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The practice of the Multiple Intelligence (MI) Based Activities by Primary School Teachers in Teaching Physical Education (PE)

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ABSTRACT

This study aims at knowing the degree to which the primary school teachers practice the multiple intelligences (MI) based activities in teaching physical education (PE) and the difference in this degree of practice according to the scientific qualifications and the professional experience. The study sample includes 28 primary school teachers working in Biskra who have been chosen randomly. The authors relied on a questionnaire based on previous studies. Findings show that the teachers practice the MI based activities in teaching PE with an average to a low degree. Moreover, there is no difference between the teachers due to the scientific qualification or the professional experience. The authors recommend employing MI based activities in teaching PE.

Keywords: Teaching; Multiple Intelligences (MI); Physical Education (PE); Primary Education.

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INTRODUCTION

The last decade of the 20th century witnessed educational changes in the teaching process due to the circumstances of the scientific life. The interest in finding more efficient teaching styles has increased. In this study, we aim at showing the importance of modern education styles in guiding teachers and helping them finding information within them and taking advantage of their potentials trough referring to, and filtering, their previous experiences to build new education. In the same line, the theory of MI, introduced by Howard Gardener, is one of the most important modern notions in education because he sees that the learners have individual characteristics, independent talents, and different preferred learning styles and responses to educational situations. Thus, the MI strategies are among the most modern teaching styles (Kebli & Taghlit, 2020, p. 118)

Undoubtedly, the theory of MI has brought about a revolution in the educational practice because it changed the teachers' perception and clarified the suitable teaching styles to use with the learners based on their mental abilities. Moreover, this theory challenged the traditional concept of "intelligence" because the educational practice used to use only one teaching style before the emergence of MI theory since the educators believed that there had been only one type of intelligence. This deprived most of the learners from efficient learning based on their individual learning styles. In this context, the diversity of intelligences of the learners obliges the teachers to use various educational styles to achieve communication with all of them (Homs & Hablos, 2013, p. 47).

The MI opened a large door for a wide range of teaching strategies that can be used easily in the classroom because it allows the teachers to develop new teaching styles. If the teachers focus on the various learning types in teaching, there will be a part of the session that allows the learner to engage in learning using his most developed intelligence (Armstrong, 2006, p. 67)

Based on: 1- what has been said, 2- other studies that shed light on the theory of MI in teaching different subjects that confirmed its importance in developing the different educational skills and its efficiency, such as the study of Methni et al., (2017), Hamidh (2017), Al-Jawaldah et al., (2013), and Wahsha (2010), Boutalebi &Shafaa (2018), Baouche et al.,(2019), 3- the fact that the authors are specialized in the physical and sportive educational

activity; 4- the importance of the educational process in PE sessions that face challenges like the other sessions in their sake to keep up in pace with the epistemological and technological developments in education and their outcomes that changed the perception to the nature of the teaching process with its strategies that aim at enabling learners to learn new skills that help them in their real life situations and at practicing sport activities adequately because Bin Qasmi. (2019), Bin Qanab et al., (2021), note that it is important to use the modern teaching strategies in PE to tackle al the learners with their different levels in good ways; 5- the importance of the primary education which is the basis of the other levels and the real start of developing the learners' knowledge, motions and emotions, and psychology; 6- the absence of studies on the degree of the use of MI based activities in teaching PE by primary school teachers, the study was carried out and focused on MI which proved its efficiency in education and brought about a revolution. Thus, we find ourselves obliged to grapple with a paramount question that is:

-To what degree do teachers of primary school practice MI based activities in teaching PE?

Other sub-questions emerge such as:

- Are there any significant differences due to the variable of the scientific qualification in practicing MI based activities in teaching PE by primary school teachers?

- Are there any significant differences due to the variable of the professional experience in practicing MI based activities in teaching PE by primary school teachers?

To answer these questions, the authors suggest the following general hypothesis:

-The degree to which teachers of primary school practice MI based activities in teaching PE is low.

Thus, the following sub-hypotheses emerge:

- There are no significant differences due to the variable of the scientific qualification in practicing MI based activities in teaching PE by primary school teachers.

- There are no significant differences due to the variable of the professional experience in practicing MI based activities in teaching PE by primary school teachers.

