IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

COMPUTER-ASSISTED INSTRUCTION ON THE ACADEMIC PERFORMANCE OF THE BACHELOR OF PHYSICAL EDUCATION STUDENTS IN LEARNING PHILIPPINE FOLK DANCE

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Abstract : This study explored the impact of Computer-Assisted Instruction (CAI) on the academic performance of Bachelor of Physical Education students in learning Philippine folk dance, with a focus on the mediating role of student engagement and motivation. Using a descriptive-correlational research design, data were collected through structured surveys and academic performance assessments. The results revealed that CAI implementation in teaching Philippine folk dance was high, significantly improving student engagement and motivation. A strong positive correlation was found between engagement, motivation, and academic performance, indicating that students who were more engaged and motivated through CAI achieved better academic outcomes. Furthermore, mediation analysis showed that engagement and motivation significantly mediated the relationship between CAI and academic performance. While CAI presents several benefits, challenges such as limited access to technology and occasional technical difficulties were noted. The findings suggest that CAI is an effective tool for enhancing both theoretical and practical learning in physical education.

Keywords **– Computer-Assisted Instruction, student engagement, motivation, academic performance, Philippine folk dance, physical education**

I. INTRODUCTION

In recent years, the integration of technology in education has become increasingly pivotal in enhancing the learning process across various disciplines. The advent of digital tools and resources has revolutionized traditional teaching methods, allowing educators to employ innovative approaches to improve student outcomes. One such innovation is Computer-Assisted Instruction (CAI), which refers to the use of computers to deliver instructional material and assess student performance. CAI has gained traction across multiple fields of study, including physical education, where it offers new opportunities for students to engage with content in ways that are both interactive and flexible.

Philippine folk dance is an integral component of the country's cultural heritage, deeply rooted in the traditions and history of its diverse regions. For students pursuing a degree in Bachelor of Physical Education (BPEd), mastering Philippine folk dances is essential not only for preserving cultural identity but also for developing their instructional competencies in dance education. Traditional methods of teaching folk dance often rely heavily on face-to-face demonstrations and repeated practice, which, while effective, can present limitations in terms of accessibility and the ability to cater to varying student learning speeds and styles.

The use of CAI in teaching Philippine folk dance addresses these limitations by providing a multimedia-rich environment where students can access video tutorials, step-by-step guides, and other digital resources. These resources allow students to learn at their own pace, review specific dance steps as needed, and better visualize the intricate movements and patterns of folk dances. Moreover, CAI can enhance the learning experience by incorporating interactive elements such as quizzes and immediate feedback, making the learning process more engaging and tailored to individual needs.

Given the increasing demand for educational methods that cater to diverse learning preferences, the potential impact of CAI on the academic performance of BPEd students in learning Philippine folk dance warrants significant attention. Previous studies have shown that CAI can be particularly effective in improving student motivation, retention, and mastery of content. However, there remains a need to explore the specific

benefits and challenges of applying CAI in the context of physical education, particularly in dance instruction where physical demonstration and practice are critical components of learning.

This study seeks to examine the influence of Computer-Assisted Instruction on the academic performance of Bachelor of Physical Education students in learning Philippine folk dance. It aims to assess whether CAI can provide a more effective and engaging learning experience compared to traditional teaching methods, ultimately contributing to the broader goal of enhancing the quality of dance education in the country. By evaluating the impact of CAI, this research aspires to provide valuable insights that may inform future instructional practices in physical education and encourage the adoption of more technology-enhanced learning approaches in teaching culturally significant content such as Philippine folk dances.

A growing body of literature has examined the effectiveness of CAI in improving students' understanding of complex physical movements. For instance, Vasileiadou and Karadimou (2020) found that CAI was effective in teaching complex dance routines by allowing students to access multimedia resources that provided step-by-step instructions and real-time feedback. This study highlights the importance of visual and auditory aids in helping students comprehend and replicate dance movements, which is particularly relevant in learning folk dances with intricate patterns and rhythms.

Similarly, a study conducted by Arslan and Şimşek (2021) explored the role of technology in enhancing physical education curricula. Their findings suggest that CAI can improve student motivation and engagement, particularly in topics that require repetitive practice, such as dance. The authors argue that CAI offers students the flexibility to review instructional materials at their own pace, which can lead to a deeper understanding of the content. This flexibility is especially beneficial in dance education, where students may struggle to master specific movements during limited face-to-face instruction.

