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The Extent of Physics Teachers Employed Active Teaching Methods in Their Classrooms (From Teachers' Perspectives)

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The study aims to examine the level of active teaching practices used by teachers teaching Physics in the classrooms. It sought to examine the potential alteration of these practices on terms of teachers' gender and experiences. The population of the studyconsisted of physics teachers within the Irbid region Educational Directorate, Jordan. There was a representative sample of 256 teachers that participated in this study. The research was conducted through a questionnaire for data collection, utilising the SPSS program for data analysis, as well as valid statistical measures. The results indicated that the degree of employment of active teaching practices by physics teachers was low but, also, somewhat variable depending on the kind of questions raised. The study also demonstrates that there were statistically significant differences in the degree of employment of active teaching practices due to teachers' gender. However, the results show that there were no statistically significant differencesin the teachers' experience. Henceforth, the study recommended the urgent need of providing teachers with professional development programs for enhancing, helping, and raising teachers' awareness of the utility of active teaching practices.

Key words: *Teaching and Learning, Active Teaching Practices, Physics Teaching, Physic Teachers.*

Introduction

The results of the international study of science (TIMSS, 2015) showed that Jordan is ranked 32 out of 39 participating countries with an average score of 426 which is 60 marks below the international average: 486. It is worth mentioning that the international study TIMSS (2015) confirmed that 71% of Jordanian students felt either moderate confidence or a significant lack of confidence in their ability to learn sciences. Although this study indicates that 90% of Jordanian students are fond of sciences, it echoes a vicious reality and a gloomy future that require rigorous measures to address this issue.

As for Jordanian science educators specifically, physics teachers, TIMSS (2015) reported that more than 75% of physics teachers in Jordan hold only a bachelor's degree and an average of 7 years experience. Students taught by teachers with higher levels of experience (10-20 years) record the highest average performance in physics. While the TIMSS study (2015) shows a positive correlation between teacher satisfaction and students' achievement in which about 55% of Jordanian physics teachers feel either 'fully satisfied' or 'dissatisfied' with their work as teachers. In addition, 62% of the teachers indicate that the schools they taught at do not focus on students' achievement.

According to the results displayed by the PISA study (2015) concerning Jordanian students, Jordan ranked 63 out of 72 countries. Indeed, this ranking is very low. It reflects neither the desired expectations nor the efforts of the educational authorities in Jordan. The findings of both TIMSS (2015) and PISA (2015) confirm that females are superior in sciences in all courses from 1999-2015 and that the performance of Jordanian students in sciences is better than that in mathematics. Nonetheless, the general results confirmed that educationalists in Jordanian schools still tend to teach students how to memorise and remember information and does not care much about providing students with problem-solving skills and critical thinking. This is evident in the fact that very few students reach high levels of performance that require the use of higher order thinking skills. This, of course, represents a major challenge for physics curriculum developers to upgrade the teaching methods to enhance students' active learning.

This review unravels unsatisfactory results about the average performance of Jordanian students in physics. It also disentangles their decline at all levels of performance, as well as thepoor use of higher levels of thinking. This indicates that the performance of Jordanian students in sciences – physics - does not go beyond the rudimentary knowledge of certain facts and concepts and the inference of information from data represented in linear graphs or models. This upshot does not correspond to the world demand for high competitive skills (Abu Lebda, Al-Twaissi, and Ababneh, 2017).

According to the TIMSS study in 2015, the weaknesses of educational standards stemmed from the shortcomings of teaching approaches and ineffective activities. The study also uncovered that Jordanian physics teachers neither considered students' needs nor implemented variegated activities to engage all the students. They rather focused on providing theoretical knowledge and inculcating mere abstract rules in traditional ways (Abu Lebda, Al-Twaissi, and Ababneh, 2017). This is confirmed by the national report of the PISA study (2015) conducted by the National Center for Human Resources Development (Ababneh, Al-Twaissi, and Abu Lebda, 2017). Importantly enough, the report recommended the necessity of reviewing teaching methods and classroom practices and developing a comprehensive, integrated approach centered on active teaching and learning.

Problem Statement

Educators in Jordan exerted enormous efforts to adopt active teaching methods that seek to maximise the role of students and make them the core of the educational learning process. Even though they attempt to raise students' critical and creative thinking skills, their attempts were deemed a failure. Similarly, although the Jordanian Ministry of Education has implemented great educational reforms since 1988 and instigated teacher professional development programs (pre-service, in-service, and programs for new teachers), the teaching of sciences in schools is still carried out through traditional approaches.

