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Original Research

Ego-resiliency and physically disabled learners: The implementation of a multiple intelligences teaching approach

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Abstract

Background: Gardner's multiple intelligences (MI) theory offers great opportunities to improve the diverse abilities potential in disabled learners. The current study investigated the effect of the MI teaching approach on physically disabled learners' MI and ego resiliency.

Methods: The purposive sample included male and female participants aged 14 to 30 years at the Arseye-Talash Institute in Urmia, West Azerbaijan for students with disabilities. To gain a complete picture of the phenomenon, the study used self-report questionnaires and semi-structured interviews. The study utilized an experimental design that included 30 participants overall, with 10 participants in a control group and 20 participants in two experimental groups according to the multiple intelligences-based instructions (MIBI) they received: first language (Persian)-oriented MIBIs & second language (English)-oriented MIBIs. For both experimental groups (n = 20), active and passive intelligences of the students were identified using a MI test. Then, the instruction was tailored to designing tasks to activate the passive intelligence for both groups. The control group (n = 10) received no training. The data were analyzed in SPSS software using ANOVA and Tukey's post hoc HSD test.

Results: Findings indicated that the use of the MI-based teaching approach contributed to a significant improvement in the learners' MI ($P<0.01$) and ego resiliency ($P<0.01$). Furthermore, findings showed a positive impact of L2-oriented (English) MIBIs compared with L1-oriented (Persian) MIBI on physically disabled learners' ego resiliency ($P<0.01$); however, no significant difference was found between the two languages' MIBIs ($P>0.01$).

Conclusion: The more diverse a learner's experience, the more effective their learning will be, and accordingly, the more successful they will be in a world of challenges. This holds especially true for physically disabled learners who have diverse experiences and hence diverse learning needs.

Introduction

Intelligence has been defined as linguistic and logical-mathematical characteristics identified by intelligence quotient tests. However, instead of describing intelligence as a single general skill, the multiple intelligences (MI) theory re-defines intelligence as many competencies designed to solve "true challenges or problems ... and, if possible, to make an acceptable product.[1] Rejecting the notion that intelligence can be assessed by standardized tests, Gardner proposed his theory of MI, which originally were seven in number; later he added an eighth one.[2] Gardner believes that individuals have differences in the intelligence nature they were born with and that each person experiences/practices intelligence differently. Gardner presents the eight types of intelligence as follows: *interpersonal*: sensitivity to other people's motivations, temperaments, moods, and desires; *logical-mathematical*: noticing logical or numerical patterns; *verbal-linguistic*: recognizing the rhythms, sounds, and meanings of words; *musical–rhythmic*: the ability to produce and understand rhythm, pitch, and timbre; *visual-spatial*: the ability to present a mental model of the spatial world; *bodily–kinesthetic*: the interest to express and create objects physically and skillfully; *intrapersonal*: awareness of one's emotions, wants, strengths and weaknesses; and *naturalistic*: the ability to understand and appreciate living things.[2-4]

This MI theory offers great opportunities to improve the

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diverse abilities potential in disabled learners. Teachers cannot teach effectively by acting as if all learners are the same in all classrooms, including classrooms where students suffer from physical disabilities.[5]

Multiple intelligences-based instruction (MIBI) has the potential to increase not only the students' confidence and passion for learning but also their learning skills. MIBI provides academic strengths and acknowledges innovative learning methods that can be of great assistance in educating and identifying children for special education services.[6] However, in the case of physically disabled students, along with their physical problems, they face dilemmas and enormous challenges, whether in their own country or overseas, existing in society and with other people. Thus, for physically disabled children, the importance of ego resiliency is a matter of utmost significance. Ego-resiliency is a construct influenced by self-regulation, and thus it is expected to be influenced by temperament and other personality characteristics (e.g., effortful control, emotionality), learning (e.g., acquisition of coping skills), and stressors in a particular context. During an individual's life span, ego-resiliency has been linked to high intellectual capacities and social competencies. An individual with ego resilience can adapt to changing situations, change behaviors, be resourceful and resilient, and implement problem-solving techniques with flexibility. Ego-resilient people do not generally give up and recover more quickly in stressful situations; after challenges and adverse conditions, they become stronger.[7] Block and Block[8] considered major transformations in biological and social life as causes of regulatory changes in ego resilience (e.g., puberty, adolescent sexuality, and university access). Accordingly, ego-resilient individuals exhibit better adjustment and higher attainment than individuals low in ego-resiliency, and they are likely to assume adult responsibilities at a younger age than other individuals.