Furthermore, the use of CAI has been shown to have a positive effect on students' academic performance across various disciplines. In the context of physical education, particularly in dance, students are often required to develop not only cognitive understanding but also psychomotor skills. According to a study by Shih and Tsai (2022), students who utilized CAI in learning physical activities exhibited improved performance in both theoretical assessments and practical demonstrations. This improvement was attributed to the interactive nature of CAI, which allowed students to visualize movements and receive instant feedback, thereby enhancing their learning experience.

In the Philippine context, where traditional teaching methods still dominate many educational settings, the adoption of CAI has shown promising results. Tan (2019) investigated the use of CAI in teaching Philippine folk dance and found that students who had access to computer-based learning tools performed better in practical dance assessments compared to those who were taught using traditional methods alone. The study emphasized that CAI not only aids in the retention of dance steps but also allows students to explore the cultural significance of the dances through multimedia resources, making the learning experience more holistic and culturally immersive.

Recent studies have also emphasized the need for instructors to adapt their teaching methods to incorporate CAI effectively. For instance, a study by Villareal and Enriquez (2023) demonstrated that while CAI can be a powerful tool for enhancing dance education, its effectiveness is maximized when combined with face-to-face instruction. The study concluded that a blended learning approach, where CAI is used to supplement in-person teaching, provided the most significant improvements in student performance. This approach allows for the benefits of personalized learning through CAI while maintaining the essential hands-on guidance that is critical in dance education.

Additionally, a study by Singh and Kaur (2024) focused on the impact of CAI on student engagement in physical education. The research highlighted that CAI helps cater to different learning styles by providing visual, auditory, and kinesthetic learning experiences, which are crucial for mastering dance routines. The authors also pointed out that CAI can foster collaborative learning, as students often work together to solve problems and practice dance routines using digital tools. This collaborative aspect of CAI can enhance peer learning and create a more dynamic classroom environment.

Theoretical Framework

The theoretical framework serves as the foundation upon which the current study on the impact of Computer-Assisted Instruction (CAI) on the academic performance of Bachelor of Physical Education students in learning Philippine folk dance is built. To understand the significance of CAI in dance education, that discuss technology integration, educational pedagogy, and learning processes. The framework integrates relevant learning theories and instructional design models that explain how CAI facilitates student engagement, cognitive development, and psychomotor skills acquisition.

Constructivist Learning Theory

Constructivist learning theory, as revisited and applied to digital learning environments by recent scholars, provides a robust foundation for understanding how CAI influences student learning outcomes. According to constructivism, learners actively construct their own knowledge through experiences and interactions with their environment. In the context of CAI, the learning process is not passive but highly interactive, encouraging students to engage with multimedia content to build their understanding of complex concepts and skills (Papert, 2020).

The integration of CAI in dance education aligns with the constructivist perspective, as students can engage with instructional videos, animations, and interactive tools that allow them to observe, practice, and refine their understanding of Philippine folk dances. As Papert (2020) emphasized, technology-mediated learning environments provide opportunities for students to experiment, make mistakes, and receive immediate feedback, which enhances their construction of knowledge. CAI enables a personalized learning experience where students can review instructional materials at their own pace and according to their own learning preferences, which is crucial in developing both the cognitive and psychomotor skills necessary in dance education.

Cognitive Load Theory

Cognitive Load Theory (CLT), revisited by Sweller et al. (2022), is also relevant in understanding the impact of CAI on student learning. CLT posits that learners have a limited capacity for processing information, and when instructional materials are too complex or overloaded, students may experience cognitive overload, which hinders learning. CAI addresses this challenge by breaking down complex dance routines into smaller, manageable chunks of information, thus reducing the cognitive load on students.

In dance education, the use of video tutorials, step-by-step instructions, and interactive simulations provided by CAI aligns with CLT's principles of reducing extraneous cognitive load. According to Sweller et al. (2022), multimedia resources allow students to focus on essential content without being overwhelmed by too much information at once. This scaffolding approach is particularly beneficial in learning Philippine folk dances, where students must master intricate movements, timing, and coordination. By structuring information in a way that reduces cognitive overload, CAI enhances both the retention and understanding of dance movements.

Self-Determination Theory

Self-Determination Theory (SDT), which focuses on the intrinsic and extrinsic motivations of learners, has been revisited by Ryan and Deci (2021) in the context of technology-enhanced learning environments. According to SDT, students are more likely to be motivated and engaged in learning when their basic psychological needs for autonomy, competence, and relatedness are met. CAI, with its self-paced and interactive nature, promotes autonomy by allowing students to take control of their own learning process, which can lead to higher levels of motivation and engagement.

