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Han, L., Ahmad, A., Sun, L., Lv, Y., & Ma, S. (2026). Research On the Application of Radio-directed Movement in Middle and High School History Teaching. *Foro de Educación*, 24(1), 142-164. doi: https://doi.org/10.14201/fde.24108

Research On the Application of Radio-directed Movement in Middle and High School History Teaching

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Recibido / Received: 05/11/2025
Aceptado / Accepted: 22/02/2026

Abstract: This research aims to find out whether the use of radio-directed movement tasks enhances middle and high school students' history knowledge, interest, critical thinking abilities, participation rate, and teamwork skills in group projects when implemented in classroom teaching. This study was done in three stages and employed a cross-sectional quantitative survey design. Questionnaires used in this study were developed by the researcher and data were analyzed using the SPSS. The results confirmed that the executed movement tasks, directed by radio, have a positive influence on the level of historical knowledge, the student's interest in history, and their critical thinking and problem-solving abilities. Students' collaboration, participation, and communication skills were also observed to have greatly benefited through the implementation of that task. The results suggests that incorporating movement tasks that are directed by the radio can increase learners' interest and as a result, increase their performance in history lessons.

Keywords: Radio-Directed Movement, History Teaching, Student Engagement, Critical Thinking, Teamwork Skills, High School, Quantitative Analysis, Classroom Teaching, Historical Knowledge, Communication Skills.

1. Introduction

1.1. Background

In the recent past, there has been much concern in teaching practices in history and years of attempts by instructors to enhance learners' interest and achievement. Radio-directed movement tasks are one of the strategies entailing doing physical activity while solving historical quests (Rikitianskaia & Balbi, 2020). Radio-directional movement is a recommended movement as it entails the use of knowledge of radio technology, maps, and direction by students in real-life situations, and hence, the practical aspect is used to reinforce what has been taught in class (Cavalcanti, 2024). This approach is effective because the current education system provides learners with the opportunity to express themselves and solves the issue whereby the practical application of theories learned in class lacks historical perspective in the teaching of history. Therefore, with the help of a radio-directed movement, the teachers can not only make students recite important historical events and individuals but also enhance such competencies as problem-solving, interaction, and speaking (Lee, 2023; Pratama, Saputra & Hikmawaty, 2024). Various past research reveals that traditional methods of history teaching are inadequately capable of engaging and motivating students (Sebbowa & Ng'ambi, 2020). By applying technology and other active forms of learning, they can be considerably minimized by involving students in real-world applications such as the radio-directed movement, which means that theoretical knowledge can be complemented with real-world applications. For instance, Lee (2023) recommends that history teachers should include the use of technology and students' critical thinking skills in the teaching-learning process, as these aspects will enhance students' performance improvement. Hence, active learning practices boost students' historical reasoning and arguing and have shown that students' interactions in historical learning activities improve their logical thinking (Hulders, Voet & De Wever, 2021). Furthermore, the radio-directed movement tasks can serve as a stimulant to awaken the critical thinking and problem-solving abilities of the students. In the course of the activities that involve the use of historical knowledge in solving certain tasks, students are expected to analyze the effects of historical events and actions (Pratama et al., 2024). This aligns with Pratama et al. (2024), who note that the incorporation of historical thinking skills in the teaching and learning processes enables students to better comprehend the occurrence of historical events. Furthermore, the movement directed by radio is a physical activity that involves the cooperation of the students, an important factor that enhances the development of team and interpersonal skills that are vital for society (Ehrick, 2017).

In the modern world, history is an important subject that people cannot ignore. By making students relate history with the current issues, they come to understand the role they play in society. During the implementation of radio-directed movement tasks, students not only receive knowledge about the historical context but also recall its applicability to the present day (Sebbowa & Ng'ambi, 2020). This pedagogical strategy assists the students in acquiring a good appreciation of the course, turning them into history-minded people with a view of making them realize that history is a social science that has a bearing on present-day society (Pratama et al., 2024). Therefore, movement tasks conducted by radio in middle and high school history teaching seem to have the capacity to help increase the quantity and quality of knowledge that students

have of history, the interest they display in the subject, and their critical thinking skills, participation, and teamwork. Consequently, this approach conforms to the prevailing calls for learner-centered education as well as the development of competencies characteristic of the 21st century. In this background, this study aims to establish the effectiveness of movement tasks directed through radio in the teaching of history.

1.2. Research Aim and Questions

This research aims to evaluate the effectiveness of integrating radio-directed movement tasks into middle and high school history teaching to enhance students' historical knowledge, interest, critical thinking, participation, and teamwork skills.

Now, based on this aim, research questions of this research are –

1. To what extent does the integration of radio-directed movement tasks in history teaching improve students' historical knowledge mastery?
2. To what extent does the use of radio-directed movement tasks in history teaching impact students' interest in history?
3. To what extent does the radio-directed movement strategy have an effect on students' critical thinking and problem-solving abilities in the context of historical learning?
4. To what extent do the radio-directed movement tasks in history teaching influence students' participation and collaboration in history lessons?
5. To what extent does the integration of radio-directed movement tasks enhance students' teamwork and communication skills during historical learning?

1.3. Research Hypothesis

H_1: The integration of radio-directed movement tasks in history teaching significantly improves students' historical knowledge mastery.
H_2: The use of radio-directed movement tasks in history teaching has a positive impact on students' interest in history.
H_3: The radio-directed movement strategy enhances students' critical thinking and problem-solving abilities in the context of historical learning.
H_4: The integration of radio-directed movement tasks in history teaching significantly increases students' participation and collaboration in history lessons.
H_5: The use of radio-directed movement tasks in history teaching improves students' teamwork and communication skills during historical learning.

