reported in terms of the hypotheses.

The First Hypothesis

The first hypothesis states that there is a statistically significant difference between the mean scores of the study participants on the pre and post-application of the lesson plan assessment form with regard to the development of the overall

competencies for designing lesson plans in favor of the post-application.

To verify this hypothesis, the researcher compared the mean scores of the study participants on the pre and post-application of the lesson plan assessment form. Z-test for paired samples (SPSS, Version 23) was used to determine the significance of differences between the pre and post-application. These results are clarified in Table 1.

Table 1

Z-Test Results for the Significance of Differences between the Participants' Mean Scores on the Pre and Post-Application of the Lesson Plan Assessment Form with Regard to the Development of the Overall Competencies for Designing Lesson Plans

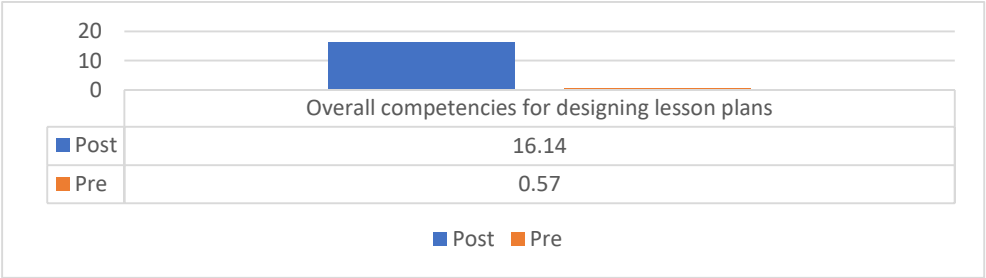
Competency	Application	N	M	SD	z-value	P-value
Overall competencies for designing lesson plans	Pre	7	0.57	0.53	2.37	0.018
	Post	7	16.14	2.26		

Table 1 shows that there is a significant difference between the participants' mean scores on the pre-application (M=0.57, SD=0.53) and post-application (M=16.14, SD=2.26) of the lesson plan assessment form with regard to the development of the overall competencies for designing lesson plans in favor of the post-application as the significance of z, i.e. p-value, is

(0.018) which is smaller than (0.05). This difference is further illustrated in Figure 2.

Figure 2

The Difference between the Participants' Mean Scores on the Pre and Post-Application of the Lesson Plan Assessment Form Regarding the Overall Competencies for Designing Lesson Plans



The Second Hypothesis

The second hypothesis states that there are statistically significant differences between the mean scores of the study participants on the pre and post-application of the observation checklist for prospective teachers' lesson implementation competencies with regard to the development of the overall lesson implementation competencies in favor of the post-application.

To verify this hypothesis, the researcher compared the mean scores of the study participants on the pre and post-application of the observation checklist using z-test for paired samples. These results are clarified in Table 2.

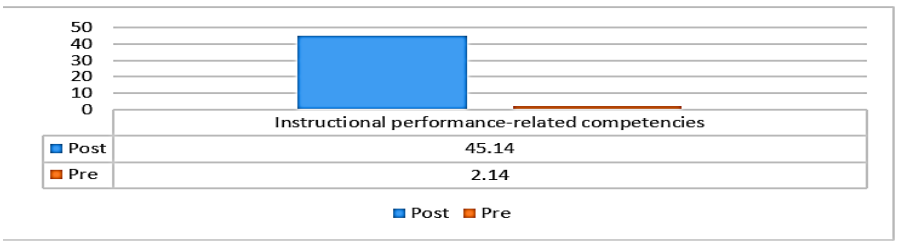
Table 2

Z-Test Results for the Significance of Differences between the Participants' Mean Scores on the Pre and Post-Application of the Observation Checklist with Regard to the Development of the Overall Lesson Implementation Competencies

Competency	Application	N	M	SD	z-value	P-value
Overall lesson implementation competencies	Pre	7	2.14	2.41	2.37	0.018
	Post	7	45.14	1.67		

As presented in Table 2, there is a significant difference between the participants' mean scores on the pre-application (M=2.14, SD=2.41) and post-application (M=45.14, SD=1.67) of the observation checklist with regard to the development of the overall lesson implementation competencies in favor of the post-application as the significance of z, i.e. p-value, is (0.018), which is smaller than (0.05). This difference is further clarified in Figure 3. *The Difference between the Participants' Mean Scores on the Pre and Post-Application of the Observation Checklist Regarding the Overall Implementation Competencies*

Figure 3



Qualitative Analysis and Discussion

An Analysis of Each Case Including Description of the Creation of Connectivism-Based personal learning environments (PLES) including personal learning networks (PLNs) and personal learning portfolios (PLPs)

First Case: Asmaa. Asmaa is a distinct student who showed great motivation to share in the study. She is one of the most active cases in terms of sharing and communication. Whenever the participants were requested to post their opinions, work, or assignments on the group, she was one of the first students to respond. In general, Asmaa was not shy to share her opinions and communicate with friends whether on the WhatsApp group or in class; however, she was very shy when she conducted her initial microteaching presentations. Her subsequent presentations showed remarkable development as she gained a great amount of self-confidence. Her presentations were among the best presentations during the study.

