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Integration of multiple intelligence in the learning process of physical education in elementary school based on teacher gender

Integración de las inteligencias múltiples en el proceso de aprendizaje de la educación física en la escuela primaria en función del género del docente

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Abstract. The purpose of this study is to determine elementary school physical education teachers' awareness of the integration of multiple intelligences in the learning process in terms of teacher gender. Multiple intelligence integration is made up of eight sub-variables: logical-mathematical, linguistic-verbal, visual-spatial, musical, body-kinesthetic, interpersonal, intrapersonal, and naturalist intelligence.This study is a comparative quantitative study. The participants in this study were elementary school physical education teachers from Special Region of Yogyakarta, Indonesia. The Simple Random Sampling system was used to collect samples, and 58 teachers agreed to participate, with 36 male teachers and 22 female teachers. Data was collected using a questionnaire instrument with 29 questions and a 5-point Likert scale answer. All question items were deemed reliable because their r-count value was greater than r-table 0.254. On Cronbach's alpha, each sub-variable tested for reliability is worth more than 0.6. For normally distributed and homogeneous data, independent sample t test analysis was used. The Mann-Whitney Test is used to identify data that does not meet the prerequisite test. According to the results of the Independent sample t test analysis, the significance value of each variable is as follows: mathematical logic (0.735 > 0.05), visual spatial (0.880 > 0.05), musical (0.045 < 0.05), and intrapersonal (0.637 > 0.05). The independent sample t test results show that there is no difference in teacher awareness of multiple intelligence integration (logical-mathematical, visual-spatial, intrapersonal) between male and female teachers. These findings also show that there are differences in teacher awareness in the integration of multiple intelligences (musical) between male and female teachers. The significance value of each variable based on the non-parametric test using the Mann-Whitney Test is as follows: linguistic verbal 0.443 > 0.05, body-kinesthetic 0.273 > 0.05, interpersonal 0.826 > 0.05, and naturalist 0.563 > 0.05. These findings show that there is no difference in teacher awareness of multiple intelligences (verbal-linguistic body-kinesthetic, interpersonal, naturalist) between male and female teachers. The findings of this study can be used by the curriculum sector, school principals, and other related organizations to facilitate physical education teachers, especially male teachers, in training the integration of multiple intelligences in the learning process. Based on the findings of this study, it is hoped that further research into the integration of multiple intelligences in physical education will be conducted.
Key words: multiple intelligence, physical education, elementary school, teacher, gender

Resumen. El objetivo de este estudio es determinar la conciencia de los docentes de educación física de educación básica sobre la integración de las inteligencias múltiples en el proceso de aprendizaje en función del género del docente. La integración de las inteligencias múltiples se compone de ocho subvariables: inteligencia lógico-matemática, lingüístico-verbal, visual-espacial, musical, corporal-cinestésica, interpersonal, intrapersonal y naturalista. Este estudio es un estudio cuantitativo comparativo. Los participantes en este estudio fueron profesores de educación física de escuela primaria de la Región Especial de Yogyakarta, Indonesia. Para la recolección de las muestras se utilizó el sistema de Muestreo Aleatorio Simple, y aceptaron participar 58 docentes, siendo 36 docentes varones y 22 docentes mujeres. Los datos fueron recolectados mediante un instrumento cuestionario con 29 preguntas y una escala de respuesta tipo Likert de 5 puntos. Todos los ítems de las preguntas se consideraron confiables porque su valor de r-count fue mayor que r-table 0.254. En el alfa de Cronbach, cada subvariable probada para confiabilidad vale más de 0.6. Para datos normalmente distribuidos y homogéneos, se utilizó el análisis de prueba t de muestra independiente. La prueba de Mann-Whitney se usa para identificar datos que no cumplen con la prueba de requisitos previos. De acuerdo con los resultados del análisis de la prueba t de muestra independiente, el valor de significancia de cada variable es el siguiente: lógica matemática (0,735 > 0,05), visoespacial (0,880 > 0,05), musical (0,045 < 0,05) e intrapersonal (0,637 > 0,05). Los resultados de la prueba t de muestra independiente muestran que no hay diferencia en la conciencia de los maestros sobre la integración de inteligencias múltiples (lógico-matemáticas, visoespaciales, intrapersonales) entre maestros y maestras. Estos hallazgos también muestran que existen diferencias en la conciencia de los docentes en la integración de inteligencias múltiples (musicales) entre maestros y maestras. El valor de significación de cada variable a partir de la prueba no paramétrica mediante el Test de Mann-Whitney es el siguiente: lingüística verbal 0,443 > 0,05, corporal-kinestésica 0,273 > 0,05, interpersonal 0,826 > 0,05 y naturalista 0,563 > 0,05. Estos hallazgos muestran que no hay diferencia en la conciencia de los docentes sobre las inteligencias múltiples (verbal-lingüística-corporal-cinestésica, interpersonal, naturalista) entre docentes hombres y mujeres. Los hallazgos de este estudio pueden ser utilizados por el sector curricular, los directores de escuela y otras organizaciones relacionadas para facilitar a los profesores de educación física, especialmente a los profesores varones, la formación en la integración de las inteligencias múltiples en el proceso de aprendizaje. Con base en los hallazgos de este estudio, se espera que se lleven a cabo más investigaciones sobre la integración de las inteligencias múltiples en la educación física.
Palabras clave: inteligencia múltiple, educación física, escuela primaria, docente, género

