DEVELOPMENT AND VALIDATION OF PROJECT i-CoNEQ (INTERACTIVE COMPUTER-AIDED NUMERACY ENHANCEMENT QUEST)

Sistoso, Jemar C.; Sistoso, Vanessa Christonette T.; Ampuan, Johaina C.

Completed 2022

Development and Validation of Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest)

Sistoso, Jemar C.; Sistoso, Vanessa Christonette T.; Ampuan, Johaina C.
Tawagan Sur National High School, Pagadian City Division
jemar.sistoso@gmail.com,
vanessasistoso@gmail.com,
johaina.ampuan@ deped.gov.ph
09667603956

Abstract

This study aimed to develop and validate Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest), an e-learning website that seeks to augment the numeracy skills of students. This study was conducted at Tawagan Sur National High during School Year 2022-2023 with expert validators from the Learning Resources Management and Development System (LRMDS) of the Pagadian City Division and 10 Grade 7 students as respondents. The Grade 7 student respondents were selected using purposive sampling. This study used a developmental research design. Expert validators utilized the tool in the evaluation and review for developing new non-print materials prescribed by the Learning Resources Management and Development (LRMDS) of the Pagadian City Division. Ratings were analyzed quantitatively through descriptive statistics using the mean rating and standard deviation. The researchers gathered suggestions and comments from expert validators obtained through face-to-face interviews. The researchers collected students' feedback from Grade 7 students with low numeracy through Focus Group Discussion (FGD). Results were analyzed using thematic analysis. Data revealed that Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest) is a highly recommended website. Project i-CoNEQ(Interactive Computer-Aided Numeracy Enhancement Quest) can improve the numeracy skills of Grade 7 students.

Keywords: *Developmental Research; Numeracy Skills; Project i-CoNEQ*

Acknowledgment

The researchers take this moment to express a deep sense of gratitude to all the people who became part of the completion of this action research.

First, to Ma. Colleen L. Emoricha, EdD, CESE, the Assistant Schools Division Superintendent, for giving us words of encouragement;

To Joseph O. Fulloso, Senior Education Program Specialist, for patiently attending to our queries;

To our very supportive Research Adviser, Mr. Carlo G. Cuba, Master Teacher I, for his untiring effort in helping us improve our work;

First, to LRMDS of Pagadian City Division headed by Mrs. Aracelli G. Cagadas for guiding us in completing the validation process of Project i-CoNEQ;

Second, to the expert validators from the Mathematics Department comprised of Mr. Salem T. Uyag, EPS in Mathematics; Mrs. Aileen S.Duran, Head Teacher V –ZSNHS and Mr. Joel B. Lomasag, Master Teacher II-Manga NHS, for rendering their expertise in evaluating the Project i-CoNEQ);

Also, to the Grade 7 student respondents for their cooperation in giving honest feedback on Project i-CoNEQ;

To the Almighty God for the wisdom, strength, and guidance bestowed upon us that enabled us to accomplish our tasks. All honor, praises, and glory belong to Him alone.

Context and Rationale

Understanding and combining mathematical fundamental concepts, terminologies, facts, and abilities in response to the external situation's requirement of the real world is what is meant by the term "numeracy," which refers to the capacity to understand and apply basic knowledge of mathematics in daily life (Layug, Velario, and Capones 2018, 14). Hence, numeracy is a fundamental skill for learners to acquire. It is of great relevance in adapting to real-life challenges.

Poor academic gain and learning of students in the Philippines are due to several factors. One of these is a lack of self-motivation and effort in their academic tasks leading to poor numeracy skills. The Department of Education urged educators to give greater numeracy priority, especially in the early school years (Yang 2022, 1). Hence, educators are encouraged to focus on foundational competencies in numeracy.

Another factor that accelerates the poor academic performance of students is their immense addiction to gadgets. Nowadays, students who spend more time on devices have less focus on their academic tasks (Betarmos et al. 2020, 1). Hence, excessive internet soaking has laid drawbacks to the numeracy skills of learners and the academic performance of students as a whole.

Based on the numeracy test conducted last August of S.Y. 2022-2023, results show that students in Grade 7 of Tawagan Sur National High School have a low mean percentage score of 20.2%. The result implies that most students answered less than half of the items. The data is quite alarming because it poses a threat to their level of readiness to learn new concepts.

With this, the researchers were motivated to design an intervention strategy that addresses the need to improve the student's academic performance in Mathematics in the 7th Grade of Tawagan Sur National High School using an interactive computer-aided numeracy enhancement quest (i-CoNEQ). This study aimed to provide an avenue for students to meet their interest in utilizing computers while improving their numeracy skills.