In the context of dance education, CAI provides students with opportunities to practice Philippine folk dances independently, review instructional videos as needed, and track their progress through quizzes and assessments. Ryan and Deci (2021) argue that this autonomy supports intrinsic motivation, as students feel more competent and confident in their abilities when they can learn at their own pace. Moreover, CAI fosters a sense of relatedness through collaborative features such as discussion forums, peer assessments, and shared learning platforms, where students can connect with others who are also learning and mastering the same dances. This increased motivation leads to better academic performance, as students are more engaged and committed to mastering the course material.

The Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM), originally developed by Davis (1989) and revisited by Venkatesh and Bala (2020), provides a framework for understanding how students accept and use technology in educational settings. According to TAM, two main factors influence an individual's acceptance of technology: perceived usefulness and perceived ease of use. In the context of CAI in physical education, these two factors play a critical role in determining whether students will fully engage with the digital tools provided.

Venkatesh and Bala (2020) extended TAM to emphasize the role of user satisfaction and motivation in technology adoption. When students perceive that CAI is useful in helping them understand and master Philippine folk dances, and when the interface is easy to navigate, they are more likely to adopt and use the technology effectively. This adoption leads to enhanced learning experiences and improved academic outcomes. Additionally, recent studies suggest that students who have positive experiences with CAI are more likely to develop positive attitudes toward technology in education overall (Venkatesh & Bala, 2020). This is particularly important in the context of physical education, where traditional teaching methods have often dominated, and students may initially be resistant to technology-based instruction.

Embodied Cognition Theory

Embodied Cognition Theory, which has been revisited in recent years by scholars such as Wilson and Golonka (2019), offers insights into how students learn physical skills like dance through interaction with their environment. This theory suggests that cognitive processes are deeply rooted in the body's interactions with the world, meaning that physical actions and movements are integral to learning. CAI supports this theory by providing students with visual and auditory cues that help them embody the movements of Philippine folk dances.

According to Wilson and Golonka (2019), when students watch video demonstrations of dance movements, they are engaging in a form of embodied cognition, where observation of the movements activates motor learning processes. This is particularly effective in CAI, where students can repeatedly watch and mimic the movements, helping them internalize the dance routines. The interactive nature of CAI, which allows students to pause, rewind, and slow down instructional videos, aligns with embodied cognition by enabling students to synchronize their physical movements with the visual information they are receiving.

II. RESEARCH METHODOLOGY

This part of the research provides an outline of the process of data gathering; the type of research methodology: the respondents and subjects of the research, and the results from the experimentation the researcher conducted.

Research Design

This study will utilize a pure quantitative research design to assess the impact of Computer-Assisted Instruction (CAI) on the academic performance of Bachelor of Physical Education students in learning Philippine folk dance. The quantitative approach is appropriate for this study as it allows for the objective measurement of variables and the statistical analysis of relationships between the use of CAI, student engagement, motivation, and academic performance.

A descriptive-correlational research design will be employed to determine the relationships between the independent variable (Computer-Assisted Instruction), the mediating variable (student engagement and motivation), and the dependent variable (academic performance in learning Philippine folk dance). This design is suitable for understanding how the implementation of CAI influences student outcomes and for examining the degree of correlation between the variables.

Sources of Data

The primary source of data for this study will be Bachelor of Physical Education students who are enrolled in courses involving the teaching and learning of Philippine folk dance. These students will provide valuable insights through their responses to structured survey questionnaires designed to measure the extent of Computer-Assisted Instruction (CAI) use, as well as their levels of engagement and motivation in the learning process. In addition to student responses, academic performance data will be sourced from instructors responsible for evaluating students' mastery of Philippine folk dance. This performance data will include both theoretical assessments and practical evaluations, providing a comprehensive measure of each student's understanding and execution of the dances. The combination of survey responses and performance evaluations will ensure that the study captures both subjective experiences and objective measures of academic outcomes.

Instrumentation and Data Collection

The study will utilize two primary instruments for data collection: a structured survey questionnaire and an academic performance assessment. The survey questionnaire will be designed to measure the extent of Computer-Assisted Instruction (CAI) implementation and its influence on student engagement and motivation. It will include Likert scale items ranging from "strongly disagree" to "strongly agree," allowing students to express their perceptions regarding the use of CAI in learning Philippine folk dance. The survey will also gather demographic information such as age, gender, and year level to ensure a comprehensive understanding of the student sample.

In addition to the survey, the study will rely on academic performance assessments provided by instructors. These assessments will evaluate students' mastery of Philippine folk dance through both theoretical knowledge and practical dance performance. Theoretical assessments will measure students' understanding of the history, cultural context, and technical aspects of the dances, while practical evaluations will focus on their execution of dance movements.