2. Previous and similar studies:

2.1 The study of Al-Jawaldah et al., (2013)on the level of practice of the

teachers of the talented learners to MI in the classroom which aimed at knowing the difference in the classroom practices related to this theory by the teachers of the talented learners due to the gender of the teacher, specialty, and scientific qualification. The study sample included 54 teachers (male and female) in the schools of Abdullah 2 for excellence in the provinces of Baqa, Zarqa, and Irbid. The researchers developed a tool to measure the level of practice of the teachers of the talented learners to MI in the classroom. The tool was made up of 56 statements and checked and confirmed its consistency and validity. Findings showed that the practiced MIs by the study sample were ordered from the most practiced to the least. These intelligences were respectively: the mathematical logical, the kinesthetic, the spatial, the musical, the verbal, the intrapersonal, and the social intelligences. Furthermore, findings showed that the females outperformed the males in the verbal intelligence while males outperformed in the spatial and social intelligences. As for the significance of the differences because of the specialty of the teachers (scientific, humanities), the arithmetic means did not show any statistical significant differences. As for the ones based on the scientific qualification, the differences in the musical and social intelligences were on behalf of the teachers who carried out higher studies.

2.2 The study of Hamidh (2017) on the level of awareness of the primary education teachers about the theory of MI in public schools of the city of Naples. The study used the descriptive method with a questionnaire. The population of the study included 455 teachers from the public schools of Naples of which 277 are males and 178 are females. The study tool included 6 sections with 62 statements in total. Findings showed that the teachers were highly aware about MI and that there were no significant statistical differences because of the age, gender, scientific qualification, and experience. The study recommended increasing the sessions of continuous professional development in MI and modern theories, enriching the curriculum, and encouraging the excellent teachers for their efforts.

2.3 The study of Wahsha (2010) aimed at knowing the degree to which the teachers of Abdullah 2 schools of excellence use the MI strategies asked the following questions: to what degree do the teachers of Abdullah 2 schools of excellence use the MI strategies? Are there any statistical significant differences at level 0.05 in the degree of use of MI strategies due to the

gender and specialty? The study population included all the teachers at the schools of Abdullah 2, estimated at 174 teachers (male and female). The study used a questionnaire of 56 statements. Findings showed that the teachers use MI strategies with a high degree.

3. Method and Materials :

3.1 The exploratory study :

First, we looked for resources and references to shape the research theme and set the hypotheses and critically and logically determine the problem. Second, we collected data about the study and the population .We conducted the exploratory study on a group of 09 teachers from the primary school of Al Jil Saaid to check the suitability of the settings of the study, check its psychometric characteristics (validity and consistence), and find its drawbacks to set right the wrong .The exploratory study allowed us to make the final shape of the questionnaire.

3.2 Methodology of the study:

We relied on the descriptive method in response to the nature of the study topic that we aim at studying practically.

3.3 Sample and population of the study:

3.3.1 The population of the study

The population of the study included 63 teachers from 3 primary schools (Diar Saada, Al Jil Saaid, and Annasho Al Jadid) in Biskra city.

3.3.2 The study sample:

We relied on a simple random sample from the schools mentioned earlier, estimated at 28 teachers.

Table 1. The distribution of the sample according to the primary schools

The school	Number of teachers
Diar Saada	10
Al Jil Saaid	08
Annasho Al Jadid	10
Total	28

Source: the authors

Fig.1. The distribution of the sample according to the primary schools

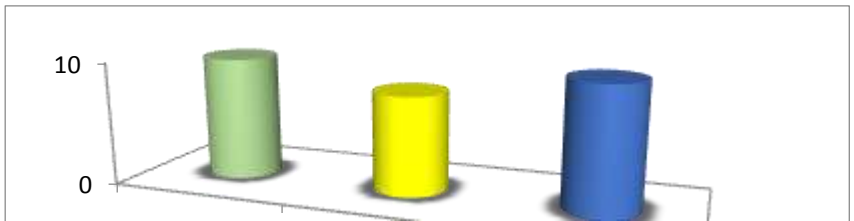


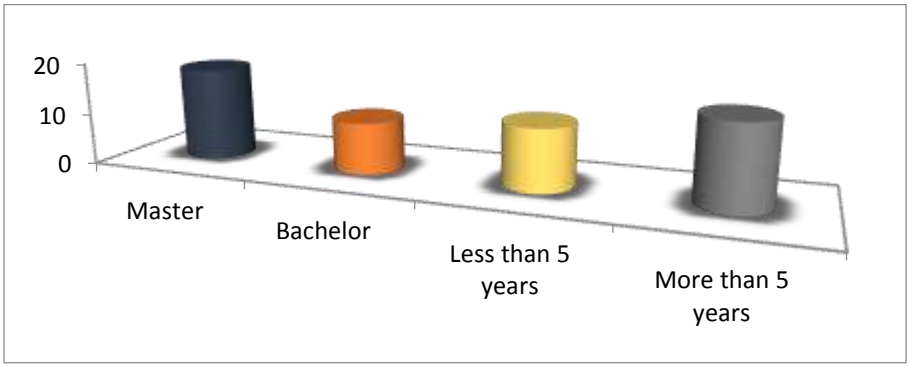
Table 2. Distribution of the study sample according to the variables

