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The perceptions of King Abdullah II School for Excellence teachers about the importance of using flipped learning for the development of students' reflective thinking in Jordan

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The study aims to reveal the perceptions of King Abdullah II School for Excellence teachers about the importance of using flipped learning in developing the reflective thinking of their students in Jordan. The population of the study consists of 227 male and female teachers. The sample of the study consists of 180 teachers: 87 males and 93 females selected using simple random method from the study society during the second semester of 2016/2017 session. The study tool, qustionaire used containing 50 items was divided into 5 stages: critical vision, detection of fallacies, give of convincing explanations, and suggestion of solutions. The study showed that the teachers' perception of using flipped learning in developing their students' reflective thinking was high in different disciplines; and there were significant differences in their perceptions based on their gender and experience. Lack of differences in their perceptions depends on specialization variable. From the findings of the study, the researchers presented a set of recommendations.

Keywords: flipped learning, reflected thinking.

INTRODUCTION

God created man and distinguished him from other creatures by giving him the ability to reason and think about many situations and his surroundings. Thinking is the most complex skill of human behavior , the most important tool that helps man to adapt to his environment and use knowledge to achieve his goals and solve problems. There are many types of thinking exercised by man, including reflection.

Reflective thinking is one of the types of thinking that makes an individual plan and evaluate his method and steps to make the right decision. It helps man to face problems and change phenomena and events. A person who thinks has the ability to understand relationships, make summaries, use information to strengthen his point of view, analyze information, review and search for alternatives (Abdel Wahab, 2005).

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The concept reflective thinking refers to "meaningful mental activity based on reflection that involves the skills of visual vision, detection of fallacies, reaching conclusions, providing abstract interpretations, and developing proposed solutions to scientific problems" (Al-Qatrawi, 2010:10).
According to Alafon (2012) and Hudaibah and Ambusidi (2015), contemplative thinking includes five basic skills:

1. Visual Vision (Meditation and Observation): It is the ability to know subject through images, drawings and shapes.
2. Detection of fallacies: It means the ability to identify gaps in the subject and identify incorrect relationships.
3. Access to conclusions: It is the ability to arrive at logical relationships about the subject.
4. Giving convincing explanations: It means the ability to give logical meaning, using previous and new experiences.
5. Developing suggested solutions: The ability to develop logical steps to solve problems through a series of steps based on mental perceptions

Erzlu and Arslan (2009) point out that reflective thinking leads to the discovery of evidence that gives attitudes new meanings. In this process, the individual can explore and deepen new experiences, become aware of what he or she is learning and think about how to modify existing knowledge to get new one by linking information to each other. Reflective thinking has a variety of characteristics (Al-Far, 2011), (Obaid and Afana, 2003):

1. A distinct mental activitythat depends directly on the general laws of phenomena; it stems from consideration, sensory experience and reflects the relations between phenomena.
2. Reflective thinking requires the use of standards, critical visual vision and it must be measured.
3. is closely related to the practical activity of man, and indicates the personality of man.
4. Is cognitive thinking, focusing on problem solving, decision making, and law enforcement,
5. It interprets results and reaches the optimal solution to any problem.
6. Is an effective thinking that follows a precise and clear methodology based on correct assumptions.

Traditional teaching method has become useless, and does not stimulate the passion for learning, because it is not compatible with the environment outside the school, where technology has taken over. This generation needs technology to add excitement and suspense to the learning environment, curriculum materials and classrooms. There is also need for effective communication between teachers and learners, to meet the individual needs of each student by using modern technologies and strategies such as e-learning strategy, blended learning strategy, web quest and flipped learning strategy (Khalifa and Mutawa, 2015).

Flipped Learning is one of the types of blended learning that uses technology to deliver lectures outside the classroom. It is widely used by Bill Gates, the founder and former CEO of Microsoft, who sees this kind of education as exciting and innovating (Bram, 2013).

Flipped learning strategy helps students to receive new concepts of studying at home; it helps teachers to use learning media and resources for lessons, such as videos, websites, social networks or e-learning management systems like Moodle, blackboard. Students can study at home using modern technologies such as smart devices (Randall, 2013).

Flipped learning has many advantages in education (Sang and Nam, 2014), (Pearson, 2013):

1. Promotes the optimal use of modern technology in education
2. Gives students the opportunity to preview the content before the time of class.
3. Ensures good use of separate time
4. Builds stronger relationships between teachers and students
5. Improves students' achievement and develops their comprehension
6. Provides interactive activities in the classroom focusing on the skills of higher level of knowledge.