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Introduction

The theory of multiple intelligences must be considered when developing teaching strategies to ensure that physical education learning objectives are met optimally. Multiple intelligences can be defined as multiple potentials and the ability to adapt to various conditions and problems. Everyone has eight intelligence profiles, but everyone has their own strengths as the dominant intelligence profile (Ardha et al., 2018). The multiple intelligences approach to teaching allows teachers to incorporate elements of creativity into their instructional designs, in which student-centered activities can be carried out in eight different ways based on the eight types of multiple intelligences (Sulaiman, Abdurahman, & Rahim, 2010). Physical education teachers can create learning models that take into account students' different intelligences. To be an effective physical educator, teachers must design and deliver experiences that promote the development of all children (Mitchell & Kernodle, 2004). Teachers should pay more attention to multiple intelligences when planning lessons (Griggs et al., 2009). Some research looks

into multiple intelligences in physical education learning. According to the literature on multiple intelligences in tennis teaching (Mitchell & Kernodle, 2004), teachers or coaches can develop students' verbal/linguistic intelligence by providing broader learning experiences during technical skill and game tactics instruction. Students who are gifted in mathematics and logic can be assisted to become game statisticians (Martin & Morris, 2013). A study created a physical activity model based on the natural environment, and this model can improve the naturalist intelligence of lower grade elementary school students, with evidence of an increase in student learning outcomes (Kusriyanti & Sukoco, 2020).

The application of multiple intelligences theory in learning makes teaching and learning activities more engaging for students and contributes to improving children's school achievement (Petruţa, 2013). It was also discovered that students enjoyed multiple intelligence activities during the learning process (Kumalasari, Hilmi, & Priyandoko, 2017). According to one study, teaching basketball in college using multiple intelligences strengthens students' initiative and enthusiasm to learn basketball (Xie & Xu, 2022). Awareness of intelligence differences and differences in teaching strategies can improve learning motivation and memory, thereby accelerating the learning process (Sulaiman et al., 2010). Some of the benefits of learning with the theory of multiple intelligences can be explained as follows by Chen, Moran, & Gardner (2009) and Cocking, Mestre, & Brown (2000): making learning more vital and active because learning focuses on students' intelligence abilities, teaching is more fun for both instructors and students, learning becomes more effective because it considers students' preferences, needs, and interests.