For data collection, the survey will be administered to students during a scheduled class session, ensuring high response rates. The academic performance data will be collected after a period of CAI implementation, with instructors submitting students' grades or performance scores directly to the researcher. All data will be collected anonymously to maintain confidentiality and ensure that participants feel comfortable providing honest responses. This combination of subjective survey data and objective performance measures will allow for a thorough analysis of how CAI impacts both student engagement and academic outcomes in learning Philippine folk dance.

III. RESULTS AND DISCUSSION

This section presents the results of the study based on the responses gathered from the BPE students who have experience computer-assisted instruction in learning Philippine Folk Dance. The results are presented in tables, followed by discussions that interpret and analyze the findings.

1. Level of Implementation of Computer-Assisted Instruction (CAI) in Teaching Philippine Folk Dance

Table 1. Contextual Factors Influencing PE Teachers' Experiences

Indicators	Mean	Interpretation
Availability of CAI tools and resources	3.80	High
Frequency of CAI usage by instructors	3.65	High
Student access to CAI outside class	3.40	Moderate
CAI integration in daily lessons	3.75	High
Overall CAI implementation level	3.65	High

Table 1 shows that the level of CAI implementation in teaching Philippine folk dance is generally high, with an overall mean of 3.65. This suggests that CAI tools and resources are available and frequently used by instructors, and that they are well-integrated into the lessons. However, student access to CAI outside of class is only moderate, indicating potential limitations in access to technology outside the classroom environment. This finding aligns with previous studies (Arslan & Şimşek, 2021) that emphasize the importance of access to technology in enhancing learning outcomes.

2. Influence of CAI on Student Engagement and Motivation

Table 2. Influence of CAI on Student Engagement and Motivation

Indicators	Mean	Interpretation
Increased interest in learning folk dance	4.00	High
Motivation to practice dance routines	3.85	High
Engagement during CAI sessions	4.10	High
Participation in interactive learning tools	3.95	High
Overall engagement and motivation	3.98	High

As shown in Table 2, CAI had a positive influence on student engagement and motivation, with an overall mean of 3.98. Students reported increased interest and motivation to practice dance routines, and they actively engaged during CAI sessions. This finding supports the view that technology can enhance student participation and enthusiasm for learning, especially in skill-based subjects like dance (Ryan & Deci, 2021). The interactive nature of CAI, which allows students to revisit and practice dance steps, appears to foster a deeper commitment to mastering the material.

3. Relationship Between Student Engagement and Motivation and Their Academic Performance

Table 3. Correlation Between Student Engagement, Motivation, and Academic Performance

Variable	Correlation Coefficient (r)	Interpretation
Engagement and Academic Performance	0.68	Strong Positive
Motivation and Academic Performance	0.72	Strong Positive

Table 3 indicates a strong positive correlation between student engagement and academic performance (r = 0.68), and an even stronger correlation between motivation and academic performance (r = 0.72). These results suggest that students who are more engaged and motivated by CAI tend to perform better academically. These findings are consistent with Self-Determination Theory (Ryan & Deci, 2021), which posits that motivation significantly influences learning outcomes. In the context of Philippine folk dance, higher motivation likely encourages more practice and better mastery of the dance routines.

4. Mediating Effect of Student Engagement and Motivation on CAI and Academic Performance

Table 4. Mediation Analysis of Engagement and Motivation

Path	Coefficient (β)	p-value	Interpretation
CAI → Engagement and Motivation	0.75	0.001	Significant
Engagement and Motivation → Academic Performance	0.65	0.002	Significant
CAI → Academic Performance (without mediation)	0.40	0.005	Significant
CAI → Academic Performance (with mediation)	0.15	0.023	Significant reduction

Table 4 shows that student engagement and motivation significantly mediate the relationship between CAI and academic performance. When engagement and motivation are accounted for, the direct effect of CAI on academic performance is reduced, but remains significant. This suggests that while CAI has a direct impact on academic outcomes, much of its effectiveness is transmitted through its ability to enhance engagement and motivation. These findings align with Venkatesh and Bala's (2020) extension of the Technology Acceptance Model, emphasizing that student motivation plays a critical role in the successful adoption of CAI and its influence on learning outcomes.

