Teachers' Perspective on Personal Learning Environments via Learning Management Systems Platform

Sarah Alserhan(✉), Noraffandy Yahaya
Universiti Teknologi Malaysia, Johor Bahru, Malaysia
sarah.alsarhan@hotmail.com

Abstract—In recent years, the landscapes of teaching and learning has changed because of the utilization of information and communications technologies. In this context, the most illustrative innovations are Learning Management Systems (LMS) and Personal Learning Environments (PLEs). Despite of the LMS and PLEs popularity in educational contexts as well as the expand set of tools and services that they offer to learners and teachers; they are still in fancy stages. In order to present the challenges Personal Learning Environments were presented; however, it is obvious that PLEs will not replace LMS. Therefore, both types of environments should coexist and interact. In this manner, the current study took teachers' perspective on integrating the third generation LMS into PLEs. In addition, this study conducted to find out the teachers' perspective on how the LMS could enhance PLEs in terms of planning before applying the PLE's; designing a framework in the PLE's; implementing the PLEs; interacting in PLEs; managing the learning process through the PLEs and utilizing technology in PLEs. The participants of the study were 575 teachers who were selected randomly from Saudi Arabia schools. The findings of this study found that teachers must apply a positive teaching approach, holding that knowledge is composed upon student-to-student interaction as well as student-to-teacher interaction. Furthermore, this study revealed that teachers must enterprise, deliver, and support K-12 online learning.

Keywords—personal learning environments, learning management systems, teachers' perspective

1 Introduction

The rapid growth of internet technologies has changed the way formal learning facilitates the educational environments. Previously, classroom was known as the only medium of communication and information sharing context. However, current e-learning environment such as Learning Management System (LMS) and Personal Learning Environments are recognized as the platforms were utilized and are extensively recognized in the educational contexts [1]. Therefore, in the perspective of Tuah et al. [1],with the adoption of Web 2.0 in e-learning's model, e-learning has enthusiastically

transported classroom content (e.g., notes, tutorial, etc.) to its participants (e.g., teachers and students), which are the focus of this paper to find out the teachers' perspective on integrating the LMS into PLEs [1].

The utilization of Information and Communication Technologies (ICT) to education, triggers changes that affect the way in which people learn and teach, raising new challenges in for learners, teachers and institutions as the ICT makes obtainable the fresh tools to support learning activities that can help to satisfy needs of teachers who are directly the purpose of this study as well as learners [2]. However, in the perspective of Conde et al. [2] this support needs that numerous matters be addressed such as the variety of technologies and tools employed in learning contexts forces students to utilize several different systems during their training and studies; secondly, the institutions should not regard learning as being limited to formal learning environments, as people learn throughout their lives in many informal contexts which are known as lifelong learning. Furthermore, Tuah et al. [1] considered that the application of different components like social media in learning environment will help users to create, preserve and reorganize their own content, which these components present a new way of learning in PLEs.

Regarding the significant role of PLEs, they all have a mutual point considering the integration of formal and informal learning with the purpose of motivating peer learning. In this context, Gaytan [3] mentioned the significance of PLEs in e-learning fields address the issues, in which associated with learner personalization and control is increasingly beneficial. Furthermore, Gaytan [3]indicated that PLEs involve consuming externally hosted Web 2.0 facilities and tools intended to improve the sharing of learning resources and materials among learners. Moreover, Ellili-Cherif and Hadba [4] considered that these platforms help learners to managing their pedagogical practices and participating in the generation of cooperative knowledge. This is while, it should place the accountability for establishing learning on the learners, which makes it an integrally self-directed practice. Fueled with the significant role of PLEs, Mundkur and Ellickson[5] confirmed that PLEs technological methods are not only pedagogical tactics designed to meet learners' exclusive goals. Thus, learners are able to build and grow their environments through being active on web-based and social networking platforms with utilizing the crowdsourcing of ideas, while remarking on and sharing educational posts. Aresta, et al. [6] believe that the PLEs reflect human and social dimensions as places, where knowledge is socially created and distributed.

On the other hand, Shaikh and Khoja [7] mentioned the lack of support to the PLEs make learning environments ineffective. In the same vein, Martinez et al. [8] believe that there is no doubt whatsoever at this stage that the degree of success or failure of some models and tools used in teaching or learning processes largely depends on the good, bad or non- existent training of teachers for the correct technical and didactic utilization of the aforesaid models and tools. Therefore, at this stage the perspective of teachers is too important, which is the focus of this study. Thus, all of this in the perspective of Cejudo[9] implies a formal change for teachers both in terms of mind-set and about action design, planning and implementation.