Table 2. Distribution of the study sample according to the variables (professional experience and scientific qualification)

Members of the sample	Scientific qualification		Professional experience	
	Bachelor	Master	Less than 5 years	More than 5 years
	12	16	10	18
Total			28	

Source: the authors

Fig.2. Distribution of the study sample according to the variables (professional experience and scientific qualification)



3.4 Settings of the study:

The practical study took place in the primary schools of Biskra where the questionnaire had been distributed and then collected. It started on 11/01/2021 and ended on 06/06/2021.

3.5 The study tool:

After having a look on the previous studies related to our study (PE teaching and MI), we designed a questionnaire made up of 21 statements divided as follows:

- Statements 1, 2 and 3 are about the verbal intelligence.

- Statements 4, 5, and 6 are about the logical intelligence.
- Statements 7, 8, 9, 10 are about the spatial-visual intelligence.
- Statements 11, 12 and 13 are about the kinesthetic intelligence .
- Statements 14, 15 and 16 are about the intrapersonal intelligence .
- Statements 17, 18 and 19 are about the social intelligence.
- Statements 20 and 21 are about the natural intelligence.

We relied on the 5 points scale as follows (strongly agree= 5, agree= 4, neutral = 3, disagree= 2, strongly disagree= 1). The 5 points scale has been turned into a 3 points scale as follows:$(5-1=1),{}^{4}/_{3}=1.33$.

This value has been used to determine the duration of the scale as follows:

- 1-2.33 low .
- 2.34-3.67 average.
- 3.68- 5.00 high .

3.6 The psychometric bases of the study:

To calculate the validity of the questionnaire and the correlation of the statements, and to make sure they do not overlap, we found the correlation coefficients using Pearson correlation through SPSS to calculate the correlation coefficient between each statement and the total scores of the scale. All the coefficients were significant as shown in the following table

Table 3. the correlation coefficient between each statement and the total scores of the questionnaire

Statements No°	**statement 01**	**statement 02**	**statement 03**	**statement 04**	**statement 05**
Pearson correlation	0,825**	0,825**	0,825**	0,962**	0,825**
Sig. (bilateral)	0,0000	0,0000	0,0000	0,0000	0,0120
No°	9	9	9	9	9
Statements No°	**statement 06**	**statement 07**	**statement 08**	**Statement 09**	**Statement 10**
Pearson correlation	0,775*	0,775*	0,924**	0,884**	0,91**
Sig. (bilateral)	0,0000	0,0000	0,0000	,0000	0,0120

No°	9	9	9	9	9

Statements No°	**statement 11**	**statement 12**	**statement 13**	**statement 14**	**Statement 15**
Pearson correlation	0,723*	0,884**	0,919**	0,919**	0,923*
Sig. (bilateral)	0,0120	0,0000	0,0000	0,0000	0,0120
No°	9	9	9	9	9

Statements No°	**Statement 16**	**statement 17**	**statement 18**	**statement19**	**Statement 20**
Pearson correlation	,919**	,923**	0,962**	0,735*	0,884**
Sig. (bilateral)	0,0000	0,0000	0,0000	0,0000	0,0120
No°	9	9	9	9	9

Statements No°	**Statement 21**
Pearson correlation	0,919**
Sig. (bilateral)	0,0000
No°	9

Source: the authors

We conclude that the questionnaire has an acceptable degree of validity because the coefficients of correlation between each statement and the total score of the scale are between 0.723* and 0.962**with a significance level of 0.005-0.001. This increases the validity of data the authors shall collect. Moreover, to calculate the consistency of the questionnaire, we used Cronbach's Alpha coefficient and got a value of 0,913**which is a high value that shows a high degree of consistency.

Table 4. Cronbach's Alpha coefficient of each statement with the total score of the questionnaire

Consistency statistics	
Cronbach's Alpha	Number of elements
0,913**	21

Source: the authors

We conclude that the questionnaire has an acceptable degree of consistency.

4. The statistical tools:

Data have been collected with the questionnaire and then recorded and organized on SPSS to be later analyzed after coding the answers. The descriptive statistics has been used to calculate Pearson correlation coefficient, Cronbach's Alpha, standard deviations, arithmetic means, and T tests for 2 independent samples to know the significance of the differences.

5. Results and their interpretation and discussion:

- Results of the main hypothesis that revolves around the degree to which teachers of primary school practice MI based activities in teaching PE have been checked through calculation of the arithmetic means and standard deviation of the statements of the questionnaire

Table 5. shows the arithmetic means and standard deviations of the answers of the study.