2. Literature Review

2.1. Radio-directed Movement and its Effect on Historical Knowledge Mastery

The strategy of radio-directed movement-based learning has been reviewed in the development of the students' historical content knowledge and their ability to remember history as it has vitality. Research has established that learning through technology, such as radio signals or devices, is quite efficient in enhancing the learning of history in students, as far as thinking abilities are concerned. Consequently, Zhang, Wang and Lu (2023) explored the effect of virtual reality (VR) technology in history teaching and learning. They establish that virtual reality can design learning contexts that

make a learner more engaged and knowledgeable about history. These technologies allow students to relive certain historical events and improve their memory and comprehension of historical information. Moreover, applying his historical thinking in a digital context, Bruér (2023) argued that technology should be incorporated into the history lessons. This research found that while adopting digital tools as a substitute for traditional modes can positively impact teaching; the said tools can also enhance students' learning experience and encourage critical thinking. Thus, technology can present new perspectives on historical content, given its paradigm to present historical learning interactively, which can augment cognitive functions in learners (Bruér, 2023). On the other hand, the specific studies do not directly support arguments put forward for movement-based learning in history education. In line with this, the study by Leow et al. (2016) does not directly examine the effect of motor activities on the retention of knowledge sustained in history but rather on the role of the primary motor cortex in implicit sensorimotor adaptation. In effect, this study does not support the claim that student engagement with physical tasks fosters their retention of historical material. Similarly, Ayanwale, Adewuyi and Afolabi (2023) studied 12 stakeholders' views about learning through radio and television during the COVID-19 time and discussed the benefits of interactive learning methods using motion to improve engagement and understanding in history education. This research, therefore, does not directly advance claims about movement-based learning in history education. Although the effects of movement from a cognitive point of view on learning are well known, the direct use of radio-directed movement tasks in history classes still has not been properly examined. Additionally, the extant literature particularly focuses on the use of these strategies in Western educational contexts and lacks knowledge regarding their effectiveness in the context of Chinese middle and high schools. Specifically, we know of no studies that have investigated the effect of radio-directed movement tasks on historical knowledge mastery for Chinese students. To this end, this research illuminated the Chinese classroom as well as supplemented existing scholarship on movement-based learning in history education.

2.2. Influence of Radio-directed Movement on Student Interest and Critical Thinking

The employment of radio-directed movement tasks in history education provides the potential to increase students' interest dramatically and develop critical thinking skills. Cognitive behavioral motivation is shown by research by Singh et al. (2022) to correlate positively with student engagement. The results of their findings support that students' active participation in the learning tasks will improve motivation and engagement, which then leads to deeper interest in the subject matter. This touches on the fact that active learning strategies can spark students' curiosity and analytical skills, thereby making learning a more enjoyable experience. However, limitations occur in the current literature concerning the effectiveness of technology-based learning strategies. For instance, Suárez et al. (2019) observed that intrinsic motivation is vitally important for student engagement but that the perceived utility of tasks ranges widely from student to student. However, this variability can make technologically enhanced learning experiences ineffective, as certain students might find radio-directed movement tasks less engaging or of less relevance to their learning goals.

In addition, the study stresses the importance of the need for tailored interventions based on the individual student's motivation, which may not be feasible in a classroom. Kurnaz, Ergün and Adıbatmaz (2024) also find that technology integration can assist student collaboration and creativity. Nevertheless, they failed to assess the impact of movement directed by radio on critical thinking in historical learning. As evidenced by the above gap, there is a call for targeted research on the efficacy of radio-directed movement tasks to foster growth, as well as disseminate original thinking concepts and problem-solving among learners in middle and high school. This research has filled this gap by drawing attention to the Chinese classroom and its part in fostering the student's interest and cognition in history learning.

2.3. Influence of Radio-directed Movement in Promoting Participation, Collaboration, and Teamwork

Radio-directed movement strategies are indeed capable of being incorporated into history education to enhance student engagement, interaction, and voice. In this regard, Muttaqiin, Lufri and Rahim (2019) state that when implementing active movement tasks in the classroom increases collaboration among learners to foster group dynamics and engagement. This research establishes that interpersonal skills and enhanced communication, as it usually involves group discussions and arguments over historical events, increase when the students utilize movement to complete various tasks. However, there are some limitations in the literature concerning the use of such strategies in safety management. For instance, Bayu et al. (2022) used a self-developed questionnaire to establish that collaborative learning was positively related to critical thinking skills, but they found out that the effectiveness of the strategy depended on how the teacher managed group interactions. This means that radio-directed movement tasks may not function to their optimum in the classrooms and might require the training of teachers to optimally deliver them. Furthermore, according to a study by Nguyen et al. (2023), while exploiting the benefits of movement-based learning may foster engagement, this does not necessarily translate into the achievement of collaboration and teamwork unless the learning environment specifically caters to enhancing those outcomes. Such concerns hold for the generalizability of such findings to movement-based tasks in different educational settings. While these insights highlight important gaps in the research on radio-directed movement tasks in history education within Chinese middle and high schools, there appears to be a significant gap in how the outcome effectiveness of such tasks is approached. This research filled this gap by drawing on the way the Chinese classroom helped strengthen students' engagement in history education and worked to raise their level of participation, collaboration, and teamwork.