Driven with the significant of teachers' perspective, Moreillon[10] stated that the learners would also be able to comprehend and understand the latest tools in their interest and make the learning process more comfortable. To compare with the role of teachers, Schaffert and Hilzensauer [11] revealed that most teachers are not comfortable with utilizing technology-driven equipment. Therefore, this would be a problematic issue if educators are not in the know to the services desired to ease PLEs. In this occasion, Shaikh et al. [7] considered that PLEs only work if the teacher can develop a multifunctional and robust association between teachers and the PLEs. Therefore, the current study seeks to investigate the teachers' perspective on integrating the third generation LMS into PLEs.

Regarding all considered issues, it should be considered that integrating LMS into the PLEs is still at its fancy stage, and it requires the adaptation of both, which can be inferred as the major goal of the study. In a study conducted by Conde et al. [2], the uses of web services and interoperability specifications facilitates the opening up of PLEs and LMSs, although they are very laborious. To provide a solution to the interconnection and interoperability, this paper seeks to investigate the integration of LMS into the PLEs.

2 Research questions

The research questions in this research are:

1. How the LMS enhances PLEs according to the teachers' perspective in terms of:
   (a) planning before applying the PLE's.
   (b) designing the theoretical framework in the PLE's.
   (c) implementing the PLEs.
   (d) interacting in PLEs.
   (e) managing the learning process utilizing the PLEs; and
   (f) employing technology in PLEs.
2. What are the relationship of:
   (a) demographic variables with teachers' roles domains in PLEs?
   (b) professional related variables with domains of teachers' role?

3 Research methods

The Survey study investigated teachers' perspective on integrating the third generation LMS into PLEs, to collect the relevant data regarding research questions the researcher distributed the questionnaire to random sampling K-12 teachers in Saudi Arabia schools. The latter involves an empirical extension in which the content needs to be valid based on the aspect of factor analysis which entails the content to be constructed using statistical models [12]. Adding to the factorial validity, its application is also unique. It is applied in the context of many dimensions with different general attributes to help measure a needed domain [12]. Another assessment related to instruments usually involves inferential statistics.

3.1 Population and sampling

The designed survey in this study was conducted on total of 575 teachers who were selected randomly out of the population of Saudi Arabia schools' teachers. To examine the research instrumentations' validity and reliability, this study conducted a pilot study on around 20 percent of teachers from the population. The pilot study was entirely designed same as the procedures of an entire data collection. This kind of study was first conducted among the total of 112 instructors selected from Saudi Arabia Schools.

3.2 Instrumentation

This study modified the Delphi method based on a study was conducted by [7] on 34 international experts to find out the university instructor roles according to PLEs' theoretical perspectives in learner-centered context. The 5-point Likert scales utilized to analyze the collected data. The questionnaire was designed based on two sections: the first section concerns the respondents' demographic information, followed by the second section to examine the evaluation of the entire roles. The questionnaire was designed in a paper-based and web-based format to be accessible online. The web-based questionnaire was designed to collect the data for conducting the pilot study to collect the extensive data quickly, and employ examined forms and sample questions rather than having to design them, and take advantage of the extensive use of the Web by individuals today, including its use as a site for social networking [13].

4 Results and discussion

4.1 Demographic characteristics of the participants

The study sample consisted of 575 participants, in which the age of 41.4% of them is 33 – 42 years; the age of 32.7% of them is 23 – 32 years, while the age of 22.1% of them is 53 – 52 years old. In addition, more than half (60.0%) of participants were females, while 40.0% of them were males. Regarding the major of participants' study, science constitutes 18.8% of them, mathematics constitutes 17.4%, while computer Science constitutes 16.9% (Table 1).

