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The effect of a Training Program based on Open Educational Resources on the Teachers Online Professional Development and their Attitudes towards it of AL-Dakhliya Governorate in Sultanate of Oman

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Abstract

This study aimed at investigating the effect of a training program based on OER on the professional development of AlDakhlia Governorate teachers. The study also investigated the teachers' attitudes towards this form of training using an experimental research method. The training program was prepared as an interactive lecture presentation for 3 days of training; one session per day for 2 hours. The educational content was available on the SHMS platform and then the experiment was implemented on 40 teachers, where 20 teachers were in the experimental group and the other 20 teachers were in the control group with professional years of experience ranged between 5 and 10 years. The results showed the significant role of the OER platforms in teachers' professional development in the form of an increase e in the level of knowledge and teaching skills. Also, the participated teachers' positive attitudes towards the online professional development indicated that these OER environments are rich in knowledge and cooperative activities. Generally speaking, these OER platforms encourage teachers to keep up with their professional development and self-learning throughout their career life.

KEYWORDS: OER, Online Professional Development, Open Educational Resources, MOOCs, Lifelong Learning.

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1. Introduction

The appearance of the open education movement forces the transformation of education worldwide. Therefore, it is necessary to shift to the Open Educational Resources since it is an existing educational resource that is free, open and easy to use and to level up the teacher competencies and professional developments. The researchers believe that the results of combining free OER such as MOOCs with professional development training programs will open a wider gate to high-quality instruction and learning process. Since the teachers are a vital component of any educational system, it forces the specialists and experts in any educational institution to focus on continuous professional development, which will be achieved easily and professionally by utilizing technology.

From the world of OER, MOOCs are probably one of the most important sources, because they offer plenty of developing courses and activities that can be modified and shared by the teachers. Many educational platforms have been established since 2002 which offer a variety of tools and essential professional development courses, such as Coursera, EDx, Udemy, Edraak, Edlal, and SHMS.

Cronin and MacLaren (2018) as cited in (UNESCO, 2012) defined OER as any "teaching, learning and research materials in any medium, digital or otherwise, that reside in the public domain or have been released under an open license that permits no-cost access, use, adaptation and redistribution by others with no or limited restrictions". These resources include textbooks, course materials, videos, tests, activities, multimedia and simulations and scientific experiments (Itmizi & Al-Salmi, 2019). The researchers believe that Open Educational MOOCs will help teachers to gain the appropriate skills and competencies for high-quality development and life-long learning because MOOCs are highly modified by specialists and allow teachers to choose what skills to obtain depending on their own needs, and offer the training courses in a very different and modern style parallel to open education

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trend, which is confirmed by many studies confirmed (Mahony, 2016; Bass, Admiraal & Berg, 2019; Al-Mubarak, 2019). However, Stracke et al. (2019) stated that the concept MOOCs need to have the four elements that make up the abbreviation, which are massive, open, online and course; therefore, not all MOOCs are categorized under this term if they do not achieve these four elements. They added that MOOCs can be perceived as OER product, but from the perspective of Open Education, MOOCs are considered innovative enablers of Open Education which shows a new method of changing education.

Open Educational Resources Network SHMS is a Saudi program aimed to offer rich educational contents and courses to support education, provide greater educational opportunities for Arab teachers, students, and faculties (Alkhasawneh, 2020). It is considered a national platform that offers safe and supportive knowledge for anyone who seeks it. On the other hand, the researchers believe that professional development for teachers through online training courses that implement technology tools to develop the educational process will achieve the proper delivery of the content in a motivating form as the training materials include drawings, pictures, videos, simulations, and chat windows, which encourage teachers to follow up and continue their professional development further.

The researchers assure that the online professional development will not only uplift the teacher's performance but will also open a new knowledge channel in which teachers can obtain continuous skill development which will reflect the quality of the whole educational process, not ignoring the reflection on the students learning as well.

The concern here is about the best form of a training program, based on an open educational resource that can overcome the variety of teachers' needs and maintain the continuous development of the teacher self-regulation skills so they can be a part of the creating, sharing, providing and modifying these resources.

1.1 Research problem

The researchers could specify the problem of this study in the one-way of the traditional method of professional development programs, established by the educational technology section, where it is not suitable anymore to achieve the main purposes and results of any professional development. This is becauseit does not include the modern tools of interaction and sharing required by any training program nor does it overcome the workload of the teachers or the geographical distance barriers. Thus, this study tries to answer the following main question:

What is the effect of a training program based on OER on the online professional development of teachers and their attitudes towards it?

