Cogent Psychology

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/oaps20

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To cite this article: Nayyereh Ghaznavi, Mehry Haddad Narafshan & Massoud Tajadini | (2021) The Implementation of a Multiple Intelligences Teaching Approach: Classroom engagement and physically disabled learners, Cogent Psychology, 8:1, 1880258, DOI: 10.1080/23311908.2021.1880258

To link to this article: https://doi.org/10.1080/23311908.2021.1880258

Published online: 07 Mar 2021.

Ghaznavi et al., *Cogent Psychology* (2021), 8: 1880258
https://doi.org/10.1080/23311908.2021.1880258

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EDUCATIONAL PSYCHOLOGY | RESEARCH ARTICLE

The Implementation of a Multiple Intelligences Teaching Approach: Classroom engagement and physically disabled learners

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Received: 03 August 2020
Accepted: 20 January 2021

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Reviewing editor:
Marcella Caputi, Universita Vita Salute San Raffaele, Italy

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Abstract: The present mixed-methods classroom-based study investigated whether the provision of multiple intelligences teaching approach to physically disabled learners could contribute to activating multiple intelligences and have a positive impact on their classroom engagement. To address this issue, three intact classes of 10 Iranian physically disabled learners participated in this study. In so doing, the study utilized an experimental design with 10 participants in the control group and 20 participants in two experimental groups. Drawing on quantitative and qualitative analysis, the results indicate that, over six months, the use of the multiple intelligences teaching approach contributed to a significant improvement in the learners' multiple intelligences. The implementation was also successful in raising the learners' classroom engagement. Further, comparing the first language (Persian) & second language (English) multiple intelligences-based instruction, L2 (English) multiple intelligences-based instruction was more effective in fostering physically disabled learners' multiple intelligences and classroom engagement.

Subjects: Educational Research; Educational Psychology; Language Teaching & Learning

Keywords: Multiple intelligences; multiple intelligences teaching approach; physically disabled learners; classroom engagement

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PUBLIC INTEREST STATEMENT

The multiple intelligence theory of Gardner offers great opportunities to improve students ' diverse abilities potential in disabled learners. He describes eight relatively distinct intelligences: linguistic, logical–mathematical, spatial, naturalistic, interpersonal, intrapersonal, bodily-kinesthetic, and musical intelligence. Instead of describing intelligence as a single general skill, the Multiple Intelligences Theory (MI) defines intelligence as composed of many competencies designed to solve "true challenges or problems … and, if possible, to make an acceptable product (Gardner, 1999). The current mixed-methods classroom-based study investigated whether the provision of multiple intelligences teaching approach to physically disabled learners could contribute to activating multiple intelligences and have a positive impact on their classroom engagement. The results revealed that positive changes took place in the multiple intelligences and classroom engagement of the participants.

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1. Introduction

Multiple intelligences (MI), an area of educational psychology, was introduced by Howard Gardner in 1983 (J. L. Chesebro, 2002a). Gardner (1983) introduced seven different intelligences that reflect the different ways people can be intelligent (as cited in J. L. Chesebro, 2002a, p. 15). Since his original publication in 1983, two additional intelligences have been added, bringing the total to nine: verbal-linguistic, mathematical-logical, musical, visual-spatial, bodily-kinesthetic, interpersonal, intrapersonal, naturalist, and existential (Gardner, 1999; as cited in Brown & Liepolt, 2004), with some including spiritual as a tenth intelligence (Farnan, 2009). Multiple intelligences theory, "Proposes that students listen in different ways" (J. L. Chesebro, 2002a, p. 15) based on their own special blend of intelligences. MI theory introduces the best way to educate and communicate with most students in the diverse environment of modern classrooms. Multiple intelligences theory warrants study because it has far-reaching implications for educational communication. Because not all students learn in the same way and each teacher represents a unique teaching style because of his or her own multiple intelligence mix, classrooms of all ages may have a wide variety of intelligences represented (J. L. Chesebro, 2002a). This topic must be studied to better prepare teachers at all levels to present material "using a variety of methods to involve all students" (J. L. Chesebro, 2002a, p. 15). Teachers must learn how to practice a variety of intelligences to engage the largest number of students possible in the learning process.

Intelligence was originally defined as the linguistic and logical—mathematical characteristics identified by IQ tests. Instead of describing intelligence as a single general skill, the Multiple Intelligences Theory (MI) defines intelligence as composed of many competencies designed to solve "true challenges or problems … and, if possible, to make an acceptable product" (Gardner, 1983, pp. 60–1). Rejecting the notion that intelligence can be assessed by standardized tests, Gardner proposed his theory of multiple intelligences, which traditionally were seven in number (Gardner, 1983); and later he added an eighth one to the original list (Gardner, 1995). He believes that individuals are different in the intelligence nature with which they were born and how each person experiences/practices it. Everybody has all the eight intelligences, according to the MI principle, and can use certain intelligences more than others (Gardner, 1983, 1995; Gardner & Hatch, 1989).

