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# Evaluation of Mathematics Teachers' Knowledge at UNRWA Schools in Gaza Strip about the Action Research Concepts and Process

**Heba A. M. Abuabdou[1*] and Salahaldin M. A. Abuabdou[2]**

*[1]Department of Curriculum and Instruction, Kulliyyah of Education, International Islamic University Malaysia, Kuala Lumpur, Malaysia.*
*[2]Environmental Engineering Department, Faculty of Engineering and Green Technology, University Tunku Abdul Rahman, Perak, Malaysia.*

***Authors' contributions***

*This work was carried out in collaboration between both authors. Author HA designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the total manuscript. Author SA managed the analyses of the study and reviews the first draft of the manuscript. Both authors read and approved the final manuscript.*

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## ABSTRACT

In this study, the availability of action research knowledge was measured among teachers of mathematics in schools belongs to Relief and Works Agency for Palestine Refugees (UNRWA) in Gaza Strip. The study sample consisted of 241 male and female teachers, where the study sample contained (25%) of the total study population, which consists of (972) active teacher during the current study time (second semester- 2019/2020). It was found that the sample has a strong knowledge about the action research concepts. Moreover, it was confirmed that there are no significant differences attributed to the variables of gender, training programs, and educational qualification. Meanwhile, the results showed that there is a significant effect by the teacher's age and cumulative experience on the teachers' knowledge of action research. Based on the findings, the challenges and obstacles that prevent teachers or limit their ability to perform action research must be studied and thus an attempt should be made to overcome those obstacles in order to push the teacher to perform the action research.

**Corresponding author: Email: hebaabuabdou85@gmail.com;*

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## 1. INTRODUCTION

Scientific research is conducted in all fields such as medicine, engineering, technology, astronomy, psychology, sociology and education because the school has a role in shaping the human being, refining his personality and developing his talents and abilities, it was necessary for researchers to intensify their efforts related to the school, the teacher, the student, and the educational process in general [1] And because specialized educational research is usually carried out by experts and researchers from outside the school environment, the perception of it has recently become that it is a theoretical research that is not related to reality and does not contribute to actually solving educational problems. From here began the interest towards action research in education, which the teacher applied himself or in cooperation with his colleagues in the workplace [2] Osterman and Kottkamp [3], provided us an action research justifications that focused on teacher professional growth and responsibility, they believed that everyone needs an opportunity for professional growth, teachers always want to change and improve, they can learn everything new, they able to take on the responsibility for their professional development, and they also need information about their performance.

Education in Palestine has been damaged by the Israeli occupation, which is working hard to destroy the educational process and prevent it from developing and opening up to the outside world. Gaza Strip has been under severe economic siege for more than 12 years. Therefore, several problems appeared, including psychological issues that affected students' feelings and behaviors, social gabs such as students' irregularity in school hours. Additionally, logistic problems like the lack of school facilities for example; laboratories and libraries, have been emerged. Moreover, the education has been affected by many problems related to the curriculum and instructions development, as well as poor academic achievement [4]. Palestinian educators are trying to overcome these difficulties and improve the educational process with all components, one of the most important of these components is the teacher who has a major and essential role. Making the teacher a researcher is one of the best methods that can be relied upon in improving the educational process and raising students' performance in basic subjects, including mathematics. Hence, this study aims to determine the extent of mathematics teachers' knowledge of action research at UNRWA schools in Gaza Strip and to evaluate their knowledge of action research according to the different study variables (gender, age, academic qualification, years of experience, training courses related to action research) at UNRWA schools in Gaza Strip. Mean over, this study may contribute to direct the attention of the educational process responsibles and its policy makers towards the importance of action research for the education process. Additionally, it might help teachers to form a clear vision and sufficient awareness of the importance of conducting action research and how to plan, implement and benefit it in overcoming educational problems and improving the educational reality.

## 2. THEORETICAL STUDY

### 2.1 Terminology of Study

Belkis [5] defined action research as "That type of educational research that a practitioner of a profession carries out in solving a problem that face, by himself or in cooperation with his colleagues who share the problem suffering together, it aims to address the problem and improve the practices followed by the individual in his profession."

Knowledge is: "The set of meanings, beliefs, judgments, concepts and intellectual perceptions that a person has as a result of his repeated attempts to understand the phenomena surrounding him" [6].