Table 1. Sample distribution based on their demographic characteristics

Variables	Number	Percentage
Age groups		
23 – 32 years	188	32.7
33 – 42 years	238	41.4
53 – 52 years	127	22.1
53 – 62 years	22	3.8
Gender		
Male	230	40.0
Female	345	60.0

Variables	Number	Percentage
Major		
Social science	96	16.7
Science	108	18.8
Mathematics	100	17.4
English language	40	7.0
Computer Science	97	16.9
Arts	30	5.2
Other	104	18.1

4.2 Participants overall score in teacher's roles domains in PLEs

Regarding the mean score of teacher's roles domains in PLEs. The highest mean score of teacher's roles domains in PLEs is 4.29 which was for the variable "use of technology" with a mean percentage of 85.8%, followed by the domain "Planning and Design" and "Management and Administration" with a mean score 4.27 (85.4%), while the lowest mean score was the domain "Instructor and Learning" with a mean score 4.23 (Table 2).

Table 2. Comparison of the mean scores of teacher's roles domains in PLEs

Domain	Mean	SD	Percentage
Planning and Design	4.27	.51	85.4
Instructor and Learning	4.23	.53	84.6
Communication and Interaction	4.26	.56	85.2
Management and Administration	4.27	.62	85.4
Use of Technology	4.29	.54	85.8

Max. Mean Score = 5, Min. Score = 1

4.3 Planning and design domain

Regarding the teachers' role in the planning and design domain in PLEs in table 3. The roles of "Planner" and "Learning designer" got the highest mean score (4.30), while the role of "Programmer" got the lowest mean score (4.23). The role of "Context analyzer" got a mean score of 4.24 out of 5. (Table 3). Table 3 shows the Teacher's role as instructor and learning in PLEs.

Table 3. Teacher's role in planning and design in the PLEs

Teacher's role in planning and design in the PLEs	Mean	SD	Percentage
Planner	4.30	.62	86.0
Context analyzer	4.24	.64	84.8
Learning designer	4.30	.57	86.0
Programmer	4.23	.65	84.6

Max. Mean Score = 5, Min. Score = 1

4.4 Instructor and learning domain

Table 4 illustrates the teacher's roles in instructor and learning, the role of "Innovator" got the maximum mean score (4.32), followed by the role "Creativity catalyst" (4.29), while the role "Enquirer" got the lowest mean score (4.05) out of (5). The role "Mentor" got the mean score 4.28, and the role "Instructor" got the mean score 4.25.

Table 4. Teacher's role as instructor and learning in PLEs

Teacher's role as instructor and learning in PLEs	Mean	SD	Percentage %
Instructor	4.25	.59	85.0
Theorizer	4.17	.66	83.4
Learner	4.17	.69	83.4
Critical reviewer	4.16	.73	83.2
Enquirer	4.05	1.02	81.0
Mentor	4.28	.67	85.6
Creativity catalyst	4.29	.62	85.8
Innovator	4.32	.63	86.4

Max. Mean Score = 5, Min. Score = 1

4.5 Communication and interaction

Moreover, as showed in table 5 the highest mean score within the domain of teacher's communication and interaction in PLEs was observed in the role as "Participant" with a mean score (4.32), followed by the role "Facilitator" and "Motivator" with a mean score (4.30) as shown in table 5. On the other hand, the lowest mean score in this domain was observed in the roles "Communicator" and "Moderator" with a mean score (4.21) out of (5).

Table 5. Teacher's role in communication and interaction in PLEs

Teacher's role in communication and interaction in PLEs	Mean	SD	Percentage %
Collaborator	4.22	.68	84.4
Facilitator	4.30	.62	86.0
Communicator	4.21	.68	84.2
Moderator	4.21	.68	84.2
Advertiser	4.25	.73	85.0
Participant	4.32	.71	86.4
Motivator	4.30	.70	86.0

Max. Mean Score = 5, Min. Score = 1

4.6 Management and administration

Table 6 shows the Teacher's role in management and administration in PLEs. The table shows that the highest mean score of Teacher's roles in management and administration in PLEs is 4.32 which was for the role "Guide" with a mean percentage of 86.4%, followed by 4.29 for the role "Change agent" with a mean percentage of 85.8%, while the role "Evaluator" got the lowest mean score (4.24) out of (5).

Table 6. Teacher's role in management and administration in PLEs

Teacher's role in management and administration in PLEs	Mean	SD	Percentage %
Change agent	4.29	.67	85.8
Administrative manager	4.26	.68	85.2
Guide	4.32	.68	86.4
Evaluator	4.24	.63	84.8

Max. Mean Score = 5, Min. Score = 1

4.7 Use of technology

Table 7 shows the teacher's role in technology use in PLEs, the highest mean score was observed in the role "Digital literacy expert" with a mean score (4.38), followed by the role "Digital technology expert" with a mean score (4.32), while the lowest mean score was observed in the role "Sharer or collector" with a mean score (4.18) as shown in table 7.