2.4. Theoretical Framework

This research aims to analyze and discuss the use of radio-directional movement in middle and high school history classes. First, as for the cognitive development theory founded by Piaget in educational psychology, students have distinct cognitive features at distinct ages (Babakr, Mohamedamin & Kakamad, 2019). Middle and high school students are in the phase between the concrete operational stage and the formal operational stage thus, they are capable of thinking logically and abstractly.

Radio-directional movement can be seen as a kind of practical activity and can effectively enhance students' learning interest and their cognitional development.

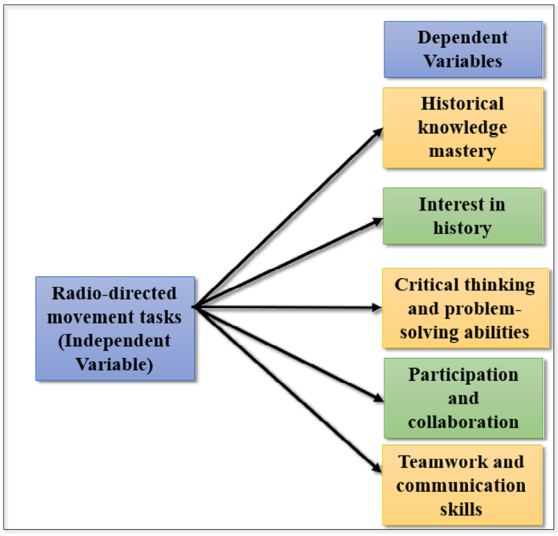
Secondly, Bloom's taxonomy of teaching objectives based on the teaching theory design states that teaching activities should include the following six levels: knowledge, understanding, application, analysis, synthesis, and evaluation (Chandio, Pandhiani & Iqbal, 2016). By using radio-directed movements, students are not only able to gain knowledge about history but also use this knowledge practically, analyze and synthesize it, and, finally, pass the evaluation.

Furthermore, the concept of situational learning theory has been incorporated into directional movement in history teaching, which states that learning should take place in real or contrived situations (Meier, 2016). Radio-directed motion is a learning model that allows students to experience historical scenarios in which they can understand the context and conditions that surround actual historical occurrences to enhance learning and retention of historical information.

Further, the theory of experiential learning suggests that learning is effective when a person participates in an activity and then reflects upon that activity (Kolb & Kolb, 2017). Therefore, radio orientation is a good way for students to learn by doing, and it enhances the learning difficulty level of history by involving the students in group learning.

2.5. Conceptual Framework

Figure 1: Conceptual Framework Presentation for this Research through Presenting Different Variables (Source: Self-generated).



The above conceptual framework of this research predicts that movement tasks directed by radio in history teaching consider enhancement of various facets of the learners (Fig 1). The study assumed that radio-directed movement-integrated learning improves students' knowledge appreciation, thinking skills, involvement and cooperation, and knowledge of history. According to the proposed framework, the above tasks should positively contribute to active learning, higher cognitive processes of the learners, and cooperation among the learners. Thus, the role of

these tasks concerning content history is investigated to determine their effectiveness in improving learning interest, idea development, and cooperation among middle and high school students.

3. Methodology

3.1. Research Design

This research was a cross-sectional quantitative research study that assisted in attaining data at a certain time to assess the effectiveness of the radio-directed movement tasks in teaching history. This design was crucial to measuring students' historical knowledge, interest, and analytical skills before and after the intervention (Cummings, 2017). This approach enabled the researcher to evaluate the overall suitability of the new teaching strategy in different classes as well as different classes. This study adopted cross-sectional survey research as the approach for assessing the enactment of radio-directed movement within middle and high school History instruction and was conducted in three phases as elaborated below:

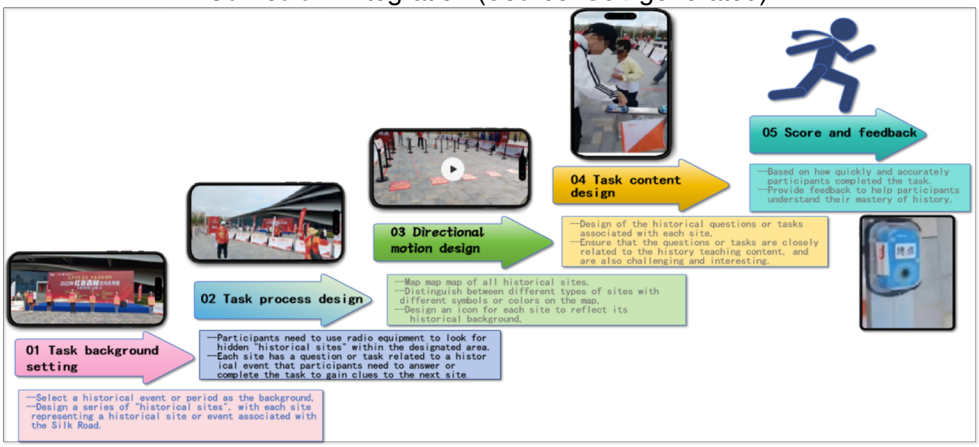
Phase One: Current Level of Indicators Determination

The first phase was focused on defining the criteria for evaluation of this new approach to teaching in the classroom. Several measures were examined, which include students' historical knowledge, learning motivation, activity participation and cooperation, critical thinking, and communication in the group and between learners. These indicators were chosen to account for the overall impact that the movement tasks directed by the radio have on students' motivation and achievement. The survey data was collected at the start of the study in an attempt to determine the student's pre-test knowledge and skills in these areas. The survey conducted in this study was used as a pre-survey in that survey results would be compared to the post-survey to ascertain the improvement incidences and participation levels of the students in acquiring skills after the intervention.