Referring to language instruction, intelligence, language, and the ability to learn are three important human traits. Christison (2005) mentioned that MI theory can propose an effective framework for language learning as it matches the complicated nature of language learning. According to MI theory (Christodoulou, 2009), there is more than one way to be smart, because intelligence is not only dictated by genetics; cultural and social influences often affect the form and degree of intelligence individuals have. Recognizing foreign language learners' active intelligence types with the help of multiple intelligences theory is important to know the relationship between MI and foreign language learning. The multiple intelligences-based instruction (MIBI) provides a unique chance to increase the learning experiences based on the abilities and traits of the learners (Weber, 2005). An instructional approach following multiple intelligences provides inputs for continuous monitoring and direct involvement with the material and objectives in an educational setting (Moran et al., 2006). The multiple intelligence theory of Gardner offers an opportunity for children with disabilities who share many similarities with ordinary kids. It is necessary to understand that many of the differences that exist between children with and without disabilities arise from disability as a condition for living and are not caused by the biomedical impairment (Bøttcher & Dammeyer, 2013). MIBI gives researchers and scholars around the world the message that all students even physically disabled ones have the right to experience the tasks that activate and develop all their intelligences. Consequently, the current study aims to address multiple intelligences-based instruction using a sample of physically disabled learners in Iran.

2. Literature review

The indispensable role of intelligence in language learning has recently attracted considerable attention among SLA scholars. However, relatively little research has been devoted to examining the multiple intelligences of physically disabled language learners despite the global trend of foreign language instruction. Referring to the field of language instruction, some studies have reported the positive effects of MI-based instruction on English language learning. Comparing traditional approaches and MIBI, MIBI affects students' attitudes positively toward English language learning (Jing, 2013; Soleimani et al., 2012). Besides, it is found that several English teaching strategies can accelerate the activation of different intelligences in individual students (Kartiah et al., 2014). MI-based teaching approach combines English language instruction into intelligence development and follows the bidirectional goal of English learning and activation of all types of intelligences. In this way, the development of students' language skills goes hand in hand with the enhancement of multiple intelligences (Zhu, 2011). The following practical steps are useful in practice: applying suitable instruments to evaluate students' intelligences (Armstrong, 1994; Teele, 1992); developing English-language learning groups in which students can engage to improve their strengths and compensate for each other's shortcomings (Moran et al., 2006); combining intelligences according to a variety of contents; and using tasks that stimulate the use of multi-intelligences in group learning.

Studies on the relationship between MIBI and language learning have mainly concentrated on uncovering the dominant kinds of intelligences that foreign language learners possess. For example, Currie (2003) gave the English Language reading class students a MI questionnaire and showed the most developed linguistic and musical intelligences among these students. And mathematical intelligence was the least common intelligence among students in this case. Isisag (2008) researched at college level student attitude towards multiple intelligences in the teaching of foreign languages. To this end, MIBI questionnaires were given to first and second-year students in a foreign language department and the results showed that interpersonal, linguistic, and intrapersonal intelligences were the most common, and naturalistic intelligence was the least prevalent.intelligence among participants of this study. Mahdavy (2008) recorded the same findings in another study in which language learners' TOEFL and IELTS listening scores were correlated with the results of their Multiple Intelligences Development Assessment Scale (MIDAS).

The multiple intelligence theory of Gardner offers great opportunities to improve students " diverse abilities potential in disabled learners. Teachers cannot act as if learners are all the same in classrooms where teachers struggle with students suffering from physical disabilities in some or all of their bodies (Murray & Moore, 2012). Helping teachers, students and parents understand the various ways of learning and develop several kinds of intellectual strength and life skills is one reason to take MI's theory into account in teaching physically disabled students. MIBI will raise not only the students ' confidence and passion for learning but also the learning skills of their students. MIBI provides academic strengths and acknowledges innovative learning methods that can be of great assistance in educating physically disabled children (Cushner et al., 2003). However, in the case of physically disabled students alongside their physical problems, they face a big dilemma and face an enormous challenge, whether they be in their own country or be overseas, with other people in society. If physically disabled children are provided with appropriate programs, the better their chances of fully actualizing their potential (Tavakolizadeh et al., 2019). Disabled-children will not get the satisfaction of making progress until they have opportunities to find and develop their potentials and these high levels of development are inseparably linked to multiple intelligence-based instruction. In effect, MIBI is great sources of challenge to guide disabled children face, understand, and solve life conditions and problems (Tavakolizadeh et al., 2019). Disabled people, regardless of the nature of their disability, are usually themselves too conscious of their differences and limitations (Selwa, 1971). Therefore, another important challenge of children with disabilities in educational contexts is the problems with learning (Norwich, 2002). Thereby Educationally purposeful activities that encourage student engagement could foster learning (Chickering & Reisser, 1993). Engagement is a multidimensional construct including behavioral, emotional, and cognitive dimensions (Ben-Eliyahu et al., 2018; Sinatra

et al., 2015; Skinner et al., 2014). Student engagement is frequently seen as a cure for the contemporary students' notion of school as boring (Burkett, 2002; Pope, 2002). Student engagement is also used to show students" willingness to participate in school routines, such as attending class, submitting schoolwork, and following class activities (Chapman, 2003a, 2003b).