Asmaa created her own personal learning network (PLN) through interacting with her colleagues during the study. She used to ask them for help whenever she had a problem. Asmaa also used to contact some teachers she already knew in order to gain advice on issues relevant to teaching and learning.

Asmaa's personal learning portfolio (PLP) was rich in content and highly reflective of her personal learning environment (PLE). Asmaa's PLP showed that the PLE she created had a significant effect on her learning. The information she presented was personalized and it reflected Asmaa's thoughts and preferences for learning. It was also evident that she used her PLE tools and resources to search for information which enhanced her learning.

Second Case: Eman. Eman had very high motivation to share in the study. Eman was more confident regarding online communication, but in class she was somewhat shy to speak in front of others. In her first presentation, she was well prepared and applied the criteria of a good lesson introduction, but was not very active. However, in the following presentations, Eman gained more confidence and her performance was enhanced.

During the study, Eman found some Facebook groups and websites which address teachers and teaching around the world, such as English teacher–Teaching ideas, Ted ED, and Discovery Education. Such communication reveals the development of Eman's personal learning network (PLN). She tried to connect with teachers from different countries and places as a way to learn from their experiences. Eman's PLN was also developed through her continuous communication with

her colleagues and teachers during the study whether online or in class.

Eman's personal learning environment (PLE) was highly reflected in her personal learning portfolio (PLP). Her PLP was rich and showed great development through the course of study. For Eman's case, it can be concluded that the program's tasks and instructions on how to create an effective PLE highly influenced her. The contents of her PLP showed that she applied the knowledge she learned and that she could, to a large extent, use the information acquired practically. Eman's PLE created on her mobile device included several tools which were gradually added during the study.

Third Case: Mohamed. Mohamed is the only male participant in this study. He is a highly motivated case who wanted to work on himself and develop his abilities in teaching and in English language as a whole. This could be observed through his interest to attend events held at the Faculty in relation to teaching English. He showed great interest in the study from the beginning. During the initial session, he frequently participated in the discussion and shared his ideas with the class. He also had great self-confidence and always took the initiative to communicate with others. His microteaching presentations were among the best presentations during the

course. He applied everything that he learned and always prepared very well before each microteaching presentation.

During the study, Mohamed created connections with his colleagues and with other teachers he already knew. In addition, he tried to connect with new people and learn from others' experiences in the field of TEFL. He also increased his connections and learning through attending different events held in the faculty such as conferences, where experienced speakers are invited to share their ideas. This added a lot to Mohamed's personal learning network (PLN) which is expected to become significantly developed in the future.

Although Mohamed was a hard worker during the study and used to search extensively and bring a lot of information to the class, his personal learning portfolio (PLP) did not include much detail. Unfortunately, it was not highly reflective of his personal learning environment (PLE). This could be referred to the fact that Mohamed involveed himself in various tasks and activities inside the Faculty. It seems that it was difficult for him to gather all the information he gained during the study in only one place.

Fourth Case: Shorouk. Shorouk is a very clever student. She had great potential and abilities, and was also motivated to share in the study and develop herself. She used to

communicate with her colleagues on the WhatsApp group most of the time and she had very distinctive viewpoints. She also used to comment on her friends' work and gave useful feedback including examples of teachers she knew, situations, etc. However, towards the end of the course, Shorouk was absent for two sessions which somehow affected her performance. Due to her absence, she missed one element in her final microteaching presentation which is incorporating appropriate examples of classroom assessment techniques (CATs).

Shorouk's personal learning portfolio (PLP) included a good amount of information covering almost all the points studied in the program. It was also organized in a way that reflected Shorouk's personal learning environment (PLE) and application of what she learned.

The researcher believes that Shorouk had more to show. Her inability to be always connected whether online or face-to-face made her involvement in the study program rather weak. This also affected the development of her personal learning network (PLN) which was not up the expected level. However, Shorouk would act better in the future since she already has a lot of potentials.

Fifth Case: Aya. Aya as a student and as a person is full of energy and has a great motivation to learn new things. She was always present during the face-to-face classes as well as the WhatsApp group discussions. She always shared in the group discussion, and had moderate opinions. Whenever someone needed help, she was the first person to offer help. After each microteaching presentation, she received her colleagues' comments with a smile and showed her intention to work more on herself so that she could do better the following time. The researcher believes that Aya will have a bright future in the teaching profession.

The connections that Aya made, whether with her colleagues and teacher or through following others' ideas and experiences online, contributed much to the development of her personal learning network (PLN). Aya was very good at socializing with others and hence it is predictable that she can make more connections in the future and can always boost her PLN.

Aya's personal learning portfolio (PLP) was very organized and it included several elements that showed her development through the course as well as the positive effects of her personal learning environment (PLE) on her learning.