This practice, of course, results in low-level achievement and retention in physics. This is indicated by both the TIMSS (2015) and PISA (2015). Jordan ranked 63rd in the world in science achievement in the PISA study (2015) out of 72; while in TIMSS (2015), ranked 32 out of 39 countries. Therefore, the Jordanian students' achievement in sciences – physics - came below expectations. The results of TIMSS (2015) indicate that the performance of Jordanian students has decreased significantly with average performances: 475, 482, 449 and 426 for the years: 2003, 2007, 2009 and 2015 respectively. Interestingly, the international averages for the same years were 474, 500, 500 and 486 respectively (Abu Lebda, Al-Twaissi, and Ababneh, 2017).

These results reflect the prevalent use of traditional teaching methods by physics teachers. According to the recommendations of TIMSS (2015) and PISA (2015), schools should adopt innovative and active teaching methods that provide experiential learning opportunities for the brain such as; based, critical thinking and problem-solving practices (Abu Lebda, Al-Twaissi, and Ababneh, 2017).

Aim of the Study

This study aims to uncover the degree of active teaching practices employed by physics teachers in Jordan in terms of gender and experience. The assumption is that the falling standards of students may be due to the lack of using active teaching.

Research Questions

The study attempts to answer the following questions:

1. To what extent do Jordanian Physics teachers employ active teaching practice in the classrooms?
2. Does the degree of active teaching practice amongst Physics teachers, in the classrooms, differ according to gender and experience?

Importance of the Study

The importance of this study lies in enhancing Jordanian physics teachers' skills in employing active teaching practices in their classes for improving students' understanding, thinking skills and favorable attitudes towards learning. Eventually, the study provides some recommendations for promoting teachers professional development through active teaching practices.

Literature Review

Active Teaching and Learning

In a traditional lecture: the teacher does most of the talking while students listen, take notes and incidentally ask a question. In a setting like this, the focus is on the teacher, information is being transferred, and students are passive. The idea that information or knowledge can be transferred from a teacher or a book to a student has been proven inadequate. Traditional teaching is only effective for the reproduction of knowledge but not for higher order thinking skills such as gaining insight, application of knowledge or analysis (Bawaneh, Ahmad Nurulazam., & Salmiza, 2010a).

Constructivism

For the past few decades, the leading paradigm for teaching and learning is that of constructivism. It states that people construct their own knowledge through experience and reflecting on those experiences. New information is built on top of and interacts with existing information which leads to the creation of new knowledge (Bawaneh, Ahmad Nurulazam., &

Ghazali, 2010b). In this view, knowledge is not something that exists on its own and that can be transferred, but every individual has to create the knowledge for him or herself. So for students to learn, they should be active instead of passive. Also, the focus in teaching and learning lies on the student, not on the teacher (Baz, & Bawaneh, 2008).
In summary: within the constructivist view, knowledge is constructed, teaching and learning should be student-centered, and students should be active.

Consequences

Given the three characteristics of constructivism, *teaching* does not equal *learning*. Sometimes we hear teachers sigh that students still don't get it, even when they have explained it a hundred times. From the constructivist viewpoint, this makes perfect sense: the fact that the teacher has explained (an attempt at knowledge transfer) doesn't mean that students have learned (knowledge construction).

So what is the role of the teacher then? They should design courses in such a way that students get the opportunity to create their own knowledge, to learn. Not by transferring knowledge, but by stimulating students to actively engage with the course materials, for example through discussions, assignments, field work, role play, problem solving etc. (Bawaneh, Ahmad Nurulazam., & Ghazali, 2010b; Baz, & Bawaneh, 2008). Of course, the information will have to transfer to the students one way or the other; they need to have something to engage *with* after all. But as we have seen, the learning doesn't end there; it is actually the starting point. When designing and teaching a course, constantly ask yourself: what should my students' *do* that will make them learn?

Active teaching practice unravels the processes through which teachers review their past teaching practice, examine their real classroom practice, and suggest better practice for further development. Teachers are supposed to think about every teaching activity in the classroom. They should review, describe, analyse and evaluate the situation to get fresh active ideas for improving future practices. Reflecting about teaching is not merely thinking about what and how we teach but it is a cyclical critical strategy for assessing the actual efficiency of teaching and an ultimate means for heightening teaching professional development (Olaya, 2018 ; Pacheco, 2011).