Table 7. Teacher's role in technology use in PLEs

Teacher's role in technology use in PLEs	Mean	SD	Percentage
Master artist	4.30	.86	86.0
Sharer or collector	4.18	.71	83.6
Network manager	4.26	.65	85.2
Digital technology expert	4.32	.63	86.4
Digital literacy expert	4.38	.61	87.6

Max. Mean Score = 5, Min. Score = 1

4.8 Relationship of demographic variables with teachers' roles domains in PLEs

Impendent sample t test was done to show the differences in the in the mean score of teachers' roles in PLEs with regard to their gender. Table 8 showed that there was no significant difference in the mean score of all teachers' roles in PLEs with regard to their gender (p>0.05).

In addition, as showed in table.9 there was no significant difference in the mean score of teachers' roles in PLEs with regard to their age groups (p>0.05). On the other hand, there was a significant difference in the mean score of "Planning and Design"

with regard to their age groups (p<0.05). Post hoc showed that the difference was observed between the age groups 23-32 years and 53-62 years in favor to participants who have the age group 23-32 years.

As showed in table 10 there was a significant difference in the mean score of teachers' roles in PLEs (Planning and Design) with regard to their major field (p<0.05). Post hoc showed that the difference was observed between social science and computer science in favor to participants who have the major "computer science". In addition, there was a significant difference in the mean score of teachers' roles in PLEs (Instructor and Learning) with regard to their major field (p<0.05). Post hoc showed that the difference was observed between social science and computer science in favor to participants who have the major "computer science".

Moreover, there was a significant difference in the mean score of teachers' roles in PLEs (Management and administration) with regard to their major field (p<0.05). Post hoc showed that the difference was observed between social science and computer science in favor to participants who have the major "computer science". In addition, there was a significant difference in the mean score of teachers' roles in PLEs (Use of Technology) with regard to their major field (p<0.05). Post hoc showed that the difference was observed between social science and computer science in favor to participants who have the major "computer science". On the other hand, there was no significant difference in the mean score of teachers' roles in PLEs (Communication and Interaction) with regard to their major field (p>0.05).

To sum up, the findings of this study showed that the experience level plays a significant role in teachers' performance; while the findings showed that teachers' role play differently according to teachers' experience. For instance, teachers with three years of experience look to play the highest role in the entire domains. However, this role is the least for the teachers with less than one year of teaching experience. Furthermore, the findings of this study revealed that the mode of teaching is established to be expressively different under each domain of teachers. For instance, blackboard has the highest score in the entire domains of the teacher's role however others show the lowest mean score. This is considerably significant that the mode of teaching does not matter in the Communication and Interaction domain although the role matters in rest of all domains including Planning and Design, Instructor and Learning, Management and Administration, and Technology utilization.

Table 8. Differences in the mean score of teachers' roles in PLEs with regard to their gender

Socio-Demographic Variables	n	Planning and Design			Instructor and Learning			Communication and Interaction			Management and Administration			Use of Technology		
		Mean	T(df) value	P value	Mean	T(df) value	P value	Mean	T(df) value	P value	Mean	T(df) value	P value	Mean	T(df) value	P value
Gender																
Male	230	4.3	1.10	.26	4.2	.907	.32	4.2	.218	.827	4.2	.180	.858	4.2	.652	.514
Female	345	4.2			4.2			4.2			4.2			4.3		

Independent Sample t Test, MD = Mean Difference

Table 9. Differences in the mean score of teachers' roles in PLEs with regard to their age groups

Socio-Demographic Variables	n	Planning and Design			Instructor and Learning			Communication and Interaction			Management and Administration			Use of Technology		
		Mean	ANOVA F-value	P value	Mean	ANOVA F-value	P value	Mean	ANOVA F-value	P value	Mean	ANOVA F-value	P value	Mean	ANOVA F-value	P value
Age																
23-32	188	4.3			4.2			4.2			4.3			4.3		
33-42	238	4.2	4.23	.006	4.2	1.68	.170	4.2	2.48	0.006	4.2	1.506	.212	4.3	1.395	.243
43-52	127	4.2			4.2			4.2			4.3			4.2		
53-62	22	3.9			4.0			3.9			4.0			4.0		

One – Way Repeated Measures ANOVA within group analysis was applied followed by Pairwise Comparison with confidence interval adjustment. MD = Mean Difference.