Physical education can simply be defined as the process of learning to move and learning through motion (Rachman, 2011). From the standpoint of multiple intelligences, movement activity as a goal and a means is a type of bodily kinesthetic intelligence. Although movement activity is kinesthetic intelligence, the physical education learning process can facilitate other types of multiple intelligences. Discovering students' diverse abilities and providing diverse experiences are critical components in assisting students in becoming physically educated individuals (NASPE, 1992). A physical education teacher's main task is to encourage every student (whether they are good or bad at sports) to live a healthy life, which is easier to do if they understand the theory of multiple intelligences (Ardha et al., 2018).

Most people who study physical education ignore the variety of intelligence and instead focus solely on body-kinesthetic intelligence. The teaching of physical education has shifted into sports education, which means that physical activity, which should create a learning environment in physical activity situations, has shifted into learning in sports situations in the form of exercises to master the movement skills of specific sports (Widodo, 2018). The teacher places a lot of emphasis on learning that focuses on structured technical skills, not paying attention to the environment and students' desires (Kaloka, Nopembri, & Yudanto, 2023). Such conditions are similar to the finding that evaluation of Physical Education subjects tends to produce practices that prioritize physical appearance and/or attitude aspects (López Ávila, Arcila-Rodríguez, & Betancur Agudelo, 2021). Physical education teachers typically use a traditional teaching style. Conditions like these lead to a suboptimal function of teaching physical education as an educational medium within the context of developing the child's entire personality (Rachman, 2011). According to the findings of interviews (Sujarwo, Suharjana, Rachman, & Ardha, 2021) for Physical Education Sport and Health in Elementary Schools, the learning model for sports and health physical education in Elementary Schools that is carried out or used in physical education learning uses three learning models, including the learning model using a tactic approach (Logical Mathematical) 16.7%, a psychomotor approach (Body Kinesthetic) 26.7%, and a drilling approach (Body Kinesthetic) 53,3%>

In general, students have a variety of intelligences that can be facilitated in the physical education learning process. Such circumstances require the use of a teaching strategy that incorporates multiple intelligences by physical education teachers, both male and female. Several relevant studies describe the condition of teachers in integrating multiple intelligences in learning in terms of teacher gender. The use of multiple intelligences by economics teachers in teaching economics is not influenced by the teacher's gender (Yidana, Arthur, & Ababio, 2022). Similar findings show that there is no significant difference in average awareness of multiple intelligences theory representation among intermediate science teachers based on gender variables (Alsalhi, 2020). It is further explained that the mean results of male teachers with a score of 3.31 and female teachers with a score of 3.49 with an observed sig p (0.976) are greater than 0.05. Similar studies show that there are no significant differences in multiple intelligences based on gender, job base, number of institutions, age, years of service, or ethnicity (Berlian, Mujtahid, Vebrianto, & Thahir, 2022).

There is no research from some of these studies that describes how teaching differs by integrating multiple intelligences in terms of the gender of teachers in physical education. Previous relevant research is also still comprehensive, not specifically describing differences in terms of teacher gender in each type of multiple intelligences. Researchers are interested in looking at the awareness of elementary school physical education teachers in integrating each multiple intelligences into the learning process in terms of teacher gender based on theory and previous research. The purpose of this study is to investigate differences in the integration of multiple intelligences in the physical education learning process based on teacher gender physical education teachers from Special Region of Yogyakarta, Indonesia. This research will produce infor-

mation about teacher awareness of integrating multiple intelligences in the physical education learning process. More specifically, this study generates data on teacher awareness in integrating each type of multiple intelligences among male and female teachers. Once the data is available, the curriculum sector, school principals, and related offices in Indonesia, particularly Yogyakarta, can consider policies. The study of elementary school physical education teachers' awareness of integrating multiple intelligences will add to the body of knowledge in the field of scientific education.

Method

This study is a comparative quantitative study that aims to determine the extent of differences between related variables. The independent sample t test and Mann-Whitney test were used to analyze the data. The Shapiro-Wilk normality test was used for the data prerequisite test, and Levene's Test of homogeneity of variance was used for the homogeneity test. This research examined at physical school elementary education teachers' awareness of multiple intelligences in the learning process based on their gender. The participants in this study were elementary school physical education teachers from the Special Region of Yogyakarta, Indonesia. The Simple Random Sampling system was used to collect the sample in this study. Simple Random Sampling is a random sampling technique that ignores existing strata and uses criteria for population members that are homogeneous or relatively homogeneous (Sugiyono, 2019). Each teacher has an equal chance of being chosen as a respondent in this study. The study's sample was made up of 58 teachers, 36 male teachers and 22 female teachers.