High levels of student involvement with interactive technology were revealed during the investigation of increasing numeracy skills using technology and suggested the enhancement in mathematics achievement (Miller 2018, 1). Creative computer-aided tasks have increased the attention of students in learning mathematics. Exposing students to interactive activities will likely motivate them to participate and put more effort into academics.

Moreover, CAI (Computer-aided Instruction) in mathematics is more efficient than conventional instruction at boosting pupils' mathematical fluency (Bochniak 2014, 4). Hence, learners who collaborated with CAI demonstrated statistically better outcomes than those who received conventional teaching.

ICT integration in Mathematics has a good impact on the teaching and learning processes (Das 2019, 19). Both the pupils and the teachers benefit from its development of critical and scientific thinking. In addition, it encourages the learners to take part in educational activities. It shows that computer-aided instruction has a positive effect on the teaching-learning process. Hence, it promotes a positive learning environment.

The primary purpose of this action research is to establish the validity of Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest) as a website for improving the academic performance in Mathematics of Grade 7 students of Tawagan Sur National High School. Furthermore, the researchers aimed to generate feedback from Grade 7 students, who will be the end users of this website.

Innovation, Intervention, and Strategy

Project-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest) is an e-learning website that serves as an intervention strategy to enhance the academic performance in Mathematics of Grade 7 students of Tawagan Sur National High School. In this project, the subject teacher conducted a regular class in January 2023, targeting one competency with three lessons as subtopics in Mathematics 7. After each session, the respondents logged in to the Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest), which contains interactive learning activities. Feedback from students as end users of the website was recorded and analyzed for the enhancement of this website.

The key features of the Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest) website include the introduction, video lessons, and online tasks such as interactive quizzes and games. An Introduction draws students into the Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest) and provides an overview of the lesson. This part presents the topic to be mastered by the students as a narrative or scenario. It also gives an overview of the tasks to complete. Video lessons show supplemental discussions. Online Tasks, in the form of interactive quizzes and games, were performed by the students to deepen their understanding of the competency that they have to master. These tasks aim to appeal to the students to find learning mathematics fun and engaging. Online Assessment is answered at the end to evaluate the level of mastery of the objectives of the lesson presented.

Action Research Questions

The primary intention of this action research was to develop and validate the Project I-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest) website.

Specifically, it sought to answer the following research questions:

1. How was the Project i-CONEQ (Interactive Computer-Aided Numeracy Enhancement Quest) website developed?
2. What extent do expert validators validate Project i-CoNEQ(Interactive Computer-Aided Numeracy Enhancement Quest)in terms of the following:
   2.1 content quality;
   2.2 instructional quality;
   2.3 technical quality; and
   2.4 other findings?
3. What are the comments and suggestions of the expert validators to improve Project i-CoNEQ(Interactive Computer-Aided Numeracy Enhancement Quest)?
4. What are the students' feedbacks on Project i-CONEQ(Interactive Computer-Aided Numeracy Enhancement Quest)?
5. Based on the findings, what enhancement to the Project i-CONEQ(Interactive Computer-Aided Numeracy Enhancement Quest) can researchers develop?

Action Research Methods

Research Design

The study used a developmental research design wherein a mixed method was employed. Developmental research is a systematic exploration of creating, developing, and assessing educational processes, products, and programs that will satisfy Project i-

CoNEQ's internal consistency requirements (APA PsycNet 2022).

In mixed-method sequential explanatory research, quantitative and qualitative data are gathered and analyzed in two separate periods within a single study (Ivankova, Creswell, and Stick 2006, 3-20). The first two phases of this study, the development of the website and the validation stage, were quantitatively done, wherein the ratings of validators from the Learning Resources Management and Development System were subject to descriptive analysis based on the tool for evaluation and review for the making of new non-print materials. This tool uses a Likert-type scale. To rate their answers to evaluative questions, respondents can select from a sequence of statements on the Likert-type scale (Vagias 2006). In the third phase of the study, the researchers analyzed the student's feedback using thematic analysis. The researchers obtained students' feedback through Focus Group Discussions (FGD) and interviews. Thematic analysis, which involves looking through data collection to find, analyze, and report recurring patterns, was used to analyze qualitative data. The selection of codes and the development of themes in thematic analysis entail interpretation (Kiger and Varpio 2020, 846).