Although Gardner introduced the theory of MI in 1983 (J. L. Chesebro, 2002a), the academic literature about its application in classroom engagement is relatively sparse. Rubado (2002) worked with a group of 17 middle school students who were having difficulty learning the general education curriculum and were at risk of failing but were not being served by the traditional special education program. To meet their needs, she began integrating MI into her instructional practices and found that students naturally began to identify their intelligences. Over the course of the 10-week study, Rubado's students participated in numerous activities intended to foster understanding of intelligence. Other teachers likewise began integrating MI into their instructional practices and found that their students readily began to identify their intelligences in their work. It was found that students, through the process of self-reflection, began to identify their areas of strength in the context of MI and were able to identify which intelligences would enhance their performance. Through the use of a self—evaluation rubric, the students, many of them with special needs, discovered that they were using all the intelligences effectively, depending on the situation and realized that they were better-rounded than they had initially believed (Rubado, 2002). Most importantly, however, the researchers found, that the students realized that there are multiple ways to learn and that they possessed multiple types of academic strengths and life skills.

A quantitative and qualitative descriptive study by Schirduan and Case (2004) investigated the impact of MI curriculum on students that have been diagnosed with attention deficit hyperactive disorder (ADHD) using the Multiple Intelligences Developmental Assessment Scale, the Piers-Harris Children's Concept Scale, and the Teacher Perception of Achievement Level in Students with ADHD Survey to gather information for their study. As a result of this study, the authors maintain that "curriculum leaders need to be mindful of the means by which the learning needs of students with ADHD can be met by a curriculum driven by MI theory."

Schrand (2008) explored how to use MI theory to promote active learning. Specifically focused on the use of interactive media, Schrand explained how proper use of technology can engage a variety of MIs in a classroom setting. Through using multimedia animation to move students from passive to active learning, Schrand suggested that the power of MI theory can truly be realized in university classrooms.

Ayesha and Khurshid (2013) examined the relationship between MI and academic achievement. The study presumed that academic achievement was dependent on MI. The study revealed, "Multiple intelligence and academic achievement are significantly positively correlated with each other" (Ayesha & Khurshid, 2013, p. 88).

Kaewkiriya et al. (2016) examined the role of MI in e-learning systems. Their study proposed that as technology advances, MI theory and its applications in the classroom must keep on pace. Ultimately, as this review of the literature demonstrates, no research has directly examined the classroom engagement of students according to multiple intelligences-based instruction in physically disabled learners, especially in Iran. Hopefully, this study can contribute to the gap and improve the present dynamic field. Hence, the main research questions are:

(1) To what extent does MIBI affect physically disabled learners' Multiple Intelligences?

(2) To what extent does MIBI affect physically disabled learners' classroom engagement?

(3) Comparing L1(Persian) & L2 (English) MIBI, which mode of MI instruction is more effective in fostering the classroom engagement of physically disabled learners?

(4) What are the participants' reflections (EGs) on the multiple intelligences-based teaching approach?

3. Method

3.1. Participants

Corresponding with the research objectives, the current study sample includes three groups (one control & two experimental groups) with physical disabilities (problems with movement and posture). The purposive sample included 14 girls and 16 boys with participants' ages ranging from 14 to 30 years. 70% of participants suffered from severe Cerebral palsy (CP), and 30% of them suffered from mild CP. According to the results of the placement test, 98% of the participants were beginner English language learners and 2% of them were elementary English language learners. Excluding the elementary ones left us with a sample of 30 beginner participants. After ensuring that the groups were homogenous in language proficiency, attempts were made to provide the groups with equal opportunities in terms of class time (an hour and a half for each session), and the number of sessions (2 sessions per week). They were randomly assigned to either the experimental groups (n = 20) or control (n = 10) group. This study was ethically approved by the disabled students' institute. Participants and their parents were informed of the purpose of the study and research ethics, including confidentiality and anonymity. Before data collection, all participants were ensured that their participation would not influence their school records at all and that the actual data would be discarded directly after being used for research analysis.

3.2. Instruments

The present study utilized a sequential explanatory mixed-method approach integrating both self-report questionnaires and semi-structured interviews to select and integrate the appropriate methods to gain a more thorough picture of the phenomenon. A combination of quantitative and qualitative data helped the researchers to see the comprehensive experiences of participating learners. The instruments were reviewed by three experts (two in English Language Teaching and one in data and information retrieval). The feedback received led to revisions such as reformulations of some of the questions and clarity of instructions. They were also pilot tested with a population of 3 learners like that in the study to test their validity and reliability. Based on the reflections that we received, we changed some parts and added some sentences to clarify what we exactly mean. The questionnaires were in Persian and then using the forward-backward translation design they were translated into English trying to keep the conceptual meaning of the original scales. Cronbach's alpha test was used to indicate each scale's level of reliability.