In fact, for a deep understanding of the state of the art of active teaching and learning, one cannot escape the great works of John Dewey. Johnston (2007) reviewed *John Dewey and the Art of Teaching: Toward Active Practice* written by six researchers: Douglas, Simpson, Michael. Jackson, Judy, Aycock (2005). He concluded that these authors investigated Dewey's writings and developed his 'statements into metaphors for teaching.

The 1980s witnessed great concerns about inquiring comparison methods, whereby researchers embarked on comparing and contrasting the impact of using two different methods on students' performance and achievement. The results indicate that there is no method that is better than all the other ones at different levels. The focus of theoretical and empirical studies was laid on the searchfor an effective methodology that not only suits learners but also improves their levels as well. In the 1990s, research sought to uncover teachers' practices in their profession. Therefore, there was a shift from external to internal factors. In line with this, Richards and Lockhart (1996) see that the "Active Approach" represents a shift from "methods" and "external" or "top down" views of teaching toward an "internal" or "bottom up" teaching approach that investigates teachers' practices and comes up with appropriate educational proposals.

Active learning requires students to participate in class as opposed to sitting and listening quietly. Strategies include, but are not limited to, brief question-and-answer sessions, discussion integrated into the lecture, impromptu writing assignments, hands-on activities and experiential learning events. As you think of integrating active learning strategies into your course, consider ways to set clear expectations, design effective evaluation strategies and provide helpful feedback (Bransford, Brown, & Cocking, 2000).

Many teachers take for granted their teaching habits which are generally wrapped in erroneous assumptions. To date, questioning these practices seems to be of paramount importance for teachers' academic development. Richards and Lockhart (1996) show that teacher' attitudes, ideas and beliefs about teaching have an influence on their classroom practices and stress the need to unravel the thinking processes underlying them.

Importantly enough, Brookfield (1998) views teachers as prisoners, trapped within their own assumptions about viewing their experiences. He shows that active practice is an inquiry whereby teachers examine the assumptions that frame their teaching through four lenses:

I. The lens of their own autobiographies as learners of active practice.
II. The lens of learners' eyes.
III. The lens of colleagues' perceptions. and
IV. The lens of theoretical, philosophical, and research literature.

Eventually, reviewing classroom practices through these lenses enables teachers to question their assumptions and diagnose their lacuna.

In the same direction, Pacheco (2011: 1) stresses the need to reflect on teachers' actions in teaching classrooms to bridge the gap between theory and practice. He proposes a model for

improving teaching through active practice and action research. In the same line, Zalipour (2015: 4) underlies that

Active learning" means students engage with the material, participate in the class, and collaborate. Don't expect your students simply to listen and memorise; instead, have them help demonstrate a process, analyse an argument, or apply a concept to a real-world situation.

Above all else, teachers' assumptions must be examined in rigorous methodological manners. In this perspective, some attempts strive at establishing a new method based on the maximum use of reflection by teachers. Olaya (2018) investigates whether active teaching can become a strategy for teaching professional development and concludes that it is "important to raise awareness about science teaching, and as a means to encourage teachers to open their minds, update their teaching methods, and make adjustments to their lessons" (p. 149).

In harmony with this view, some researchers (Richards and Lockhart, 1996; Pacheco, 2011; Olaya, 2018) suggest the employment of a range of effective instruments and strategies to record active classroom experiences. The most commonly used strategies include journals, diaries, notebooks, peer observation, portfolios, reports, surveys, questionnaires, interviews, self-monitoring methods, case analysis, action research as well as audio and videotape recordings or a combination of some these forms. The use of active teaching strategies represents a challenging task that necessitates not only passion and commitment on the part of teachers but also more time, effort and sacrifice for dispensing good teaching quality.

In addition to the proliferation of numerous studies that examined the theoretical foundations of active teaching practice, a battery of experimental research works was carried out to explore how this approach can enhance active thinking among teachers and students alike. They investigated the efficiency of this approach in terms of various variables, such as gender and experience.

Töman (2017) investigated the impact of the active teaching practice on the development of teaching skills of the pre-service teachers at Beirut University Faculty of Education Department of Elementary Science Education. Results showed positive effects on promoting thinking skills in planning, implementation and evaluation of a lesson.

Some studies dealt with external factors influencing active practice. Al-qatraoui (2010) study found that using analogical strategies developed students' scientific processes, thinking, action recognition, prediction, deduction and classification processes. In another direction, Al-Atrash (2016) sought to identify the efficiency of a proposed program based on multiple intelligences for developing thinking skills and communication skills of the ninth-grade pupils in Gaza. He

expressed an urgent need to employ programs that are based on multiple intelligences, thinking skills and communication skills to promote students' standards.