### 2.2 Previous Studies

The study of Alaa Aumla [7] aimed to know how the level of awareness of science and mathematics teachers in the preparatory school of action research skills and its relationship to the values scheme prevailing in them. The sample of the study consisted of (198) male and female teachers who were chosen by the random stratified method of science and mathematics teachers in governmental schools affiliated to the North Hebron Education Directorate in the Palestinian Ministry of Education. The researcher used the relational descriptive approach, where two tools were designed for the study, which are

the action research skills test and a questionnaire to measure the system of values. The results showed that science and mathematics teachers in the preparatory school are aware of action research skills with a low degree. Accordingly, the researcher recommended organizing training courses for teachers on action research skills, organizing conferences in which teachers' achievements are presented and experiences are exchanged, and working on disseminating the results of action research to teachers in order to develop enhancement plans for solving the problems faced by students, teachers and the educational system.

- Roland van Oostven [8] presented a study titled by meaningful action research and review of the professional development of science and technology educators. A team of four educators was formed whom responded to an invitation to participate in a collaborative action research project. In this study, qualitative methods were used in dealing with and addressing the multiple viewpoints and positions expressed by teachers as well as. The four teachers were studied as a case study. The study concluded that professional development is thorny and difficult. The study recommended the implementation of action research groups within the school structure. Also, providing teacher groups with support through long sessions up to one year duration, with a rate of two meetings per week. Moreover, forcing teachers to participate in Action Research will not result in effective professional development. Therefore, the methods of their recruitment must respect their needs. Finally, the study also recommended to allow groups to define their research topics friendly.
- Yigit, C. & Bagceci, B [9] conducted a study aimed to examine the extent of the contribution of action research in the professional development of teachers. The researchers used one of the qualitative research methods, which is "case study". The working group in this study included six teachers who work in primary and elementary public schools and undergo a training in action research. Based on the results of the research, it can be recognized that the action research is beneficial to teachers in many aspects of their personal and professional development. Also, action research helps teachers to create positive engagement, implement joint plans and give the opportunity to self-critique. Furthermore, the action research improves communication with pupils, increases their level of awareness and knowledge and it ensures more activity from pupils during the lessons.
- In a study carried by Mahdi Mahrani [10] on the experience of teachers in performing action research. The study examined the goals that language teachers seek to achieve in their research studies. Also, the study revealed the challenges that teachers face while performing procedural research. Data were collected through a questionnaire applied on 68 teachers, a reflective article was written by 9 teachers, and individual interviews were conducted with 12 other teachers. Analyzing of the information and classifying the main ideas showed that teachers believe that action research broadens their understanding of language teaching and provides them with a framework for contemplation of their practices. It also gives them the strength to play more important roles in the educational system and broadens their awareness of students' needs. The results of the research also indicated the most prominent challenges that teachers face when they initiate action research which are: lack of teachers' time, shortage of specialized research knowledge, administrative restrictions, and absence of cooperation. The study recommended that action research be added as an academic course in teacher educational programs, or at least as a component of current research methodology courses. Moreover, the study suggested another alternative to give teachers an opportunity to learn about the action research which they might be provided by the educational workshops, seminars or in-service training programs.
- Sarah Al-Otaibi [11] prepared a proposed training program and achievement test to measure knowledge of female students from primary grades pre-service teachers of the action research skills. Additionally, a note card was prepared to measure the performance of female students; future teachers, in action research skills. The researcher used the quasi-experimental approach based on designing one

experimental group represented by the eighth-level students in the Department of Curricula and Teaching Methods at Princess Noura Bint Abdul Rahman University in Saudi Arabia, with 39 female teachers. The results of the research indicated the effectiveness of the proposed program in developing the action research skills of teachers in the primary classes before service. The researcher recommended the necessity of approving action research course in the faculties of education. In addition, a recommendation to teachers to be encouraged for doing action research to contribute in solving problems that surrounding them during work.