Phase Two: Design of Radio-directed Movement Tasks

The second phase was the development of radio-directed movement tasks, which were devised historically to elicit students' responses. The radio-directed movement task design was done in the form of an intervention that was carried out for 30-40 days. The tasks were well aligned with the history syllabus, and the students were grouped into teams to solve history-related missions while using the radio for learning and analysis. To create radio-directed movement tasks for middle and high school history classes, these tasks were relevant to the curriculum standards but also took into account the features of radio technology. The purpose of these tasks is to increase student motivation and improve their comprehension of historical content by actively interacting with it. This strategy is not only helpful for enhancing students' learning motivation, for students to be able to learn and revise the historical knowledge when they are completing tasks, but also helpful for students to enhance their understanding of historical knowledge in practice (Figure 2).

Figure 2: Illustration of Radio-Directed Movement Task Design for History Curriculum Integration (Source: Self-generated).



The first step for the teachers was to define the historical themes and events that related to the tasks in question. For instance, when dealing with topics such as historical civilizations, then a task could be "Identifying artifacts of the ancient world." In such a case, the students were using radios to get instructions to different places within the school compound or nearby and looked for items or objects that represented the different aspects of the civilization being studied. This task, therefore, not only helped the learners to apply their knowledge of history but also their teamwork, analytical, and creative thinking skills as they solved the clues and worked in groups to accomplish the task.

When developing these tasks, there was a need to set goals that were in line with the history syllabus. Therefore, the use of the historical scenes simulation was an excellent way of teaching. Here, the students were able to learn the existence of the historical atmosphere from their own experience in the reconstruction of the specific historical environment and enhanced their understanding of the history as well as the culture behind the events (Fig 3). For instance, during a lesson on the American Revolution, a radio-directed movement task could be to have students act out battles or events using a set of radio commands that mimicked how communication was done during that era. The students could be divided into groups and given certain roles, for example, soldiers or strategists, and they were to make decisions according to certain radio broadcasts that contained certain situations in history. This interactive activity helped the students to grasp the content since, to complete the task, they had to think in terms of historical perspective. In addition, the teachers should also have considered adding aural elements like recordings of historical speeches or sound effects that created the ambiance of the period. Thus, these elements could have helped students to have a closer emotional experience of the historical events that were learned and, therefore, enhanced their interest and motivation to study.

Moreover, the design of radio-directed movement tasks should have been considered because students had different learning styles and capabilities. In this connection, the use of team cooperation in middle and high school history teaching was an effective aspect of radio radio-directional movement teaching strategy. As a result, it not only could train students' collaborative and communicative skills but also enhance students'

comprehension and practice of historical concepts, and thus enhance the teaching efficiency. According to the age and cognitive level of the students, the teacher could differentiate tasks in terms of the level of difficulty and range of activities. For instance, the younger learners might have been asked basic questions that could have been related to historical facts, while the older learners could have been asked problems that required the evaluation of information. Furthermore, the actual and potential roles of the teacher resources from the different discipline in students learning may have contributed. The technology that is applied in radio presentations could have been obtained from technology teachers, and technology history teachers should have helped the students master those technologies. This also helped in enhancing learning achievement and made the students more ready to face the practical use of technology in various fields. Therefore, the possibilities of using radio-directed movement tasks in history classroom learning were determined by more reflective planning in trying to consider students' motivation, knowledge, and the process of working in groups.

Figure 3: Model of Immersive Simulation of Historical Scenes Aligned with the History Curriculum (Source: Self-generated).

Thus, movement tasks radio-directed in middle and high school history classes were useful for the development of active learning among students. For this purpose, the teachers should have selected significant content area topics, identified clear learning objectives, used visual and auditory materials, and offered multiple options for students. The improvement of these tasks by technology, as well as cooperation between educators, made it even more effective and therefore improved the gains of students in history education. Using this unique approach, there was a possibility of making history attractive and meaningful, thus capturing the student's attention during the lesson.

Phase Three: Evaluation through Pre-Post Comparison

The last stage in the research design was. Therefore, the evaluation of the impacts

created by the radio-directed movement tasks was carried out with the help of pre- and post-survey comparisons. Students' historical knowledge, interest, engagement, critical thinking, and teamwork were assessed via a Likert-based questionnaire before and after the intervention. The pre-survey was conducted before the tasks to define the students' starting points, while the post-survey was conducted at the end of the tasks to determine the changes in the fields in question in the student's eyes. The purpose of this evaluation was to determine how much the movement strategy through the use of radio-directed impacted class attendance, learning outcomes, and psychomotor skills. The pre-and post-survey proved to be useful when assessing the success of the teaching strategy that has been applied during the implementation phase. For example, if there is an increase in historical knowledge mastery, it will mean that students manage to apply the acquired knowledge in real-life scenarios, if there is an improvement in teamwork and critical thinking, it will illustrate that the tasks boost group problem-solving and thinking skills, respectively.

3.2. Research Participants

For this research study, the populace was chosen from a single Y Experimental Middle School in Changchun, China. This school has an elementary school department, a middle school department, and a high school department, and from this school, six classes were chosen for the teaching intervention. These six classrooms are three middle school classrooms for grades six, seven, and eight and three high school classrooms for grades nine, ten, and eleven. According to the demography of the sample, the middle school classrooms contained 11- to 14-year-old students, while the high school classrooms contained 15 to 17-year-old students. There were 35 students in each class, and this raised the total number of participants to nearly 210.