MIBI gives researchers and scholars around the world the opportunity to see that all students, including physically disabled students, can experience tasks that activate and develop all their intelligences. Therefore, the current study addressed MI-based instruction using a sample of physically disabled Iranian learners to answer the following research questions:

1. To what extent does MIBI affect physically disabled learners' MI?
2. To what extent does MIBI affect physically disabled learners' ego resiliency?
3. Comparing L1(Persian) & L2 (English) MIBI, which mode of MI instruction is more effective in fostering physically disabled learners' MI?
4. Comparing L1(Persian) & L2 (English) MIBI, which mode of MI instruction is more effective in fostering physically disabled learners' ego resiliency?
5. What are the participants' reflections on the MIBI teaching approach?

Materials and Methods

This experimental study was conducted based on a pretest-posttest design with a control group. The study was undertaken at the Arseye-Talash Institute for students with disabilities in Urmia, West Azerbaijan. The purposive sample included male and female participants aged 14 to 30 years. All suffered from cerebral palsy (CP), 70% with severe CP and 30% with mild CP. Nine participants had stiff muscles (spasticity), 13 had uncontrollable movements (dyskinesia), and 8 had poor balance and coordination (ataxia). According to the results of the placement test, 98% of the students were beginner-level English language learners and 2% were elementary-level English language learners. Excluding the elementary-level students resulted in a total of 30 beginner-level English language learner participants. After ensuring that the groups were homogenous in language proficiency, groups were provided with equal opportunities in terms of class time (one hour and a half for each session), and number of sessions (two sessions per week). One class of ten students acted as the control group (n = 10), and 20 students acted as the two experimental groups according to the MIBIs they received: the L1-oriented MIBI group (n = 10), and the L2-oriented MIBI group (n = 10). Participants and their parents were informed of the purpose of the study and research ethics, including confidentiality and anonymity.

For the experimental groups, active (above the mean) and passive (below the mean) intelligences of the students were identified using an MI test. Their instruction was then based on designing tasks to activate all intelligences in both groups based on the initial assessment of their intelligences. Class time was distributed hierarchically from the least to the most active intelligence. The following activities were used for teaching the **Aa** letters. *1) Verbal-Linguistic Intelligence (Word Smart):* Completing crossword puzzles and playing games with words containing **Aa** letters; writing words with **Aa** letters. *2) Logical-Mathematical Intelligence (Math Smart):* Searching for **Aa** patterns inside and outside the classroom; designing **Aa** codes. *3) Spatial Intelligence (Picture Smart):* Using clay or play dough to make **Aa** letters; using maps to study geographical locations containing **Aa** letters. *4) Musical Intelligence (Music Smart):* Setting a poem containing **Aa** sounds to music and then performing it for the class; using rhythm to memorize words with **Aa** letters. *5) Bodily-Kinesthetic Intelligence (Body Smart):* Playing games with body movements and acting out characters in a book (Alice), animals (Ant), or other **Aa** topics. *6) 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**. *7) Intrapersonal Intelligence (Self Smart):* Writing reflective papers on **Aa** topics; working alone on letter **Aa**. *8) 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 the letter **Aa**.

The only difference between the two experimental groups was using Persian in the L1group and English in the L2 group. The control group of 10 students received no MIBI training. After six months, the potential progress was measured by comparing the MI and ego resiliency of control and experimental groups. The data were analyzed in SPSS software using ANOVA and Tukey's post hoc HSD test.