- Al-Shanbari [12] aimed in his research to achieve the following:

1- Determine the action research skills that can be practiced by science teachers in the preparatory school; 2- Planning and implementing a training program that helps to improve some action research skills for science teachers in Al-Qunfudhah Governorate schools; 3- Note the impact of the training program on providing science teachers with cognitive skills and developing their action research skills. However, the researcher used the descriptive, analytical, and experimental approach based on designing a single group with two pre and post-tests. Although, the research sample consisted of 11 teachers and was trained for five days (15 training hours), the results indicated that there is a large impact of the training program on both the cognitive skills and the performance skills of action research on the teachers. The researcher recommended of benefiting from the proposed program in training the science teachers alongside encouraging them to conduct such research.

### 2.3 Comment on Previous Studies

The previous studies indicate the importance of the development of action research science and its interesting improvement along the time. Where previous studies were unanimous on the useful of action research and its importance in the professional development of teachers. It also showed that teachers believe in the importance of action research and the necessity of its conducting, but they do not possess the skills and knowledge sufficient for this. Therefore, these studies suggested holding training courses and workshops on action research for teachers while in service and making action research a compulsory course for pre-service teacher students. These studies have emphasized the tangible psychological and material impact of conducting action research by teachers. As these studies designated that teachers have self-respect for themselves when they carry out action research. The current study has benefited from previous studies in determining the action research skills that researcher requires in preparing the questionnaire for the research. However, to the best of our knowledge, there is no studies related to this field have been implemented on the educational system in Palestine, especially in Gaza Strip. Therefore, this study considered the importance of enriching the educational process in Palestine with this type of works related to action research.

## 3. METHODOLOGY

### 3.1 Study Method

This study is quantitative. Therefore, the researcher used the descriptive and analytical method to answer the research questions, which is often used in educational research, as it is considered one of the most appropriate scientific methods and the most widely used in studying humanitarian issues [13].

### 3.2 The Limits of the Study

- Human limits: teachers of mathematics at UNRWA schools.
- Spatial boundaries: UNRWA schools in Gaza Strip.
- Time limits: the second semester of 2019/2020 academic year.
- Conceptual limits: The concepts of this study were defined by the terms and definitions mentioned in it.

### 3.3 Study Population

The research community included mathematics teachers in UNRWA schools for the academic year (2019/2020), they were 972 teachers; male and female, distributed in 11 educational areas, where the number of female teachers was 568, while the number of male was 404 teachers.

### 3.4 Research Sample Selection

To select the sample, the method of stratified random sampling was used according to the five study variables, wherever this type of sample is used in heterogeneous societies, where the parameters of community differ according to a specific characteristic, such as gender, educational level or age [14]. The sample size reached to 241 male and female teachers. This is 87.3% of the designed sample size according to the table [15], which counted 276 teachers out of the 972 existing mathematics teachers at UNRWA schools in Gaza Strip. It was an acceptable percentage, and the sample was representative of the original population of the study.

### 3.5 Study Tool

The tool used in this study was the questionnaire which was modified based on a deep review of latest literatures. The questionnaire included twelve paragraphs related to the extent to which math teachers at UNRWA schools possess sufficient knowledge of action research. Responses were classified using a five-gradient scale:

1- Strongly disagree 2- Disagree 3- Neutral 4- Agree 5- Strongly agree.

#### 3.5.1 Validity of the study tool

Five experts from Faculty of Education at the International Islamic University in Malaysia, the Islamic University of Gaza - Palestine, and the Sharqia University in Oman, tested the validity of the content of the questionnaire. They removed irrelevant terms, made some changes to others, and made recommendations for another, all to enhance its content and to improve its efficiency in order to measure the study parameters effectively.

#### 3.5.2 Stability of the study tool

To verify the stability of the study tool, the questionnaire was applied on a pilot sample. The pilot sample has same characteristics as the targeted group. The questionnaire was distributed to 50 participants of mathematics teachers in UNRWA schools in Gaza Strip, in order to answer the questionnaire items. They were asked to give feedback on the items that may contribute to confusion or misinterpretation, and to identify any items or words that are not understood, and to verify any other problems found during dealing with the questionnaire. The information was captured using SPSS version 19 to test the stability of the questionnaire with a degree of stability above a recommended reliability score of 0.7 [16], using the Cronbach alpha parameter. The stability factor of the questionnaire was equal to 0.726, which is an acceptable degree of stability.