Verbal intelligence				
No°	**Statement**	**Mean**	**Type of variance**	**Level**
01	I use the skills, sportive plans, and laws correctly.	1,500	0,5774	Low
02	I use a correct language and sportive vocabulary related to the educational sport activity.	2,036	0,6372	Low
03	I use the exercise calls adequately for each exercise.	1,500	0,6939	Low
	Total mean	1,6787	0,6362	Low

Visual spatial intelligence

Logical intelligence				
No°	**Statement**	**Mean**	**Type of variance**	**Level**
04	I encourage the learners to learn measurement in the educational sport activities that require that.	1,321	0,5480	Low
05	I encourage he learners to calculate the results in the sport competitions.	1,357	0,4880	Low
06	I develop the logical thinking of the learners through teaching the sport planning of the different sportive educational activities.	1,143	0,4484	Low
	Total mean	1,2737	0,4948	Low

No°	Statement	Mean	Type of variance	Level
07	I use pictures and symbols when presenting the movement to be performed .	2,321	0,7228	Low
08	I encourage the learners to contemplate and imagine the movements before execution.	2,214	0,6299	Low
09	I encourage the learners to determine the playing centers in the collective games .	2,321	1,6342	Low
10	I encourage the learners to recognize the colors in the educational situations.	4,607	1,1706	High
	Total mean	2,8657	1,0393	Average
Kinesthetic intelligence				
No◦	**Statement**	**Mean**	**Type of variance**	**Level**
11	I make educational situations where the learners can perform the movements that require the whole body.	4,750	0,7993	High
12	I encourage the learners for behaviorist responses with varying the types and hardship of the movement in order to improve the result or the movement.	2,929	1,0157	Average
13	I enable the learners to adapt with critical movements.	3,500	1,1055	Average
	Total mean	3,7263	0,9567	High

Intrapersonal intelligence				
No◦	**Statement**	**Mean**	**Type of variance**	**Level**
14	I encourage the learners to evaluate themselves and recognize their weaknesses and strengths .	1,964	0,3313	Low
15	I make individual educational situations .	2,000	0,2722	Low
16	I give the learners the chance to think and attempt before executing the task.	1,821	0,3900	Low
	Total mean	1,9283	0,3311	Low
Social intelligence				
No◦	**Statement**	**Mean**	**Type of variance**	**Level**
17	I encourage the learners to coexist in the group and actively participate to reach the goals of the activity.	2,857	1,0079	Average
18	I teach the value of respecting the others even if they were adversaries.	3,429	0,9201	Average
19	I encourage the learners to accept the others and treat them according the sport regulations.	2,929	1,0157	Average
	Total mean	3,0717	0,9812	Average
Natural intelligence				
No◦	**Statement**	**Mean**	**Type of variance**	**Level**
20	I encourage the learners to collect the trash from the play yard and put it in the correct place.	2,107	1,3700	Low
21	I make sport activities in green spaces and try to link the educational situations with the external environment.	1,036	,1890	Low
	Total mean	1,5715	0,7795	Low

Total mean of the questionnaire	2,3022	0,9181	Low

Source: the authors

Findings of this question show that the degree to which teachers of primary school practice MI based activities in teaching PE is low with an arithmetic mean of 2.3022, and that the most used MI activities are the activities of the kinesthetic intelligence with a mean of 3.7263; they got the 1st rank with a high degree. The logical sport activities ranked the 7th, i.e. the last, with an arithmetic mean of 1.5715 with a low degree. Between these two ranks we find MI activities starting with the social intelligence with an arithmetic mean of 3.0717 in the second rank, the visual spatial intelligence with an arithmetic mean of 2.8657 in the third rank, the intrapersonal intelligence with an arithmetic mean of 1.9283 in the fourth rank, the verbal intelligence with an arithmetic mean of 1.6787 in the fifth rank, the natural intelligence with an arithmetic mean of 1.5715 in the sixth rank.

We interpret the use of the kinesthetic intelligence activities by the teachers in PE sessions more than other sessions because they believe that this subject depends on the educational activities practiced by the learners in order to exchange movements, make body movement attempts, try to control the body consciously and creatively either in the technical or sportive performance, improve the movement skills through the body activities, and improve the body characteristics such as power of the muscles, flexibility, and fitness needed for the sport activities. These results contradict with previous studies of Hamidh (2017) who found that the social intelligence activities ranked 1st with a high degree because the teachers focus on developing the social relationships and strengthening the participation of the learners in the social events. Moreover, our findings disagree with the findings of Al-Jawaldah et al., (2013) which found that the logical intelligence sport activities were the most used because the talented learners' mental abilities motivate the teachers and guide them to use the mathematical logical intelligence more than the other types of intelligence in order to satisfy the learners' high mental abilities that require the mathematical logic in proving and explaining many scientific issues. Furthermore, our results are not compatible with those of Wahsha (2010) who found that the Intrapersonal intelligence activities ranked 1st because the teachers focused on developing the excellent learners' personalities through boosting their self esteem and confidence in their abilities and developing their future vision and planning.

