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EFFECTIVENESS OF THE MULTIPLE INTELLIGENCES INSTRUCTIONS WITHIN THE E-LEARNING SETTING DURING THE POST-COVID ERA

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Abstract:

The COVID-19 outbreak quickly demonstrates the importance of adopting online education in teaching and learning. It has forced education systems worldwide to find alternatives to face-to-face interactions. Language instructors have made attempts to explore and utilise the e-learning tools to enrich their teaching and assist learners in improving their language learning. This paper, therefore, attempts to shed light on the effectiveness of implementing the Multiple Intelligences Instructions within the e-learning setting, thus present an unprecedented opportunity to continue adopting this digitally-enhanced approach post-pandemic. A Paper 800/4 (Writing) Task 2 of Malaysian University English Test (MUET) 2020 question was administered to 40 pre-university students from Preparatory Centre of Science and Technology, Universiti Malaysia Sabah. The study employed a quantitative methodology and the data were analysed using the Mann-Whitney U Test. The findings show that the adoption of the Multiple Intelligences Instructions in the English as a Second Language (ESL) writing classes improves the students' skills in writing. This study calls Malaysian English educators to acknowledge students' differences in learning, thus redesign the lessons by incorporating all intelligence for the students to actively manifest their preferred learning styles in acquiring the English language. The implementation of this writing module in an e-learning environment received positive feedbacks from the students, suggesting it would be a promising module to improve the students' writing skills.

Keywords:

COVID-19, Effective, E-learning, ESL, Writing

Introduction

Modern society, with its rapid scientific and technological advances, has seen an exponential rise in accessible knowledge with continuously changing and emerging technologies (Goldie, 2016). Even before the global Coronavirus Disease (COVID-19), there was already high growth and adoption in education technology. The internet has been long used for educational purposes and many prominent models of the internet-based education has emerged over the past 20 years (Szymkowiak et al., 2021). However, the COVID-19 outbreak quickly demonstrates the importance of adopting online education in teaching and learning (Selvaraj, Vishnu, Nithin, Benson & Mathew, 2021). Effect of pandemic based online education on teaching and learning system. *International Journal of Educational Development*. <https://doi.org/10.1016/j.ijedudev.2021.102444>. It has forced education systems worldwide to find alternatives to face-to-face interactions. With tens of millions of students across the world forced to stay at home from school, it has opened to the possibility of integrating technology into the existing curricula.

Despite the challenges and scepticism over the incorporation of the e-learning tools for classroom practice, language teachers and lecturers, for instance, have made attempts to explore and utilise these tools to enrich their teaching and assist learners in improving their language learning (Lockyer & Patterson, 2008). A possible explanation for this might be that the traditional practices are no longer suitable to the Gen Z- those born between 1996 and 2009 – who would prefer a wider and freer sense of expressions and to learn following their learning styles and pace. Specifically, in a time when children handle digital information, communicate with others via mobile technologies, and play more games than the previous generation (Beck & Wade, 2006), online learning might be a more appropriate approach to teaching and engaging children in education in a more successful way than the traditional learning methods (Ünlüsoy et al., 2013). The learning environment has become more dynamic than ever before, and as a result, today's learners are very different from those that our educational system was designed for.

While many are taunting the benefits of shifting the conventional teaching approaches to e-learning, the Multiple Intelligences theory is deemed to be the best solution to ensure continuity in learning in an era of what has been coined as the “new norm”. Even though it was developed nearly two decades ago, it has not remained static – an enormous secondary literature has developed around it and many individuals have propagated this theory in various ways. The technology has allowed a quantum leap in the delivery of individualized services for both students and teachers. It is already possible to create software that addresses the different intelligences, provides a range of entry points, allows students to exhibit their own understandings in diverse symbol systems (linguistic, numerical, musical, graphic, etc.), and begins to allow teachers to examine student work flexibly and rapidly. Also, the development of “intelligent systems” that will be able to evaluate student work and provide relevant feedback is no longer simply a chapter from science fictions. Its potential for language learning and teaching has led some educators to adapt their standard curriculum so that it can be presented through several intelligences, while others have chosen to focus directly on particular intelligences and have sought to reconfigure the curriculum so that it enhances particular intelligences (Sulaiman, Sulaiman & Suan, 2011).