### 3.6 Data Collection

Because of the Corona pandemic sweeping the world and because of the preventive measures taken by most countries including Palestine, where students and teachers were prevented from going to their schools for their safety, it became difficult and even impossible to deliver the questionnaire to the teachers to fill them inside schools. Therefore, an electronic copy of the questionnaire designed in a way (Google Forms) was sent to the math teachers of the UNRWA through WhatsApp accounts and groups that include them. Finally, the scientifically validated questionnaire was applied to the study sample at the end of the second semester of 2019/2020 academic year.

### 3.7 Data Analysis

The statistical program SPSS version 19 was used to analyse the collected data. To answer the first question, descriptive analysis was used including (frequencies, percentages, arithmetic means, and standard deviations). To answer the second question, constructive analysis was used, including Independent samples t-test and One-way variance analysis (ANOVA) test.

## 4. RESULTS AND DISCUSSION

### 4.1 Demographic Characteristics of the Research Sample

The questionnaire sample was 241 teachers and it was distributed among five variables that formed the different sample layers (gender, age, educational level, years of experience, and training programs). The distribution of the sample data on the five variables was explained in Table 1.

Table 1 Shows that about 40% of the studied sample were males, while the percentage of females was approximately 60%. And also almost half of the sample is from the younger age group (25-35) years, about a third of the sample is from the second age group (36-45)

years while the rest of the sample "a part of five" was of the older age group (46 years and over). It can be noted from the table that the holders of diploma represent only 2% of the study sample, while Bachelor holders considered as the most of the sample; approximately 79%, and those with postgraduate studies accounted for approximately 19%. In the term of years of experience, 60% of the sample had more than 10 years, wile 40% of them have less than 10 years. Just a quarter of the sample had received action research training programs.

## 4.2 Results Related to the First Question: To What Extent do Mathematics Teachers at UNRWA Schools in Gaza Strip Know About Action Research?

Table 2 shows the distribution of the responses of sample members to the paragraphs of the questionnaire related to the teachers' knowledge of the action research and its foundations represented in percentages and frequencies. In addition, the table presents the means and standard deviations for each paragraph of the questionnaire, arranged in descending order according to the mean. The total mean in the table indicates that mathematics teachers at UNRWA schools in Gaza Strip possess knowledge of action research at a high level, as the total mean reached (3.8 from 5). The average of responses of the paragraphs ranged from (1.7) to (4.5). Paragraphs 8 and 12 have the highest mean (4.5), followed by sixth, second and third paragraphs with means of 4.3, 4.2 and 4.0, respectively. Where paragraphs 7 and 11 have a mean of (3.9), while paragraph 1 had a lowest mean which is (1.7).

The results showed that mathematics teachers possess a strong knowledge of what is action research. This might be attributed to the teachers' interests about developing themselves professionally and are constantly working on it. They also believe that the best way to do this is through action research, which gives them the opportunity to reflect on their educational practices with the aim of improving and developing them. This is consistent with the results of a study conducted by Mehrani [10] which showed that teachers are mainly interested in the practical aspects of their professionalism such as developing their teaching skills and improving students' knowledge. Additionally, this finding agrees with the results of the study conducted by Yigit, C. & Bagceci, B [9] which indicated the extent to which action research contributes to the professional development of teachers. This is also in line with the study results of DiGuilo [17], which showed that continuing professional development will make teachers have their own reasons for conducting action research. While this result contradicts the results of the study conducted by Alaa Aumla [7] where her study showed that teachers perceive action research skills with a low degree.

## 4.3 Differences in Levels of Knowledge Possession of Action Research

Results related to the second question, "Does the degree of mathematics teachers possessing knowledge of action research differ according to the different study variables (gender, age, academic qualification, years of experience, and conducting training courses related to action research) in UNRWA schools in Gaza Strip?"

The second question aims to know the differences in the extent to which teachers possess knowledge of action research according to the variables of gender, age, academic qualification, years of experience and training courses. Therefore, constructive analysis using independent samples t-test and single-test variance (ANOVA). Before starting the two tests, the possibility of applying the parametric tests was verified by checking the naturalness of the study variables as shown below:

### 4.3.1 Kolmogorov-Smirnov normality test

Table 3 displays the results of the normalization test of data which applied to each of the variables for measuring the teachers 'knowledge of the action research.