Multiple intelligences questionnaire

The MI questionnaire is a 32-item self-report questionnaire aimed at assessing the levels of MI. The questionnaire is based on Gardner's MI theory of,[1, 9] developed by Armstrong[10] and modified by Tirri & Nokelainen,[11] cited in Tirri et al.[12] Through this scale, the teacher gained some initial perceptions about students' preferred types of intelligence and, simultaneously, researchers could establish MI profiles for the students. 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 (0.87) in the current study using Cronbach's alpha.

Ego-resiliency questionnaire

Ego resiliency was measured using the ego-resiliency (ER) questionnaire developed by Block and Block[8] and modified by Block and Kremen.[13] The ER questionnaire is a self-report measure consisting of 14 items ranked on a 4-point scale ranging from 1 = not at all to 4 = a lot. This measure has also demonstrated adequate internal consistency (0.89) in the current study using Cronbach's alpha.

Both instruments were reviewed by three experts (two in English Language Teaching and one in data and information retrieval). The questionnaire items were also piloted with a population similar to that of the current study to check validity and reliability. Based on the feedback, some items were changed and some sentences were added to clarify meaning. The questionnaires were translated into Persian and then using the forward-backward translation design they were translated back into English trying to keep the conceptual meaning of the original scales.

Semi-structured interview

In addition to quantitative data analysis, the current study followed the phenomenological method aimed at reflecting the participants' experiences of the project. Consequently, a semi-structured interview was used for the qualitative phase of the study. The interviews were conducted in Persian by the researchers and lasted between 10 and 20 minutes. They were recorded with a digital Olympus voice recorder and manually transcribed. The qualitative analysis of interviews was conducted by comparing the data, extracting patterns, and categorizing themes.

Results

As illustrated in Figure 1, the L1 and L2 experimental groups showed a considerable increase in mean scores for seven of the eight intelligences (linguistic, musical, spatial, bodily, interpersonal, intrapersonal, and natural)

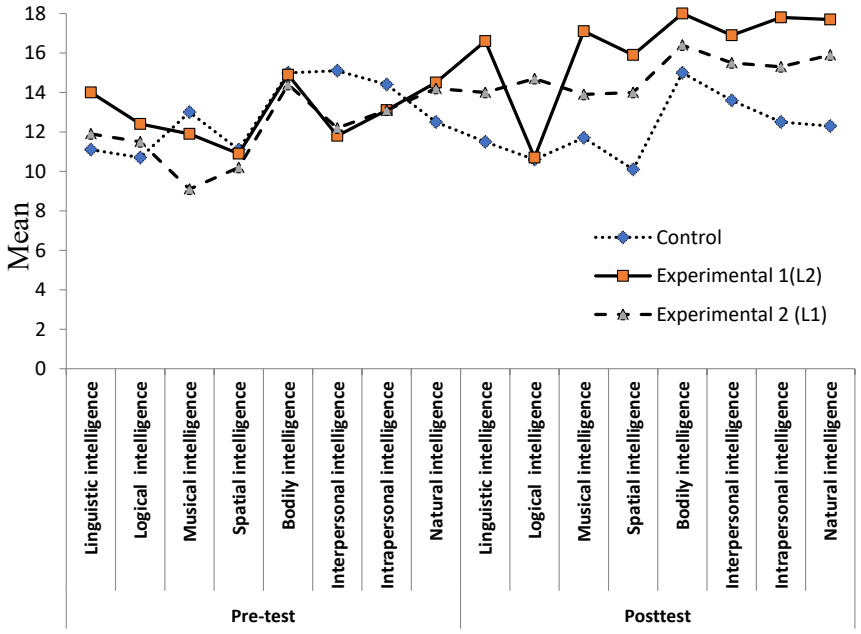

Figure 1. Multiple intelligences.

compared to the control group. Concerning logical intelligence, only the L1 experimental group showed a considerable increase in the mean scores.