As modern education method considers learners to be the center of the process of learning, researcher of knowledge, thinker and contemplator independently without the guidance of teachers, by exploitation of the technological potential available to them outside the classroom, such as smart phones and tablets, Websites, social networking sites, various websites of diverse information, help links, and online guides, this study examines the perceptions of teachers of King Abdullah II Schools for Excellence about the use of inverted learning in the development of their students' thinking in Jordan

Problem of the study

The researchers have noted through their previous work in the field of education and supervision at the Ministry of Education, that there are weaknesses in different skills, particularly thinking, since students rely on learning to memorize and conserve information. Also, some studies have indicated the low level of students' thinking ability like that of Al Baali (2006) and Abdul Wahab (2005). In their study, Al-Qur'an and Al-Hamouri (2011) noted that students have difficulty in employing thinking skills to solve problems. They also noted that enough time is not given in the classroom to carry out the programs and strategies needed to develop students' abilities to think

and reflect. To do so, the strategy of flipped learning has to come up. Flipped learning is a technical solution to the development of thinking skills. The problem of the study is therefore determined by answering the main questions of the study:

Research question

1. What are the perceptions of teachers of King Abdullah II School for Excellence about the use of flipped learning in developing the thinking skills of Jordan students?
2. Are there differences in the perceptions of teachers of King Abdullah II Schools for Excellence about the importance of using flipped learning in the development of reflective thinking in their students according to gender, experience and specialization?

The importance of the study

1. Encourage teachers to use education technology, and to exploit students' smart devices.
2. Direct the Ministry of Education and various educational institutions to activate the application of flipped learning, and use it in the development of thinking among students.

Study terms

Perceptions

It is the degree of awareness of the teachers of King Abdullah II Schools for Excellence about the contribution of flipped learning to the development of students' thinking; it is measured by the tool developed by the researcher, and is characterized by honesty and persistence.

King Abdullah II Schools for Excellence

It belongs to the Ministry of Education in Jordan, which attracts outstanding students, aims to provide a model environment to create a generation capable of reaching the future with confidence and efficiency.

Flipped learning

An educational strategy based on the use of modern technological media and global information network that allows the teacher to prepare lessons through video clips, audio files and other media for students outside the classroom (at home, for example); the students use their computers or smartphones before attending class, while classroom time is allocated for discussion, implementation of various activities and feedback.

Reflective thinking

The student's mental activity in the educational situations in front of him enables him to identify his strengths and weaknesses, to discover logical fallacies, to reach conclusions, to provide convincing explanations, and to develop suggested solutions.

Previous studies

This section deals with the studies that enable the researcher to access them after his knowledge of the literature in this field. The researcher mentioned some studies related to flipped learning, and meditation as follows.

Arcos (2014) conducted a study aimed at understanding the perceptions of teachers in the general education system who implement the flipped learning system through open educational resources on the performance of learners in some US schools. The researcher used the descriptive approach. A teacher uses and applies the flipped learning system. The study shows that the use of open educational resources instead of the opposite learning led to increased learners' satisfaction with the learning process, and participation , as well as increase in the rate of cooperation of colleagues in the management of learning.

The study of Ahmadi (2011) aimed at revealing the attitudes of teachers in the leading schools in the Medina area towards the importance of educational techniques in the development of thinking among students. The study was applied to a sample of 140 teachers who were chosen by random stratified method. The study indicates that the attitudes of teachers were high for all fields, and that there are differences of statistical significance due to the variables of the study, such as specialization and literary benefit, BSc, experience in teaching and in favor of top experienced teachers. The study recommended focusing on teaching methods based on the use of educational techniques, and that it improves students' thinking.

Al ostaze (2011) conducted a study on the level of reflective thinking ability of science teachers in the implementation of educational tasks at the basic stage. The sample consisted of 108 teachers; descriptive analytical method was used. The results of the study indicated that the level of the contemplative thinking ability of science teachers is less than the default rate of 70%; there were statistical significant differences based experience variable; there were no statistical significant

differences of in the variables of gender and scientific qualification.