This paper, therefore, attempts to shed light on the effectiveness of implementing the Multiple Intelligences Instructions to improve the students' writing skills in an online learning

environment. Five intelligences become the focal point for the activities, assimilated into the preexisting syllabus for writing. Also, this study seeks to examine whether the knowledge taught with the Multiple Intelligences Instructions can be retained by the students, proving that this theory could be transformed and enhanced digitally to fit the current teaching scenario post-pandemic. Given the substantial lack of research on the adoption of this theory into the e-learning settings, this has opened to more possibilities of findings within the same context and targeted students to fill in the gaps underexplored by many. The findings could add to the existing literature body and further prove that the Multiple Intelligences is not only being accepted and applied by educators worldwide, but it is also effective in developing the students' language skills online. It will somehow change the dynamic of teaching strategies and can be adopted post-pandemic.

Literature Review

Multiple Intelligences Theory

Intelligence is defined as “the ability to modify and adjust one’s behaviours to accomplish new tasks” (Peariso, 2008). The term ‘intelligence’ is traditionally measured with the IQ, which designates the ration between a person’s mental and chronological age to assess human intelligence. The individuals’ intelligence is measured by the accumulated scores of linguistic and mathematics tests, without considering other abilities. However, Howard Gardner, a distinguished American Cognitive Psychologist at Harvard University, United States who specializes in intelligence, observes that every human is endowed with different levels of natural potentials. He challenged this notion of intelligence by stressing that the IQ scores do not provide any information on other types of intelligence. This is further supported by Shearer and Karanian (2017), as they found the neural patterns are consistent with Gardner’s 1983 hypothesis, indicating that general intelligence is closely associated with Linguistic and Logical-Mathematical intelligence.

Gardner (1983) believes that each individual has a multitude of intelligence that are quite independent of each other. The child who takes more time to master language skills may learn them best through a different approach, may excel in a field other than English, or maybe looking at and understanding the ESL learning process at a fundamentally deeper level. Equipped with this assumption, he then developed and propounded the theory of Multiple Intelligences and redefines intelligence as “an ability or set of abilities to solve problems or create products that are valued within one or more cultural settings or communities”. Howard Gardner posits that each individual has varying levels of intelligence and each individual has a unique cognitive profile (Hajhashemi, Akef, & Anderson, 2012). Gardner originally identified seven distinct intelligences in the first edition of the ‘Frames of Mind’ – Bodily-Kinesthetic, Intrapersonal, Interpersonal, Verbal-Linguistic, Logical-Mathematical, Musical, and Visual-Spatial - and has since added an eighth ‘Naturalist’ form of intelligence in 1995 and a ninth form of ‘Existential’ intelligence in 1998. Confirming the exact number of intelligence is not the main highlight, but simply the plurality of the intellect. Through years of research, Gardner claims that each person has raw biological potential. Although we were born with a different intelligence, the ways we develop it is what makes us different from others. A similar conclusion was drawn in a study conducted by Sherman & Key (1932) as they claim that children would portray better and encouraging results in academic if they were provided with favourable environmental situations such as better schooling and learning experiences.

Multiple Intelligence in the 21st Century

E-learning has become an integral component of the modern education system. Educators are urged to transform the techniques in conducting language learning by incorporating technological tools because Gen Z students tend to thrive when they are given the opportunity to have a fully immersive educational experience with digital learning tools deeply integrated into their education (McFarlane, 2011). Many academic institutions in Malaysia commit themselves to e-learning because they believe in its effectiveness as an alternative approach to conventional teaching strategies of disseminating information (Raja Hussain, 2004). From the analysis conducted on the responses of e-learning administrators and lecturers from Malaysian Higher Education Institutions (HEIs), the percentage of courses offered through the blended mode by lecturers are between 1 to 80 per cent, while the percentage of online courses taken by students is 81 to 100 per cent. Most of the lecturers in Malaysia HEIs (73.5 per cent) also believed that there is an increase in e-learning activities in the past two years (Embi, 2011). Although this data was derived in 2011, it clearly shows that there was already high growth and adoption in education technology in Malaysia from the pre- to early-COVID-19 period.

