Effectiveness of Project-Web Learning Approach in the Development of Action Research Skills among Master's Students in Oman

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Abstract

The study aimed to prepare a program in action research based on Project-Web Learning Approach, and investigate the effectiveness of this program to develop the action research skills for master's students at Dhofar University in Oman. The study was based on the semi-experimental design of one group (pre-post application). The study sample comprised (27) master's students of Education Department in College of Arts and Applied Science of Dhofar University. Data were collected via the test of action research skills for the sample in the courses of educational research and seminar in curriculum & instruction. The study was carried out during 13 weeks. Data were analyzed using means, standard divisions, and T test. The study concluded that there was a significant difference at (0.01) between the mean grades of students in the pre- test of action research and that of the post-test in favor of the post-test. In light of the results, the study recommended preparing the content of all courses to master's students in accordance with the Project-web learning Approach, and improving the instructors' performance to develop action research skills for their students.

Keywords: action Research, electronic learning, project learning, project-web learning, masters students, Oman.

Cite as: Elsayed, A. M. A. (2019). Effectiveness of Project-Web Learning Approach in the Development of Action Research Skills among Master's Students in Oman. *Arab World English Journal (AWEJ) Special Issue on CALL (5)*. 51-64 DOI: <https://dx.doi.org/10.24093/awej/call5.5>

1. Introduction

Educational research is very important for both developed and developing countries and societies, and it is the basis for development in all educational fields, as it keeps educational institutions away from arbitrary actions that may happen to be right in some cases but wrong in others.

Action research is one of the types of educational research that has recently emerged in educational institutions that offer distinguished professional work. It has become one of the styles of professional development of the teachers, as it encourages them to think about their practices, examine their performance and specify the problems that face them to solve them using an appropriate scientific methodology (Al-Maziny & Al-Mazroua, 2010).

Action research depends on the researcher's pondering at the practices of the educational field, in order to make a better understanding of the educational process. Then, it makes positive changes in the teacher's level, and school administration.

Due to the importance of action research in the professional development of teachers, many conferences were held, including three consecutive international conferences about action research in United Kingdom at 1990, 1992, and 1994 (Obeidi, 2010). College of Education in Qatar University also organized four consecutive conferences to discuss the concepts and skills of action research at 2008, 2009, 2010, and 2012 (Elsayed & Al-Amri, 2015).

Arab Thought Foundation in Lebanon also presented several projects that aimed at developing teachers' skills in the use of action research such as: Tammam Project (1) and Tammam Project (2). These projects have been implemented in Lebanon, Saudi Arabia, Egypt and Jordan (Arab Thought Institute, 2013).

Ministry of Education in Oman focused on promoting action research skills for Omani teachers and staff in the field of education through educational symposiums, educational meetings, and educational versions. As the Ministry of Education in Oman agreed with the International Reading Association to implement a training program to develop the research skills of the senior teachers, supervisors, and specialists training in the ministry was carried out during the period from 26/2/2011 to 03/03/2011 (Al-Baluchi, 2011).

In light of the development of modern technologies, there is a need for modern educational techniques that guide the preparation of students and teachers in the knowledge society so that there would be an opportunity to publish courses online to be available to students at any time and from any place (Zawaidi, 2014).

Project-Web Learning Approach is one of the most appropriate approaches that can be used to train and prepare students and teachers. It is possible to employ and use electronic web-based tools to collaborate and engage students in the implementation of these projects and to make use of all electronic resources available through the web to access information and exchange them electronically among students (Arif, 2015).

Project-based learning across the web is one of the educational approaches that have emerged in recent years as a result of the integration of e-learning and project-based learning, which is seen as an integrated, interactive and influential learning process (Saraya, 2012).

Project-based learning across the web is based on constructional learning approaches, which emphasize that learning is an active, constructive, contemplative process achieved in a realistic social context by practicing social negotiation skills within real learning environments rich in multiple learning resources. These approaches include several strategies and educational systems, the most important of which are problem-based learning, collaborative learning, situational learning, deep learning, discovery learning (Ching, 2016).

Mohamed (2018) believes that training students in the development and implementation of action research through Project-Web Learning Approach may contribute to developing awareness of action research and reducing their teaching anxiety.