Jeremy (2007) did a study at the University of Ohio, using flipped learning in mathematics. He providing students with illustrations and videos prepared in advance; they were told to do some of the learning activities and duties in the classroom, assuming to be at home. Learning outside the classroom was based on the Smart Tutoring System (STS), such as laptops with access to Internet. The results of the study show that the students were not sufficiently satisfied with the flipped learning strategy as they were more adaptive to the traditional method and based primarily on teachers' efforts. The results were somewhat unsatisfactory. As for students' activity and classroom interaction, the results indicated a preference for the experimental sample, but not to the extent that the results could be distributed along the same lines. The researcher recommended further research and experiments on the flipped learning strategy and providing sufficient training period for both teachers and learners.

Comment on the previous studies and the location of the current study

Some of the studies dealt with flipped learning such as: Arcos, (2014), Graham, (2013), Jeremy, (2007), others studies dealt with general thinking and contemplative thinking such as Ahmadi (2011), (Jeremy, (2007); and some studies have used the analytical descriptive approach such as: Arcos, (2014), Graham, (2013), Jeremy (2007), Ahmadi (2011), and Professor (2011).
The researcher benefited from the previous studies in identifying the problem and formulating its hypotheses, determining the procedures used in this study, designing the study and its tools

What distinguishes the current study from its predecessor is it is one of the first studies to examine the perceptions of the teachers of King Abdullah II Schools of Excellence about the importance of using flipped learning in the development of thinking among students in Jordan.

STUDY PROCEDURES AND METHODOLOGY

The population of the study consists of all teachers of King Abdullah II Schools of Excellence (227) . The sample of the study was 180 teachers: 87 males and 93 females were selected by simple random method from the study society during the second semester of 2016/2017. Table 1 shows the distribution of the study sample according to its variables.

The study instrument

The study instrument consisted of a questionnaire developed according to the educational literature on the subject of the study, especially the study of Ahmadi (2011) and Abo Nahl (2010). The study tool consisted of 57 sections divided into five fields.

The validity of instrument

The validity of the study instrument was verified by presenting it to a group of 10 arbitratary specialists and experienced members of the Faculty of Educational Sciences in Jordanian universities, in addition to some supervisors, 7 arbitrators (70%). The amendments received by the arbitrators were taken into consideration, and the arbitrators unanimously agreed to delete, add or amend any of the paragraphs. Upon the deletion of 7 paragraphs, the researchers' opinions and observations were taken; four paragraphs were amended. The final form consisting of 50 out of 57 paragraphs was included (Table 2).

The researchers used a five-point scale; the scale scores are given as follows: Grade 5 is a very strong response, grade (4) is OK, grade (3) is neutral response, grade (2) is unapproved response, grade (1) is severely disagreeable response.
The researcher saw the use of the gradual criterion to judge the responses of the members through the following equation:

(highest value – lowest value)÷ Number of categories = Number of categories = 5
5-1=4
4÷5 = 0.8

The reliability of the instrument

To verify the statistical treatments, the researcher extracted the coefficient of internal consistency using the coefficient Kronbach Alpha; the stability coefficient was based on the total score (89.0). This value is sufficient and acceptable for the purposes of this study.

Study variables

The study includes the following variables:

Independent variables

1. Sex has two categories: (male, female)
2. Experience in teaching has three levels: (from 1 to 5 years, from 6 to 10 years, more than 10 years).
3. The academic field has two levels: scientific and human.

The gender variable was chosen because of the difference in the pattern of thinking among the categories of this variable. In addition, the teachers' society consists of males and females. The choice of the variable of the academic field for its relation to the cognitive aspect and its different levels indicate the difference in knowledge and skill in each individual.

Dependent variables

Perceptions of teachers of King Abdullah II Schools of Excellence for the use of flipped learning in the development of students' reflective thinking.

Statistical processes

The means and standard deviations of the perceptions of teachers of King Abdullah II Schools of Excellence will be calculated for the importance of using inverted learning in the development of reflective thinking. In order to answer the second question of the study, the means, standard deviations, and the independent sample

Table 1. Distribution of the sample of the study according to its variables (N=180).

S/N	Variable	Level		Percentage
1	Gender	Male	87	84.4
		Female	93	51.6
2	Specialization	Scientific	81	45
		Humanitarian	99	55
3	Experience in the field	1-5 years	38	21
		6-10 years	54	30
		Above 10 years	80	48

Table 2. Items questionnaire on study fields.

Field	Number of paragraphs
Critical visual vision	7
Detection of ablutions	9
Reach conclusions	8
Give convincing explanations	14
Put suggested solutions	12
Total	50

Table 3. The gradual criterion for judging the perceptions of the members of the study sample.