Other studies tackled the relationship between active practice and gender among students. Almorshid (2014) investigated the levels of active teaching among Al-Jouf University students in terms of gender and detected a correlation between the acquired level of thinking skills and students' grade point average. A survey was designed based on Kember's RTQ (Kember *et al*., 2000), which comprises four levels: Habitual Action, Understanding, Reflection, and Critical thinking. The study revealed that the overall level of active thinking among Al-Jouf university students had not reached the minimum level of 75%. The findings also showed a decline at all levels of thinking amongst students in first, second and third years but therewas a growth in the fourth year. The study also revealed the presence of significant differences between male and female students at all levels of thinking in favour of males.

In the same perspective, Al-Sa'ydeh (2016) investigated active teaching and its relationship with the demographic variables of gender and grade among gifted students in King Abdullah II schools for excellence in Jordan. The results showed that the level of active teaching was average, and there were statistically significant differences to the gender variable in favour of the males and due to the grade variable in favour of secondary school students. The researcher recommended the urgent needfor training teachers to use active teaching strategies.

Alongside with the previous studies, some research works sought to gauge the level of active teaching practice among teachers. Ostaz (2011) conducted a study aimed at discerning the extent of using active teaching among science teachers at the basic stage in UNRWA and Governmental schools. The results showed that the level of active teaching was less than 70% and that there were no significant differences attributed to gender, scientific qualifications and educational institution. Yet, there were significant differences attributed to educational experience in favour of long experience. Similarly, Hassan (2013) strived at identifying the effectiveness of active teaching-based programs on developing teacher pre-service skills in Egypt and Saudi Arabia. The results revealed a low level implementation of active teaching practice in both countries. According to them, the new program was effective in developing active teaching skills following both experiential and constructive theory.

It is noteworthy that some researchers found that active teaching practice might result in effective classroom-management. Aljabber (2013) investigated the effectiveness of active teaching tools in solving classroom management problems for teachers teaching Science to students at Teachers' Collegeat King Saud University. The results showed positive impacts of the use of active teaching tools on students' acquisition and behaviour. The use of active practices in teaching helps students regulate their time management in the classroom and

minimise ineffective conversation management, excessive daydreaming, inappropriate dialogues, disobedience to teacher's instructions and hyperactive movements.

In light of the results of all these studies, the present article seeks to explore active teaching practice in terms of two demographic variables: gender and experience. We opted for conducting these variables not only because they are not deeply investigated but also because they are significant for further research development.

Methods and Procedures

Population

The population of this study comprised all male and female physics teachers enrolled at Bani Kenanah Educational Directorate from Irbid Governorate / North of Jordan, in the 2017/2018 Academic Year.

Sample

A sample of 256 Jordanian teachers from Irbid region Educational Directorate participated in this study. They were selected randomly without any discriminating factor (Gay & Airasian, 2003). All of them held a major in physics. While some of them held a high Diploma or Master in science/ physics education, others held a Master degree in physics. Table 1 shows the participants' distribution according to their gender and experience.

Table 1: Participants' Distribution by gender, experience

Variable		N	%
Gender	Male	84	33%
	Female	172	67%
Experience / Y	1-5	40	16%
	6-10	61	24%
	11-15	62	24%
	More than 15	93	36%

Table 1 shows participants' distribution by gender and experience. The sample included 256 physics teachers: 84 males and 172 females. They were distributed as follows: 36% of the teachers with an experience more than 15 years, 24% with an experience ranging from 6-10 and 11-15 years, and 16% new teachers with less than five years of experience.

Study Design

To investigate the objectives of the study, the researchers followed the descriptive analytical method.

Study Variables

Independent variables:
1. Teachers' gender (Male, Female)
2. Teachers' experience / year: (1 – 5, 6 – 10, 11 – 15, more than 15)

*Dependent variable*s:
1. The degree of employing active teaching practices in the classrooms by physics teachers.

Research Instrumentation

The researcher adopted the research tool from Ryan (2014) and elaborated it according to Likert scale with five levels (Very often: 5, Often: 4, Neutral: 3, Rarely: 2, and Very rarely: 1). The tool aimed at measuring the level of active teaching in the classrooms applied by Physics teachers.

Validation of the Instrument

To check the validity of the study instrument, the initial version was presented to eight experts in teaching and learning. Three of them held a PhD degree in science education and taught at a university level. Two held a Master's degree in science education and worked as educational supervisors at Irbid region of Educational Directorates. Two-science teachers: one of them holding a Master's in chemistry and the other a Bachelor's in physics and a high diploma in science education. The tool included 32 items, yet five items were deleted based on the experts' recommendations, and the wordings of several items were amended. Overall, the final version included 27 items.