Sub questions emerged from the main question as follows:

1. What is the suitable theoretical framework behind the teacher online professional development?
2. What are the requirements of the teacher online professional development?
3. What is the effect of a training program in SHMS platform on the teacher online professional development?
4. What is the effect of an online program at SHMS platform on the teachers' attitudes towards the online professional development?

1.2 Research objectives

The study objectives are:

1. To emphasize a proper theoretical framework of the teacher online professional development.
2. To identify the essential requirements of the teacher online professional development.
3. To investigate the effect of SHMS in the teachers' online professional development.
4. To investigate the effect of an online training program on the teachers' attitudes towards online professional development.

1.3 Research significance

1. This study could reframe the training programs in the educational technology sections in the Sultanate of Oman Governorates.
2. This study could present proper solutions to many training obstacles in the Ministry of Education.
3. This study could encourage the main training centre and training institutions in adopting new open training methods.
4. This study could alter the view of the educational systems about the Open Educational Resources and encourage them to step forward in benefitting from them.
5. This study could grab the stakeholder's attention to improve the existing national platforms for more development and implementation in education.

1.4 Research delimitations

This study is delimitated to:

- Effect of a training program on SHMS platform on teachers online professional development.
- Professional development training courses on the SHMS platform only.
- Teachers from AlDakhlia Governorate.
- Second semester of 2020/2021.

1.5 Research methodology

This study is based on an experimental method to investigate the effect of the training program on online professional development and teacher's attitudes towards it.

1.6 Research variables

First: independent variable, represented by the online training program on SHMS platform,
Second: dependent variables, represented by:

- Online professional development,
- Teachers' attitudes towards OER online training.

2. Materials and Method

2.1 Open Educational MOOC (SHAMS)

Despite the significant role of MOOCs in offering synchronous and asynchronous online distance learning, they still face challenges in Arab countries. The major obstacle is the language, so many Arab countries established some regional MOOCs to overcome this barrier. For example, Edraak and Rawaq were the initial Jordanian and Saudi platform, respectively. Other Arab MOOCs were established recently, like Omani Edlal, Oman academy, and the Saudi SHMS platform. SHMS is a Saudi network considered as OER offering educational materials and sponsored by the National Center of e-learning and distance learning in Saudi Arabia (Al-Raghbi, 2019). All educational materials published in SHMS have been licensed under Creative Commons license, which provides very intensive lessons, lectures, libraries and scientific experiments. It is considered to be a safe and reliable knowledge source for all students, teachers, faculties and even parents, as well as anyone who seeks knowledge without any registration, or certificates.
In this study, the researchers specifically pick SHMS platform for several reasons, as noticed from the official website:

- It is a complete OER platform, where any student, teacher or faculty can use its content without registration, which is frankly mentioned on the website.
  - Its mother language is Arabic.
  - It is sponsored by the National Center for e-learning, which ensures high quality of content and resources.
  - Various universities and institutions are participating in SHMS.

The researchers noticed that the students highly participated in the platform as well as the teachers who create the content and collaborate with others for further improvements. Therefore, the researchers believe it is a rich environment with plenty of educational tools for raising up professional development and lifelong learning as (Al-Shamrani, 2019) agreed and proved.
SHMS started with 13 from 25 universities in Saudi Arabia with 61 permanent academic staff with 35,000 published educational materials. Now, there are 15 participating universities, 1,786 academic staff, and 180,000 published educational materials according to the sixth report issued in 2018 (National Center for e-Learning, 2018). This study relies and is based on the principles of the connectivism theory by Siemens and Downes, because it takes into account the use of technology and networks in learning and then connects the main principles and knowledge of the learner to form the learning paradigm in which precision and knowledge updating is the key factor of the whole learning activity. This enables the learner to decide and choose what he/she wants to learn, which is typically applicable to MOOCs, where the learner learns through various channels like courses, email, blogs, forums, discussion groups, and web search (Al-Hadi, 2010). As Al-Raghbi (2019) mentioned in her study, the connectivism theory ensured that the learning has to have a final goal to be achieved by learners through developing the performance of specific skills as well as self-assessing skills and mastering access to modern knowledge resources. The researchers believe that constructivism theory also emphasizes the learning or training through MOOCs as the learners build up their knowledge since they are free and responsible for their time and learning mechanism, and also MOOCs ensure social and collaborative learning (Al-Zahrani, 2018).
To the researcher's knowledge till now, no previous Arabic studies investigated the implementation of SHMS educational materials for professional developments, which drives the researchers to do this study in the first place.