4.20 - 5.00	Very high
3.40 - 4.19	High
2.60 - 3.39	Medium
1.80- 2.59	Low
1.00 - 1.79	is very low

t-Test of teachers' perceptions by gender variable and academic field will be calculated. In the area of teaching experience, means and standard deviations will be calculated using One-Way ANOVA.

RESULTS AND DISCUSSION

To answer the first question of the study, which states: "What are the perceptions of the teachers of King Abdullah II Schools for Excellence about the importance of using flipped learning in the development of students' thinking in Jordan?" The results of the perceptions of the teachers of King Abdullah II Schools of Excellence in the study were presented according to the sections of the study instrument divided based on fields (Table 4).

Table 4 shows that the degree of the teachers 'perceptions of the importance of using reverse learning in the development of students' reflective thinking was high with an average of 3.83 and a standard deviation of 0.52. In the area of the instrument, the first area to reach conclusions came first with an arithmetic mean of 4.03 and a standard deviation of 0.75. In the second place, the field detecting of ablutions came with an average of 3.97, and a standard deviation of 0.66. In the fourth place came the field of developing proposed solutions with an average of 3.73, and a standard deviation of 0.47. In the fifth place came the field give convincing explanations with an average of 3.66 and a standard deviation of 0.49.

In order to understand the perceptions of the teachers of King Abdullah II schools for each of the five fields, the statistical averages and standard deviations of each paragraph in each field were extracted in descending order as follows:

The first area "reaching conclusions"

Table 5 shows that this 7 items of field were highly rated. Their means ranged between 3.99 - 4.19, and their standard deviations ranged between 1.05 – 0.74, except for paragraph which came in average estimate, with an average of 3.38 and it standard deviations 0.94. This field as a whole came first with an average of 4.03 and a standard deviation of 0.75.

The Second area is "Detecting Mistakes"

Table 6 shows that all paragraphs were high; their mean

Table 4. Means and standard deviations for the study fields.

Field	Domain	Mean	Standard deviation	Degree
First	Reach conclusions	4.03	0.75	High
Second	Detection of ablutions	3.97	0.54	High
Third	Critical visual vision	3.77	0.66	High
Forth	Put suggested solutions	3.73	0.47	High
Fifth	Give convincing explanations	3.66	0.49	High
Total		3.83	0.52	High

Table 5. The arithmetical averages and the standard deviations of the perceptions of the subjects on paragraphs the first area is "reaching conclusions".

Rank	Paragraph number	Paragraph	Mean	Standard deviations	Degree
1	2	Flipped learning contributes to clear results.	4.19	0.74	High
2	4	Flipped learning helps to move from year to year.	4.17	0.74	High
3	5	Inverted learning helps to make judgments about the validity of the conclusion.	4.15	0.75	High
4	3	Flipped learning contributes to organizing ideas in a variety of areas.	4.15	0.71	High
5	1	Flipped learning helps to use previous experiences to reach conclusions.	4.11	0.85	High
6	6	Flipped learning helps to analyze the relationship between different concepts.	4.10	1.140	High
7	8	Flipped learning helps to move from the local to the global.	3.99	1.05	High
8	7	Backward learning helps to achieve the logical sequence of ideas.	3.38	0.94	Medium

Table 6. The means and the standard deviations of the perceptions of the study subjects in the second area.

Rank	Paragraph number	Paragraph	Mean	Standard deviations	Degree
1	9	Flipped learning contributes to identifying gaps in different subjects.	4.11	0.83	High
2	5	Flipped learning helps to bridge gaps in perceptions and ideas.	4.11	0.78	High
3	7	Flipped learning helps identify incorrect relationships in subjects.	4.09	0.95	High
4	8	Flipped learning contributes to the identification of irrational relationships in different subjects.	4.08	0.41	High
5	1	Flipped learning helps to modify some misconceptions.	4.04	0.66	High
6	4	Backward learning helps to understand unorganized thoughts.	4.04	0.74	High
7	3	Flipped learning helps to recognize deficiencies.	3.86	1.09	High
8	2	Flipped learning helps validate information in terms of: (scientific health, modernity, applicability).	3.74	0.84	High
9	6	Flipped learning helps to recognize ambiguities.	3.70	0.61	High

ranged between 4.11 and 3.70. Their standard deviations ranged between 0.61 and 0.83. This field as a whole came in second place with an average of 3.97 and a standard deviation of 0.54.