3.3. Data Collection and Sampling

The data collection process was preceded by the acquisition of the necessary permission from the Chinese high school under study. After receiving the administration's permission, the researchers moved ahead with the process of choosing six classes from the history department in the school. These were three middle school (grades 6, 7, and 8) and three high school (grades 9, 10, and 11) classrooms. These specific grades were chosen as they were already part of the history curriculum, which was important for matching the goals of the study with the material taught. These classrooms were chosen to limit the study to history teachers from middle and high schools where the intervention would apply to the curriculum.

Once the classrooms were identified, the researchers used simple random sampling by picking students from the identified classrooms. An advertisement was circulated through class teachers and pasted on the notice board within the school. This advertisement contained a brief about the research, the aim, the title, and a QR code. The use of the QR code meant that interested students could get more information about the study, which included the name of the researcher and his or her contact details, such as email address. The interested students were asked to forward an email to the researcher to indicate their willingness to be part of the study.

After the researchers got their responses, 35 students were randomly chosen from

each classroom. This was done through the use of a random sampling technique, which allowed every student a chance of being selected, thus reducing the possibility of bias that is associated with sample selection and increasing the chances of the study findings being generalized (Etikan & Bala, 2017). However, this method also helped to reduce selection bias because all students who had an interest in participating in the study were allowed to do so.

To gather data for this study, a survey link was given to all the participants to be selected. It remained active for one week, and the students could fill out the survey on their own time. The first survey was used to assess the historical understanding, interest, engagement, and collaboration of the students. Subsequently, the researchers introduced the radio-directed movement tasks in the history classrooms for 40 days, and all students had to engage in the tasks as part of their class work.

After the radio-directed movement tasks had been performed, the same set of key indicators (historical knowledge, interest, participation, and teamwork) were assessed again using the second survey. The link to the post-survey was provided to the participants, and the survey was conducted for one week. In both surveys, none of the students were missing, so all the students in the selected population completed the surveys. The questionnaires had multiple-choice questions to make the process less time-consuming and convenient for the participants.

3.4. Research Instrument

The researcher-made questionnaire was employed as the major data collection tool in this study. The same survey was used for the pre and post-test to ensure the effectiveness of the comparison of the levels of student engagement, knowledge, and skills. There were two parts of the questionnaire used in the study. The first part of the study consisted of four demographic questions, like age, gender, grade level, and willingness to engage in activities such as radio-directed movement tasks. The second section comprised the main survey questions, which were based on five key variables: The five objectives that can be achieved through the use of Historical Knowledge Mastery, Student Interest in History, Critical Thinking and Problem-Solving Abilities, Student Participation in History Lessons, and Teamwork and Communication Skills. The survey had 15 main questions, with three questions under each variable. These main survey questions were developed using a Five-point Likert scale where participants chose their response from the options available, namely, Strongly Disagree, Disagree, Neutral, Agree, and Strongly Agree (Batterton & Hale, 2017). The time taken to complete the questionnaire was estimated to be between 10 to 12 minutes so as not to take much of the participants' time. The analysis of internal consistency and reliability by Cronbach's alpha was done with the 15 main items of the questionnaire, which resulted in a value of 0.923, which is considered high and excellent. This high alpha value provides credence to the instrument as a suitable tool for measuring the constructs intended to be evaluated (Taber, 2018).

Table 1: Tabular Representation of Reliability Statistics.

Cronbach's Alpha	N of Items
.923	15

3.5. Data Analysis

The pre and post-test data was analyzed by using SPSS software version 26.0. First, data was summarized through frequency and percentage for demographic data of age, gender, grade, and interest in the tasks. Subsequently, to assess the effects of the radio-directed movement tasks on the students' historical knowledge, interest, critical thinking, participation, and teamwork, an independent sample t-test was used. This statistical test analyzed the participants' responses' mean scores before and after the intervention. It was chosen that the level of statistical significance has $p < 0.05$ to compare the students' achievements based on different variables.

3.6. Ethical Consideration

This study kept the following ethical standards to safeguard the participants in the study. Permission was sought from all the students and their guardians since they were below 18 years of age. The researchers ensured that participants were well informed of the purpose of the study, the methods, and the possible consequences of participation. This study was conducted without coercion, and students could withdraw from the study at any time without reprisal. All data was kept anonymous, and all participants were assured that their responses would be kept confidential. The study also made sure that none of the participants or nonparticipants were not exposed to any form of disadvantage. The research was approved by the school administration, and ethical consideration was observed throughout the research regarding the rights and welfare of the participants.

4. Findings

4.1 Analysis of Demographic Data

Table 2: Demographic information about Participants.

Factor	Attribute	Frequency	Percent %	Mean	Standard Deviation
Age	11-13 Years	74	35.2	1.99	0.83
	14-16 Years	65	31.0		
	17-18 Years	71	33.8		
	Total	210	100.0		
Gender	Male	107	51.0	1.49	0.50
	Female	103	49.0		
	Total	210	100.0		
Interested in participating in interactive task-based activities	Very Interested	62	29.5	1.90	0.69
	Somewhat Interested	107	51.0		
	Neutral	41	19.5		
	Total	210	100.0		
Grade	6th Grade	24	11.4	3.71	1.64
	7th Grade	37	17.6		
	8th Grade	29	13.8		
	9th Grade	42	20.0		
	10th Grade	41	19.5		
	11th Grade	37	17.6		
	Total	210	100.0		