3.2.1. Multiple intelligences questionnaire

Multiple Intelligences questionnaire used in this study was based on the Multiple Intelligences theory of Howard Gardner (1983, 1993)), developed by Armstrong (1993) and modified by Tirri and Nokelainen (2011), as cited in Tirri et al. (2013) (Appendix A). Through this scale (32 items), the teacher gained some initial concepts on students' preferred intelligences and, simultaneously, the researchers could establish an MI profile of the students. The checklist consists of eight sections representing the eight types of intelligences based on Gardner's classification. The checklist was administered at the beginning and end of the experiment to both control and experimental groups. Eight sections of the multiple intelligences inventory are verbal/linguistic intelligence, logical/mathematical intelligence, visual-spatial intelligence, bodily-kinesthetic intelligence, musical/rhythmic intelligence, interpersonal intelligence, intrapersonal intelligence, and naturalistic intelligence. The participants were asked to indicate how frequently they did so on a 5-point scale, with 1 for strongly disagree and 5 for strongly agree. This measure has demonstrated adequate internal consistency (.87) in the present study using Cronbach's alpha.

3.2.2. Student engagement questionnaire

To assess the potential effect of MIBI on participants' classroom engagement, Lam et al. (2014) classroom engagement questionnaire (33 items) (Appendix B) was used: a 3-item factor labeled

affective engagement, behavioral engagement, and cognitive engagement. The affective engagement subscale (9 items) assesses students' feelings for learning and school. The behavioral engagement subscale (12 items) measures students' effort in learning and participation in school activities. The cognitive engagement subscale (12 items) evaluates students' use of meaningful information processing strategies in learning. The students were asked to indicate their agreement to the affective and behavioral engagement items on a 5-point scale, with 1 for *strongly disagree* and 5 for *strongly agree*. But for the cognitive engagement items, they were asked to indicate how frequently they did so on a 5-point scale, with 1 for *never* and 5 for *always*. This measure has demonstrated adequate internal consistency (.96) in the present study using Cronbach's alpha.

3.2.3. Semi-structured interview

A semi-structured interview was designed for the aim of qualitative data collection. Five open-ended questions were mainly focused on the participants' overall experiences. The interviews, lasting between 15 and 20 min, were conducted in Persian by the researchers, recorded with a sonny voice recorder and manually transcribed. Data analysis was done using examination, comparison, conceptualization, and categorization of data. The data was analyzed until the researchers agreed that no further themes and subthemes could be extracted. The interviews were analyzed in Persian, and the excerpts used to illustrate our results in the current paper were translated into English. Two sample questions are "How did you find your experience in this course?" and "In what ways do you think the program influenced your general and academic life and why?"

3.3. Procedure

An experimental research design that included three intact classes was used. The study was undertaken at an institute, *Raad Institute*, for students with disabilities located in Kerman, Iran. One class acted as the control group (n = 10), and 20 participants acted as experimental groups according to the multiple intelligences based instruction they received: L1-oriented MIBI Group (n = 10), and L2-oriented MIBI Group (n = 10). The use of the control group and a pretest facilitated the exploration of the size and direction of selection bias. After ensuring that the groups were homogenous in language proficiency, no L2 background, attempts were made to provide the groups with equal opportunities in terms of class time (an hour and a half for each session), and the number of sessions (2 sessions per week). Learners were not told in advance that there would be different interaction modalities, and they were randomly assigned to one of the three modalities, resulting in 10 traditional instruction with no MIBI and L2 exposure, 10 L1-oriented MIBI Group, and 10 L2-oriented MIBI Group. For experimental groups, after using a multiple intelligence test, active (above the mean) and passive (below the mean) intelligences of the students were detected. Then, the instruction was based on designing tasks to activate all intelligences in both groups based on the initial assessment of their intelligences. The class time was distributed in a hierarchical order from the least to the most active intelligence. The following activities were used for teaching letter **Aa**: *Verbal-Linguistic Intelligence (Word Smart)*: Completing crossword puzzles and playing games with words containing letter **Aa**; Writing words with **Aa** letter. *Logical-Mathematical Intelligence (Math Smart)*: Searching for **Aa** pattern inside and outside the classroom; Designing **Aa** codes. *Spatial Intelligence (Picture Smart)*: Using clay or play dough to make letter **Aa**; Using maps to study geographical locations containing letter **Aa**. *Musical Intelligence (Music Smart)*: Setting a poem containing **Aa** sound to music and then performing it for the class; Using rhythm to memorize words with **Aa** letter. *Bodily-Kinesthetic Intelligence (Body Smart)*: Playing games with body movements and acting out characters in a book (Alice), animals (Ant), or other **Aa** topics. *Interpersonal Intelligence (People Smart)*: Working in pairs or cooperative groups to design and complete **Aa** letter projects; Tutoring other students or classmates working with **Aa**. *Intrapersonal Intelligence (Self Smart)*: Writing reflective papers on **Aa** topics; working alone on letter **Aa**. *Naturalistic Intelligence (Nature Smart)*: Sorting and classifying natural objects, such as leaves and rocks presenting **Aa** shapes; Researching and observing animal habitats and natural surroundings containing letter **Aa**. The only difference between the two experimental groups was using Persian in L1and using English in L2 group. However, the control group

received no MIBI training. Finally, after six months, progress was evaluated by comparing the multiple intelligences and classroom engagement of control and experimental groups.