E-learning has been proven effective to facilitate learning in the classroom. Empirical studies revealed numerous benefits of the adoption of e-learning tools in language classes. These include increased participation among students, improved quality of language outputs (Warschauer, 1995), enriched vocabulary (Perez, 2003), and a collaborative learning environment. It also provides a more equitable platform and a less threatening environment for second language acquisition (Hussin, 2008; Warschauer, 1995). Engaging these learners in a digitally mediated learning environment could elicit more interest and productive output in the targetted language. It provides different opportunities to make learning more fun and enjoyable in terms of teaching the same things in a new way.

Digital technology in the 21st century improves many skills more efficiently and effectively—for example, apps can assist one to learn the three Rs (Reading, Writing, and Arithmetic) and through MOOCs (Massive Open Online Courses), and many scientific, mathematical, and computational skills can be presented. As technology is increasingly used in the educational process, it is becoming a more powerful tool in putting Multiple Intelligences to use. For example, the power of the projector has now evolved from a simple presentation device to the heartbeat of interactive whiteboards, which bring content to life for all learners (McCoog, 2007). It offers the most suitable and effective platform for the 21st century instructional and educational methodologies, as it can be gleaned from the application of various technologies in the learning process. Technology incorporation in learning has a tremendous relation to students' learning style preferences hence enhancing academic performance (Simuth & Schuller, 2014), thus the association of technology and Gardner's Multiple Intelligences theory can benefit both students and teachers throughout the learning process. It also provides the most sensible platform to allow the 21st generation of second language learners to access and experience the target language in a natural manner in this information era. A student who has found his learning styles that best fits his or her intelligence has found the 'right' way to learn (Pour-Mohammadi, Zainol Abidin, & Yang Ahmad, 2012).

Thus, this study illuminates the effectiveness in implementing the Multiple Intelligences Instructions and discusses the possibility of adopting this digitally mediated learning approach to assist the learners in language learning. To effectively engage and teach generation Z with different learning abilities, educators should transform the present instructional practices by

considering the integration of technology in the lesson plans. Adjusting teaching strategies with the students' intelligence has improved learning motivation and emotional intelligence to positively improve their achievement in learning (Martin, Gragera, Acedo, & Mellado, 2017). This could be a steppingstone for educators to start redesigning 21st-century learning with the adoption of the Multiple Intelligences to suit the need of Gen-Z.

Methodology

Participants

Forty pre-university students from the Foundation Programme of the Preparatory Centre for Science and Technology, Universiti Malaysia Sabah were involved in this study. As quantitative research tends to employ convenience sampling to meet its goal of inquiry, the participants were selected in regards to some reasons including class participation and willingness. In this context, the participants attended more than 80 per cent of total meetings (9 meetings), took part in the writing assessments, and were willing to participate in the experimental research, which aims to investigate whether the implementation of Multiple Intelligences Instructions enhances ESL writing performance among the pre-university students.

Research Procedures

This quasi-experimental design was adopted to which applies a pre- and post-test approach. Through convenience sampling, two intact groups were assigned with experimental and control treatments, administered a pre-test to both groups, conducted experimental treatment activities with the experimental group only, and then administered a post-test to assess the differences between the two groups. Figure 1 briefly explains the procedure of this research:

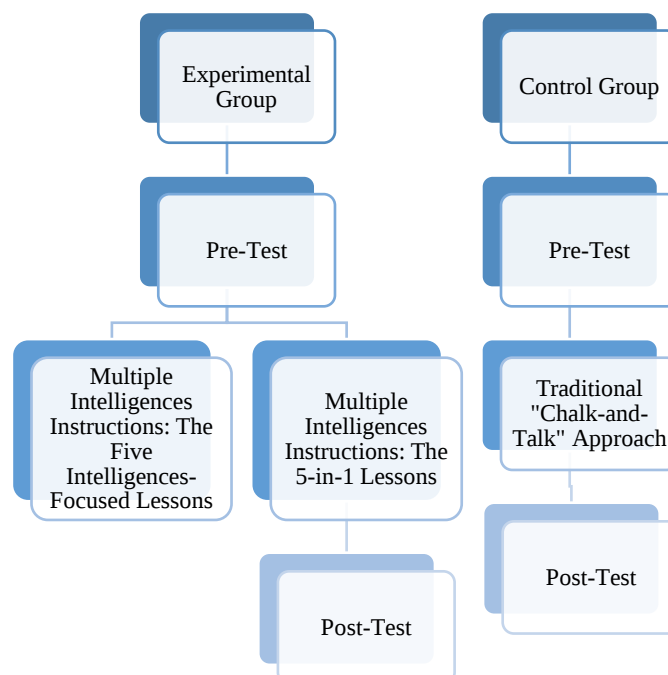


Figure 1: Research Procedures

Forty pre-university students were distributed equally into two language classes. One class was selected as control, while the other was experimental. The control class was taught with a conventional teaching technique, delivering lectures using the syllabus outlined for teaching writing. The experimental, however, was introduced with Multiple Intelligences Instructions, lessons which redesigned from the same syllabus used in the current semester. Both control and experimental classes were given the same tests, the pre- and post-tests, but with different treatment conditions.