2.2 Teacher professional development

Teacher professional development is a critical factor in improving the quality of education. Therefore, constant professional development programs are needed to ensure that all teachers can meet the needs of the 21st century, to introduce teachers to the latest updates in the field of education, to provide teachers with sufficient knowledge about the education techniques and various education strategies, and to train teachers on learning and self-evaluation methods (Castaño-Muñoz et al., 2018). Laurillard (2016), also demonstrated the importance of professional development to develop teachers' instructional skills, thinking skills, and innovation.
Basically, teachers' professional development has to be classified as high-quality professional development, which is different from conventional and widely practised form of professional development, to ensure the greatest effect in improving teaching practices and therefore students' outcomes, and this can be achieved when combined with in-service training features, resulted from multiple empirical research papers. Researchers who studied high-quality professional development like (Desimone & Park, 2017; Song et al., 2018; Hassan, 2019) ensured that the combination of three professional development features enhances powerful and high-quality professional development practices, and these are: 1) content-focused learning, 2) active learning, and 3) collaborative learning. The content-focused learning concept is all about focusing on supplying teachers with knowledge and skills through learning activities, which required higher-level

of thinking skills (Desimone & Park, 2017). This form of practices enables teachers to understand and explore new instructional methods and approaches which definitely led to essential development in teaching practices (Musset, 2010). Engaging teachers in active learning by observing expert teachers, offering curriculum materials transforming opportunity, planning for classroom implementation, leading discussions among groups, presenting and engaging in written works (Niemi et al., 2016), will reflect directly in the teacher ability to criticize ideas and resources and upgrade the teachers own learning construction and skills, thus changing their teaching practices (Song et al., 2018). The third feature is collaborative learning, which represents in its simplest form a group of teachers encouraged to actively share and support their learning process during in-service training (Barrera-Pedemonte, 2016). In the researchers' opinion, the importance of collaboration lies on the opportunity in exchanging experiences and sharing thoughts and ideas or even assessments of other colleagues' work (Brown et al., 2016).

Previous studies emphasized the obstacles of the professional development programs like Hassan (2019) and Desimone and Park (2017), who agreed that training centres cannot train the numerous numbers of teachers, either because they lack big training halls for the training or because they lack sufficient numbers of trainers, corresponding to the huge numbers of teachers, as well as the lack of training programs that represent the actual need for the teacher. Other reasons demonstrated by (Zidan, 2018) argued that traditional training has shortcomings in material and human capabilities, and some training programs take place only once during the semester or sometimes once a year, which results in the reduction opportunities to join the training program. Furthermore, the geographical distance from the training center may reduce the teacher's desire to attend the training program and that is exactly what the researchers usually deal with while waiting for some teachers to arrive to the training center to start the program.

It might be concluded that OER illustrated as MOOCs combine all the three high-quality features, as educational resources involved active, constructive, collaborative, and content-focused resources. Moreover, recent perspectives have focused on the quality of distance education of MOOCs which is an important elements of success MOOCs since the gap between the designers' perspectives and the learners' preference for interaction might inhibit the success of MOOCs (Stracke et al., 2018). Stracke et al. (2019) added that MOOCs can go beyond OER in terms of its contribution to education quality through transforming online education through peer education and building education communities. Therefore, the researchers believe that utilization of an online professional development program is a powerful alternative solution to overcome obstacles rather than keeping on training teachers conventionally. In the researchers' own belief, when teachers are able to learn new ways of instruction methods and cope with the rapid developments of pedagogical approaches, students construct learning reflected directly and positively in return.