4. Results

Regarding the data analysis, the quantitative and qualitative phases were performed as stated in the following sections.

4.1. Quantitative analysis

As illustrated in Figure 1, L1 and L2 experimental groups obtained a considerable increase in the mean scores for the linguistic, musical, spatial, bodily, interpersonal, intrapersonal, and natural intelligences, but not for the control group. Concerning the logical intelligence, just the L1 experimental group obtained a considerable increase in the mean scores.

Comparison of means (Table 1) showed that mean of classroom engagement in learners in control group before the project was higher than after the project.

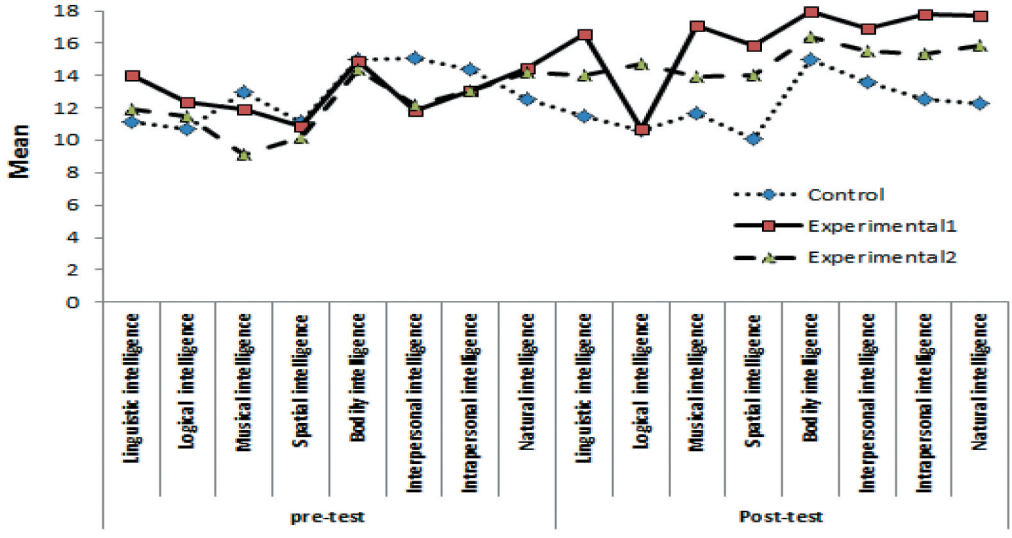

Figure 1. 1.Multiple intelligences.

Table 1. Paired-samples t-test of classroom engagement in control group

	Time	N	Mean	SD	T-Test	df	P-Value
Total Engagement	pre-test	10	101.90	25.85	1.70	9	.1
	post-test	10	96.70	24.41			
Affective Engagement	pre-test	10	31	9.06	2.12	9	.06
	post-test	10	29.30	8.43			
Behavioral Engagement	pre-test	10	38.30	9.53	1.18	9	.3
	post-test	10	36.80	9.92			
Cognitive Engagement	pre-test	10	32.60	12.12	1.32	9	.2
	post-test	10	30.60	10.88			

Table 2. Paired-samples t-test of classroom engagement in experimental group L2

	Time	N	Mean	SD	T-Test	Df	P-Value
Total Engagement	pre-test	10	106.90	30.31	−6.98	9	.000
	post-test	10	146.20	14.34			
Affective Engagement	pre-test	10	36	5.83	−4.57	9	.001
	post-test	10	43.90	1.20			
Behavioral Engagement	pre-test	10	39.30	10.67	−5.34	9	.000
	post-test	10	54	4			
Cognitive Engagement	pre-test	10	31.60	18.43	−6.20	9	.000
	post-test	10	48.30	12.32			

Table 3. Paired-samples t-test of classroom engagement in experimental group L1

	Time	N	Mean	SD	T-Test	Df	P-Value
Total Engagement	pre-test	10	109	26.16	−7.09	9	.000
	post-test	10	139.10	18.35			
Affective Engagement	pre-test	10	33.60	8.28	−4.93	9	.001
	post-test	10	41.10	5.07			
Behavioral Engagement	pre-test	10	39.70	10.09	−4.73	9	.001
	post-test	10	51.50	5.78			
Cognitive Engagement	pre-test	10	35.70	11.58	−4.44	9	.002
	post-test	10	46.50	9.62			

Observation of diversification of classroom engagement in pre-test and posttest showed that the classroom engagement was significantly different in experimental group L2 (Table 2) in pre-test and in posttest ($p < 0.01$). The total effect size was ES = 1.76, r = 0.661. The Effect size for Affective Engagement was ES = 2.25 (r = 0.747); for Behavioral Engagement was ES = 2 (r = 0.708) and for Cognitive Engagement was ES = 1.09 (r = 0.477).