The third area is "critical visual vision"

Table 7 shows that 2 paragraphs were very high; their mean ranged between 4.31 and 4.28. Their standard deviations ranged between 0.26 and 0.48. Table 8 shows that 3 paragraphs were high; their mean ranged between4.16 and 3.98. Their standard deviations ranged between 0.74 and 0.88 and Table shows that (3) paragraphs were Medium, their mean ranged between (3.15) and 3.32 Their standard deviations ranged between (0.52) and 0.68.

The fourth area, "Developing Proposed Solutions"

Table 8 shows that 2 paragraphs in this field were very

Table 7. The means and standard deviations of the perceptions of the study subjects in the three areas of the "Critical Visual Vision".

Rank	Paragraph number	Paragraph	Arithmetic mean	Standard deviation	Degree
1	3	Flipped learning contributes to the presentation of aspects of the subject in various forms.	4.31	0.48	Very High
2	1	Flipped learning helps to give an accurate description of the concepts and their components.	4.28	0.56	Very High
3	7	Backward learning helps to show the relationships between concepts and information using charts and illustrations.	4.16	0.74	High
4	5	Flipped learning contributes to linking the subject elements.	4.16	1.12	High
5	4	Flipped learning helps to organize data.	3.55	0.88	High
6	2	Flipped learning helps identify similarities and differences.	3.32	0.52	Medium
7	6	Flipped learning helps to analyze the elements of the subject.	3.24	1,08	Medium
8	7	Flipped learning helps predict results.	3.15	0.68	Medium

Table 8. The means and standard deviations of the perceptions of the study subjects in the fourth area "development of proposed solutions".

Rank	Paragraph number	Paragraph	Mean	Standard deviation	Degree
1	2	Flipped learning contributes to the discussion of ideas.	4.42	0.68	Very High
2	8	Flipped learning helps to visualize and predict.	4.36	0.46	Very High
3	3	Flipped learning helps to predict results.	4.16	0.82	High
4	5	Flipped learning contributes to clarifying the relationship between different concepts.	4.16	0.41	High
5	9	Flipped learning helps to examine accidents and intended events.	3.98	1,09	High
6	4	Flipped learning helps produce the most solutions and ideas.	3.96	0.44	High
7	12	Flipped learning helps to test hypotheses.	3.82	0.66	High
8	4	Flipped learning helps to assume alternatives to the hypothesis test.	3.77	0.78	High
9	16	Flipped learning helps to formulate assumptions and alternatives.	3.19	0.88	Medium
10	6	Flipped learning helps pay attention to detail as much as possible.	3,04	0.72	Medium
11	1	Flipped learning helps to offer compelling solutions.	3.02	0.54	Medium
12	7	Flipped learning helps to bring up new ideas.	2.88	0.68	Medium

high. Their mean ranged between 4.42 and 4.36. Their standard deviations ranged between 0.68 and 0.46. 6 paragraphs in this field were high. Their mean ranged between 4.16 and 3.77. Their standard deviations ranged between 0.82 and 0.78. 4 paragraphs in this field were medium. Their mean ranged between 3.19 and 2.88. Their standard deviations ranged between 0.88 and 0.64. This field as a whole came fourth with an average of 3.73 and with a standard deviation of 0.47.

The fifth area is "convincing explanations"

Table 9 shows that 1 paragraph in this field was very high. Its mean was 4.31 and standard deviation was 0.48. 11 paragraphs in this field were high. Their means ranged between 4.12 and 3.40. Their standard deviations ranged between 0.46 and 0.88. 1 paragraph was medium. its mean was 2.79, and its standard deviation was 0.72.

This field as a whole came in fifth place with an average of 3.66 and a standard deviation of 0.49.

The researchers believe that these high estimate of the perceptions of King Abdullah II schools of excellence teachers for the importance of flipped learning in the development of reflective thinking in all areas is due to the teachers' belief in the importance of flipped learning as it enhances the role of the teacher, which makes the learner participate effectively; discuss, try, examine, analyze, The use of flipped learning gives the student a qualitative leap by interacting with his colleagues, conversing, commenting, contradicting his point of view, and participating in the planning, preparation, and execution of activities. This finding is consistent with a study with Al-Ahmadi (2011), which showed that teachers' attitudes towards the importance of teaching techniques in thinking development were high in all areas, and Graham (2013), which showed that flipped

Table 9. The means and the standard deviations of the perceptions of the individuals in the fifth field.