It is noted from the results shown in Table 3 that the value of the statistical significance test (Sig.) for the three variables is smaller than the value of the assumed significance level ($\alpha$=0.05). Therefore, it can be confirmed that the study variables are subject to a normal distribution. Thus, parametric tests can be applied to verify the objectives of the study.

### 4.3.2 Analysis of variance test (ANOVA) and mean difference (t-test)

The mean difference test was performed for independent samples to determine the extent to which mathematics teachers possess knowledge of action research according to the different study variables (gender, age, academic

qualification and years of experience and training courses) depending on two separate sections. The first section included the binary variables (gender and training courses), where (t-test) was performed on these two variables. While the second section included variables with multi categories (age, academic qualification and years of experience), where ANOVA test was performed on them.

The level of significance of the statistical tests was determined at a level of ($\alpha = 0.05$) for all tests. Therefore, it was concluded that there are significant differences when the value of the Sig. is smaller than the significance level (0.05). Accordingly, both (ANOVA) test and (t-test) were performed for independent samples and the results were as shown in the following tables.

Based on the results shown in Table 4, it can be seen that there is no significant effect of gender on the teachers' knowledge of the action research. This indicates a great convergence in the knowledge of males and females regarding their level of knowledge of the action research. We can explain that by the fact that teachers whether male or female work under the same conditions, are governed by the same laws, follow the same administration, receive the same training and have been selected within the same criteria. Also they receive the same professional preparation methods through courses and workshops. Hence it is natural that they possess the same level of knowledge and this is consistent with the results of Rima Hallaq [18].

It is clear from Table 5 that there is no significant effect of the training programs on the extent of math teachers' knowledge with action research. This can be explained in one of two ways, probably by the fact that teachers who receive training programs are keen to transfer the knowledge presented to them in those programs to their colleagues. Or training may have a positive, negative or no impact .This came in accordance with the results of the study conducted by the Deanship of Quality and Development at the University of Hail [19] Whereas, the results of both the study of Khaled Al-Shanbari [12] and the study of Tahani Al-Muzaini and Haya Al-Mazrou [20] indicate the existence of a significant impact of the training programs on the cognitive skills of action research.

Table 6 shows that there is a significant effect of age on the teachers' knowledge of action research. Whereas, the age group (56 years and over) was the best in terms of knowledge. While the youngest age group (25-35 years) is the least in terms of knowledge. And this is normal as the higher the age, the greater will be the knowledge. While the younger teachers are still in the process of forming themselves and gaining more experience at work. This result came in line with the result obtained by Nidal Al-Zatma [21] where his study showed statistically significant differences attributed to the age variable in the field of knowledge in favor of the older sample members.

**Table 1. Research sample demographic and characteristics**

| Variable | | Number | Percentage |
|---|---|---|---|
| Gender | Male | 96 | 39.83% |
| | Female | 145 | 60.17% |
| Age | 25 – 35 years | 107 | 44.40% |
| | 36 – 45 years | 77 | 31.95% |
| | 46 – 55 years | 39 | 16.18% |
| | 56 years and above | 18 | 7.47% |
| Academic qualification | Diploma | 5 | 2.07% |
| | Bachelor | 190 | 78.84% |
| | Post degree | 46 | 19.09% |
| Experience | < 5 years | 35 | 14.52% |
| | 5– 10 years | 59 | 24.48% |
| | >10 years | 147 | 61.00% |
| Training | Got | 61 | 25.31% |
| | Did not get | 180 | 74.69% |

**Table 2. The percentages, means, and standard deviations for the answers of questionnaire questions related to knowledge, arranged in descending order according to the mean value**

