Enhancing Handicraft Education Through Interactive Instructional Materials: An Evaluation of Learning Effectiveness

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ABSTRACT

An Interactive Instructional Material System for Handicraft at Camarines Norte State College has been established as the outcome of this research. Using weighted mean and ranking, its acceptability level was evaluated in terms of content, quality, functionality, and ease of use. Then, t-test was utilized to assess effectiveness of IIMS between the pre-test and post-test of the experimental and control groups of BTLED and BTVTED students. All the acceptability parameters resulted highly acceptable. Regarding the effectiveness, there is a significant difference between the pre-test and posttest of the control and experimental group. As a result, both groups of students can reject the null hypothesis. So, the study led to the conclusion that IIMS is an effective instructional material since experts and students have already expressed their strong agreement with the acceptability of its content, quality, functionality, and ease of use parameters. Nevertheless, the researcher recommends IIMS additional features upgrades, utilization of the crafted system as an additional instructional tool, crafting of much comprehensive manual and lastly, collaboration of faculty members and other researchers to carry out studies that is similar to or comparable to the completed study which will promote integration and development of technology-based instruction using different locales and a larger population to further validate the results of the study and continuous innovation for the field of TLE and TVL courses.

Keywords: Interactive Instructional Material System, Handicraft, TLE, TVL

INTRODUCTION

The global education system faced significant challenges during the COVID-19 pandemic, with school closures affecting nearly 1.5 million students worldwide as of March 2021 (Szmigiera, 2022). This disruption challenged the United Nations Sustainable Development Goal of ensuring inclusive and quality education for all (UN, 2015). In the Philippines, the government emphasized Human Capital Development and flexible learning strategies to ensure education continuity (NEDA, 2017). Although the Philippines boasts a high literacy rate of 97.95%, a mismatch between graduates' skills and job opportunities persists, with 65% of graduates unemployed in their chosen fields (Tang, 2020).

In response, the Commission on Higher Education (CHED) implemented flexible learning modalities, emphasizing the importance of localized and unbiased instructional materials for improving teaching effectiveness, particularly in subjects requiring hands-on activities (Pedido & Regnim, 2020; Limon & Vallente, 2016). This aligns with efforts by higher education institutions to integrate advanced methodologies and prepare educators for the demands of diverse learners.

One State College in South Luzon, offering programs like the Bachelor of Technology and Livelihood Education (BTLEd) and Bachelor of Technical Vocational Teacher Education (BTVTEd), includes Home Economics course focused on handicraft education. These course aim to develop students' competencies in handicraft production, covering materials, techniques, and design. However, the absence of accessible learning materials in this field, particularly for non-national certificate competencies such as needlecraft, woodcraft, and leathercraft, hampers teaching and learning outcomes (Arante et al., 2020).

Recognizing this gap, the study aims to develop an Interactive Instructional Material System for handicraft education to:

1. Create a model system for college students in handicraft education.
2. Evaluate its acceptability in enhancing student learning.
3. Assess the effectiveness of technology integration on student outcomes.

This initiative addresses the urgent need for comprehensive learning materials to improve the delivery of handicraft education and support future educators in meeting their career demands.

METHODS AND MATERIALS

This study aimed to develop and assess the effectiveness of an Interactive Instructional Material System (IIMS) tailored for handicraft education among college students. Following a Research and Development framework combined with a Cross-sectional Quantitative Quasi-experimental design, the study utilized the Agile Methodology's System Development Life Cycle (SDLC), which involved planning, product development, modification, evaluation, and finalization. The system's content was aligned with the K-12 Basic Education Curriculum Map for TLE and TVL tracks, focusing on modules such as fashion accessories, macramé, basketry, needlecraft, leathercraft, and woodcraft. Collaboration with a software developer ensured the system's technical robustness, utilizing tools like Visual Studio 2019 for programming and XAMPP for database management.

To evaluate its acceptability, the IIMS underwent validation and feedback from a panel of experts, including educators and IT professionals, and was assessed by 25 students from BTLED and BTVTED programs. Adapted survey questionnaires measured the system's content, quality, functionality, and ease of use. The system was also tested for effectiveness through a quasi-experimental design, comparing learning outcomes between control (traditional instruction) and experimental (IIMS-based learning) groups using pre-test and post-test assessments. Statistical methods, including weighted mean, ranking, and t-tests, were applied to analyze and interpret the results.

The IIMS was developed using specific hardware and software components, including an Intel Core i5 processor, 16GB RAM, and Windows 10 Pro as the operating system. Designed for offline use on Windows-based computers, the system was distributed as an executable file and is not compatible with mobile devices.

The final product is a self-paced, interactive learning tool that integrates instructional modules aligned with curriculum standards. It aims to enhance student engagement and skill development in handicraft education while providing an efficient and user-friendly learning experience.

RESULT AND DISCUSSION

The Features of Interactive Instructional Material System

The following stages were completed in order to develop the Interactive Instructional Material System (IIMS) for Craft Design (Handicraft): (1) Obtaining factual data about the end user's needs to acquire course mastery; (2) Installing the Visual Studio version 2019 for programming of system functions and designing of system interface; (3) Installing XAMPP for database to creates the database entities and its properties for users (administrators, instructors & students), results (pre-test, post-test & summative assessment) and question banks; and (4) Connect the system to the database using MySQL data extension.

Secondly, the IIMS for Craft Design (Handicraft) features were comprised of the following: (1) User Registration and Log-in Feature for Student and Instructor; (2) Landing Page for Student; (3) Student Main Menu Screen; (4) Elements of Lesson Screen; (5) Assessment Pop-Up Results; (6) Landing Page for Instructor; (7) Question Bank; and (8) Assessment Results.