Reliability of the Instrument

To calculate the reliability of the instrument, the researchers applied the tool only one time for 35 science teachers from the second Irbid Education Directorate. Then, they calculated the reliability coefficient of 0.76. This value was considered acceptable in the social sciences (Al-Kellani; and Al-Shraifeen, 2011).

Treatment Procedures

For conducting this study, the researcher asked for a recommendation letter from the Jordanian Ministry of Education. As soon as he received the approval letter, we embarked on piloting the research work.

The next step was selecting the sample from the population and assigning participants to collect the data. Then, we proceeded with the random selection of the teachers in coordination with Irbid Regions Provincial Directorates of Education. In the beginning of April 2018, we started collecting the data from the teachers, and this process lasted until the end of May 2018. Eventually, the SPSS program was used to analyse the data, and valid statistical analyses were provided.

Results

To answer the first question of the study: "To what extent do physics teachers employ active teaching practices in the classrooms?", the researchers calculated the Mean and standard deviation of the instrument items prepared for this purpose, and the results were cast on Table 2.

Principle of items Classification

The following equation was adopted for items classification from (Al Rashidi, 2018).
= (Upper limit of scale - minimum scale) / number of required categories
= (5 – 1)/ 3
= 1.33
The categories are (1 - 2.33: Weak (W), 2.34 – 3.60: Medium (M), and 3.60 – 5: Strong (S)).

Table 2: Means and SD of active teaching practices among Jordanian physics teachers (N=256)

NO	Items	Mean	SD	Degree
1	Starting from student's preparations and abilities	1.70	0.50	W
2	involve students in determining their learning outcomes	1.50	0.70	W
3	Linked to student's life, reality needs and interests.	1.80	1.00	W
4	I allow students to manage themselves and their learning.	1.60	0.72	W
5	Evaluate themselves and their colleagues	1.90	0.94	W
6	Participation students in choosing the system of work and its rules	1.80	0.91	W
7	Spread an atmosphere of tranquility, joy and pleasure while learning	2.00	0.94	W
8	Enable all directions of communication between the learner and the teachers	2.00	0.71	W
9	Diversity of learning resources	2.00	0.83	W
10	Use Dialogue and discussion strategy	2.00	1.04	W
11	Use Brainstorming strategy	2.00	0.90	W
12	Use Problem Solving Strategy	2.17	1.14	W
13	It occurs through the interaction of the student with everything that surrounds him in his environment.	2.07	1.00	W
14	It happens in all places where the learner is active (home - school - neighborhood - club - theater)	2.31	1.10	W
15	Use Discovery Strategy	2.10	0.95	W
16	Use Collaborative learning strategy	2.16	1.07	W
17	Use Self - learning strategy	2.60	1.20	M
18	Use Peer Learning Strategy	1.95	0.80	W
19	Use Role Playing Strategy	2.20	0.94	W
20	Use Mind Mapping Strategy	2.60	1.23	M
21	Use Six Hats Strategy of thinking	2.75	1.25	M
22	Use brain – based teaching Strategy	3.01	1.30	M
23	Use conflict mapping strategy	2.40	1.10	M
24	Use ICT in teaching	2.56	1.23	M
25	I conduct project based teaching.	3.58	1.15	M
26	Develops the ability to think and do researches	3.97	1.20	S
27	Use student-centered teaching strategies.	3.31	1.46	M
Overall		**2.30**		**W**

The results in Table 2 show that the overall Mean for physics teachers is 2.29. This shows that their level of employing active teaching practices in the classrooms is extremely weak. The

highest average Mean for physics teachers is 3.97 (Strong item) corresponding to item 26, which indicates that physics teachers are very active in writing and publishing educational research works because the Ministry of Education has decreed research publication as one of the requirements for ranking teachers. This is followed directly by item 25 with a Mean of 3.58 (Medium item) which supports the previous one that science teachers are seriously doing action research in learning through conducting project based teaching. Then, comes item 27 with a Mean 3.31 (Medium item) in the third rank. This indicates that physics teachers using student-centered teaching strategies for improving students' skills and competencies.