2.2.1 Online professional development

Why do we need online professional development? To answer this, we must first pay attention to the idea that professional development is a constant process of training, learning and support activities, which could be taking place in either work-based settings (conventional) or network-based settings (online), aimed mainly to develop professional knowledge, skills and attitudes to educate students more effectively (Karlovac, 2016). Hence, education and training are highly affected by technology, along with the wide availability of computers, internet and mobile devices. The implementation of technology overcomes lots of obstacles. Song et al. (2018) pointed to a surprising finding of their study about teacher professional development over 47 countries. They found that teachers who have participated in professional development activities were very low. Miyazaki (2015) hinted at some of the online benefits that overcome obstacles, such as the following:

- Serving massive numbers of teachers at once through the internet, in different locations.
- Open and available to anyone continuingly.
- Courses are easily accessible and cost-effective.
- Offering a new method of learning with unique features.

Brown et al. (2010) also pointed out other reasons:

- Providing self-directed professional development.
- Observing expert experiences and improving collaborative skills.

The researchers agree with Abdul Wahab (2017) and Al-Gahni (2017), in that OER in training is a modern and advanced method of training, offering knowledge and educational materials in a very accessible manner anytime, anywhere, which overcomes any financial and epidemiological troubles in the world, like facing COVID-19 virus nowadays. Many researchers investigated the utility of MOOCs for professional development around the world (e.g., Al-Harthy, 2016 & Koutsodimou & Jimoyiannis, 2015), demonstrated the utility of MOOCs in Greece and Saudi Arabia, and confirmed a high rate of interaction in completing training courses of all the teachers who participated.

To the researcher's knowledge, no prior studies have examined the effect of a training program on SHMS platform in relation to online teacher professional development and examined the perception of teachers towards OER.

2.3 Research tools

1- Cognitive test (Self-designed) mainly to measure the achievement of the trainee regarding the topic of the training course.

According to the training program objectives and the educational content, a cognitive test was prepared as follows:

- Test purpose: measuring the cognitive aspect of some skills of technology (e.g. applying YouTube videos as instructional strategies, download YouTube videos directly from the web, remove ads from videos, using google chrome in their teaching as a technological tool) of the targeted teachers who are participated in the training program.
- Formulation of test questions: 20 multiple choice questions were prepared and formulated according to the program objectives and suited the academic level of the teachers as well as their professional experiences.
- Test instructions: the researchers prepared a set of instructions for the test so that all the participators will follow the test clearly. The following general considerations were taken place:
  - Simple, clear, and direct instructions are established.
  - Clarify the right way of answering the test questions.
  - The test time is not affected by the instruction reading time at the beginning of the test.

After the researchers determined the questions, they transformed it into an online exam using Google forms because it is the most suitable form of any test in any online environment and it is easy to design and distribute to participants in the study either by email or WhatsApp application.

The researchers wrote the test instructions in the first scene of the test so that all participants could follow easily. Each question consists of 4 options to choose from as the right answer.

- Initial test examination: the test was first applied to a test sample of teachers; the sample size was 10 teachers.

This is basically done to:

- Determine the test time.
- Calculate test validity.
- Measure the test reliability.

The initial experiment has achieved its goals which includes:

- Determining the test time: by recording the time of the first teacher to complete the test and the time spent by the last teacher to complete the test by the following formula:

$$\text{Test time} = \frac{\text{first teacher finished time + last finished}}{2}$$

$$\text{Test time} = \frac{45 + 30}{2} = 38 \text{ minutes}$$

- Calculating test validity**:** the test is considered valid if it meets and achieves the purpose goals, the researchers determined the frequency of the test sentences and then proposed it to 4 specialists who confirmed the test validity before implementation. They advised to change some questions and delete some other questions, so 20 questions only were left to implement. Then, the researchers calculated the intrinsic validity of the test by calculating the square root of the coefficient of the test validity and found that the intrinsic validity coefficient (0.87) is considered an acceptable ratio which indicates that this test is valid.
- Measure the test reliability**:** the reliability coefficient of this test was calculated using the Kuder-Richardson formula through v 23.0 SPSS statistical analysis program. The test reliability coefficient reached (0.85) and that demonstrates that the test is stable enough and ready for implementation.