Observation of diversification of classroom engagement in pre-test and posttest also showed that the classroom engagement was significantly different in experimental group L1 (Table 3) in pre-test and in posttest ($p < 0.01$). The total effect size was ES = 1.35, r = 0.560. Effect size for Affective Engagement was ES = 1.12 (r = 0.490); for Behavioral Engagement was ES = 1.49 (r = 0.597); and for Cognitive Engagement was ES = 1.02 (r = 0.454).

The ANOVA and Post Hoc Tukey HSD Test results indicated that there was no significant difference between the mean scores of classroom engagement in the participants of the three groups before the multiple intelligence training, however, the classroom engagement was significantly different comparing the physically disabled students of the control group with experimental groups in the posttest ($p < 0.01$) (Tables 4 & 6).

4.2. Qualitative Analysis

Using thematic analysis of the data, from a total of 20 students' responses (L1 & L2 oriented MITA) concerning their reflections on implementing the MIBI, we developed 3 main themes of: (1) engagement (2) enjoyment and (3) achievement. The following three codes were mentioned by participants of both the L1 & L2 groups.

Table 4. One-way anova of classroom engagement in pretest

		Model	Sum of Squares	Df	Mean Square	F	P-Value
	Total Engagement	Between Groups	266.07	2	133.03	.18	.8
		Within Groups	20,439.80	27	757.03		
		Total	20,705.87	29	-		
	Affective Engagement	Between Groups	125.07	2	62.53	1.02	.4
		Within Groups	1660.40	27	61.50		
		Total	1785.47	29	-		
	Behavioral Engagement	Between Groups	10.40	2	5.20	.05	.9
		Within Groups	2758.30	27	102.16		
		Total	2768.70	29	-		
	Cognitive Engagement	Between Groups	91.40	2	45.70	.22	.8
		Within Groups	5586.90	27	206.92		
		Total	5678.30	29	-		

Table 5. One-Way ANOVA of Classroom Engagement in Posttest

Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**P-Value**
Between Groups	14,328.07	2	7164.03	18.88	.000
Within Groups	10,244.60	27	379.43		
Total	24,572.67	29	-		

Table 6. One-way anova of classroom engagement in posttest

Groups		**Mean Difference**	**P-Value**
Control	Experimental1(English)	−49.50	.000
Control	Experimental2(Farsi)	−42.40	.000
Experimental1(English)	Experimental2(Farsi)	7.1	.7

4.2.1. Involvement

This category focuses on participants' propensity for classroom engagement. The boosted sense of task participation is vivid in most responses made by participants of this study, especially the L2 oriented MITA group.

Since I am handicapped with some special problems, I thought that I could do nothing in the class, but now I feel much better. I like and enjoy class participation.

After this program, there is a feeling of connection with others in the classroom. And there is a sense of engagement although we have different needs, goals, and problems.

4.2.2. Enjoyment

MI tasks motivated the participants in the right direction, and this has been documented from the participants' responses.

Multitasks we did (in groups, pairs, or with the teacher) motivated me to learn new things.

At first, it was just a force to me, but now there is a strong motivation to attend my classes.

4.2.3. Achievement

The following category focuses on students' achievement whereby it is attempted by both students, teachers, planners, and all those involved in the educational system to shape bright personal and academic achievements.

Due to my physical problem, I usually chose to remain passive, but this project using role-plays, games, discussions, etc. helped me to learn the course concepts in a different way that seems more effective.

I can feel and see the dramatic changes affecting both the linguistic and behavioral part of me.

5. Discussion

As mentioned earlier, the present study examined the effects of MIBI on the multiple intelligences and classroom engagement of physically disabled learners in Iran. By administering two questionnaires and conducting an interview, quantitative and qualitative data were gathered. Concerning the first and second research questions—To what extent does MIBI affect physically disabled learners' multiple intelligences and classroom engagement?—the quantitative results indicate that both experimental groups showed improvement in multiple intelligences (except logical intelligence), and classroom engagement from the pretest to the posttest which supports the use of MIBI as an alternative to conventional teaching approaches. While both MIBI groups performed positively in multiple intelligences, and classroom engagement, the control group was found to generate less classroom engagement for physically disabled learners. Therefore, MIBI groups appeared to be more beneficial for engagement improvement. The findings in the current study follow Armstrong (2003) that the growth of intelligences depends on different factors, including experiences with classmates, friends, teachers, and others who either help activate intelligences or prevent them from developing. Besides, the results in line with some other studies (Christison, 1998; Moran et al., 2006; Torresan, 2007) show that everyone has all types of intelligences which are dynamic and can be developed.