Therefore, the present study is trying to use the Project-Web Learning Approach to develop the action research skills among Masters Students in Oman.

2. Problem Statement

It was clear to the researcher through his long practical experience in teaching the courses of educational research, educational statistics, scientific seminar in curriculum & instruction and general teaching theory and strategies- advance level that most of the master's students at Dhofar University have a low level of action research skills. This is confirmed by the results of the tests, where the results of these students were lower in the questions related to the action research skills compared to the other questions in the tests.

This coincided with the results of several studies, including (Al-Shanfari, 2012), (Elsayed & Al-Amry, 2015), (Al-Hussaini, 2018), which indicated a low level of action research skills among individuals in various educational disciplines in the Sultanate of Oman.

Several studies, including (Stozhko, et al., 2015), (Pilten & Pilten, 2017), (Mohamed, 2018) have recommended the need to develop students' action research skills and the need to use new approaches and strategies based on web applications, especially project-based learning through the web, for their great importance and educational benefits and it is also the most appropriate approach to the development of procedural research skills.

So the present study attempts to answer the following research questions:

1. What is the proposed program based on Project-Web Learning Approach in the development of action research skills among Masters Students in Oman?
2. What is the effectiveness of the proposed program based on Project-Web Learning Approach in the development of action research skills among Masters Students in Oman?

3. Study Limit

The limits of the study were as follows:

- 3.1 The following action research skills: selecting the research problem, reviewing the literature and writing the hypotheses, preparing the proposal of the research, carrying out the research procedures, and writing the research report.
- 3.2 The approach of learning based on collaborative projects across the web.
- 3.3 Master students in education department in college of arts and applied science at Dhofar University.
- 3.4 The study was carried out during the academic years (2106/2017 and 2017/2018).

4. Terminology of Study

4.1 Proposed Program

A set of targeted and planned educational modules and their objectives, procedures, activities, and evaluation methods) based on project-based learning across the web to develop the research skills of master students in education department at Dhofar University.

4.2 Project-Web learning

Learning based on a set of organized procedures and activities, which enables the master student in education department at Dhofar University to conduct a participatory action research based on tools and techniques of interaction in a variety of electronic learning environment under the supervision and guidance of the researcher in order to develop their action research skills.

4.3 Action Research:

An organized intellectual process based on specific scientific procedures carried out by the master student in education department at Dhofar University for the treatment of a problem facing him or the development of his professional performance.

4.4 Action Research Skills:

The ability of the master student in education department at Dhofar University to conduct action research with precision and proficiency, through the exercise of skills (selecting the research problem, reviewing the literature and writing the hypotheses, preparing the proposal of the research, carrying out the research procedures, and writing the research report). It is measured by the degree obtained by the student in action research skills test prepared for this purpose.

5. Study Hypothesis

1. There is a significant difference at (0.01) between the pre and post application of action research skills test on the study sample in favor of the post application.

6. Literature Review

6.1 Project-Web Learning Approach:

Project-based learning across the web is an e-learning approach that employs all the potential of the web, enabling students to gain experience, communicate purposefully, engage, interact and collaborate with their peers electronically to achieve learning goals through clear steps and specific tasks for each individual in the work group.

The learning of projects through the web is based on scientific principles based on the principles of constructivism theory as it is a learning strategy centered on the learner who builds his own knowledge by practice and addresses real problems (Mubarez, 2014).

It is defined as a typical educational process for practicing social negotiation skills among students when implementing the educational project plan through the use of synchronous and asynchronous electronic communication tools such as e-mail and discussion forums (Shadiev & Huany, 2015, 124).

Mohammed (2013, p. 357) defines it as an instructional model focused on learner-centered learning that allows him or her to work independently or in small collaborative groups to build their own learning. It is used to provide subjects that require research and inquiry, to enhance collaborative work and decision-making skills.

In this regard, Mohammed (2018) explains that project-based learning across the web allows students to participate positively in the educational situation through their research, application and employment of the knowledge and skills acquired in real situations under teacher supervision and guidance. So it provides students with a deeper knowledge of the curriculum, and it is an effective way to integrate technology into the educational process to build positive communication and collaborative relationships among students.