Comparison of means showed that the mean of ego resiliency in learners in the control group before the project was significantly lower after the project as shown by the pre- and post-tests ($P < 0.01$) with an effect size of ES = 0.39, r = 0.193 (Table 1). Observation of diversification of ego-resiliency at pre-test and posttest also showed that ego-resiliency was significantly higher in both the L1 and L2 groups at the posttest: $P < 0.0001$ for L1, with an effect size for E1 of ES = 1.98, r = 0.704, and $P < 0.001$ for L2 with an effect size for E2 of ES = 2.88, r = 0.822.

The ANOVA and Tukey's post hoc HSD test results found no significant difference among the mean scores of ego resiliency in the participants of the three groups before the multiple intelligence training, however, the ego resiliency was significantly different comparing the physically disabled students of the control group with experimental groups at the posttest ($P < 0.01$) (Tables 2 and 3).

In addition to the quantitative phase of the study, the phenomenological method was used to reflect participants' experiences. Using thematic analysis on a total of 20 students' responses from both experimental groups (L1 & L2) concerning their reflections on implementing the MIBI, we developed four main themes: (1) Willingness to take risks; (2) Emotional regulation; (3) Social development; and 4- Self-growth. The first three themes were mentioned by participants in both the L1 & L2 groups. However, the fourth theme was mentioned only by L2 participants.

The main interview questions were as follows:

1. How was your experience in this classroom?
2. How do you think the program has affected your daily life and why?
3. What do you think about the effect of this program on your academic experience?
4. Can you find any potential psychological, social, or behavioral changes after this experience?

Willingness to take risks

This category focuses on participants' propensity for risk preference. A boosted sense of taking risks is evident in most responses made by participants of this study, especially the L2 group.

Experiencing various tasks motivated me to take risks and make decisions knowing that they have consequences and involve risks.

The project aided me to step out of my comfort zone, take some risks, and forget my disability. It was a sort of courage to feel that I can do it.

Emotional regulation

MI tasks were especially challenging in a new language, guiding the participants in the direction to learn how to deal with their own and others' emotions. This is shown in the participants' responses.

Performing class tasks was a complex process that involved initiating, inhibiting, or modulating my state or behavior in the given situations – for example, during the role-plays I learned how to accept and express my emotions.

During English classes, the understanding and control of my emotions and feelings have increased, and now I know myself better.

Social development

The following category focuses on students' social change where students, teachers, planners, and all those involved in the educational system make the effort to shape a bright personal and social future.

Table 2. One-way ANOVA of ego resiliency

Model	Sum of squares	Df	Mean square	F	*P* value
Between groups	2.87	2	1.43		
Within groups	1584.50	27	58.69	0.02	0.9
Total (pre-test)	1587.37	29	-		
Between groups	1454.87	2	727.43		
Within groups	520.50	27	19.28	37.73	0.000
Total (post-test)	1975.37	29			

Table 3. Tukey's post-hoc HSD test of ego resiliency at post-test

Groups		Mean difference	*P* value
Control	Experimental G (L2)	-15.90	0.000
Control	Experimental G (L1)	-13.30	0.000
Experimental G (L2)	Experimental G (L1)	2.6	0.39

Table 1. Paired-samples *t* test of ego resiliency

Group	Time	N	Mean	SD	T test	*df*	*P* value
Control Group	Pre-test	10	38.00	6.99	3.27	9	0.01
	Post-test		35.50	5.72			
Exp. L1	Pre-test	10	37.40	5.17	-7.22	9	0.000
	Post-test		48.80	2.74			
Exp. L2	Pre-test	10	37.30	10.02	-4.73	9	0.001
	Post-test		51.40	4.20			

Due to my physical problem, I usually chose to remain socially passive rather than active with the risk of embarrassment. However, class activities aided me to learn how to interact with one another collaboratively and productively, such as role-plays, games, discussions, etc.

New language, new names, and new titles encouraged me to be assertive in expressing my needs and preferences. I think it is the starting point to ensure the development of positive self-esteem, self-confidence, and a sense of social development.

Self-growth

As mentioned by Norton,[14] every time language learners are exposed to a different linguistic context, they are not only communicating with their partners but also constructing and reconstructing a sense of who they are and how they contribute to the world around them. Accordingly, this category deals with English language learning and potential changes in self.