Table 10. Differences in the mean score of teachers' roles in PLEs with regard to their profession

Professional related Variables	n	Planning and Design			Instructor and Learning			Communication and Interaction			Management and Administration			Use of Technology		
		Mean	ANOVA F-value	P value	Mean	ANOVA F-value	P value	Mean	ANOVA F-value	P value	Mean	ANOVA F-value	P value	Mean	ANOVA F-value	P value
Majors																
Social Sciences	96	4.32			4.27			4.24			4.27			4.25		
Sciences	108	4.20			4.09			4.16			4.14			4.19		
Mathematics	100	4.30	4.233	.000	4.30	3.22	.004	4.30	1.65	.129	4.34	2.35	.030	4.35	2.903	.009
English Language	70	4.13			4.21			4.21			4.25			4.23		
Computer Sciences	97	4.47			4.39			4.40			4.45			4.46		
Other	104	4.18			4.16			4.22			4.22			4.25		
Computer Skills																
Beginner	42	3.97			4.05			4.15			4.18			4.11		
Intermediate	287	4.20	14.04	.000	4.16	8.06	.000	4.18	5.34	.001	4.19	5.35	.001	4.23	5.30	.001
Advance	247	4.41			4.36			4.36			4.39			4.39		
Experience																
Less than one year	67	4.10			4.09			4.10			4.18			4.20		
One year	59	4.09			4.03			4.07			4.07			4.15		
Two years	84	4.26	3.78	.001	4.17	3.83	.001	4.17	3.43	.002	4.13	3.49	.002	4.21	2.40	.027
Three Years	103	4.37			4.31			4.33			4.42			4.41		
More than three years	260	4.33			4.31			4.34			4.34			4.32		

One – Way Repeated Measures ANOVA within group analysis was applied followed by Pairwise Comparison with confidence interval adjustment. MD = Mean Difference.

5 Discussion

5.1 Teacher's role in planning and design in the PLEs

These results are in line with Cejudo [9] who claimed that there is a very positive findings from the perspective of teachers about the viability of technical process, instruments as well as performing PLE. In the same vein, Castañeda et al. [14] considered that the PLE is more than ever the pattern for supporting new learning approaches and techniques; particularly for the online contents. The findings of internal and external factors of a learning environment analysis showed teachers were agreed to adjust support accordingly to fit the demands of internal and external factors. These findings are in line with Shaikh and Khoja (2014) who claimed that educators must be the most knowledgeable party that is crucial for the learners to develop connotation among themselves and the PLEs. Consequently, emerging the teachers' perspective in supporting a valuable personalized learning experience is essential [7].

Hence, the statistical information shows near about 86% of the participants considered teachers' role as learning designer in PLEs including teachers proposed students the constancy of design and functionality across innumerable tools with the purpose of supporting their learning procedures; hence they utilized learning designs which lead to create automatically personalized learning activities. As the findings of Soumplis et al. [15] study claimed that the usage of PLEs in education on the serviceability experience compared to the applied technology behind it attracts more users to develop their experiences.

5.2 Instructor and learning domain

The participants declared teachers not only understand behavioural, cognitive, constructive, and social phases of instruction, but also assess the excellence and quantity of students' learning, treated connections between them, as well as utilized collaborative, philosophical, active, and reliable learning approaches once desired. These results agree with several researchers that have suggested that teachers must be provided with adequate professional development, training and staff support for teachers in order to increase their awareness of the complex interplay between technology, pedagogy, and the cognitive content in their disciplines [16-19]. However, research has shown that providing effective training and practice opportunities with technology for teachers is not straightforward [16-18, 20, 21]. On the other hand, 52.4% of teachers fortified students to advance their personal opinions about the world. Students to catch the fundamental source of an effect or an event and the concealed connotation of things. Furthermore, students agreed that teachers' extremely creative role as a learner in PLEs. These results illustrate the importance of role of teachers in PLE [16, 18-20].