Regarding the third research question—Comparing L1(Persian) & L2 (English) MIBI, which mode of MI instruction is more effective in fostering physically disabled learners' classroom engagement?—ANOVA results showed that the difference among groups was not significant for classroom engagement on the pretest, so the distribution was regular in all the groups, but the difference among control and experimental groups was significant for classroom engagement on the posttest. The mean improvement was significant in both experimental groups (L1 & L2 MIBI). The greatest improvement occurred in the L2 MIBI Group followed by L1 MIBI Group. The results corroborated previous research (Ayesha & Khurshid, 2013; Rubado, 2002; Schirduan & Case, 2004; Schrand, 2008) that all types of intelligence, to some degree, need to work together and cooperate to the learners' best achievement. The outperformance of the L2-oriented MIBI groups compared with the L1-oriented MIBI group inline with Staudinger and Kunzmann (2005) confirmed that change or development happens when individuals cope with and adjust to new challenges and experiences (second or foreign language exposure in this study) which also has important implications for their social-emotional growth which can lead to successful social interactions.

Regarding the fourth research question—What are the participants' reflections (EGs) on the multiple intelligences-based teaching approach? -Drawing on qualitative analysis, the participants of both experimental groups believed that the use of the MIB teaching approach (both L1 & L2) contributed to their classroom engagement, motivation, and achievement. The focus of the MIBI is on student's active learning and participation and differs from teacher-centered approaches (Denny et al., 2008;

Weber, 2005). The emphasis of the MIBI approach is on creating fresh, constructive, and goal-directed climates appropriate for the students' development (Weber, 2005). Each student brings their abilities and characteristics to the classroom and this must be taken into consideration before planning and designing teaching activities (Beghetto, 2007).

It is now time to take MI out of the theoretical world and move it into the world a wide-ranging application in classrooms of physically disabled children. While it unrealistic to think every lesson that every teacher at every level offers will be custom tailored for each MI represented in each particular class, the current state of technology and MI research is allowing teachers to move toward this ideal (Kaewkiriya et al., 2016). All these things mean that the various MI represented in classes is more diverse than ever. As such, those teaching for physically disabled children or aspiring to do so must understand how diversity and MI theory will affect physically disabled students. If the goal of teaching is to get students to learn content in to cognitive domain, learn the skills required to physically and mentally apply the knowledge gained in the psychomotor domain, and gain affect for the subject in affective domain (McCroskey, 2002), then teachers at all levels must learn to effectively apply MI theory to their lessons. "Students hold the clues and keys to good teaching" (J. Chesebro, 2002b, p. 202). The excellent teacher will unwrap the MI blends of students and classes and use that information to guide classroom communication and engagement.

To sum up, the result of the study reveals the significance of a multidimensional style of education and pinpoints several ever-neglected key considerations in the area of disabled children's instruction. The more diverse our students experience, the more effective their learning will be, and accordingly, the more successful they will be in the challenging world, especially physically disabled ones.

6. Conclusion

The present study supports the use of MIBI, as a means of drawing upon the learners' strengths and abilities so that they can achieve greater personal and social success. In effect, if physically disabled children are provided with appropriate programs, the better their chances of fully actualizing their potential (Tavakolizadeh et al., 2019). Disabled-children will not get the satisfaction of making progress until they have opportunities to find and develop their potentials and these high levels of development are inseparably linked to multiple intelligence-based instruction. Thereby educationally purposeful activities that activate students' intelligences foster their classroom engagement. The findings of this study may shed new light on knowing the nature of intelligences in an educational setting, students with special needs in this case. This study will be of particular interest to educators who prepare students with the knowledge, skills, and attitude necessary for the complex world of inside and outside the classroom. MIBI, as a method of teaching and learning, offers an innovative approach for teaching life skills. If teachers try to activate all intelligences through the pedagogical tasks they apply in their classrooms, they can stimulate the growth of all types of intelligences in their students. It helps students know themselves and their potential traits better and, therefore, use most of their abilities and opportunities. Accordingly, the need to study the relationships between these abilities continues. Although this study successfully investigated the demanded topic, there were some limitations through the path that must be considered before assessing its contributions. This study took place in one site only with a small sample size (n = 30) and therefore, only reflect physically disabled learners in this one site in Iran. The small sample size could be considered to lack statistical representation. As the study participants may be influenced by the context of the study, further studies can be conducted using Multiple Intelligences in other contexts. Some studies among students with diverse cultures attending different institutions as well as different residential areas should also be conducted. Future studies can address the view of the parents and teachers and the consequences these instructions have on their home and school life. Regarding the major differences between males and females, gender influence requires more study.

Funding
The authors received no direct funding for this research.

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Citation information
Cite this article as: The Implementation of a Multiple Intelligences Teaching Approach: Classroom engagement and physically disabled learners, Nayyereh Ghaznavi, Mehry Haddad Narafshan & Massoud Tajadini, *Cogent Psychology* (2021), 8: 1880258.