Data was collected using instruments in the form of a questionnaire. Elementary School Physical Education Teachers in Special Region of Yogyakarta were given questionnaires in the form of a Google Form. A questionnaire in the form of a Google form was created to investigate the level of awareness of multiple intelligences in the physical education learning process among elementary school physical education teachers in the Special Region of Yogyakarta, Indonesia. The questionnaire is divided into two sections: the first section contains general information from physical education teachers, and the second section contains 29 item statements related to the research objectives. Table 1 displays item statements for each type of intelligence.

Table 1.
Dimensions of multiple intelligence integration questionnaires

Dimensions	item
Logical Mathematical	1, 9, 17, 25
Linguistic verbal	2, 10, 18, 26
Visual Spatial	3, 11, 19
Musical	4, 12, 20
Body Kinesthetic	5, 13, 21, 27
Interpersonal	6, 14, 22, 28
Intrapersonal	7, 15, 23, 29
Naturalist	8, 16, 24

The statements in the questionnaire were developed based on intelligence theory and relevant instruments. For closed statements, researchers used a 5-point Likert scale to assess agreement with the statement limits. To ensure the validity of the questionnaire, it was sent to four experts, including physical education experts, sports psychologists, learning psychology experts, and physical education curricula experts, who provided written grades, comments, and suggestions. The researchers then modified certain statements to ensure the research objectives were met. Before being used in research, the instrument was tested for validity (Product Moment Pearson Correlation SPSS) and reliability (SPSS Alpha Cronbach). The results of the Product Moment Pearson Correlation validity test for all question items have an r-count value greater than r-table 0.254 and a sig. (2-tailed) of 0.000 0.05 at a significance level of 5%, indicating that all question items are valid. The reliability test results on Cronbach's alpha are greater than 0.6, implying that all question items are declared reliable or consistent. The table below clarifies the validity and reliability results.

Table 2.
Validity of multiple intelligence integration instruments

Item	r count							
	Logical Mathematical	Linguistic verbal	Visual Spatial	Musical	Body Kinesthetic	Interpersonal	Intrapersonal	Naturalist
1	.691**	.747**	.806**	.669**	.796**	.759**	.634**	.810**
2	.663**	.685**	.649**	.781**	.778**	.689**	.783**	.748**
3	.733**	.816**	.879**	.790**	.695**	.721**	.794**	.782**
4	.714**	.761**			.759**	.784**	.773**	

Table 3.
Reliability of multiple intelligence integration instruments

Dimensions	Cronbach's Alpha	N of Items
Logical Mathematical	.640	4
Linguistic verbal	.744	4
Visual Spatial	.678	3
Musical	.603	3
Body Kinesthetic	.745	4
Interpersonal	.717	4
Intrapersonal	.731	4
Naturalist	.674	3

Result

Hypothesis Test Result

Prerequisite Test

The first prerequisite test was carried out using the Shapiro-Wilk normality test, with the condition that if Sig. > 0.05, the data is normally distributed; otherwise, Sig. 0.05 indicates that the data is not normally distributed.

According to the calculations, there are normally dis-

tributed data and non-normally distributed data. Data for male teachers with normal distribution include logical mathematical intelligence (sig value 0.343 > 0.05), visual spatial intelligence (sig value 0.194 > 0.05), musical intelligence (sig value 0.051 > 0.05), and naturalist intelligence (sig value 0.121 >0.05). Data on female teachers with normal distribution include logical mathematical intelligence with a sig value of 0.750 > 0.05, linguistic verbal intelligence with a sig value of 0.294 > 0.05, musical intelligence with a sig value of 0.072 > 0.05, musical intelligence with a sig value of 0.555 > 0 .05, interpersonal intelligence with a sig value of 0.160 > 0.05, naturalist intelligence with a sig value of 0.354 > 0.05, and interpersonal intelligence with a sig value of 0.0500 > 0.05.