There are two types of project-based learning across the web. The first is learning based on individual projects across the web, where students work individually, meaning that each student prepares a project different from other projects or is the same project but each student is working individually. The second is learning based on collaborative projects across the web, where projects are implemented in groups. Each group assigned a specific project to be implemented, and the work is divided into one group so that each student has a specific role to complete the work of the rest of the group (Albritton, 2016).

Projects are implemented across the web in a series of stages (Tilchin & Kittany, 2016; Riyanti, 2017; Mohamed, 2018):

- Project Selection Phase, taking into account that the project is suitable for the students' tendencies and abilities. It is implementable, achieves the objectives of the educational material and returns educational benefit to the student.
- Project planning stage. Students will develop the project implementation plan under the supervision of the teacher. The students will be given the freedom to distribute their roles and responsibilities in collecting information, designing the project plan and its stages. The plan will be presented to the teacher for approval.
- Project implementation stage: Each student will implement the relevant part of the plan, record the results reached by the team and identify the problems encountered to overcome them under the supervision of the teacher, with continuous guidance from the teacher.
- Project follow-up and evaluation stage: The students present their projects, and the teacher and peers evaluate each project so that each student sees the outcome of his effort within the group

effort. At this stage, each group also provides a report on the educational benefits of the project, the problems encountered and how it was resolved.

It is clear from the above that it is important to introduce project-based learning in the educational process, and learning based on collaborative projects across the web is also distinguished from learning based on individual projects across the web in many aspects such as providing cooperation among students, benefiting from each other, and quality in the final product. Therefore, the current study focuses on collaborative projects across the web to develop action research skills among master students at Dhofar University.

6.2 Action Research Skills

There are several names for action research in theoretical literature, some of them are called the situational research, and some of them are called the work research or the action research, and it is also called the research performance or research for improvement.

Johnson (1993, p. 25) defines action research as "athoughtful and directed investigation towards solving a problem, and can be done by an individual or a group". This type is characterized by forming helical rings each one of which includes (identifying the problem, collecting organized data, thinking, analysis, taking action in the light of the data and finally redefine the problem)

Yousef (2014, p.102) indicates that it is "a participatory activity of teachers to develop their performances and educational practices or solve problems in the educational process by reflecting on their teaching practices to make the desired change in the educational process".

Elsayed & Al-Amry (2015, p.197) define action research as "a kind of investigation conducted by teachers, and requires them to use self-reflection of their teaching practices, ways of their students' learning, and problems about these aspects, to find scientific solutions to these problems in order to improve the educational process, and raise the efficiency of students".

There are three types of action research depending on the number of individuals involved. The first is the individual procedural research, which addresses a particular problem facing a teacher within the classroom and tries to reach a solution to that problem. The second is the cooperative procedural research, which deals with a common problem among a number of teachers, and there is an exchange of experiences and communication between them to solve this problem. The third is the procedural research at the level of the educational institution, and this research is shared by all teachers in the educational institution in order to solve a problem to improve their performance, and thus improve the overall performance of the institution (Morales, 2016).

Through the analysis of several studies, such as: Fernandez & Adelina (2014), Elsayed & Al-Amry (2015), Miller (2017), the skills of action research can be identified in the following figure:

Figure 1 Action Research Skills
(Elsayed& Al-Amry, 2015)

It is clear from the above that project-based learning steps across the web are highly compatible with the steps of the preparation and implementation of action research.

7. Methodology

In this part the researcher describes the method and procedures that were followed in the current study, as he deals with a description of the study sample, tools, and procedures to ensure validity and reliability. Moreover, he discusses the statistical treatments used in the data analysis.

7.1 Sample of the Study

The study sample comprised (27) master's students of Education Department in College of Arts and Applied Sciences at Dhofar University.