Sixth Case: Horeya. The researcher believes that Horeya had the highest motivation among all the study participants. At the beginning, she showed her pleasure to share in the study and mentioned that she was sure she would learn a lot. She also aimed at developing her language abilities through communication with colleagues along the study. The problem that faced Horeya is that sometimes she had internet connection problems which made her absent from the WhatsApp discussions during that time, but she tried to fix this kind of problems as soon as possible. In class, she was very active and used to share in the discussions all the time.

Horeya's connections and social abilities significantly contributed to the development of her personal learning network (PLN). She was one of the participants who were keen on learning from others and connecting to different teachers through Facebook groups and other websites.

Horeya's personal learning portfolio (PLP) was very rich and reflected the development of Horeya's performance, character, thoughts as well as her personal learning environment (PLE) throughout the study.

Seventh Case: Esraa. Esraa is a good student who had an intention to develop herself and learn. She had very good language and abilities; however, she was usually shy to share in

the discussions whether in class or on the WhatsApp group. She mentioned that this was her nature. During her first presentation, she was very shy and she wanted to finish as quickly as possible. The researcher always tried to encourage her to share and communicate with her colleagues. She used to respond sometimes but only to a limited extent. On the other hand, she used to submit the assignments on time and did all the required tasks. Esraa obviously had more abilities than she showed during the study.

Esraa was in the right way to create a personal learning network (PLN); yet, it was not significantly developed because of Esraa's lack of trust to communicate with others, especially at the beginning. However, Esraa already started to overcome these problems, and she is expected to do better in the future.

Esraa's personal learning portfolio (PLP) was written in a different, interesting way. She wrote it in the form of a journal introducing an account of all the events which took place during the study program. Hence the PLP was very expressive and extremely reflective of Esraa's personal learning environment (PLE) especially because it was very personal. In addition, her PLP showed that she perceived the benefits gained through the study to a great extent. In her PLP, she mentioned in detail all the points where she found the course of real importance to

her. She could feel herself becoming more confident and more independent.

Furthermore, the researcher held interviews with the participants towards the end of the study program. Participants were asked some questions regarding their perceptions of the study program and the benefits gained through this program according to their own opinions. As concluded from their responses, the participants perceived the program as beneficial for them and thought that the knowledge gained through the program would help them later on in real teaching situations. They also felt that the personal learning environments (PLEs) they created helped them regarding organizing and personalizing their learning. An example of the interview questions is: "how did you benefit from the course in general?" Participants' responses to this question included: "we were taught how to teach a lesson", "we know many things about classroom management", "I'm able to design a good lesson plan", "we learned how to search for information on different websites and to see other people's experiences", "I can deal with different classroom problems and I will plan alternative scenarios", and "we made a lot of presentations which was extremely helpful because it made us no longer afraid to speak in front of others".

The qualitative results discussed above support the study's quantitative results. Both the quantitative and qualitative results reveal the study program's effectiveness in developing EFL prospective teachers' instructional performance through creating connectivism-based PLEs. This effectiveness could be referred to the personal nature of the program's tasks and applying the principles of connectivism including connecting to different information sources while personalizing and self-organizing learning. This agrees with the study of Richert (2020) which concluded that "personal learning approach is becoming widely recognized as an effective pedagogy that leads to deeper learning dispositions and outcomes" (p.11). It also conforms to the study of Kashive et al. (2020) in which they emphasized that connectivist networks and environments such as PLEs are highly effective in establishing a healthy learning environment where every personal interest, need and educational requirement is taken into consideration.

In addition, using mobile platforms as a common tool where the participants could create their PLEs contributed to the program's effectiveness due to easy access and sharing of PLEs on mobile devices. Similarly, the study of Wei et al. (in press) advocated for the use of mobile technologies to create

PLEs. Wei et al. concluded that mobile PLEs foster student-centered learning time and encourage student participation.

Conclusion and Recommendations

In light of current finidings, it is concluded that

- Connectivism-based PLEs have a significant effectiveness in developing EFL prospective teachers' instructional performance.
- Applying the principles of the theory of connectivism in teacher preparation programs leads to various positive outcomes.
- Personalizing learning through the creation of PLEs is effective since it provides an opportunity for the students to learn according to their preferences. This develops their sense of responsibility, decision making abilities, self-regulation, as well as their motivation to learn and achieve.
- The students' collaboration, communication and sharing – whether online or face-to-face – are very helpful since this kind of communication creates a network where all the participants can share ideas with one another which enhances their learning and develops their competencies.

It is recommended that the principles of connectivism should be addressed while designing teacher preparation programs since the theory of connectivism is very appropriate

for modern times and technological advances in general. In addition, more attention should be paid to the practical aspects of teaching and to personalizing learning while designing these programs.

The study suggests that EFL researchers may further investigate the effectiveness of creating connectivist personal learning environments (PLEs) in different EFL teaching and learning contexts. Examples of the studies that may be attempted are: investigating the effectiveness of other programs for creating connectivism-based PLEs in developing different ILOs, exploring students' perceptions at different stages on the importance of PLEs in teaching and learning, and replicating this study on a wider group of prospective teachers and in different contexts.

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