The demographic information in Table 2 provides an overview of the 210 participants' characteristics in this research study. The age distribution shows that the participants are fairly well spread across three age groups. The majority (35.2%, 74 participants) are between 11-13 years of age, followed by those in the 17–18-year group (33.8%, 71 participants). The 14–16-year age group comprises 31% (65 participants), indicating a balanced representation across age brackets. In terms of gender, there is a slight male majority, with 51% (107 participants) of the sample being male and 49% (103 participants) being female. The mean response score for males is 1.49, with a standard deviation of 0.50, which suggests a fairly consistent pattern of responses among male participants. Female responses, though not specifically broken down here, would be implied to show a somewhat similar distribution due to the close proportions in gender representation. The participants were also asked about their interest in participating in interactive task-based activities. A significant portion (51%, 107 participants) indicated that they were "Somewhat Interested." However, 29.5% (62 participants) were "Very Interested," with a mean score of 1.90 and a standard deviation of 0.69, which suggests moderate enthusiasm. The remaining 19.5% (41 participants) were neutral on the subject. The grade distribution reveals that most participants are spread across a wide range of school grades. The largest group of participants are in 9th grade (20%, 42 participants), followed by those in 10th grade (19.5%, 41 participants). There is also a notable number of participants in 7th grade (17.6%, 37 participants) and 11th grade (17.6%, 37 participants). The smallest group is in 6th grade, comprising only 11.4% (24 participants). The mean grade score is 3.71, with a standard deviation of 1.64, indicating a moderate variation in grade levels among the participants. Therefore, the demographic data suggests a diverse sample of participants with a balanced age and gender distribution and varying levels of interest in interactive activities.

4.2. Hypothesis Testing

4.2.1. H1: The integration of radio-directed movement tasks in history teaching significantly improves students' historical knowledge mastery.

To test this hypothesis, an independent sample t-test was performed to compare the historical knowledge mastery of students who were taught using radio-directed movement tasks with those who were not.

Table 3: Mean Comparison of Historical Knowledge Mastery Between Students Who Experienced Radio-Directed Movement Tasks and Those Who Did Not (Source: SPSS Data Illustration).

	Pre-test		Posttest		*t*	*p*	Cohen's *d*
Variables	**M**	**SD**	**M**	**SD**			
Historical Knowledge Mastery	1.88	0.41	3.67	0.51	-39.30	0.000	3.87
Note. M = Mean, SD = Standard Deviation							

Table 3 shows the results of the independent sample t-test conducted to compare historical knowledge mastery scores between students who took the pre-test and post-test. The results revealed a highly significant difference in historical knowledge

mastery between the two groups (t = -39.30, p < .001). Students who participated in the post-test scored significantly higher (M = 3.67, SD = 0.51) compared to those in the pre-test group (M = 1.88, SD = 0.41). This indicates that the integration of radio-directed movement tasks in history teaching led to a substantial improvement in students' historical knowledge mastery. The value of Cohen's d was 3.87, which indicates a very large effect size, reinforcing the conclusion that the intervention had a strong and meaningful impact on students' ability to master historical knowledge.

4.2.2. H2: The use of radio-directed movement tasks in history teaching has a positive impact on students' interest in history.

To prove this hypothesis, an independent sample t-test was performed to compare students' interest in history before and after the use of radio-directed movement tasks.

Table 4: Mean Comparison of Students' Interest in History Before and After the Intervention.

Variables	Pre-test		Posttest		t	p	Cohen's d
	M	SD	M	SD			
Student Interest in History	2.10	0.52	3.80	0.50	-34.03	0.000	3.33
Note: M = Mean, SD = Standard Deviation							

Table 4 reveals a statistically significant difference in student's interest in history before and after the intervention of radio-directed movement tasks (t = -34.03, p < .001). The results indicate that students showed a significant increase in their interest in history after participating in the radio-directed movement tasks. Specifically, Students who participated in the post-test scored significantly higher (M = 3.8016, SD = 0.49805) compared to those in the pre-test group (M = 2.1048, SD = 0.52338), with a substantial difference in their interest in history. Cohen's d value of **3.33** suggests a very large effect size, indicating that the intervention had a substantial positive impact on students' interest in history. This demonstrates that the radio-directed movement tasks used in history teaching were highly effective in enhancing student engagement with the subject.

4.2.3. H3: The radio-directed movement strategy enhances students' critical thinking and problem-solving abilities in the context of historical learning.

To test this hypothesis, an independent sample t-test was performed between students' critical thinking and problem-solving abilities before and after the intervention of radio-directed movement tasks.

Table 5: Mean Comparison of Critical Thinking and Problem-Solving Abilities Before and After the Intervention (Source: SPSS Data Illustration).

	Pre-test		Posttest		*t*	*p*	Cohen's *d*
Variables	M	SD	M	SD			
Critical Thinking and Problem-Solving Abilities	2.05	0.40	3.75	0.50	-38.57	0.000	3.74
Note. M = Mean, SD = Standard Deviation							

Table 5 revealed significant mean differences in students' critical thinking and problem-solving abilities before and after the radio-directed movement intervention ($t = -38.57$, $p < .001$). Students who participated in the post-test scored significantly higher ($M = 3.75$, $SD = 0.50$) compared to those in the pre-test group ($M = 2.05$, $SD = 0.40$). These findings suggest that the radio-directed movement strategy had a significant positive impact on enhancing students' critical thinking and problem-solving abilities. Cohen's d value of 3.74 indicates a very large effect size, demonstrating that the intervention substantially improved students' abilities in critical thinking and problem-solving within the context of historical learning.