Participants and/or other Sources of Data and Information

The comments and suggestions of identified expert validators of the Learning Resources Management and Development System of Pagadian City Division established the consistency and validity of the Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest) website. The inquiry applied a Likert-type scale questionnaire to collect the ratings of expert validators based on the indicators specified in the evaluation and review for the development of new non-print materials. Thematic analysis analyzed the comments and suggestions of the expert validators.

The student participants of this study were determined using purposive sampling. Students who obtained low scores during the numeracy tests participated as respondents. The study's respondents were the ten Grade 7 students of Tawagan Sur National High School (TSNHS), Tawagan Sur, Pagadian City. Specifically, the researchers chose ten students to whom the Project i-CoNEQ was administered on January 2023 to obtain feedback from them as end users of this website. The researchers used the students' feedback to enhance further the Project i-CoNEQ website.

Data Gathering Procedure

To gather the data from the participants, the researchers first secured permission to conduct a study signed by the Schools Division Superintendent of Pagadian City Division. After this, they also secured consent from the parents of the identified respondents, who are Grade 7 students of TSNHS and are considered minors. The researchers conducted an orientation before exposing the participants to Project i-CoNEQ (Computer-Aided Numeracy Enhancement Quest).

The Project i-CoNEQ was subjected to validation of non-print materials by the expert validators of the Learning Resources Management and Development System, Pagadian City Division. The researchers used the expert validators' comments and suggestions to further improve the Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest) as a website for enhancing the numeracy of Grade 7 students of Tawagan Sur National High School. The researchers utilized feedback from Grade 7 students with low numeracy to improve the Project i-CoNEQ website. Researchers conducted face-to-face interviews with Focus Group Discussions (FGD) with ten Grade 7 students of TSNHS identified as study respondents and end users of

the Project i-CoNEQ website. The researchers used their feedback to enhance Project i-CoNEQ.

Research Instrument

In today's digital age, websites have become integral tools for disseminating information, engaging users, and conducting various activities. To ensure the quality and usability of the Project i-CoNEQ website, the evaluation tool for new non-print materials of DepEd-LRMDS was used to validate the recently developed website. This research instrument, which includes evaluating the content quality, instructional quality, technical quality, and other findings, plays a critical role in validating the effectiveness of Project i-CoNEQ. The subsequent part of the questionnaire also captures the comments and suggestions of the expert validators to improve the material. Moreover, an interview guide is another research instrument utilized to gather students' feedback on the use Project i-CONEQ.

Data Analysis

The statistical processes performed in this investigation were descriptive statistics and thematic analysis. Researchers used descriptive statistics to describe how close the responses were to central tendencies. Mean and standard deviation were the descriptive statistics employed to describe the feedback of validators from the Learning Resources Management and Development System based on the indicators for non-print materials. The researchers utilized thematic analysis to analyze the students' feedback as well as the comments and suggestions of the expert validators.

The researchers utilized simple calculations in Microsoft Excel to ascertain the accuracy and reliability of the results.

Results and Discussion

Development of Project i-CoNEQ. The researchers used a free-domain website known asprofreehost.com powered by WordPress in making Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest). WordPress is an open-source management system (CMS). WordPress is a popular tool for individuals who want to build websites without coding experience. The software costs nothing. Anyone can install and modify it for free. The researchers developed the Project i-CoNEQ website that contains supplemental video lessons, games, quizzes, and other interactive activities. The website used videos and games linked from different sites, such as Youtube and iknowit.com. The researchers cited the sources of the links to avoid plagiarism. The researchers utilized self-made quizzes and other interactive activities using installed plug-ins already incorporated in WordPress, such as Quiz Maker and H5P. WordPress also contains tools that enable the researchers to customize and edit the website's interface, including graphics, text, banner, header, footer, background, typography, and buttons.

Validation of Project i-CoNEQ by the Expert Validators. The researchers used four (4) dimensions of the evaluation and review for developing new non-print materials utilized by the expert validators of LRMDS in evaluating Project i-CoNEQ. The project was assessed based on its content quality, instructional quality, technical quality, and other findings.

Table 1 shows the extent to which expert validators rated Project i-CoNEQ as Very Satisfactory *(Mean=4.00, SD=0)* regarding content quality. It means that the expert validators unanimously graded Project i-CoNEQ as Very Satisfactory in terms of the

quality of its content. The result implies that activities and tasks provided in Project i-CoNEQ are anchored on the curriculum standards set by the Department of Education as stipulated on the DepEd learning competencies in Grade 7 Mathematics. The ideas created would enhance, support, or help students achieve the chosen learning objectives and promote the students' critical thinking skills. It also shows that the researchers developed and organized the content of Project i-CoNEQ to be free from cultural and gender biases.