Moreover, the findings revealed that teachers developed empathy for students' responses throughout the class and thus, imitated critically on teaching and learning components which reinforced personalized learning. The findings revealed that only 81% of respondents agreed with the idea of teachers' role as enquirers in PLEs. On the other

hand, mentoring was approvingly obliged as the subsidiary percentage for this task elevated to 85.6%. In line with Bagozzi [22] (2007) and Giesbers et al. [23], an important difference is that this study took the actual usage behaviour of the teachers in an experimental setting into account and not just the intention to use it   .The respondents (86.4%) venerated teachers' role as an innovator in PLEs, as the teachers employed innovative, enhanced, and pioneering teaching and learning methods, learning apparatus, models, simulations, and movies to classify the learning partialities of students, and efficient herself through better learning plans, methods, and possessions when accessible.

5.3   Communication and interaction

The majority of respondents agreed with the statement teachers put an extraordinary value on collegiality between students. Ultimately, ease of communication online measure is contained as the latest dimension. Despite The Fact That current study typically just concentrates on few of these dimensions e.g., Ledbetter and Amber [24] claim that, Various justifications for favoring online communication might generate various results. They fortified cooperative learning accomplishments between students and checked students' behaviour to recognize if they work collaboratively. In addition, teachers established an appropriate learning outline through what learners can effortlessly collaborate, connect, and assimilate. Accordingly, participants were agreed that teachers work as an organizer, and claim that teachers managed learning content before it gets complex. According to 84.2 % of responses, teachers put their efforts as good Communicator. In accordance with Bulotsky-Shearer[25] interaction must be constructive in that it is based on the concepts and work from others, such as assisting others in teaching and learning.

Moore [26] declared that students also need to understand the significance of learning communication as an essential part of teaching and learning. Moore [27] examines autonomous students looking for factors which do not affect dialogue and structure to improve their learning experience. Several studies revealed that learner's cooperation with their classmates have an impact on their reaction in relation to their collaboration with their classmates [28, 29]. Furthermore, studies stated that teacher is playing an important role as communication and interaction supporters, since they are responsible for assisting, reassuring, and encouraging interaction and communication between learners [30-33].

Besides, 85% of participants believed that they showed themselves as good Advertiser. Therefore, teachers' scores to classify components of consensus between students endured high with the support of 85% of respondents. Hence, participants venerated teachers for their role as advertisers such as adapting the motivating language to endorse a set of standards by students to classify occasions and strategies for cultivating students' recital, and to inspire students to have self-belief. Moreover, 86.4 % of respondents stated teachers work in PLEs as a participant; considered teachers guaranteed the participation of all stakeholders of students' learning procedure and they implied, fortified, recognized, and reinforced students' aids. The findings showed that a teacher is recognized as a motivator among 86% of study respondents. Thus, mean values in

this study support the arguments about teachers' role in PLEs within the domain of communication and interactions. Nevertheless, Stroet, et al. [34] effectively studied 71 experimental research about the effects of autonomy-supportive education on learner's motivation and found a clear positive association. Students will not reach the same autonomy level without studying student's autonomy insights, reflecting on their educational experiences, sharing these experiences and reflections with their classmates, and understanding the factors that influence all these procedures [35].

5.4   Management and administration

Respondents believed that teachers are decent change mediators, who become effective leaders to motivate students through their personalities which indicates that learners who can evaluate their own learning independently of teacher-centered summative assessments are more likely to become self-regulated students [36]. According to Zimmerman[37], teachers may empower students to assess themselves in the classroom by aiding them in monitoring their learning objectives and strategies, and then making improvements to certain priorities and strategies based on learning performance. It is followed by 86.4% of responses that presented teachers as Guide to the existing and upcoming learning context of students, expressing approaches that reply to that context, and enhancing the knowledge volume of students by a belief that someday this knowledge will exceed their own. In addition, 85.2% of participants agreed with the perspective as an administrative manager, a teacher definite what pattern of instructional approaches, presentation genres, and dispersal methods would be best carrying the last program to the learners. Hence, around 85.8% of participants considered that teachers are Change agents that establish and modify deliberate tasks like how to answer to students' expectations, learning desires, etc. The responses revealed that teachers managed the classroom based on the seats and channels of communication. Thus, the findings portrayed teachers' role as a guide was supposed certainly according to most respondents (85.8 %). Hence, around 84.8 % of respondents supported that they worked as Evaluator through offering students filtered information about pertinent learning resources according to their preceding experience and through presenting front-end analysis in order to compare definite and perfect performance levels of students.