4.2.4. H4: The integration of radio-directed movement tasks in history teaching significantly increases students' participation and collaboration in history lessons.

To test this hypothesis, an independent sample t-test was performed to compare students' participation and collaboration in history lessons before and after the use of radio-directed movement tasks.

Table 6: Mean Comparison of Student Participation and Collaboration in History Lessons Before and After the Intervention.

	Pre-test		Posttest		*t*	*p*	Cohen's *d*
Variables	**M**	**SD**	**M**	**SD**			
Student Participation in History Lessons	2.16	0.51	3.64	0.65	-25.99	0.000	2.53
Note. M = Mean, SD = Standard Deviation							

Table 6 revealed significant mean differences in students' participation and collaboration in history lessons before and after the intervention of radio-directed movement tasks ($t = -25.99$, $p < .001$). Students who participated in the post-test scored significantly higher ($M = 3.64$, $SD = 0.65$) compared to those in the pre-test group ($M = 2.16$, $SD = 0.51$). These results suggest that the integration of radio-directed movement tasks significantly increased students' participation and collaboration in history lessons. Cohen's d value of 2.53 indicates a large effect size, demonstrating that the intervention had a substantial positive impact on enhancing student engagement and collaboration in history classes.

4.2.5. H5: The use of radio-directed movement tasks in history teaching improves students' teamwork and communication skills during historical learning.

To test this hypothesis, an independent sample t-test was conducted on students' teamwork and communication skills before and after the use of radio-directed movement tasks.

Table 7: Mean Comparison of Teamwork and Communication Skills Before and After the Intervention.

	Pre-test		Posttest		*t*	*p*	Cohen's *d*
Variables	**M**	**SD**	**M**	**SD**			
Teamwork and Communication Skills	1.96	0.42	3.77	0.52	-39.11	0.000	3.81
Note. M = Mean, SD = Standard Deviation							

Table 7 revealed significant mean differences in teamwork and communication skills among students before and after the radio-directed movement intervention ($t = -39.105$, $p < .001$). Findings showed that students who participated in the post-test scored significantly higher in teamwork and communication skills ($M = 3.77$, $SD = 0.52$) compared to those in the pre-test group ($M = 1.96$, $SD = 0.42$). Cohen's d value of 3.81 indicates a very large effect size, suggesting that the intervention had a substantial positive impact on students' teamwork and communication skills during historical learning.

5. Discussion

5.1. Impact of Radio-Directed Movement on Historical Knowledge Mastery

The research has shown that the addition of radio-directed movement tasks to history teaching shows great promise in helping students master historical knowledge. The results showed that students who underwent these movement-based tasks experienced a marked improvement in their learning and retention of historical content as compared to those who did not. Phoong et al. (2019) also supported these findings by showing that the use of technology-enhanced learning environments can be effective, and with smart classrooms, students' subject-based knowledge will improve. The results of this current study underscore the importance of interactive and engaging teaching methods, consistent with the research findings. While the study they conducted is mainly on higher education and mathematics education, which is different from History education, they did present the correct combination of interactive teaching practice and students' subject knowledge. Similarly, Gosain (2024) observed that the application of Web 3.0 technologies in education, in effect, transforms the conventional teaching practices of education into an interactive and responsive learning mode that boosts the knowledge of subject students. It is consistent with the argument that innovative pedagogic strategies can raise learning outcomes.

5.2. Effect of Radio-Directed Movement on Student Interest in History

The use of radio-directed movement-based tasks in history teaching has been found by this research to significantly increase student interest in the subject. The study results showed that students who took part in these tasks increased their engagement and enthusiasm for history compared with what the students initially were interested in. For instance, Jamiludin and Darnawati (2022) also study the effects of using project-based learning methods on students' engagement with local history. This research showed that digital photovoice was an effective method for engaging students in history lessons and making them more interested in the process. This supports the existing literature that agrees with the effectiveness of activities that involve participation and movement as a way of increasing student participation. Rhoads et al. (2021) also highlighted the usefulness of movement-integrated learning activities in most educational settings. They noted that the children are motivated by movement, and this enhances the overall interaction of the students with the lesson. This underlines the fact that active learning strategies may create interest among students in history.

5.3. Enhancement of Critical Thinking Through Radio-Directed Movement

The findings of this research highlighted that radio-directed movement tasks in history teaching enhance students' critical thinking and problem-solving skills. The use of movement-based tasks greatly enhanced the students' analytical skills and their ability to solve historically based-problems when given data. In this view, Tallavaara and Rautiainen (2020) agreed with the findings, which hold that inquiry-based learning in history education improves historical literacy and critical thinking of learners. According to the findings of this research, the teaching of history in schools should move its focus to the kind of skills that enable the learners to analyze and interpret history rather than just telling them the history. Another study focused on technology and its application in the history classroom and how it can help develop critical thinking (Lee, 2023). The results of the study also indicate that adopting new approaches to teaching, like technology-enhanced learning, enhances the students' potential for critical thinking and problem-solving in history. This supports the idea that active learning methods, including radio-directed movement tasks, may enhance students' cognitive abilities.

5.4. Radio-Directed Movement's Influence on Student Participation and Collaboration

The research established that integrating history lessons with radio-directed movement tasks enhances participation and collaboration among learners. The findings indicate that students who undertook such tasks performed much better as far as participation and group work in history lessons were concerned. Reflecting on the current study, Song et al. (2022) examined the impact of case-based learning on student engagement and revealed that the level and quality of active participation in a group learning environment enhance student's motivation. The findings of this study support the argument for using interactive teaching methods to enhance students' participation, as suggested by this study. In another study, Jihan et al. (2023) examined the post-pandemic learning strategies and their effects on engagement of learners. It was discovered that learning activities that encourage student participation and collaboration enhanced the levels of student engagement. This supports the notion that elements of movement, as used in this study, can positively enhance student engagement within history classes.