Knowing the English language and the ability to speak it gives me a strong command of self-confidence. I feel more confident.

Learning new languages means new challenges, which makes us stronger. I feel [I am] challenging myself and my abilities in learning the English language.

Discussion

Reviewing the quantitative analysis, results indicate that both experimental groups showed improvement across MI with the exception of logical intelligence, and ego resiliency improved from the pretest to the posttest, which supports the use of MIBI as an alternative to conventional teaching approaches in a group of physically disabled students. The results of the current study are in line with theories of MI, supporting that all types of intelligence, to some degree, need to work together[15] and cooperate.[16] Christison states that "multiple intelligences always interact with each other in complex ways. No intelligence stands by itself in life".[17] ANOVA results from this analysis showed that the difference among groups was not significant for ego resiliency at the pretest, but the difference between the control and experimental groups was significant for ego resiliency on the posttest, indicating that the MIBI intervention improved ego resiliency in both experimental groups. While the larger improvement occurred in the L2 group, the mean improvement was significant in both experimental groups (L1 & L2). Both MIBI groups improved positively in MI and ego resiliency; however, the control group was to have negative ego resiliency from pre- to posttest. Therefore, MIBI appears to be beneficial for ego improvement.

The higher performance of the L2 group compared with the L1 group is in line with Staudinger and Kunzmann,[18] who confirmed that change or development happens when individuals cope with and adjust to new challenges and experiences (in this study, second or foreign language exposure) which has important implications for social-emotional growth which can lead to successful social interactions. When L2 learners speak English, they are also investigating and shaping their sense of self concerning the rest of the world. In L2 contexts, identity is often seen as a site of investment for L2 learners,[19] given that speaking an L2 often includes "a context to construct a new identity that is true to self".[20] For the current study, identity is primarily understood as "self-definition by groups or individuals".[21] While learning a second language, the learner experiences the construction and reconstruction of both identities—the L1 self and the L2 self. The new language exposure is considered a challenging situation towards learners' self-development. The findings indicate that the ego state evolves creative ways of coping with the demands of foreign language exposure.

The findings in the current study also follow Armstrong's view[22] that the growth of MI is dependent on various factors, including experiences with parents, classmates, friends, teachers, and others, who either aid in activating MI or prevent them from developing. These results are also in line with other studies[15-17] showing that each individual has all types of intelligence which are dynamic and can be further developed.

Drawing on results of the qualitative analysis, our findings show that the use of the MIBI teaching approach (both L1 & L2) contributed to learners' willingness to take risks, emotional regulation, and social development. Additionally, the L2-oriented MIBI teaching approach contributed even more to learners' self-growth. The focus of MIBI is on the student's active learning and participation and differs from teacher-centered approaches.[23,24] The emphasis of the MIBI approach is on creating fresh, constructive, and goal-directed climates appropriate for student development.[24] Each student brings their own abilities and characteristics to the classroom and this must be taken into consideration before planning and designing teaching activities.[25]

Conclusion

The current study reports the complex relationship among intelligence, language, and learning. The findings of the current study may shed light on the nature of MI in a unique educational setting, students with physical disabilities in this case. The current study will be of particular interest to educators who are preparing students with the knowledge, skills, and attitude necessary for the complex world inside and outside the classroom. MIBI, as a method of teaching and learning, offers an innovative approach for teaching educational and life skills. If teachers attempt to activate all kinds of intelligence through pedagogical tasks in their classrooms, they can stimulate the growth of all types of intelligence in their students. It helps students to know themselves and their potential traits better and, therefore, use more of their abilities to make the most of their opportunities. Accordingly, the need to study the

relationships among these abilities continues.

Ethical approval

The current study underwent ethical review and was approved by the Arseye-Talash Institute. Participants and their parents were informed of the purpose of the study and research ethics, including confidentiality and anonymity.

Competing interests

On behalf of all the authors, the corresponding authors declare that there are no competing interests to be declared.

Authors' contributions

All authors contributed to the study design, data collection, manuscript drafting, and study revision.

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