7.2 Study materials and tools

7.2.1 Proposed program based on Project-Web learning

The proposed program has been prepared according to the following steps:

- **Analysis Stage:** This stage included an analysis of the educational needs of the master students, which was the lack of students' research skills. And then analyze the characteristics of the students, which consisted in the acquisition of students' e-learning skills. And finally the analysis of the characteristics of the educational environment, which was the availability of e-learning requirements in the classroom.
- **Design Stage:** This stage included the following steps:
 1. Defining the objectives of the program: The overall objective of the program is to develop the action research skills of the Master's students at Dhofar University. The procedural objectives of each of the program's modules have been determined, as well as the specific objectives for each session of the program.
 2. Identifying and organizing the content of the program: The content of the program was determined in light of its educational objectives. It included five educational modules related to the research skills that were previously devised in figure (1), which consisted in selecting the research problem, reviewing the literature and writing the hypotheses, preparing the proposal of the research, carrying out the research procedures and writing the research report. The content is organized in the form of educational modules, and each module includes a number of training sessions that depend on self-learning.
 3. Identifying Media and Educational Activities: A number of multimedia and learning resources have been identified for the contents of the program, represented by presentations, pdf text files, video clips, synchronous virtual chapters, and thematic enrichment sites.
 4. Identifying learning methods and strategies: The proposed program included the following learning strategies and styles: electronic discussion, e-learning platforms, online learning, electronic brainstorming, electronic lecture, self-learning, collaborative learning, and training workshops.
 5. Identifying training phases using project-based learning across the web: This step has been implemented through selecting the title of action research project, planning for the preparation of action research project, implementation of the action research project and evaluation of action research project.

- **Development stage:** This stage included preparing multimedia and learning resources for each topic in the content of the program, creating an educational forum to allow for dialogue and discussion among students, and using virtual classes to communicate between groups and provide educational content, preparing working paper questions for each program topic as a construction evaluation and preparing the final test in the action research skills as a final evaluation.
- **Evaluation stage:** This stage was carried out through the construction evaluation which was carried out at each stage of the project preparation, and the final evaluation which was carried out at the end of the project by comparing the post-application and the pre- application of action research skills on the study sample.
- **Preparing the program in the final image:** To check the validity of the program, this program was presented to five faculty members specialized in curriculum, teaching methods and technology and it was modified according to their suggestions, so that the program in its final form is a component of the training manual, and the working papers.

7.2.2 Action Research Skills Test

The researcher built a test in order to measure the students' action research skills. This test consisted of twenty-five questions related to the five skills of action research skills, depending on the relative weight of each skill and the number of sub-skills. Therefore, four questions were assigned to the skills of selecting the research problem, reviewing the literature and writing the hypotheses, and writing the research report. Other seven questions were assigned to the skill of preparing the proposal of the research, and six questions were assigned to the skill of carrying out the research procedure. To ensure the validity, this test was presented to six faculty members specialized in curriculum, teaching methods and technology and some items were modified based on their suggestions. The degree of agreement was found to be at (89%). To check the reliability, the researcher carried out the test as a pilot study on (20) master students in college of commerce and business administration. Reliability coefficient was calculated for the test using the Cronbach's Alpha equation and was found to be at (0.92). One or two marks were given for correct answer and zero mark for the wrong answer. Thus, the maximum score for the test is (50) marks, while the minimum is (0), taking into account that the time of the exam was (120) minutes.

7.3 Variables

Study variables are defined in the proposed program based on project learning across the web as an independent variable, and action research skills as a dependent variable.

7.4 Study Design

X1	O	X2
X1: Performance on the pre-test of action research skills.		
O: Treatment for the sample (proposed program).		
X2: Performance on the post-test of action research skills.		

7.5 Experimental Treatment:

After selecting the study sample, they were divided into groups of five students per group. Each group prepares an action research to address a particular problem in a participatory manner. The

sample was pre-tested by applying action research skills test prior to their training on the proposed program, followed by an introductory meeting with them to give a comprehensive idea of the proposed training program and train them. After the completion of the training program, each group of students was assigned the task of conducting a participatory action research on one of the problems in their field of specialization. In the end, the test of action research skills was applied to the study sample.

7.6 Statistical Treatment:

Data were analyzed using mean, standard division, T test, and η^2 using SPSS version 22.