2- *Teachers' Attitudes towards OER training program scale (self-designed).*

After the teachers have been trained by OER resource, the researchers designed this scale as follows:

- Scale purpose**:** this scale is designed to measure the teachers' attitudes towards the training program based on OER platform and whether they accepted the idea or not to demonstrate the extent of their impact on them and if they made a positive or a negative attitude towards using these resources in their instruction methods at schools. The researchers designed this scale in the form of a questionnaire integrating both positive and negative sentences.
- Formulating scale sentences**:** the researchers drafted the scale sentences according to the teachers' characteristics, and the technological skills level they have, and their point of view on the environment they trained in**.** The scale consists of 30 sentences reflecting the target objectives. The researchers measured the validity and stability of this scale to confirm its sincerity as follows:
- Calculate scale validity: the researchers proposed the scale to 4 educational technology experts who confirmed the validity of it with some phrases modified. Then, after modifying the scale, the researchers calculated the intrinsic validity of it by calculating the square root of the validity coefficient and found that the intrinsic validity coefficient is (0.85) which is an acceptable ratio of validity.
- Measure the scale reliability**:** to calculate the reliability factor, the researchers calculated the reliability parameter of the scale using the method of analysis of variance using the Kuder-Richardson formula through v 23.0 SPSS statistical analysis program. The test reliability coefficient reached (0.91) which indicates a fair enough degree of acceptance for stability, indicating that the scale is suitable for implementation. Since the training is in an online environment, the researchers transformed the attitude scale into an online scale by Google Forms.

2.4 Research sample and experimental design

1- Research community and sample

- Community: consists of AlDakhlia teachers at all levels of education, teaching any subject, male and female teachers with professional experiences between 1-10 years.
- Research sample: the researchers determined the sample randomly, through the training center database by sending the teachers a survey in their e-mails requesting them to attend the training program and be a part of the experiment. Once the study sample replies to the survey, 40 male and female teachers were intentionally chosen. Those selected had participated in Intel for teachers' program to avoid OER ignorance because, at intel program, the participants usually are given a brief background on OER.

The researchers separated them into experimental group and control group as follows:

- Randomly selected 10 male teachers and 10 female teachers as the experimental group with professional experiences between 5 and10 years.
- Randomly selected 10 male teachers and 10 female teachers as the control group with professional experiences between 5 and10 years.

Care was taken to avoid homogeneous groups in sex and professional experiences.

2- Experimental design

The researchers used the experimental design with one control group and one experimental group design. They were trained in the educational technology center in AlDakhlia Governorate. Figure (6) shows the experimental design of the research.

Group	Pre-test O1	Independent variable X	Post-test O2
Experimental and Control Groups	Cognitive test O11	X1	Cognitive test O21
Experimental and Control Groups	Attitude scale O12		Attitude scale O22

Figure 1- Research experimental Design.

Where O11, O12 are the pre-test of cognitive test and attitude scale, respectively.
Where O21 and O22 are the post-test of cognitive test and attitude scale, respectively.
where X1 is the experimental group with independent variable treatment.

2.5 Research hypothesis

Depending on the previous literature review and various studies results, the study hypotheses can be represented as follows:

1- There is a statistically significant difference at the level of (0.05) between the average degrees of the pre-test and the average degrees of the post-test of the experimental group in the Online training program cognitive test valid to post-test.
2- There is a statistically significant difference at the level of (0.05) between the average degrees of the post-test of the experimental group and the average degrees of the post-test of the control group valid to the experimental group in the Online training program cognitive test.
3- There is a statistically significant difference at the level of (0.05) between the average degrees of the pre-test and the average degrees of the post-test of the experimental group in attitudes scale towards online professional development valid to post-test.
4- There is a statistically significant difference at the level of (0.05) between the average degrees of the post-test of the experimental group and the average degrees of the post-test of the control group in attitudes scale towards online professional development valid to the experimental group.

2.6 Procedures

First of all, the researchers searched for the appropriate OER needed for the training program. There were many options, but SHMS met the properties that the researchers were looking for, such as complete support for Arabic language, OER supportive, no registration needed to view and ability to use any educational resources. Then, the researchers determined the suitable content to be presented in SHMS according to the objectives needed to be achieved. The researchers depended on the content design on lots of other courses on SHMS related to the objectives of the training program, which was mentioned before in the instructional design. After that, the researchers designed the training program as an interactive presentation lecture and uploaded it to the platform. The teachers participating in the study were chosen from 150 teachers responding positively to the survey, then 40 teachers were chosen intentionally who had prior training at Intel for education to ensure the participants are heterogeneous in terms of sex and professional experiences. This in turn will lead to knowledge sharing, exchange and modification among the participants. So, each experimental group consisted of 10 males with 10 female teachers (to avoid sex variable interfere with the study results) with professional experiences ranging from 5 to10 years. The control group also consisted of 10 males with 10 female teachers with professional experiences ranging from 5 to10 years.
Before starting the training program, the cognitive test and the attitude scale were prepared in the form of Google forms to make sure all participants have them, since the training is on an online environment. The links are provided in the training program.
After the pre-test of both the cognitive test and the attitude scale were implemented for the experimental