Before the pre-test was administered, the students of the two groups received a lecture; the traditional form of instruction in the class without physically intervened (or manipulated with interventions) for two weeks. Everyone would have a similar experience regardless of the experimental or control conditions for the first couple of weeks. They were taught basic writing skills specifically on an argumentative essay. Each student was tested to produce a full essay on the argumentative genre in 50 minutes. This task requires the students to give an opinion or make a stand based on the statement given. Logic, depth, and maturity of thought on whether the *traditional make role has remained unchanged with modernisation* were sought. The scores obtained from the pre-test would reflect the students' actual writing abilities because they had not been exposed to any physical intervention.

The adaptation of Multiple Intelligences Instructions into the current teaching syllabus was adapted in the experimental classrooms for ten weeks. During the intervention period, the students experienced two parts of the teaching strategies: The Five Intelligence-Focused Lessons and the 5-in-1 Lessons. The intelligences involved in Part One and Two were Visual-Spatial, Verbal Linguistic, Logical Mathematics, and Intrapersonal and Interpersonal intelligences while the intelligences related to these writing components in Part Two are Topic-word association, Brainstorming, Mind-mapping, Rank ordering, and Metacognition. Although there were four other Multiple Intelligences strategies available to be implemented in the classroom, these intelligences were involved as the sub-domains of the five intelligence-based lesson plans.

The Five Intelligence-Focused, which was the process of teaching and learning language skills with five intelligences for five consecutive weeks. Each week was dedicated to one intelligence-based teaching plan. The five intelligences involved in this teaching and learning process were Verbal-Linguistic, Logical Mathematics, Visual-Spatial, Interpersonal, and Intrapersonal Intelligences. The versatility of these intelligence to fit naturally into the structured syllabus was the main reason for them to be chosen. These intelligence-focused lesson plans were largely aimed at giving children prior knowledge on these five intelligences upon experiencing them in the second part of the intervention phase. The students would experience learning language skills with five different intelligences as illustrated in Table 1 below:

Table 1: The Five Intelligence-Focused Lesson Plans

Five Intelligence-Focused Lessons Plans	
Week 1	Visual-Spatial intelligence-focused lesson plan
Week 2	Verbal-Linguistic intelligence-focused lesson plan
Week 3	Logical-Mathematics intelligence-focused lesson plan
Week 4	Interpersonal intelligence-focused lesson plan
Week 5	Intrapersonal intelligence-focused lesson plan

The second part of the intervention was a process of teaching and learning writing components with a combination of these five intelligences. These components were Topic-Word Association, Brainstorming, Mind-Mapping, Rank-Ordering, and Metacognition. Since the students were familiar with the intelligences introduced in Part One of the intervention, the Visual-Spatial, Verbal-Linguistic, Logical Mathematics, Interpersonal, and Intrapersonal Intelligences were combined and structured to form a lesson plan which was used and altered for five weeks. In the second part of the intervention phase, the 5-in-1 Lessons would be based on three stages: Pre-, While-, and Post-Teachings. The students were introduced to the steps of writing effective essays through five components during the While-teaching: Topic-Word Association, Brainstorming, Mind-Mapping, Rank-Ordering, and Metacognition, and each of these components represented those five intelligences they learned before. Steps of writing an effective essay are outlined below in Table 2:

Table 2: Steps of Writing an Effective Essay in the 5-in-1 Lessons

Writing Component	Lesson Plans	Intelligence
Topic-word Association	Students were asked to think of words or phrases related to the topic discussed individually. They were given about 5 minutes to list down the words or phrases associated with (topic) in the box at the corner of the display sheet.	Verbal-Linguistic
Brainstorming	The list of words or phrases needs to be gathered and discussed with the group members. Through these words, they need to brainstorm and develop the topic sentences (main ideas) of the topic.	Interpersonal
Mind-mapping	The comparison essay was organized differently compared to the other essays. In groups, they need to discuss the best strategy in structuring and organizing these points by rank-ordering them, from the best to the weakest points.	Logical-Mathematics
Rank-Ordering	In groups, the students need to map the topic sentences (main ideas) through the mind-map on the display sheet. They were then asked to develop supporting details and examples from each of the topic sentences.	Visual-Spatial
Metacognition	The students were then asked to think at least two questions related to the topic before they start writing the essay. The questions will be later discussed at the end of the class.	Intrapersonal

These steps would be the base for all the lesson plans outlined in the 5-in-1 Lessons. The students were later expected to produce a full-length essay based on the points discussed, and the essay needs to be exchanged with the other team member for peer-evaluation. The Post-teaching served as the students' reflections to share the values with other classmates and was

opened for discussion and knowledge exchanged. These steps were implemented for the remaining five weeks from Week Six to Week Ten, and in the final week of the intervention, the students sat for the post-test to see if the Multiple Intelligences Instructions improved the students' writing skills.

All of the participating students were asked to produce a full-length argumentative essay at the end of the tenth week. The task was similar to the pre-, and it requires candidates to present a discussion on whether the traditional male role has changed with modernisation. This study would be assessing the students' writing performance at the end of the tenth week after the students had gone through the intervention stage since the first week of its implementation. The students were asked to produce a well-written argumentative essay in 50 minutes.

A pretest-posttest comparison of the writing performance would provide a clearer indication of the influence Multiple Intelligences had on them than using the post-test measure alone would. The differences in the treatment received by both groups were determined by the students' writing performance in the post-test.

Data Collection and Analysis

The pre- and post- tests were marked by two examiners who have years of experience teaching and marking MUET Writing papers. Each composition was marked by the two examiners to check for interrater reliability. Because this method obtains observational scores from two or more individuals, it has the advantage of negating any bias that any one individual might bring to scoring.

The data would be gathered and analysed using the Mann-Whitney U Test to show significant improvement in the writing ability after the treatment. This statistical procedure did not only compare the differences in the mean scores but through them, we could assume the cause-and-effect relationship in applying the Multiple Intelligences Instructions to the students' writing abilities. These statistical procedures could only be proceeding once the examiners have given the marks for all the tests. All the data were gathered during the final week of the semester (Week 12)

As for the second objective of the research, the aim of conducting this analysis was to check whether the knowledge taught with the Multiple Intelligences Instructions was retained by the students of the experimental group. These students, whom had experienced the intervention in August – October 2021, sat for the Malaysian University English Test (MUET) Session 1 Written Test on the 26th of March 2022. The MUET result was gathered from these students by asking them to fill in the *Google Form*. The data was analysed and presented in the *Result and Discussion* part.

Results and Discussion

The Effectiveness of the Multiple Intelligences Instructions Within the e-Learning Setting

The statistical comparisons between the control and experimental groups were evaluated through the writing scores of pre- and post-tests. The pre- and post-tests comparison would yield the effect of different teaching methods, thus manifested through writing scores of these students in the post-test. A Mann-Whitney U-Test was used to highlight the significant difference in the writing scores between the student's pre- and post-test.

The Mann Whitney U Test was adopted to test for the differences between the two independent groups on a continuous measure (Pallant, 2011). It converted the scores on the continuous variable to ranks across the two groups to see if they differed significantly. The Mann Whitney U Test was ideally used to compare the achievement in the writing test across the two independent groups as this research mainly aimed to show that the experimental groups achieve better writing scores in the post-test than the control group. This non-parametric analysis had to be performed twice to see if these two groups differ significantly in the writing scores of the pre-test, and also in the post-test.

Table 3: The Mean Ranks of the Pre-Tests Between the Control and Experimental Groups

		Ranks			U	p
Type_of_group		N	Mean Rank	Sum of Ranks		
Test	Control	20	20.08	401.50	191.500	0.817
	Experiment	20	20.93	418.50		
	Total	40				

Referring to Table 3, it is apparent that the p values (2-tailed) of the pre-test is bigger than alpha values ($p=0.817 > 0.05$). Generally speaking, there was no significant difference in the mean scores of the pre-test between the control and experimental groups of students based on the data displayed in Table 3, with only 20.08 and 20.93 recorded for these two groups. From this table, it can be assumed that the students displayed the same intelligence capacities in producing good pieces of writing at the beginning of the research. It also means that the students started off the intervention period with the same proficiency level without having other external factors that might influence the results of this research.