| Paragraph number | The paragraphs | Strongly disagree | Disagree | Neutral | Agree | Strongly agree | Mean | Standard deviation |
|---|---|---|---|---|---|---|---|---|
| **8** | Action research methodology and scientific research methodology have the same steps | 2.9%<br>7 | 8.3%<br>20 | 24.9%<br>60 | 45.2%<br>109 | 18.7%<br>45 | 4.5 | 0.73 |
| **12** | Time management is an essential component of performing action research | 0.8%<br>2 | 1.7%<br>4 | 7.1%<br>17 | 38.6%<br>93 | 51.9%<br>125 | 4.5 | 0.78 |
| **6** | All results should be written into the action research | 1.7%<br>4 | 6.2%<br>15 | 23.2%<br>56 | 39.4%<br>95 | 29.5%<br>71 | 4.3 | 0.82 |
| **2** | Teacher can bridge the gap between theory and practice | 0.8%<br>2 | 1.2%<br>3 | 18.3%<br>44 | 54.4%<br>131 | 25.3%<br>61 | 4.2 | 0.69 |
| **3** | Teacher can conduct action research in collaboration with colleagues or alone | 2.1%<br>5 | 8.3%<br>20 | 30.3%<br>73 | 41.1%<br>99 | 18.3%<br>44 | 4.0 | 0.75 |
| **10** | Participation of the action research community is voluntary | 1.7%<br>4 | 5.8%<br>14 | 23.7%<br>57 | 36.1%<br>87 | 32.8%<br>79 | 4.0 | 0.95 |
| **7** | Action research has sequential steps that the researcher must follow | 0.8%<br>2 | 0.4%<br>1 | 7.9%<br>19 | 33.6%<br>81 | 57.3%<br>138 | 3.9 | 0.96 |
| **11** | One of the ethics of action research is to maintain the confidentiality of participants' data | 1.2%<br>3 | 0.8%<br>2 | 7.9%<br>19 | 27.4%<br>66 | 62.7%<br>151 | 3.9 | 0.97 |
| **9** | It is preferable to obtain consent of all participants when conducting action research | 1.7%<br>4 | 6.2%<br>15 | 15.8%<br>38 | 42.7%<br>103 | 33.6%<br>81 | 3.7 | 0.97 |
| **4** | The action research includes educational supervisors | %2.9<br>7 | %7.5<br>18 | %28.2<br>68 | %42.3<br>102 | %19.1<br>46 | 3.7 | 0.94 |
| **5** | Action research needs to collect data from different sources | %0.8<br>2 | %0.8<br>2 | %15.8<br>38 | %35.7<br>86 | %46.9<br>113 | 3.7 | 0.96 |
| **1** | Teacher can solve the educational problems facing the students | %0.8<br>2 | %0.4<br>1 | %8.3<br>20 | %55.6<br>134 | %34.9<br>84 | 1.7 | 0.44 |
| | All paragraphs | | | | | | 3.8 | 0.45 |

Table 7 demonstrates that there is no significant effect of academic qualification on teachers' knowledge of action research. . The reason for this is that the teachers working for the UNRWA are highly qualified and have the highest university results. They were selected after passing the recruitment exams and interviews and outperforming all their peers. Thus they do not lack scientific knowledge in general and knowledge of action research in particular. This result is consistent with the result of Al-Ghamdi's study [22], which concluded that there are no statistical differences between knowledge and academic qualification. Meanwhile, this result did not agree with the result of Budi Prasetyo [23] research, where the study concluded that action research knowledge is affected by the academic degree of the teacher. This result also did not agree with the results of Nidal Al-Zatma [21] ,Firas Odeh [24], and Yasser Al-Otaibi [25], as these studies found that there are statistical differences between knowledge and education qualifications, as the higher the scientific qualification, the greater the knowledge.

As shown in Table 8, it can be confirmed that there is a significant effect of the experience period on teachers' knowledge of action research. The differences were in favor of the class of teachers with more than ten years of experience. This can be explained by the fact that the more years of experience the teacher has, the greater his knowledge of what develops and benefits his profession. This result is consistent with the study of Naeem Jainini [26], which showed statistically significant differences for the years of experience variable on teachers' knowledge in favour of teachers with higher experience. While this result did not meet the findings of Jamal Al-Khatib [27] where his study found that there are no statistically significant differences in the level of teachers' knowledge according to the years of experience variable.

Accordingly, the Least Square Difference (LSD) test was performed to identify differences in the statistically significant hypotheses, as shown in Table 9.