group, the participants were allowed to access the training course in the OER platform and started learning the content. The researchers posted a subject on the discussion board provided for the course and made sure that all participants have access to it without facing any issues. Later, the researchers posted a discussion subject that all participants exchange their new knowledge after completing the course, which takes only 2-hours for the session. Next day, at the same time, the researchers posted an activity that the participants could access and criticize any other course content available in the platform. They can choose the course by their own interest. The third day, the researchers requested that each participant edit the content of the course that were chosen by him/her the previous day and revise it and exchange the new editing course with the other colleagues. Furthermore, each revised content will be criticized by others for further editing. There has been an emphasis on all participants to share all the resources of information that anyone of them obtained under a cooperative framework. The researchers made available external resources of some technological tips with a full explanation of them, so any participant can benefit from them. All available tools were utilized by the participators such as the discussion board in the group provided at the platform, downloading any course materials of interest for the participants, editing any course content, revising them and redistributing them among colleagues. On the other side, the control group was trained in the same course conventionally in the training center for one session only.

Throughout the three days sessions, there was a careful follow-up to increase highly positive participation and interaction among participators. There was a continuous and precise follow-up on the performance of the participants, guiding them and providing advice among the sessions by utilizing the communication tools provided in the platform and the emails. After the completion of the experiment period, the post-test of cognitive test and attitude scale were distributed again to all participants, and then statistical treatments were conducted as required, as will be discussed in the study discussion part.

3. Results and Discussion

Data processing and analysis of this study were done using the SPSS statistical program for MAC V23.0.

3.1 Test the validity of the first hypothesis

There is a statistically significant difference at the level of (0.05) between the average degrees of the pre-test and the average degrees of the post-test of the experimental group in the Online training program cognitive test valid to post-test. To check the validity of this hypothesis, the researchers measured the difference between the average degrees of the pre-test and post-test of the cognitive test for the experimental group using the Paired samples T-test as follows:

Group	Test	No	Mean	S.D.	T	Sig. (2-tailed)
Experimental	Pre	20	20.8	8.2	8.3	0.001
	Post		36.4	2.5		0.001

Table 1 - Paired Samples T-test results of pre-test and post-test of the experimental group.

A paired-samples T-test was conducted to compare the average degrees of the pre-test (M=20.8, SD= 8.2) and post-test (M= 36.4, SD= 2.5) of the cognitive test for the experimental group; t (19) = 8.3, P= 0.001, shows that the first hypothesis is valid. From table (1), it is clear that there is a positive improvement in the degrees of the pre and post-test of the experimental group in the cognitive test. This is confirmed by the previous studies mentioned in the literature review. The results indicate the effectiveness of OER training program in achieving some technical skills and instruction competencies of the participators, which has a positive effect on the teachers learning. This can be explained by that OER allows the teachers to encourage themselves to participate and learn the way they are capable of, and this encourages and promotes the teachers' self-learning through dealing directly and freely with the OER materials, provided in the platform. This was confirmed by Alkhasawneh (2020) and Zidan (2018), who ensured that teachers who learned by online training achieved a higher level of learning compared to teachers who were trained conventionally and that the social interaction within the discussion forums provided by the platform increases learning opportunities for all participants. Hodgkinson-Williams (2017) also ensured that learning with OER encourages the teachers to feel free and safe when downloading any educational materials, thus contributing to the development of a sense of belonging to a trustful community where teachers can share their educational resources with no fear plus the nature of OER in terms of ease of use and the time available for teachers to cooperate in the forums and discussion group provided by the platform. This is confirmed also by (Abu Khatwa, 2016) when discussing the advantages of the MOOCs in encouraging participants to feel more engaged in the course and group of work which consequently results in increasing the desire of participants to learn more for achieving their educational objectives, which reflected directly and obviously with the increase in the cognitive test degrees of the post-test degrees. Barrera-Pedemonte (2016) assured that the online environment provided the participants with the appropriate tools of self-learning which develop their performance and teaching competencies and this is completely different from the training in the conventional environment, which offers limited opportunities of participation and limited social exchange of educational materials, which may result in

unaccepted objectives achievements or desired goals. The researchers believe that the heterogeneity among the participators increases the degree of sharing and exchanging the educational experiences through mutual participation, and sharing educational resources with the others affected positively the cognitive test results, and that exactly what discussed by (Al-Hadi, 2010).