A Mann Whitney U Test has been performed again on the writing scores of the post-test to see the differences in the mean ranks between the control and experimental groups. This non-parametric analysis had to be performed twice, each with a different test, to observe and compare the ranks for the pre- and post-tests for the two groups. The output generated for the post-test between the two groups is presented in Table 4 below:

Table 4: The Mean Ranks of the Post-Tests Between the Control and Experimental Groups

		Ranks			U	p
Type_of_Group		N	Mean Rank	Sum of Ranks		
Test	Control	20	16.60	332.00	122.000	0.034
	Experiment	20	24.40	488.00		
	Total	60				

The data pinpoints that there was a statistically significant improvement generated in the experimental group as the mean ranks climbed from 20.93 (Table 3) to 24.40 (Table 4). Contrary to this, the mean ranks between pre- and post- of the control group attributed to negative improvement with a value of 20.08 (Table 3) climbing down to 16.60 (Table 4). This is further encapsulated by the p-value (2-tailed) at 0.034 in Table 4, as it demonstrates a statistically significant difference in the post-test between the two groups. Since the p values (2-tailed) of the post-test is lesser than alpha values ($p=0.034 < \alpha=0.05$), this finding strongly suggests that the experimental student performed better in the writing tests compared to the control group. Thus, the improvement of the writing performance in the experimental group reveals that the Multiple Intelligences Instructions is effective in pursuing the students to write better, although the intervention was conducted online.

Knowledge Retention

To demonstrate if the Multiple Intelligences theory brings a long-term impact through its implementation in an online setting, means of the post- and retention tests were compared, and this was done to see if the designated Multiple Intelligences Instructions taught to the students were retained. The data was analysed by comparing the marks of the post- and Retention tests obtained by the students in the experimental group. Similar to the statistical methods used previously, the Mann Whitney U Test generated the mean ranks of the two test, and it is presented in Table 5:

Table 5: The Mean Ranks of the Post-Test and Retention Test of the Experimental Groups

Type_of_Test	N	Mean Rank	Sum of Ranks	U	p
Post-Test	20	24.40	488.00		
Test Retainment	20	24.60	492.00	198.000	0.955
Total	60				

The p -value of 0.9546 which is greater than the α value ($p= 0.955 > 0.05$). Since the value is greater than this cut-off, it practically means that there was no significant difference found between the mean marks of the post- and the retention tests. This result highlights that the knowledge of Multiple Intelligences Instructions could be retained by the students. Not only the Multiple Intelligence theory improved the writing skills, but the knowledge gained through it could also be retained, even after a month of sitting for the test.

Conclusion

The findings of this study help us to understand that the students benefit from the integration of Multiple Intelligences in the language classrooms. It encourages them to write better and eventually helps them to improve their English proficiency levels. However, the results were addressed in a small-scale sample, and it may not represent the overall population of pre-university students of different institutions in Sabah. By introducing Multiple-Intelligence teaching strategies to the students, the writing problems they have could be addressed and tackled before they enter tertiary education levels, whereby students are expected to write with more maturity and sophistications to match their perceived level of intellect. Reviving the theory of Multiple Intelligences into the Malaysian educational scene is still a long journey with the ever-changing educational policies, but it can still be re-introduced in the preuniversity levels because it has more academic freedom and flexibility.

Teaching and learning can no longer remain conventional if the Malaysian HEIs want to produce competitive, innovative, and creative graduates. The traditional practices are no longer suitable to the Gen Z are skilled in sharing information through social media and are interested in learning new things. We should be considering switching from conventional classrooms to digitally assisting classrooms with utilizes e-learning platforms. Learning a language is not an exception. We could gain benefits as these online platforms offer fun learning experiences for the learners. Based on these findings, the Multiple Intelligences Instructions enhance students' writing skills. It gives a fresh outlook in teaching writing skills, thus lead educators to consciously expand their repertoire of techniques, tools, and strategies beyond the typical linguistic and mathematical ones predominantly used in classrooms (Lawrence, 2014).

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