Rank	Paragraph number	Paragraph	Means	Standard deviation	degree
1	7	Flipped learning contributes to discovering the facts.	4.31	0.48	Very high
2	10	Flipped learning helps in interpreting the facts contained.	4.12	0.46	High
3	11	Flipped learning helps to interpret attitudes, opinions, and events.	4.09	0.62	High
4	12	Flipped learning contributes to linking observations to conclusions.	3.91	0.81	High
5	14	Inverted learning helps to analyze images in light of the interpretation of attitudes.	3.83	0.78	High
6	13	Flipped learning helps to analyze situations clearly.	3.66	0.54	High
7		Flipped learning helps to connect to the intellectual while handling subjects.	3.62	1,09	High
8	3	Flipped learning gives convincing explanations of situations.	3.51	0.38	High
9	1	Flipped learning helps to give correct and logical justification.	3.51	0.58	High
10	2	Flipped learning gives clear explanations.	3.46	0.42	High
11	4	Flipped learning gives rational explanations.	3.41	0.64	High
12	8	Flipped learning gives integrated and coherent justifications.	3.40	0.88	High
13	9	Flipped learning gives meaningful justification.	2.79	0.72	Medium

learning provided a flexible learning environment, The study of the teacher which showed that the level of thinking ability of the science teachers is less than the default rate (70%).

To answer the second question of the study

Are there differences in the perceptions of teachers of King Abdullah II Schools of Excellence about the importance of using flipped learning in the development of students' reflective thinking according to gender, academic (scientific, human) and years of experience? To find out if there were statistically significant differences at the level of α = 0.05 in the perceptions of the teachers of King Abdullah II Schools of Excellence about the importance of the use of flipped learning in developing their students' thinking according to gender variable, the arithmetic mean and standard deviations of each section field, and for the domain as a whole by sex variable were calculated (Table 10).

Table 10 shows that there are apparent differences in the perceptions of the teachers of King Abdullah II Schools of Excellence about the importance of using flipped learning in the development of reflective thinking according to gender variable. t-test was used to determine the statistical significance of these differences (Table 11).

Results of independent t-test were used to indicate the differences in the perceptions of teachers about the importance of flipped learning in the development of thinking among students by gender variable.

Table 11 shows that there are statistically significant differences at the level of α = 0.05 in all areas of the study instrument in favor of female teachers. This may be because the teachers are more familiar with educational and scientific developments. The teachers are more likely to compete and show everything that is new and innovative; they are also more serious in applying what they learn from the training courses, as well as the characteristic of students' desire, concern and interest in learning and striving for excellence and innovation. They work harder to make students learn. For the teachers to have proper appearance within the school and the community they need knowledge , need to do research and use modern methods of teaching, such as reversed education. The results of this study are consistent with the results of Al-Azri (2007). The results of his study indicate that there are statistically significant differences between males and females and in favor of females in the practice of teachers to develop skills of thinking. This result differs with the study of AL ostaz (2011), which indicated that there are no statistically significant differences between males and females with regard to the level of thinking ability of science teachers. To find out if there were statistically significant differences at the level of (α = 0.05 in the perceptions of the teachers of King Abdullah II Schools of Excellence about the importance of using reverse learning in the development of students' thinking according to the variable of teaching experience, the means and the standard deviations of each paragraph of the field, and the field as a whole were calculated (Table 12).

Table 12 shows that there are differences in the perceptions of the teachers of King Abdullah II Schools of Excellence about the importance of using reflected learning in the development of reflective thinking according to the variable of experience.

To determine the statistical significance of these differences, ANOVA analysis was used to indicate the teachers 'estimates of the importance of inverted learning in developing their students' thinking according to the

Table 10. The means and standard deviations of teachers 'estimates of the importance of inverted learning in developing their students' thinking by gender variable.

S/N	The field	Gender	The number	Arithmetic mean	Standard deviations
1	Reach conclusions	Male	87	3.90	0.48
		female	93	4.11	0.46
2	Detecting fallacies	Male	87	3.88	0.62
		female	93	3.98	0.81
3	Critical visual vision	Male	87	3.74	0.78
		female	93	3.98	0.54
4	Develop suggested solutions	Male	87	3.68	1.09
		female	93	3.77	0.38
5	Give convincing explanations	Male	87	3.89	1.02
		female	93	4.01	0.42
The tool as a whole		Male	87	3.82	0.58
		Female	93	3.95	1.07

Table 11. Results of independent t-Test indicating differences in the perceptions of teachers about the importance of flipped learning in the development of thinking among students by gender variable.