3.2 Test the validity of the 2nd hypothesis

There is a statistically significant difference at the level of (0.05) between the average degrees of the post-test of the experimental group and the average degrees of the post-test of the control group valid to the experimental group in the online training program cognitive test. To check the validity of this hypothesis, the researchers measured the difference between average degrees of the post-test of the experimental group and the average degree of the post-test of the control group in the cognitive test valid to the experimental group using the Independent samples T-test as follows:

Group	Test	No	Mean	S.D.	T	Sig.(2-tailed)
Experimental	Post	20	36.4	2.5	7.5	0.001
Control	Post		22.7	7.9		0.001

Table 2 - Independent Samples T-test results of post-test of the experimental and control group.

An Independent samples T-test was conducted to compare the average degrees of the post-test of the experimental group (M=36.4, SD= 2.5) and post-test of the control group (M= 22.7, SD= 7.9) of the cognitive test for the control group; t (19) = 7.5, P= 0.001, shows that the second hypothesis is valid. From table (2), it is clear that there is a statistically significant difference between the post-test of the experimental and the control group of the cognitive test valid to the experimental group, which demonstrates the positive effect of the training by online OER training program. This might be explained by the same reasons mentioned in discussing the results of the first hypothesis and to which (Laurillard, 2016) confirmed that the online training programs represent an effective means and tools of professional and skills development and contribute to providing all participants with the adequate skills of scientific research where the platforms are provided with external resource links that encourage the participants to seek more knowledge in a very short time. Agreeing with what was mentioned above, (Hassan, 2019; Goodyear, 2017) added that online training allows participants to obtain a higher level of thinking; hence, they exchange their educational materials with others and also can edit others' educational materials and criticize, reuse, remix and redistribute them freely. Besides, the participants are getting closer to other colleagues in the same group, so that they can solve the problems facing each other and exchange their new knowledge with each other, so the learning environment becomes very rich, which reflects directly on their cognitive knowledge as the post-test results showed. On the contrary, the control group trained by the traditional training, where they all stayed in the same class and meet the trainer face to face. Although this form of training for any professional development program is very powerful since the participants are meeting the trainer directly and obtaining their knowledge from direct experiences (Al-Hadi, 2010), it is still a poor environment of the self-obtaining skills that any participant is capable of if the educational environment is provided by the appropriate tools. In the researcher's own belief, once the educational environment is rich and full of negotiation, discussion, and collaboration opportunities, it will definitely ensure the consistency of the knowledge provided by it. That is why in the researchers' opinion, the experimental group post-test degrees increased compared to the post-test degrees of the control group, who were trained traditionally as (Al-Zahrani, 2018) confirmed as well.

3.3 Test the validity of the 3rd hypothesis

There is a statistically significant difference at the level of (0.05) between the average degrees of the pre-test and the average degrees of the post-test of the experimental group in the attitudes scale towards online professional development valid to post-test. To check the validity of this hypothesis, the researchers measured the difference between average degrees of the pre-test of the experimental group and the average degree of the post-test of the experimental group in the attitude scale valid to the pre-test of the experimental group using the Paired samples T-test as follows:

Group	Test	No	Mean	S.D.	T	Sig.(2-tailed)
Experimental	Pre	20	90.30	11.2	11.1	0.001
	Post		117.5	18.1		0.001

Table 3 - Paired Samples T-test results of pre-test and post-test of the experimental group of the attitude scale

A paired-samples T-test was conducted to compare the average degrees of the pre-test of the experimental group (M=90.30, SD= 11.2) and post-test of the experimental group (M= 117.5, SD= 18.1) of the attitude scale valid to the experimental group; t (19) = 11.1, P= 0.001, which shows that the third hypothesis is valid. As shown in table (3), it is clear that there is a statistically significant difference between the average degrees of the pre-test of the experimental group and the average degrees of the post-test of the experimental group valid to post-test, which demonstrates the positive effect of the training by online OER training program on the participants' attitudes. It is clear that there is a significant improvement in the attitudes towards the OER training programs of the experimental group, which the researchers believe is a logical result

as the OER online training programs contributed to the high level of cognitive knowledge that all participants obtained after the training program. This can also be emphasized, in my opinion as a result of the teamwork in the OER community and the level of openness and access provided by OER which has greatly contributed to the positive attitude of the participants of the experimental group, which is in line with Niemi et al. (2016). As the sense of security provided by the OER, it will naturally increase the participants' positive attitudes towards this evolutional and technological tool that contributed to a change in getting the knowledge and improving the educational skills that teachers all over the world demanded. This also is discussed by (Su, Tu-Sheng, 2016).