Acceptability of Interactive Instructional Material System

The interactive instructional material developed was subjected to acceptability evaluation to gather valuable comments and insights for the improvement of the system in terms of its content, quality, functionality, and ease of use.

Table 1. Acceptability of Interactive Instructional Material System

	IM Evaluation Committee		Instructors Handling Major Subjects		IT Experts Instructors		BTLED Students		BTVTED Students		TOTAL		
INDICATORS	**WM**	**VI**	**WM**	**VI**	**WM**	**VI**	**WM**	**VI**	**WM**	**VI**	**WM**	**VI**	**R**
a. Acceptability of IIMS in Terms of Content	4.41	A	4.67	HA	4.97	HA	4.95	HA	4.75	HA	4.75	HA	3
b. Acceptability of IIMS in Terms of Quality	4.20	A	4.60	HA	5.00	HA	4.90	HA	4.77	HA	4.69	HA	4
c. Acceptability of IIMS in Terms of Functionality	4.64	HA	4.58	HA	5.00	HA	4.95	HA	4.74	HA	4.78	HA	1
d. Acceptability of IIMS in Terms of Ease of Use	4.52	HA	4.78	HA	5.00	HA	4.90	HA	4.82	HA	4.78	HA	2
GRAND MEAN	**4.47**	**A**	**4.67**	**HA**	**4.99**	**HA**	**4.93**	**HA**	**4.77**	**HA**	**4.76**	**HA**	

Legend:

WM (Weighted Mean)	VI (Verbal Interpretation)	R (Rank)
4.51 – 5.00	Highly Acceptable (HA)	
3.51 – 4.50	Acceptable (A)	
2.51 – 3.50	Moderately Acceptable (MA)	
1.51 – 2.50	Less Acceptable (LA)	
1.00 – 1.50	Not Acceptable (NA)	

Overall computed weighted grand mean = 4.76 (highly acceptable). Based on the grand mean computed results, following were ranked according to how "highly acceptable" experts and students respondents (IM Evaluation Committee, Instructors Handling Majors Subjects, IT Experts Instructors, BTLED, and BTVTED Students) in their perceptions of all the IIMS acceptability parameters: 1) Acceptability of IIMS in Terms of Functionality (mean = 4.78, highly acceptable); 2) Acceptability of IIMS in Terms of Ease of Use (mean = 4.78, highly acceptable); 3) Acceptability of IIMS in Terms of Content (mean = 4.75, highly acceptable); and lastly 4) Acceptability of IIMS in Terms of Quality (mean = 4.69, highly acceptable).

These findings coincided with the study of Rahmadi, (2021), Pedido and Regnim, (2020), which contended that the continuous adoption of new technologies, testing of innovative methods and utilizing interactive instructional materials aimed at improving the quality of education and the citizens produced by schools. A capacity to use technology is something educators can develop in their students.

Effectiveness of the Interactive Instructional Material System (IIMS)

Table 2. Test of the Effectiveness of the IIMS for BTLED Students

	Experimental	**Control**
Mean	93.66666667	89.41666667
Variance	14.78787879	22.81060606
Observations	12	12
Df	11	
t Stat	2.306299721	
P(T<=t) two-tail	0.041568568	
t Critical two-tail	2.20098516	

At 95% confidence level the computed t value is 2.306 greater than the critical value of 2.201 or ($p > 0.01$) interpreted significant. Thus, null hypothesis is rejected. It implies that there is significant difference on the post-test results of control and experimental group during the implementation of IIMS. Table 14 shows the test of effectiveness of the interactive instructional material system for Toted students.

Table 3. Test of the Effectiveness of the IIMS for BTVTED Students

	Experimental	**Control**
Mean	94.53846154	90.53846154
Variance	20.76923077	14.26923077
Observations	13	13
Df	12	
t Stat	2.355136231	
P(T<=t) two-tail	0.036371542	
t Critical two-tail	2.17881283	

At 95% confidence level the computed t value is 2.355 greater than the critical value of 2.179 ($p < 0.01$) interpreted significant. Thus, null hypothesis is rejected. It implies that there is significant difference on the post-test results of control and experimental group during the implementation of IIMS.

These findings confirmed the study of Pedido and Regnim (2020), and Tenorio et al., (2017) which stated that the development and innovation of interactive module will serve as lesson models and will be the first step in building and designing programs that can be used in the classroom as a teacher-assisted learning kit or self-learning kit for greater understanding and retention of information. It could serve as a benchmark for future improvement considering its compatibility with the existing curriculum in order to achieve the basic requirements for creating globally competitive graduates.

CONCLUSIONS AND RECOMMENDATIONS

From the salient findings, the researcher concludes the following; In terms of design, the interactive instructional materials system has several features that can be easily accessed and used by both teachers and students. Each feature has its own function which helped the students to learn and the teachers to teach the course effectively. For the level of acceptability in terms if content, quality, functionality, and ease of use, the system was highly accepted in all parameters. In terms of its effectiveness, the system was found to be

effective as shown by the significant difference of the students' performance in their pre-test and post-test for both experimental and control group.

Nevertheless, the researcher recommends the following: (1) To address the first objective of the study the continuous improvement and upgrades of IIMS particularly with regard to those features that will help to serve a larger population by making the application available online and on android devices; (2) Next, to address the second objective of the study, the enhancement of the parameter with only an "acceptable" perception of the expert and students respondents which were the content and quality acceptability, additional interactivity is also feasible like pop-up questions or trivia in between discussions and simulation games or activities for each lesson, as well as, a much comprehensive manual could be crafted with regards to the utilization of the system; (3) For the last objective, collaboration of faculty members and other researchers to carry out studies that is similar to or comparable to the completed study which will promote integration and development of technology-based instruction using different locales and a larger population may be carry out to further validate the results of the study and the continuous innovation can be made for the field of TLE and TVL courses.

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