However, the second item comes in the last order in terms with a Mean of 1.53 (Weak item). This item addresses that physics teachers do not involve the students in determining the learning outcomes. It shows that students are not engaged from the very beginning, or they are not motivated to practice new skills in their classes. Indeed, students' attitude is not positive enough to try out new ideas for enhancing their learning. This is supported by the next lowest item which is number 4 with a Mean 1.62 (Weak item) and demonstrates that the teachers do not allow students to manage themselves and their learning.

To answer the second question: "Does the degree of active teaching practices employed by physics teachers in the classrooms differ according to gender and experience?", the researcher calculated the statistical Means and standard deviations as shown in Table 3.

Table 3: Means and standard deviations of physics teachers' active teaching practices in the classrooms

Variable		N	Mean	SD
Gender	M	84	2.42	0.53
	F	172	2.24	0.49
	Total	256	2.30	0.51
Experience / Y	1-5	40	2.20	.480
	6-10	61	2.30	.530
	11-15	62	2.37	0.48
	More than 15	93	2.29	.520
	Total	256	2.30	0.51

The results in table 3 show that there is a difference in the Mean between males and females with 0.18 for males, where the mean of males is 2.42, and the standard deviation is 0.53. In comparison to the Mean of females is 2.24 with a standard deviation of 0.49. Regarding teachers' experience, Table 3 indicates that the category of teachers with teaching experience (11-15 years) is the highest one towards active practices in the classrooms with a Mean of 2.37 and a standard deviation of 0.48. Yet, the active practices in the classrooms of (1-5 years) category are the lowest with a Mean of 2.20 and a standard deviation of 0.48.

The examination of the above results reveals apparent differences in the mean of the degree of employing active teaching practices in the classrooms by physics teachers according to the variables of gender and experience. To ascertain the validity of the differences, the researcher performed the ANOVA test, and the results are presented in Table 4 below:

Table 4: ANOVA test of physics teachers' active teaching practices in the classrooms

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	Hypothesis	1222.950	1	1222.950	702.097	0.024
	Error	1.742	1	1.742[a]		
Gender	Hypothesis	1.742	1	1.742	6.912	0.009
	Error	64.010	254	.252[b]		
Intercept	Hypothesis	1228.755	1	1228.755	5524.357	0.000
	Error	0.765	3.442	0.222[a]		
Experience	Hypothesis	0.661	3	0.220	0.853	0.466
	Error	65.091	252	0.258[b]		

Table 4 shows that there are statistically significant differences in physics teachers' active teaching practices in the classrooms due to teachers' gender where $F = 6.912$ and $\alpha < 0.05$. On the other hand, the results indicated that there are no statistically significant differences in Physics teachers' active teaching practices in the classrooms due to the teachers' experience where $F = 0.853$ and $\alpha = 0.466$.

Discussions

Concerning the result that the level of using active teaching practice is low among physics teacher, many researchers (Al-Ustad, 2011; Hasan, 2013; Almorshid, 2014; Al-Sa'ydeh, 2016; BuQhoos, 2017) suggest that several justifications may explain this finding. First, the scientific content of physics text books is not designed in a way that is consistent with active teaching practice, and this, of course, does not encourage physics teachers to adopt this strategy. Second, physics teachers do not perform active practice in their daily educational behavior. Besides, there is a lack of opportunities for direct interaction and dialogue among physics teachers to develop their skills in active teaching practice. Most importantly, the results pinpoint that teachers' difficulties in possessing active teaching skills and practice are due to the lack of pre- and in-service training that should be provided by specialists in the field.

According to the results, there is no difference in terms of the scientific experience of physics teachers. Several researchers (Ostaz, 2011; Al-Sa'ydeh, 2016; Abu-Sultan and Abu-Asker, 2017; Al-Rfou'a, 2017; BuQhoos, 2017) believe that the lack of active teaching practices of

Physics teachers is due to other reasons that are not related to the scientific qualification. Active teaching practice is a new approach in the preparation of teachers, and teachers, regardless of their scientific qualifications, are not trained in this field. Physics teachers who work in the public sector provide the same content under the same method and work under the same conditions. There are also no significant differences in the material income, according to the difference of experience and scientific qualification as well as in the case of differences in educational standards. This, of course, reduces the motivation of physics teachers to devote themselves to teaching and experimenting with modern strategies and techniques.