3.4 Test the validity of the 4th hypothesis

There is a statistically significant difference at the level of (0.05) between the average degrees of the post-test of the experimental group and the average degrees of the post-test of the control group in attitudes scale towards online professional development valid to the experimental group. The researchers measured the difference between the average degrees of the post-test of the experimental group and the average degrees of the post-test of the control group in the attitude scale using the Independent samples T-test as follows:

Group	Test	No	Mean	S.D.	T	Sig.(2-tailed)
Experimental	Post	20	117.5	18.2	10.2	0.001
Control	Post		90.90	11.0		0.001

Table 4 - Independent Samples T-test results of post-test of the experimental group and the control group of the attitude scale

An Independent samples T-test was conducted to compare the average degrees of the post-test of the experimental group (M=117.5, SD= 18.2) and post-test of the control group (M= 90.90, SD= 11.0) of the attitude scale valid for the experimental group; t (19) = 10.2, P= 0.001, shows that the hypothesis is valid. Moreover, the two standard deviations of the two groups are less than the difference between the means, which supports the results of the results of the *p*-value and this hypothesis. From table (4), it is clear that there is a statistically significant difference between the average degrees of the post-test of the experimental group and the average degrees of the post-test of the control group of the attitudes scale valid to post-test of the experimental group, which demonstrates the positive effect of the training by online OER training program on the participants' attitudes. As researchers, this result is expected due to two main reasons. It is all about curiosity and the great opportunities provided by the OER for teachers while learning such as free download of any content, authority to transform any educational materials, and the sense of belonging to the educational community as discussed by Al-Shamrani (2019). As the researchers mentioned in discussing the results of the 3rd hypothesis, and as (Kwak, 2017) discussed, this new trend of open pedagogy is starting to diffuse and spread in the education society that encourages teacher's curiosity about it, and so the desire of learning and using it in their professional career and the new channels of obtaining knowledge provided by OER platforms. Despite that, there is a hesitation in utilizing these resources due to fear and ignorance. OER and open pedagogy are still very justified by so many teachers and faculty members who are used to teaching behind doors. They are concerned about opening up their research for others to see, to be judged, or to reuse it. The researchers admit that the challenges facing the utility of OER, especially in Arab Countries, should not stop us from benefiting from these educational treasures. The researchers believe that with the invasion of Coronavirus, it is a good time to rely on OER to train teachers remotely, especially since all training programs in educational institutions have stopped altogether because of the pandemic. So, the Ministry of Education should adopt a platform to provide OER for professional development for educators. The holdings of this platform should be from ready-made OER and also locally designed.

4. Conclusion

The findings of the study showed that a significant role for the OER platforms such as SHMS in terms of teachers' professional development, especially enhancing their knowledge and skills of teaching. Besides, the study showed that there are different aspects that increase the positive role of MOOCs such as exchanging knowledge and teaching skills, and interactivity while doing the requested tasks. The positive impact of these activities is reflected in the sharing of diverse educational resources and references among them, and there was clear development in their knowledge and skills with regard to the technical skills targeted in the training program. The participants seriously pursued obtaining all the information related to the topic of the training program and share it with colleagues through the online environment based on OER, which shows the positive effect of the training program in SHMS platform on the teachers' professional development. Besides, the participants have a positive attitude towards the impact of the training program in SHMS platform on their professional development. It is concluded that the online training programs overcome and solve many problems related to the current situation of educational professional development programs. Besides, these online platforms provide teachers with an interactive cooperative environment that helps the participant teachers in getting feedback from other' experiences which helps in enhancing teachers' innovative teaching skills. Future studies can make an in-depth investigation for the feedback in MOOCs using multimodality since these platforms help to gather different types of data from the participants.

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