The linguistic-verbal f male teachers has a sig value of 0.014 < 0.05, the body-kinesthetic intelligence is 0.001 < 0.05, the interpersonal intelligence is 0.007 < 0.05, and the intrapersonal intelligence is 0.023 < 0.05. Data on female teachers with an abnormal distribution of body-kinesthetic intelligence were revealed, with a sig value of 0.001 < 0.05.

Table 4.
Normality test for male and female teacher data

	Male			Female		
	df	Statistic	Citeria	df	Statistic	Citeria
Logical Mathematical	36	.343	Normal	22	.750	Normal
Linguistic verbal	36	.014	Abnormal	22	.294	Normal
Visual Spatial	36	.194	Normal	22	.072	Normal
Musical	36	.051	Normal	22	.555	Normal
Body Kinesthetic	36	.001	Abnormal	22	.001	Abnormal
Interpersonal	36	.007	Abnormal	22	.160	Normal
Intrapersonal	36	.121	Normal	22	.354	Normal
Naturalist	36	.023	Abnormal	22	.050	Normal

The Levene's Test of Homogeneity of Variance was used for the second prerequisite test, with the condition that if the Sig value is greater than 0.05, it can be considered that the data variation is homogeneous; otherwise, if the Levene Statistic value is lower than 0.05, the data is not homogeneous.

Table 5.
Homogeneity Test

Dimensions	Sig.
Logical Mathematical	.721
Linguistics Verbal	.977
Visual Spatial	.709
Musical	.570
Body Kinesthetic	.695
Interpersonal	.873
Intrapersonal	.451
Naturalist	.940

Calculations have shown that each type of intelligence has a Sig value > 0.05, resulting in homogeneous variation in the data collected. As for each value, they are: mathematical logical intelligence (Sig 0.721>0.05), linguistic verbal intelligence (Sig 0.977>0.05), visual spatial intelligence (Sig 0.709>0.05), musical intelligence (Sig 0.570>0.05), body-kinesthetic intelligence (Sig 0.695>0.05), interpersonal intelligence (Sig 0.873>0.05), and intrapersonal intelligence (Sig 0.451>0.05), and naturalist intelligence (Sig 0.940>0.05). The following table can help explain the homogeneity test results.

Independent sample t test.

After the requirements for the normality and homogeneity tests are met, an independent sample t test is conducted. The Independent sample t test was used in this study to examine whether gender differences existed in the gender-specific knowledge of multiple intelligences in the physical education learning process among elementary school physical education teachers in the Special Region of Yogyakarta (males and females). Logical-mathematical intelligence, visual-spatial intelligence, musical intelligence, and intrapersonal intelligence are the categories of intelligence that will be tested using the Independent sample t test. In the Independent Sample t Test, Ho is accepted and Ha is rejected if the Sig value is less than or equal to 0.05, and vice versa if the Sig value is greater than or equal to 0.05.

Table 6.
Independent Samples Test Results

	Male (N=36)		Female (N=22)		Mean Difference	t test
	Mean	SD	Mean	SD		
Logical Mathematical	15.9167	2.12972	15.7273	1.93174	.18939	.735
Visual Spatial	10.2778	2.10593	10.3636	2.08271	-.08586	.880
Musical	10.4444	1.66381	11.3636	1.64882	-.91919	.045
Intrapersonal	16.5278	2.32362	16.8182	2.15222	.61182	.637

Based on the results of the Independent Sample t Test analysis, it can be seen that each variable has a significance value of 0.735 > 0.05 for logical mathematical, 0.880 > 0.05 for visual-spatial, 0.045 0.05 for musical, and 0.637 > 0.05 for intrapersonal.