5.5. Improvement of Teamwork and Communication Skills via Radio-Directed Movement

It has been established in this study that the radio-directed movement tasks greatly influence the students' teaming and interpersonal skills in the teaching of history. These findings indicate that students who worked on these tasks demonstrated greater improvement in their collaboration and communication skills in historical learning than those who did not work. Omar and Plumb (2023) also support these findings, suggesting that teamwork during interactive teaching-based activities enhances student participation and problem-solving skills. They also found out that when students are grouped, they can generate more ideas and solutions, and

hence, the learning experience is enhanced. This is in support of the current study's focus on effective teaching strategies that enhance the teaming aspect. Mahmudah, Kirana and Rahayu (2022) also investigated the possibility of using problem-based learning to enhance critical thinking skills and students' group work. In their study, the authors noted that the students in the problem-solving activities also improved their communication skills, which are vital in history. This is in line with the argument that movement-based activities, which were used in this study, enhance teamwork and communication skills. Therefore, the study enriches the literature, suggesting that active and collaborative learning is effective in enhancing students' ability in teaming and communication.

6. Conclusion

6.1. Key Findings

There has been a notable positive impact of radio-directed movement tasks on students' learning in history teaching. The result of students' historical knowledge mastery revealed a high increase, which indicated that the strategy improved students' understanding and memory of historical content. Further, the intervention raised students' interest and made history more interesting and appealing. Critical thinking and problem-solving also improved, which shows that this method helps students develop deeper thinking about the historical topic. The levels of collaboration and participation among students were higher, which meant that the strategy encouraged the students to be more engaged in group discussions and activities. In addition, the increase in teamwork and communication skills suggests that this approach may help in the development of a collaborative learning environment. These results collectively support the contention that radio-directed movement tasks enhance student learning outcomes.

6.2. Limitation of Study

Nonetheless, it is important to mention some limitations of this study that may affect the conclusion and generalization of the findings. Firstly, the study was carried out in one school, and therefore, the findings cannot be easily applicable to other schools or educational systems. However, the sample size used in the study was adequate for the study but limited to six classrooms in one educational institution, thereby limiting the generality of the results. Furthermore, the surveys used in the study were based on self-assessment, and this may have led to response bias whereby students provided exaggerated results of their learning. The study's short period of implementation of the intervention at 30-40 days may also not allow for the assessment of enduring effects on students' historical knowledge and skills. Furthermore, the study involved middle and high school students only, and therefore, the findings cannot be generalized to other educational levels.

6.3. Future Recommendation

Further research should be done with a higher number of schools and students from different backgrounds to increase the validity of the results. Moreover, using

a longitudinal design, it would be possible to examine the impact of radio-directed movement tasks on students' historical knowledge and skills in the long run. Possible future studies could also examine the potential of using other forms of data collection methods, including interviews or even class observations, to supplement the survey data collected to gain a better sense of the effects of the intervention. Future studies may also try to implement the intervention in other levels of education, for instance, primary or university level, to find out whether this teaching method will be effective for all levels of education.

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Appendix

Survey Questionnaire for Pre- and Post-test

Demographic Questionnaire

1. What is your age?

- 11-13 years
- 14-16 years
- 17-18 years

2. What is your gender?

- Male
- Female

3. Are you interested in participating in interactive, task-based activities like the radio-directed movement tasks in history class?

- Very Interested
- Somewhat Interested
- Neutral
- Not Very Interested
- Not Interested at All

4. Which grade are you currently in?

- 6th Grade
- 7th Grade
- 8th Grade
- 9th Grade
- 10th Grade
- 11th Grade

Main Survey Questionnaire

No.	Question	Options				
		Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
Historical Knowledge Mastery						
1.	I am able to recall and explain key historical events clearly after participating in the radio-directed movement tasks.					
2.	I have gained a deeper understanding of historical facts and concepts through the radio-directed movement tasks.					
3.	I feel more confident in applying historical knowledge in discussions after the radio-directed movement tasks.					
Student Interest in History						
4.	I find history more interesting after participating in the radio-directed movement tasks.					
5.	The radio-directed movement tasks made me more excited to learn about historical topics.					
6.	I feel motivated to explore historical topics outside of class after the radio-directed movement tasks.					
Critical Thinking and Problem-Solving Abilities						
7.	I used critical thinking skills to solve problems during the radio-directed movement tasks.					
8.	The radio-directed movement tasks helped me improve my ability to analyze historical situations from different perspectives.					
9.	I feel that I can approach historical problems more logically and creatively after the radio-directed movement tasks.					
Student Participation in History Lessons						
10.	I actively participated in the radio-directed movement tasks in my history class.					
11.	I felt encouraged to contribute more during group discussions after the radio-directed movement tasks.					
12.	The radio-directed movement tasks increased my overall participation in history lessons.					
Teamwork and Communication Skills						
13.	I worked well with my classmates in completing the radio-directed movement tasks.					
14.	The radio-directed movement tasks improved my ability to communicate effectively with my peers.					
15.	I believe my teamwork skills have improved as a result of the radio-directed movement tasks.					

Foro de Educación, v. 24, n. 1, enero-junio / january - june 2026, pp. 142-164.
e-ISSN: 1698-7802