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Appendix A: Multiple Intelligences Questionnaire (Howard Gardner, 1983 &1993)

The Multiple Intelligences Profiling Questionnaire					
	1 Totally disagree	2 disagree	3 neutral	4 *agree*	5 Totally agree
1. At school I was good at mathematics, physics or chemistry.					
2. I often think about my own feelings and sentiments and seek reasons for them.					
3. Writing is a natural way for me to express myself.					
4. At school, geometry and various kinds of assignments involving spatial perception were easier for me than solving equations.					
5. After hearing a tune once or twice I can sing or whistle it quite accurately.					
6. When listening to music, I can discern instruments or recognize melodies.					
7. I can analyze my own motives and ways of action.					
8. I spend time regularly reflecting on the important issues in life.					
9. Even in strange company, I easily find someone to talk to.					
10. I get along easily with different types of people.					

(*Continued*)

11. I am handy.					
12. I can work with and solve complex problems.					
13. I make contact easily with other people.					
14. I can easily do something concrete with my hands (e.g., knitting and woodwork)					
15. I am good at games and problem solving, which require logical thinking					
16. I have recently written something that I am especially proud of, or for which I have received recognition.					
17. I like to read psychological or philosophical literature to increase my self-knowledge.					
18. I am good at showing how to do something in practice.					
19. It is easy for me to conceptualize complex and multidimen sional patterns.					
20. I can easily imagine how a landscape looks from a bird's-eye view.					
21. Mental arithmetic is easy for me.					
22. I can easily keep the rhythm when drumming a melody.					

(*Continued*)

(Continued)					
23. Metaphors and vivid verbal expressions help me learn efficiently.					
24. In negotiations and group work, I am able to support the group to find a consensus.					
25. I notice immediately if a melody is out of tune.					
26. When I read, I form illustrative pictures or designs in my mind.					
27. I was good at handicrafts at school.					
28. At school studies in native language or social studies were easier for me than mathematics, physics and chemistry. (Note new wording: At school, studies in native language were easy for me.)					
29. I love animals and I spend a lot of time with them.					
30. I enjoy visiting zoos, natural history museums or other places where the world is studied.					
31. I like being outside whenever possible; I feel confident and comfortable there.					

(*Continued*)

32. I want to become a volunteer in an ecological organization (such as Greenpeace or Sierra Club) to help save nature from further destruction.					

Appendix B: Engagement (Lam et al., 2014)

Affective engagement **How much do you agree that the following statements accurately describe your learning experience in this semester?**					
1. I am very interested in learning.	1 *strongly disagree*	2 *disagree*	3 *neutral*	4 *agree*	5 *strongly agree*
2. I think what we are learning in school is interesting.					
3. I like what I am learning in school.					
4. I enjoy learning new things in class.					
5. I think learning is boring. (R)					
6. I like my school.					
7. I am proud to be at this school.					
8. Most mornings, I look forward to going to school.					
9. I am happy to be at this school.					
Behavioral engagement **How much do you agree that the following statements accurately describe your learning experience in this semester?**					
1. I try hard to do well in school.	1 *strongly disagree*	2 *disagree*	3 *neutral*	4 *agree*	5 *strongly agree*
2. In class, I work as hard as I can.					

(*Continued*)

(Continued)					
3. When I'm in class, I participate in class activities.					
4. I pay attention in class.					
5. When I'm in class, I just act like I'm working. (R)					
6. In school, I do just enough to get by. (R)					
7. When I'm in class, my mind wanders. (R)					
8. If I have trouble understanding a problem, I go over it again until I understand it.					
9. When I run into a difficult homework problem, I keep working at it until I think I've solved it.					
10. I am an active participant of school activities such as sport day and school picnic.					
11. I volunteer to help with school activities such as sport day and parent day.					
12. I take an active role in extra-curricular activities in my school.					
Cognitive engagement **When learning things for school in this semester, how often do you do the following?**					
1. When I study, I try to understand the material better by relating it to things I already know.	1 *never*	2 *rarely*	3 *sometimes*	4 *often*	5 *always*

(*Continued*)

2. When I study, I figure out how the information might be useful in the real world.					
3. When learning new information, I try to put the ideas in my own words.					
4. When I study, I try to connect what I am learning with my own experiences.					
5. I make up my own examples to help me understand the important concepts I learn from school.					
6. When learning things for school, I try to see how they fit together with other things I already know.					
7. When learning things for school, I often try to associate them with what I learnt in other classes about the same or similar things.					
8. I try to see the similarities and differences between things I am learning for school and things I know already.					
9. I try to understand how the things I learn in school fit together with each other.					
10. I try to match what I already know with things I am trying to learn for school.					

(*Continued*)

(Continued)					
11. I try to think through topics and decide what I'm supposed to learn from them, rather than studying topics by just reading them over.					
12. When studying, I try to combine different pieces of information from course material in new ways.					

***Cogent Psychology* (ISSN: 2331-1908) is published by Cogent OA, part of Taylor & Francis Group.**