8. Results

8.1 Results related to the first question

The first question is: What is the proposed program based on Project-Web Learning Approach in the development of action research skills among Masters Students in Oman? This question was answered within the literature review of the current study (P. 8), where the researcher prepared a proposed program based on Project-Web learning approach in a scientific method according to five basic steps, namely: analysis stage, design stage, development stage, evaluation stage, and preparing the program in the final image.

8.2 Results related to the second question

The second question is: What is the effectiveness of the proposed program based on Project-Web Learning Approach in the development of action research skills among Masters Students in Oman?

The hypothesis below emerged from the above question:

There is a significant difference at (0.01) between the pre and post application of action research skills test on the study sample in favor of the post application.

To verify the validity of the above hypothesis, the researcher found the significance of the differences between the degrees of pre and post application to the test of action research skills on the study sample, as shown in Table 1.

Table 1. *Significance of differences between the pre- posttest using T test*

Action Research Skills Test	Pre- Test			Post- Test			T test	Sig.	η^2
	N	Mean	Std. Div	N	Mean	Std. Div.			
1. Selecting the research problem	27	3.33	1.18	27	7.23	1.47	11.27	0.001	0.19
2. Reviewing the literature and writing the hypotheses	27	3.67	1.18	27	7.67	0.84	15.06	0.000	0.23
3. Preparing the proposal of the research	27	9.80	1.50	27	13.50	1.60	9.21	0.001	0.20
4. Carrying out the research procedure	27	7.50	1.48	27	11.40	0.94	12.30	0.001	0.21
5. Writing the research report	27	2.60	1.67	27	6.87	1.14	11.55	0.000	0.21
Total	27	19.97	4.33	27	43.53	3.39	23.39	0.000	0.39

The table 1 shows the following:

- There are substantial differences in the mean grades of the pretest and the posttest for action research skills test in favor of the pretest at each skill separately and the test as a whole.
- There are significant differences at (0.01) between the mean grades of the pretest and the posttest for action research skills test in favor of the pretest at each skill separately and the test as a whole.
- The effect size (η^2) of the proposed program based on Project-Web Learning Approach on action research skills was high at each skill of action research skills separately and the skills as a whole. So it can be said that the proposed program based on Project-Web Learning Approach led to the development of action research skills for the participants of the study. Therefore, the study hypothesis is accepted.

9. Discussion

The results of this study can be attributed to:

- The continuous and varied training offered to students through electronic participation groups made the discussions rich, and the students benefited from each other and their teacher, resulting in an improvement in the level of their research skills.
- The proposed program offered a variety of knowledge and skills to students about action research through a variety of interesting electronic resources, thus encouraging them to do more to learn all about action researches.
- Various training activities and multiple models of action research provided students with a broad understanding of different research approaches to action research, and the right criteria for performing each skill.
- Intensive electronic training of students on the skills of action research skills, and the continuous evaluation by the researcher led to the students' knowledge of weaknesses in the implementation of research skills one by one, and then enhancement and improvement of these skills continuously. Therefore, all their research skills improved without exception.

However, many studies have found that the Project-Web Learning Approach has been effective in developing many different professional, cognitive and skills aspects of students and teachers, especially action research skills, such as: (Mohamed, 2018; Risnani, 2017; Kapenieks, 2016).

10. Conclusion

The researcher in the current study has built a program in action research based on learning projects across the web for the master students at Dhofar University according to the following steps: analysis stage, design stage, development stage, evaluation stage, and preparing the program in the final image. This program led to the development of action research skills for the participants of the study. Action research skills that have been developed are: selecting the research problem, reviewing the literature and writing the hypotheses, preparing the proposal of the research, carrying out the research procedures, and writing the research report. The effect size (η^2) was high for all skills.

11. Recommendations

Based on the results of this study the researcher recommends the need to expand the use of the Project-Web Learning Approach in the teaching of all the courses of the master's students, because

it has a positive effect to improve the motivation of students towards learning, and develop their academic skills. It is also necessary to provide material and moral support and training appropriate for Master's Students to encourage them to conduct action researches in the field of specialization, in order to solve their practical problems by a scientific method. More research should be conducted to identify the effect of using Project-Web Learning Approach to develop other variables, and prepare a comparative study on the effect of using Project-Web Learning Approach and other Approaches on development action research in other educational stages other than the one examined in this study.

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