5.5   Use of technology

The results showed that teachers' role in technology use in PLEs has recorded the least results above all domains in teachers' role in PLEs. It is considered that participants claimed that teachers determined when, how, and where suitable learning instruments or skills could be utilized. Moreover, technology use precisely influences electronic learning system deployment then indirectly influences electronic learning systems [38]. Consumer mobility demands to be considered in applying technology to mobile information systems [39]. For a certain technology to be employed, the technology needs a decent correspondence with the task at hand; in a wireless atmosphere, this

involves location information use [40]. Thus, the geo-location capabilities of smart mobile tools let mobile consumers explore offers in their current zones, saving both effort and time, therefore reaching the technology with the task at hand [41]. Teachers acknowledged approbation as sharer and collector from 83.6 % of participants. However, respondents considered teachers shared e-portfolios, online identities, and learning environments with students. The findings revealed that most respondents were agreed with the statement that teachers support students to master skills required to raise a network of information that works within a flexible structure. Hence, in the perspective of 85.2 % of participants, teachers improved this network of information by illustrating students' consideration of probable content.

Apparently, 85.2% of participants believed that teachers assessed students' efficiency in consuming the network of information and checked students' development to assure they are working professionally these results are in line with prior research results [41]. Furthermore, teachers supported submissions of learning, learning communities, and groups of learners. In the perspective of 86.4% of participants, teachers are digital technology experts; because they accomplished students on how to tackle common technological subjects and lead students to familiarize themselves with the changes brought on through new learning technologies these results are agreed by previous research [38]. Then, most participants (87.6 %) considered teachers' tasks as digital literacy experts in PLEs. In this sense, the mean values correspondingly supported the influences underlying the domain of technology employment in PLEs.

6 Conclusion and future work

This study considered teachers must occupy specific competencies conducive to a detailed analysis of the E-learning approach. The findings showed that teachers must know how best to integrate the Internet and the content materials. Likewise, teachers must have a solid foundation for the information being delivered to students. In this sense, the findings showed that teachers must recognize the accuracy of the story to deliver students with ethical knowledge. Consequently, according to the finding's students prove a vaster extent of participation. In addition, the findings of this study showed teachers must apply a positive teaching approach, holding that knowledge is composed upon student-to-student interaction as well as student-to-teacher interaction. Furthermore, this study revealed that teachers must enterprise, deliver, and support K-12 online learning. Hence, it desires mentioning here that there is little guidance both on the part of reliable research and menu Models to create courses, programs, and experiences to make for the training of novice teachers and preparation of experienced teachers. Moreover, this study considered that teachers must be acquainted with consuming social networking to share information, recognize resources, and obtain new knowledge. Considering evaluation, this study showed that teachers observed that participants presented a preference for difference of delivery process, and their development areas were considered. Finally, the findings of this study deal with the assessment of learning results. In this sense, teachers who expended the students' attainment scores after the involvement found a difference in their performance. Hence, teachers used

surveys to comprehend better the students' discernments before and after the involvement. Personalize learning platform can also be applied to any other research in Educational Technology area in Augmented Reality [42] [44]. Another future study that can be explored in future is about teacher digital readiness [43].

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8 Authors

Sarah Al Serhan is currently pursuing the Ph.D. degree with the College of Education, Universiti Teknologi Malaysia, Johor. She received the master's degree in Educational Technology from King Saud University, Saudi Arabia. Her research interests

include educational technology, instructional design, personalize learning, virtual environment.

Associate Prof. Dr. Noraffandy Yahaya is an Associate Professor at Faculty of Education, Universiti Teknologi Malaysia since 2013. He obtained his PhD in Computer Based Learning from University of Leeds, United Kingdom. He was Head of Department at Department of Educational Science, Mathematics and Creative Multimedia for 9 years. Noraffandy has research background in Multimedia in Education, Online Learning and ICT in Education. He conducted studies on students' interaction in online learning environment, Learning Analytics and Massive Open Online Courses (MOOCs). He has published more than 85 papers in Web of Science, Scopus indexed journals, conferences proceedings and non-index journal in the research area of Online Learning, ICT in Education and the use of technology in teaching and learning. He has been a supervisor to more than 25 completed master's degree students and 14 completed PhD students in the area of Educational Technology, Online Learning and ICT in Education. He had also been appointed as external examiner for universities in Malaysia and Australia for doctoral theses and had been an assessor for Master dissertation for university in New Zealand (email: p-afandy@utm.my).