These findings can be interpreted as: 1) there is no difference in teacher awareness of logical-mathematical intelligence in the learning process of physical education in elementary schools between male teachers and female teachers; 2) there is no difference in teacher awareness of

visual-spatial intelligence in the learning process of physical education in elementary schools between male teachers and female teachers; 3) There are differences in teachers' awareness of musical intelligence in the process of teaching physical education in elementary schools between male teachers and female teachers; 4) there are no differences in teachers' awareness of intrapersonal intelligence in the process of teaching physical education in elementary schools between male teachers and female teachers. These findings suggest that the idea that male and female teachers exhibit different levels of awareness of the multiple intelligences (logical-mathematical, visual-spatial, and intrapersonal) is rejected because the value of Sig > 0.05. These findings support the hypothesis that there are differences in teacher awareness of multiple intelligences (musical) among male and female teachers because the Sig value is 0.05.

Mann-Whitney Test

When the homogeneity and normality test requirements were not satisfied, the Mann-Whitney Test was used. In order to ascertain whether there are gender differences in the awareness of multiple intelligences in the physical education learning process among elementary school physical education teachers in the Special Region of Yogyakarta, the Mann-Whitney test is used (male and female). The linguistic-verbal, body-kinesthetic, interpersonal, and naturalist subtypes of intelligence will all be assessed using the Mann-Whitney Test. According to the Mann-Whitney Test, Ho is accepted and Ha is rejected if the Sig value is less than or equal to 0.05, and vice versa if the Sig value is greater than or equal to 0.05.

Table 7.
Mann-Whitney Test Results

	Male (N=36)		Female (N=22)		Mann-Whitney U	Asymp. Sig. (2-tailed
	Median	Mean	Median	Mean		
Linguistic verbal	16.0000	15.1667	14.5000	14.6818	348.500	.443
Body kinesthetic	19.0000	18.2222	19.0000	18.6364	329.500	.273
Interperonal	18.0000	17.3889	17.5000	17.4545	382.500	.826
Naturalist	12.0000	11.7222	12.5000	11.9091	360.500	.563

The significance values of each variable are as follows, based on the results of the Mann-Whitney Test analysis: linguistic verbal 0.443 > 0.05, body-kinesthetic 0.273 > 0.05, interpersonal 0.826 0.05, and naturalist 0.563 > 0.05. These findings show that 1) there is no difference between male and female teachers' awareness of verbal-linguistic intelligence in the process of teaching physical education in elementary schools; 2) there is no difference between male and female teachers' awareness of body-kinesthetic intelligence in the process of teaching physical education in elementary schools; 3) There is no difference in teacher awareness of naturalist intelligence in the physical education learning process in elementary schools between male teachers with female teacher; and 4) There is no difference in teacher awareness of interpersonal intelligence in the physical education learning process in elementary schools between male teachers and female teacher. These results indicate that the idea that male and female teachers have different levels of awareness of the multiple intelligences (verbal-linguistic, bodily-kinesthetic, interpersonal, and naturalist) is rejected because the value of Sig > 0.05.

Discussion

Physical education teachers have typically integrated multiple intelligences into the learning process in elementary schools. In order to achieve results and the dominance of different types of intelligence, it is important to integrate each multiple intelligence into physical education learning. Research in Malaysia also revealed the predominance of integrating different types of multiple intelligences (Sulaiman et al., 2010). With 174 teachers as its sample, this study examines the multiple intelligences-based teaching techniques used by high school science and math instructors. According to the study's findings, intrapersonal and logical-mathematical intelligence rank higher than interpersonal intelligence. Research shows that each intelligence has a different teacher awareness dominance (Yidana et al., 2022) which came to the conclusion that economics teachers emphasize interpersonal and linguistic intelligence and typically employ instructional strategies like cooperative learning, group work, and discussion. A study on multiple intelligences was done in a Mexican program for English teachers. The results show that the highest forms of intelligence are body kinesthetic, interpersonal, intrapersonal, and musical, while the lowest are naturalist, existential, verbal linguistics, logical mathematical, and visual spatial (Carlín, Salazar, & Cortés, 2013).