More importantly, the results indicate that there is a statistically significant difference among teachers in terms of gender in favor of males. In contrast to male teachers who are free of any domestic duties in Arab societies, female teachers are also considered as housewives who are responsible for carrying out different daily household chores. In this context, Ostaz (2011) suggests that this statistically significant difference in gender in favor of males is due to the nature of the society that largely depends on females at home after the end of their school time. When the woman returns home, she must carry out household obligations such as preparing food for the family, cleaning, washing, ironing and other works. This burden reduces the time available for the female teacher to reflect on the lessons she has already dispensed to her students and to prepare for the coming lessons adequately. However, when the male teacher returns home, he does not have many commitments at home, especially if he has no other work to increase his family income. Therefore, the male teacher has enough time to reflect on the preparation of his lessons and the accomplishment of his teaching tasks somewhat appropriately. Al-Rfou'a (2017) confirms this viewpoint and further asserts that Arab society, in general, is male-oriented that often gives males more opportunities for discussing, debating and experimenting with new ideas.

Conclusions and Recommendations

Overall, the active teaching approach should, in no way, be estranged from any pedagogical practice if teachers want to accomplish professional development and long-life prosperity in the twenty-first century. The study recommended the necessity of instructing teachers about the importance of using active teaching practices. It also pinpointed the need for professional development programs in order to enhance teachers' skills in active teaching in the classroom. The study also recommended the obligation to supplement all disciplinary teacher guides with efficient mechanisms for furthering active teaching practices in the classroom.

REFERENCES

Ababneh, E; Al-Twaissi, A; and Abu Lebda, Kh. (2017). Program for International Student Assessment (PISA2015): *National Report. National Center for Human Resources Development (NCHRD*), (1787 / 4 / 2017), Amman, Jordan.

Abu Lebda, Kh; Al-Twaissi, A; and Ababneh, E. (2017). Jordanian National Report of TIMSS 2015 Study. *National Report. National Center for Human Resources Development (NCHRD)*, (2017/8/3881), Amman, Jordan.

Abu-Sultan, A; and Abu Asker, M. (2017). The Active Practices of Science Teachers in the Upper Basic Stage in the northern Gaza. *Journal of Palestine University for Research and Studies. 7(1), 1-27.*

Al-Atrash, T. O. N. (2016). *Effectiveness of a suggested program based on multiple intelligences in developing the skills of Active thinking and mathematical communication among ninth graders in Gaza*. Master Dissertation. The Islamic University, Gaza.

Aljabber, J. (2013). The effectiveness of Active teaching tools in solving classroom management problems for science student teachers at Teachers' College in King Saud University. *International Journal of Educational Research*, Vol. 33, pp: 91-128. UAE.

Al-Kellani, A, Al-Shraifeen, N. (2011). *Introduction to research in educational and social sciences*. (3rd Ed), Dar Almaisarah for publishing, distribution and printing. Amman, Jordan.

Almorshid, Y. (2014). Levels of Active Thinking among Al-Jouf University Students: A Cross-sectional Study. In *Taiba University Journal of Educational Sciences*, 9/2: 163-184.

Al-qatraoui, A. (2010). *The Effect of using 'Analogical Strategy' on developing science process and Active thinking skills in sciences among eighth graders Fundamental School*. Magister Dissertation, Faculty of Education, Islamic Ghaza University.

Al-Rashidi, F. (2018). The level of using the Active practices among secondary school teachers-from their points of view- in Baredah governorate. *Journal of Faculty for Basic Education in Educational and Human Sciences / Babel University, April(38), 284-294.*

Al-Rfou'a, M. (2017). The degree to which tenth grade students possess Active thinking skills and its relationship with their academic achievement. *Journal of the Faculty of Education, Al- Azhar University, 174(1), 721-752.*

Al-Sa'ydeh, N. M. (2016). Active thinking and its relationship with some demographic variables among gifted students in King Abdullah II Schools for Excellence in Jordan.*Studie in Educational Sciences*, Jordan, Vol. 43, No. 4: pp. 1747-1757.

Angel, G. (2015). *PISA 2015 Results in Focus. Andreas Schleicher Andreas.Schleicher@oecd.org*. paper see also [online]. [Accessed 16 March 2019]. Available from the World Wide Web: http://www.oecd.org/pisa/pisa-2015-results-in-focus.pdf.

Bawaneh, A., Ahmad Nurulazam., & Ghazali, M. (2010). The effective of conflict maps and the v-shape teaching method in science conceptual change among eight-grade students in Jordan. *International Educational Studies*, 3(1), 96-108.

Bawaneh, A., Ahmad Nurulazam., & Salmiza, S. (2010a). Radical conceptual change through teaching method based on constructivism theory for eight grades Jordanian students. *The Journal of International Social Research*, 3(14), 131-147.