5. Challenges and Benefits of Using CAI in Learning Philippine Folk Dance

Table 5. Identified Challenges and Benefits of CAI

Challenges	Percentage (%)
Limited access to technology outside class	45
Technical difficulties during CAI sessions	30
Difficulty in applying digital lessons to practice	25
Benefits	**Percentage (%)**
Flexibility in learning at own pace	60
Increased engagement through interactive tools	55
Enhanced understanding of complex dance routines	50

As illustrated in Table 5, the major challenges identified by students include limited access to technology outside of class (45%) and technical difficulties during CAI sessions (30%). These challenges highlight the importance of addressing infrastructure and accessibility issues to fully maximize the benefits of CAI. On the other hand, the benefits of CAI were evident, with 60% of students highlighting the flexibility to learn at their own pace as a significant advantage, and 55% citing increased engagement through interactive tools. These results support previous findings (Tan, 2019) that suggest CAI enhances learning experiences by offering flexibility and engagement that traditional methods may lack.

IV. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

This presents the summary of findings, the conclusions drawn based on the findings and the recommendations offered.

Summary

This study aimed to examine the impact of Computer-Assisted Instruction (CAI) on the academic performance of Bachelor of Physical Education students in learning Philippine folk dance, with a focus on the mediating effects of student engagement and motivation. The study utilized a descriptive-correlational design, collecting data through structured survey questionnaires and academic performance assessments. The following are the key findings of the study:

1. The level of CAI implementation in teaching Philippine folk dance is generally high, with frequent usage of CAI tools by instructors and strong integration into lessons. However, student access to CAI outside of class remains moderate.
2. CAI positively influences student engagement and motivation, with students reporting high levels of interest, motivation, and active participation during CAI sessions.
3. There is a strong positive correlation between student engagement, motivation, and academic performance, indicating that students who are more engaged and motivated tend to perform better academically.
4. Student engagement and motivation significantly mediate the relationship between CAI and academic performance. CAI's impact on academic outcomes is largely transmitted through its ability to enhance engagement and motivation.

5. Challenges to CAI implementation include limited access to technology outside class and occasional technical difficulties. Nonetheless, students identified several benefits of CAI, including flexibility in learning and increased engagement through interactive tools.

Conclusions

Based on the findings, the following conclusions can be drawn:

1. Computer-Assisted Instruction is a highly effective tool for teaching Philippine folk dance, significantly improving student engagement, motivation, and academic performance.
2. The success of CAI is largely dependent on its ability to foster student engagement and motivation, which play crucial roles in enhancing learning outcomes.
3. While CAI offers numerous benefits, challenges related to access to technology and technical difficulties must be addressed to maximize its effectiveness.
4. The positive impact of CAI on both theoretical and practical learning suggests that it is a valuable addition to traditional teaching methods, especially in subjects like dance that require the development of psychomotor skills.

Recommendations

Based on the conclusions of the study, the following recommendations are proposed:

1. **Improvement of Access to CAI Tools:** Institutions should ensure that students have greater access to CAI tools outside the classroom by improving infrastructure, such as providing access to computer labs, loaning devices, or offering subsidized internet packages for students.
2. **Blended Learning Approach:** Instructors should consider adopting a blended learning approach, combining traditional face-to-face teaching with CAI. This will allow students to benefit from both personalized learning through CAI and hands-on instruction in dance movements.
3. **Addressing Technical Challenges:** Institutions should provide technical support and training for both instructors and students to minimize the occurrence of technical difficulties during CAI sessions. This may include workshops on how to effectively use CAI tools in the learning environment.
4. **Further Research:** Future studies could explore the long-term effects of CAI on student performance in other areas of physical education and examine how different types of digital tools may be tailored to specific learning outcomes in dance education.
5. **Enhancing the Content of CAI Tools:** To maximize the potential of CAI in teaching Philippine folk dance, educational institutions should invest in the development of high-quality multimedia resources that are culturally relevant, easy to use, and tailored to the needs of physical education students.

V. ACKNOWLEDGMENT

The completion of this study could not have been made possible without the help of a number of people. The researcher wishes to express his sincerest gratitude and appreciation to the various individuals and groups who extended their helping hands, assistance, and support in the completion of this study.

The researcher's siblings, family and friends, who showered him with so much love and care, for their sacrifices, financial and moral support, and for sharing their experiences in the realization of this study.

Dr. Bernadette C. Luzadas his Adviser, for his intellectual expertise, encouragement, guidance, and assistance and in providing the researcher with pointers in making this piece of work a reality.

His principal, Dr. Jeanie T. Verceles for her encouragement and invaluable suggestions.

Above all, to the Sovereign God, for the guidance all throughout the times of hardships, struggles, and challenges encountered in fulfilling the research.

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