S/N	The field	Value of "t"	Level of significance
1	Reach conclusions	12,423	0.004
2	Detecting fallacies	11,112	0,000
3	Critical visual vision	15,207	0,000
4	Develop suggested solutions	10,616	0.002
5	Give convincing explanations	12,712	0,000

variable of experience. Table 13 illustrates this.

Table 13 shows that there are statistically significant differences at the level of α = 0.05 in all domains at the three levels of experience in favor of the most experienced teachers. This may be due to the fact that the instructional experience provides teachers with a clear conception of teaching methods and strategies. This is because they have been trained under the supervision of the Ministry of Education, as well as their experiences gained through the years and knowledge of everything new in technology and education strategies during their service at home and abroad in various educational institutions.

This finding is in line with the study of Ahmadi (2011), which indicated that there are differences of statistical significance due to the experience of teachers with higher experience

To find out if there were statistically significant differences at the level of α = 0.05 in the perceptions of the teachers of King Abdullah II Schools of Excellence about the importance of using flipped learning in the development of their students' reflective thinking according to specialization variable, t-test was used (Table 14).

Table 14 shows that there are no statistically significant differences at the level of significance α = 0.05 due to the specialization variable. This result is explained by the fact that teachers regardless of their specialization are convinced of the importance of flipped learning in the development of students' reflected thinking. This is achieved through the exchange of visits between them regardless of their specialization. Most of them also have a post-bachelor educational qualification; they use diverse teaching methods and strategies, and employ the latest in education technology. This result is consistent with Professor's (2011) study.

RECOMMENDATIONS

1. Direct the Ministry of Education to train teachers and encourage them to use the flipped learning.

Table 12. Means and standard deviations for study fields according to experience variable.

S/N	The field	Experience	N	Means	Standard deviations
1	Reach conclusions	From 1 to 5	38	2.91	1.40
		6-10	54	3.75	0.63
		More than 10 years	88	4.12	0.73
2	Detecting fallacies	From 1 to 5	38	3.34	1.23
		6-10	54	3.89	0.39
		More than 10 years	88	4.06	0.52
3	Critical visual vision	From 1 to 5	38	2.96	1.46
		6-10	54	3.74	0.58
		More than 10 years	88	3.98	0.66
4	Develop suggested solutions	From 1 to 5	38	3.33	1.09
		6-10	54	3.91	0.43
		More than 10 years	88	4.16	0.56
5	Give convincing explanations	From 1 to 5	38	3.48	1.09
		6-10	54	3.79	0.41
		More than 10 years	88	4,24	1.22
The tool as a whole		From 1 to 5	38	3.20	1.07
		6-10	54	3.82	0.52
		More than 10 years	88	4.11	0.49

Table 13. The results of ANOVA according to experience variable.

Field	Source of variance	Degrees of freedom	Sum of squares	Mean of squares	"t" Value	Significance
Access to conclusions	Between groups	3	10.03	0.33	2.19	0.004
	Within groups	176	17.12	0.16		
	Total	179	27.15			
Detecting fallacies	Between groups	3	6.72	2.51	3.09	0.000
	Within groups	176	48.64	0.42		
	Total	179	55.36			
Critical visual vision	Between groups	3	9.17	0.94	0.118	0.000
	Within groups	176	56.72	0.49		
	Total	179	65.89			
Develop suggested solutions	Between groups	3	13.08	0.33	1.29	0.001
	Within groups	176	22.73	0.26		
	Total	179	35.81			
Give convincing explanations	Between groups	3	11.05	2.23	2.11	0.000
	Within groups	176	15.14	0.38		
	Total	179	26.19			
Total	Between groups	3	10.01	1.27	1.12	0.000
	Within groups	176	Total squares	0.34		
	Total	179	10.03			

2. The school should exploit the smart devices that the students have in flipped learning, and exploits class time to practice various thinking processes.
3. Further studies on flipped learning in the Arab world

Table 14. The results of independent sample (t-Test) according of specialization variable.

Specialization categories	N	D.F	Means	Standard deviations	"t" value	Level of significance
Scientific	81	178	3.48	0.25	2.76	0.061
Humanitarian	99		3.50	0.32		

should be conducted.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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