Baz, T., & Bawaneh, A. (2008). The effect of using conflict maps as an instructional tool in changing alternative conceptions of eight grade students in science in the Hashemite kingdom of Jordan. *The Educational Journal*. University of Kuwit, 87(22), 149–189.

Brookfield, S. D. (1995). *Becoming a Critically Active Teacher*. San Francisco: Jossey-Bass, Brookfield, S. D. (1998). Critically Active Practice. *The Journal of Continuing Education in the Health Professions*, Volume 18, pp. 197–205. Printed in the U.S.A.

BuQhoos, K. (2017). Relationship between Active thinking and teaching performance of student teachers specialized in science and mathematics. *International Journal for Research in Education. 41(1), 38-65.*

Gay, L. R. and Airasian, P. W. (2003). *Educational research: Competencies for analysis and application*. (7th Ed), Prentice Hall. USA.

Hassan S. J. M. (2013). A Active teaching-based program for developing teaching skills in accordance with quality standards and improving the teaching theory of Arabic language and Islamic pre-service teachers in Egypt and Saudi Arabia. *International Journal of Education,* Vol. 2, No 7, pp: 652-682

Johnston, J. S. (2007). *Review of John Dewey and the Art of Teaching: Toward Active and Imaginative Practice* by Douglas J. Simpson, Michael P. Jackson, and Judy C. Aycock (2005). Thousand Oaks, CA: Sage Publications. *Paideusis*, Volume 16, No. 1, pp. 69-71

Martin, M. O., Mullis, I. V., Foy, P., Hooper, M. (2016). TIMSS 2015 International Results in Science. Publisher: TIMSS & PIRLS International Study Center, Lynch School of Education, Boston College, Boston College, Chestnut Hill, MA 02467, USA.

Mathew, Priya: Mathew Prasanth and Peechattu Prince, J. (2017). Active practices: A means to teacher development. *Asia Pacific Journal of Contemporary Education and Communication Technology*, Volume: 3, Issue: 1, pp. 126-131.

Obiedat, D. H; Kayed, A; & Adass, A. (2016). *Scientific research: understandable, tools and methods.* Dar Alfiker: Publishers and distributors. Amman, Jordan.

Olaya Mesa, M. L. (2018). Active teaching: An approach to enrich the English teaching professional practice. HOW, 25(2), 149-170. https://doi.org/10.19183/how.25.2.386.

Ostaz, M. (2011). The ability level of Active thinking of science teachers in basic stage in Gaza. *Journal of Al-Azhar University in Gaza, Series of Humanities*, 13(1B), 1329-1370.

Pacheco, A. Q. (2011). Active teaching and its impact on foreign language teaching. *Actualidades Investigativas en Educación* · DOI: 10.15517/aie. v5i3.9166 pp: 1-19.

Rayford, C. R. (2010)."Active practice: The teacher in the mirror" UNLV Theses, Dissertations, Professional Papers, and Capstones. 5. University of Nevada, Las Vegas

Richards, J. C. and Lockhart, C. (1996). *Active Teaching in Second Language Classrooms.* Cambridge: CUP.

Richert, A. (1990). Teaching teachers to reflect: A consideration of programme Structure. *Journal of Curriculum Studies*, 22 (6), 509-527.

Richardson, V. (1990). The evolution of Active teaching and teacher education. R. T. Clift, W. R. Houston, & M. C. Pugach, (Eds.), *Encouraging Active Practice in Education,* New York: Teachers College Press.

Ryan, A. (2014). The Degree of Active Practices of Mathematics Teachers in Hebron Directorates of Education & Its relationship with Teaching Self-Efficacy. *Manara Journal*, AL-Bayt University, 20 (1B), 143-173.

Schön, D. (1983). *The Active Practitioner*. New York: Basic Books, Inc.

Schön, D. (1987). Educating the Active practitioner: Strengthening teachers' Active decision making. *Journal of Staff Development*, 9 (3), 18-27.

Tajik, L., & Pakzad, K. (2016). Designing a Active Teacher Education Course and its Contribution to ELT Teachers' Reflectivity. Australian Journal of Teacher Education, 41(9). http://dx.doi.org/10.14221/ajte.2016v41n9.4

Töman, U. (2017). Investıgatıon of Active Teachıng Practıce Effect on Traınıng Development Skılls of the Pre-servıce Teachers. Journal of Education and Training Studies, Vol. 5, No. 6: 232-239.

Zalipour, A. (2015). Active practice: Teaching development unit. Retrieved from https://www.waikato. ac.nz/__data/assets/pdf_file/0006.