Specifically, the objective of this research is to examine how the gender of teachers affects how each type of multiple intelligence is integrated into physical education instruction at the Yogyakarta Special Elementary School. The findings of this study demonstrate that there are no appreciable differences between male and female teachers in their utilization of the seven types of intelligence. The independent sample t test results reveal that there is no difference between male and female teachers' awareness of the integration of multiple intelligences (logical-mathematical, visual-spatial, and intrapersonal). According to the non-parametric Mann-Whitney test, there is no difference between male and female teachers in their awareness of how to integrate multiple intelligences, including verbal, linguistic, body-kinesthetic, interpersonal, and naturalist. Research that demonstrates that the widespread use of multiple intelligences by economics teachers

in teaching economics is not influenced by the teacher's gender supports similar findings (Yidana et al., 2022). Based on the most recent similar studies' findings, there are no appreciable differences in multiple intelligences based on gender, job type, number of institutions, age, years of experience, or ethnicity (Berlian et al., 2022). A study involving male and female science teachers revealed similar findings (Alsalhi, 2020). This study finds no statistically significant gender differences in the average representational awareness of the theory of multiple intelligences (Alsalhi, 2020). The average score for male teachers is 3.31, while the average score for female teachers is 3.49. Similar findings were reported in a study (Gul & Rafique, 2017), which included 253 male and female teachers and found no appreciable differences between the sexes in multiple intelligences teaching techniques.

This study discovered that one of the eight types of multiple intelligences integrated in physical education learning had significant differences in terms of teacher gender. Between male and female teachers, there are noticeable differences in how music intelligence is integrated into learning. Male and female teachers have different levels of awareness of how to integrate multiple intelligences (musical), according to the independent sample t test results. Male teachers integrate music intelligence into learning on average at a mean of 10.44, compared to female teachers at a mean of 11.36. The notion that men and women approach musical tasks differently is thought to further support this condition (Hallam et al., 2017). Further investigation is required into the variables that affect how differently male and female physical education teachers integrate music into their lessons in elementary schools.

To deal with the diversity of their students' learning styles and to design engaging physical education learning environments, physical education teachers must be adept at the integration of multiple intelligences. Teachers must have the right skills to develop content and develop strategies according to the intelligence that is most present in their students, and learning should be able to reveal as much as possible of the skills and knowledge of students in solving problems (Asqui et al., 2017). The Multiple Intelligences approach to teaching and learning engages students in enjoyable activities (Kumalasari et al., 2017). A lot of intelligence-based instruction helps teachers engage students through their natural curiosity, monopolize teachable moments, and increase student participation through their own excitement. The teaching and learning environment needs to be created in a variety of ways in schools to appreciate the individual potential of each student (Barrientos Hernán, López Pastor, & Pérez-Brunicardi, 2018). When students understand and apply their personal intelligence, they become more connected to their learning (Abdi, Laee, & Ahmadyan, 2013). Through a multiple intelligences approach, physical education can reveal students' abilities and capacities to achieve the expected physical education learning (Martínez Aguilera, 2022). Physical education with a specific purpose requires intervention. Research proves that programs developed as intervention steps in physical education can improve several aspects, including enjoyment, social relations, and positive behaviour (Gil-Madrona, Samalot-Rivera, & Kozub, 2016). Similar program development proves to increase positive behavior as well as interpersonal intelligence (López, Prieto-Ayuso, Samalot-Rivera, & Madrona, 2016). According to studies, instruction that is based on the theory of multiple intelligences helps students develop their capacity for logical, critical, and creative thought as well as higher order thinking (Calık & Birgili, 2013).

Each student in a class possesses a variety of intelligences. Even though students in physical education classes learn through movement activities, it's possible that they lack a strong sense of body-kinesthetic intelligence. The findings of a study of 161 elementary school students in Monterrey, Nuevo Leon, Mexico (grades 3, 4, 5, and 6) support this condition (Treviño, Rocha, Hernández, & Palacios, 2020). According to this study, students have the following levels of intelligence: Logical-Mathematical (25.45), Linguistic Verbal (37.99), Body-Kinesthetic (37.99), Musical (27.30), Visual Spatial (32.94), Interpersonal (39.68), Intrapersonal (36.96), and Naturalist (34.42). Additionally, the findings show that there are notable gender differences in intrapersonal intelligence and that boys have higher intrapersonal intelligence than girls.