**Table 3. Results of the normal data test applied to the study variables**

| | **Knowing teachers about action research and its foundations** |
|---|---|
| Test statistic F | 0.394 |
| The moral test (Sig) | <0.001 |

**Table 4. The results of (t-test) for independent samples due to the gender variable**

| | **Gender** | | | **F** | **The significant sources of the differences** | **The decision** |
|---|---|---|---|---|---|---|
| | | **Male** | **Female** | | **(P-value)** | **a=0.05** |
| | **n** | **96** | **145** | | | |
| Knowing teachers about action research and its fundamentals | Average<br>S | 4.01<br>0.571 | 4.097<br>0.476 | -1.27 | 0.223 | There is no sig. effect |

**Table 5. The results of (t-test) for independent samples due to the training programs variable**

| | **Training courses** | | | **F** | **The significant sources of the differences** | **The decisio** |
|---|---|---|---|---|---|---|
| | | **yes** | **no** | | **(P-value)** | **a=0.05** |
| | n | 61 | 180 | | | |
| Knowing teachers about action research and its fundamentals | Average<br>S | 4.148<br>0.601 | 4.033<br>0.483 | 1.34 | 0.182 | There is no significant effect |

**Table 6. The results of (ANOVA) test for independent samples due to the age variable**

| | | Age | | | | F | The significant sources of the differences (P-value) | The decision a=0.05 |
|---|---|---|---|---|---|---|---|---|
| | | 25 - 35 | 36-45 | 46-55 | 55 and above | | | |
| | **n** | **107** | **77** | **39** | **18** | | | |
| Knowing teachers about action research and its fundamentals | Averages | 3.963<br>0.598 | 4.143<br>0.420 | 4.103<br>0.447 | 4.222<br>0.428 | 2.659 | 0.049 | There is a sig. effect |

**Table 7. The results of (ANOVA) test for independent samples due to the academic qualification variable**

| | Academic qualification | | | | F | The significant sources of the differences (P-value) | The decision a=0.05 |
|---|---|---|---|---|---|---|---|
| | | Diploma | Bachelor | postgraduate | | | |
| | **n** | 5 | 190 | 46 | | | |
| Knowing teachers about action research and its fundamentals | Averages | 4.000<br>0.707 | 4.058<br>0.484 | 4.087<br>0.626 | 0.095 | 0.909 | There is no significant effect |

**Table 8. The results of (ANOVA) test for independent samples due to the period of experience variable**

| The dependent | Experience | | | | F | The significant sources of the differences (P-value) | The decision a=0.05 |
|---|---|---|---|---|---|---|---|
| | | <5 years | 5 – 10 years | > 10 years | | | |
| | n | 35 | 59 | 147 | | | |
| Knowing teachers about action research and its fundamentals | Averages | 3.857<br>0.733 | 4.034<br>0.490 | 4.122<br>0.452 | 3.939 | 0.021 | There is a sig. effect |

**Table 9. the results of the least squares test to determine differences in the hypotheses of statistical significance**

| Transactions of the test | Preference for differential source levels (LSD) test | | | | |
|---|---|---|---|---|---|
| | Gender | Age | Academic qualification | Experience | Training courses |
| Knowing teachers about action research and its foundations | There is no preference | 1- (56 years and above)<br>2- (36 – 45)<br>3- (46 – 55)<br>4- (25 – 35) | There is no preference | 1- More than 10 years<br>2- Less than 10 years | There is no preference |

Table 9 summarized the preferences of the different variables and arranged the significance independents according to the strength of its effect.

## 5. CONCLUSION

This study aimed to measure the availability of adequate knowledge of action research among mathematics teachers at UNRWA schools in Gaza Strip. The results showed that teachers have a high level of that knowledge. Moreover, the results showed that the degree to which mathematics teachers possessed knowledge of action research did not differ according to the difference of gender, training programs received and academic qualifications, as well as. Whereas, the results indicated that there was a significant effect of the teacher's age on the teachers' knowledge of the action research. The preferences favored the older age group, while the youngest groups were the lees knowledge of all groups. The study also resulted in a significant impact of the period of experience on teachers' knowledge of action research, whereas, teachers with more than ten years of experience have knowledge of action research better than their peers with less than ten years of experience. The following points might be recommended for the future prospective:

1) To carry out this study on math teachers in public and private schools in Gaza Strip.
2) To Study the challenges and obstacles that prevent teachers or limit their ability to perform action research and thus try to overcome those obstacles in order to push the teacher to perform the action research.
3) To conduct studies that include a comparison between the performance of students taught by teachers conducting action research and those taught by teachers who do not conduct action research.

## CONSENT AND ETHICAL APPROVAL

As per university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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