As for the total result of the degree to which teachers of primary school practice MI based activities in teaching PE, it was low because they rely on the conventional method of teaching PE and are not specialized in this domain and because of the absence of continuous professional development sessions about teaching PE. The total result was contradictory with that of Al-Jawaldah et al., (2013), Wahsha (2010), and Hamidh (2017) that found that the degree to which teachers of primary school practice MI based activities in teaching PE was very high regarding the nature of the educational content of the subjects tackled in these studies whose nature differ from the PE.

-Results of the 1st sub-hypothesis that said that there are no significant differences due to the variable of the scientific qualification in practicing MI based activities in teaching PE by primary school teachers have been checked using T.Test on 2 independent samples. Findings are shown in table 6:

Table 6: T value of the significance of the differences

Category	Number of individuals	Arithmetic mean	Standard deviation	Calculated T.	Scheduled T.	Freedom degree	Significance level	Decision
Bachelor	12	46.2500	4.26668	-1.971	2.05553	26	0.225	Insignificant
Master	16	53.9375	12.93815					

Source: the authors

We see from results of table 6 that the value of the calculated T of the evaluation difficulties by the primary school teachers is estimated at -1.971 while scheduled T reached 2.05553 at significance level of 0.05 and freedom degree of 26. From the comparison between them, we find that calculated T is less than the scheduled. This indicates that there are no statistical significant differences at the degree level of the practice of MI based activities in PE sessions among the primary school teachers at level a=0.05 due to the scientific qualification. This goes with the 1st sub-hypothesis because of the theoretical nature of the university training both at the bachelor and master

levels. Moreover, both categories receive the same professional training. Moreover, this goes with the studies of Wahsha (2010) and Al-Jawaldah et al., (2013) who indicate that the curricular MI based activities do not require the teacher to have a high scientific background as Hamidh (2017) found. The latter explained that the teacher's qualification does not have any impact in practicing MI nor in his awareness about MI theory.

-Results of the 2nd sub-hypothesis that said that there are no significant differences due to the variable of the professional experience in practicing MI based activities in teaching PE by primary school teachers have been checked using T.Test on 2 independent samples. Findings are shown in table 7:

Table7 .T value of the significance of the differences

Category	Number of individuals	Arithmetic mean	Standard deviation	T. calculated	T. scheduled	Freedom degree	Significance level	Decision
Less than 5 years	10	50.7	4.42342	0.021	2.05553	26	0.005	Insignificant
More than 5 years	18	50.6111	13.15133					

Source: the authors

We see from results of table 6 that the value of the calculated T of the degree of practice by the primary school teachers is estimated at 0.021 while the scheduled reached 2.05553 at significance level 0.0.5 with a freedom degree of 26. From the comparison between them, we see that the calculated T is less than the scheduled. This indicates that there are no statistical significant differences at the degree level of the practice of MI based activities in PE sessions by primary school teachers at level a=0.05 due to the professional experience. This goes with the findings of Hamidh (2017) which indicated that there is no effect for the variable of professional experience in teaching with MI because of the common concepts among the teachers despite the difference in experiences and the common understanding of the MI theory regardless the years of work. This explains that the experience of

the teacher does not have any statistical significance in the teachers' awareness about MI.

7. Conclusion:

The theory of MI is so important and can be relied on in the educational process in general, and PE in particular because it can bridge the gap of the individual differences of the students due to the difference in their intelligence levels and skills. This study aimed at shedding light on the degree to which primary school teachers use MI theory in teaching PE. Findings show that this degree is low with no statistical significant differences at the level of using MI based activities in PE due to the variables of professional experience (less/more than 5 years) and scientific qualification (Bachelor/Master). In the end, we insist on the importance of MI theory in PE sessions as it provides the teachers with a great chance to formulate infinite educational situations based on its principles.

8.Recommendations:

In the light of what has been said, we recommend:

- Making training sessions for primary school teachers that discuss MI (theory and practice) in teaching PE. It would be better to be organized by specialists from PE institutes.

- Employing MI based activities in PE sessions.

- Making studies on the effect of the teaching styles based on MI in the PE.

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