Some students stand out among their peers in the classroom for having a strong musical intelligence. According to studies, students who score higher on musical IQ tests see a significant and favorable impact on academic achievement when background music with a soft beat is used in the classroom (Lozano & Armando, 2007). The interaction between learning strategies and musical aptitude in influencing student achievement is demonstrated by similar findings (Simanjuntak, Napitupulu, & Mursid, 2018). There are numerous ways to integrate music intelligence. Play background music throughout the practice that emphasizes the tenor and mood of each practice segment. For instance, during the cool-down period, play soothing music (Mitchell & Kernodle, 2004). Music can be selected to be played during practice sessions, and participants with musically and rhythmically talented can select a theme for the highlight event (Martin & Morris, 2013). The research's findings, which demonstrate how regularly recreational sports participants incorporate musical elements into their activities, are described as incorporating music (Abdullah et al., 2020). Based on the findings of this study, it is necessary to maximize how male teachers of physical education can learn music intelligence. For their professional development in the area of music education, teachers must participate in service training (Sazak, 2014). Training for music integration in learning must be conducted in accordance with the gender preferences of the teacher.

Need assistance from related parties in order to provide knowledge and instruction on the integration of multiple intelligences in the teaching of physical education in primary schools. There is a need to respond to the multidimensional human paradigm in building his life, and physical education supports the integral line of well-being and development in different contexts (Rivera Sosa, Arras Vota, Tarango, Mendoza Meraz, & López Alonzo, 2020). According to (Carlín et al., 2013), it's critical to systematically diagnose and foster these intelligences in trainees so they can use their knowledge of multiple intelligences in their future teaching. Teacher didactic training is needed to plan suitable and stimulating scenarios that allow students to achieve development (Martínez Aguilera, 2022). Teacher training is a critical stage in which the educational experience can influence the development of learning, values and skills that facilitate attention to diversity in future teachers (Maravé-Vivas, Salvador-García, Gil-Gómez, & Chiva-Bartoll, 2022). Increasing the ability of educators to create models, approaches, strategies, and learning activities; strengthening the teacher recruitment system; enhancing performance; and fostering collaboration on all fronts with the primary players being the government, school principals, supervisors, communities, and teachers. Designing student-centered strategies, supporting the implementation of student-centered learning, and increasing teacher understanding and performance through multiple intelligences-based instructional training all make a significant contribution (Yaumi, Sirate, & Patak, 2018).

Conclusion

According to the Independent sample t test results, the significance value of each variable is as follows: mathematical logic is 0.735 > 0.05, visual spatial is 0.880 > 0.05, musical is 0.045 < 0.05, and intrapersonal is 0.637 > 0.05. The independent sample t test results show that there is no difference in teacher awareness of multiple intelligence integration (logical-mathematical, visual-spatial, intrapersonal) between male and female teachers. These findings also show that male and female teachers have different levels of awareness when it comes to integrating multiple intelligences (musical). The significance value of each variable based on the non-parametric test using the Mann-Whitney Test is as follows: linguistic verbal 0.443 > 0.05, body-kinesthetic 0.273 > 0.05, interpersonal 0.826 > 0.05, and naturalist 0.563 > 0.05. These findings show that there is no difference in teacher awareness of multiple intelligences (verbal-linguistic body-kinesthetic, interpersonal, naturalist) between male and female teachers. The findings of this study can be used by the curriculum sector, school principals, and other related organizations to facilitate physical education teachers, particularly male teachers, in training the integration of multiple intelligences in the learning process. Based on the findings of this study, it is hoped that further research into the integration of multiple intelligences in physical education will be conducted. For example, integrating multiple intelligences is based on teaching experience, teacher education level, and other factors.

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