Table 1: The Extent to Which Expert Validators Validate Project i-CoNEQ in Terms of Content Quality

Factor A. Content Quality	*Mean*	*SD*	*Interpretation*
1. The content is consistent with topics/skills found in the DepEd Learning.	4.00	0	Very Satisfactory
2. The concepts developed contribute to enrichment, reinforcement, or mastery of the identified learning objectives.	4.00	0	Very Satisfactory
3. The content is accurate.	4.00	0	Very Satisfactory
4. The content is up-to-date.	4.00	0	Very Satisfactory
5. The content is logically developed and organized.	4.00	0	Very Satisfactory
6. The content is free from cultural, gender, racial, or ethnic bias.	4.00	0	Very Satisfactory
7. The content stimulates and promotes critical thinking.	4.00	0	Very Satisfactory
8. The content is relevant to real-life situations.	4.00	0	Very Satisfactory
9. The language (including vocabulary) is appropriate to the target user level.	4.00	0	Very Satisfactory
10. The content promotes positive values that support formative growth.	4.00	0	Very Satisfactory
Overall	**4.00**	**0**	**Very Satisfactory**

Mean Range: 1.00-1.74-Not Satisfactory; 1.75-2.49-Poor; 2.50-3.24—Satisfactory and 3.25-4.00-Very Satisfactory

Website designers must craft non-print learning materials to enrich and aid in making the concepts easier for students to comprehend and support students' learning at a distance (Mutiara, Zuhairi, and Kurniati 2007, 95). The web designer must develop the content quality of any non-print learning material suitable for learning.

Content quality is one of the most critical points to consider in the proliferation of e-learning materials. Content quality is one factor that determines the quality of education (Yildiz and Isman 2016, 2857). Designing the content of any e-learning materials needs thorough consideration.

Table 2 confirms the Very Satisfactory rating *(Mean= 4.00, SD=0)* of the expert validators to Project i-CoNEQ regarding instructional quality. The researchers draw that the expert validators strongly agreed that Project i-CoNEQ provides enjoyable, stimulating, and challenging activities with a well-defined purpose. It implies that the platform has appropriate graphics, colors, and sounds suitable to target users. Expert

validators consistently approved that the Project i-CoNEQ is easy to manipulate, enabling target users to control the presentation rate.

Strategically designed graphics and images can increase comprehension and understanding and have the power to enrich communication and stimulate an emotional response (Clark 2007, 1). The e-learning designers should use pictures and sound with clear value; otherwise, they can give learners wrong impressions. For a material to be stimulating and engaging, it must incorporate good graphics and audible sound.

Table 2: The Extent to Which Expert Validators Validate Project i-CoNEQ in Terms of Instructional Quality

Factor B. Instructional Quality	*Mean*	*SD*	*Interpretation*
1. The purpose of the materials is well-defined.	4.00	0	Very Satisfactory
2. The materials achieve their defined purpose.	4.00	0	Very Satisfactory
3. The learning objectives are clear and measurable.	4.00	0	Very Satisfactory
4. The level of difficulty is appropriate for the intended target user.	4.00	0	Very Satisfactory
5. The graphics/colors/sounds are used for appropriate instructional reasons.	4.00	0	Very Satisfactory
6. The material is enjoyable, stimulating, challenging, and engaging.	4.00	0	Very Satisfactory
7. The material effectively stimulates the creativity of the target user.	4.00	0	Very Satisfactory
8. The feedback on the target user's responses is effectively employed.	4.00	0	Very Satisfactory
9. The target users can control the rate and sequence of presentation and review.	4.00	0	Very Satisfactory
10. The instruction is integrated with the target user's previous experience.	4.00	0	Very Satisfactory
Overall	**4.00**	**0**	**Very Satisfactory**

Mean Range: 1.00-1.74-Not Satisfactory; 1.75-2.49-Poor; 2.50-3.24—Satisfactory and 3.25-4.00-Very Satisfactory

The layout of a website should be straightforward, user-friendly, and quick to load in any browser (Barikzai 2009, 4). A good and effective website does not contain images and animations that lag while loading. It can lead learners to lose patience. Users should be able to navigate a good e-learning platform with ease. Learners should control it and learn at their own pace. It should be stress-free for the students to load the learning site to sustain their interest.

Table 3 shows the extent to which expert validators rated Project i-CoNEQ as Very Satisfactory *(Mean=4.00, SD=0)* regarding technical quality. It indicates that Project i-CoNEQ website contains videos with good audio-visual quality that the target user will

benefit from this transformative platform. The expert validators all together decided that its technical quality is very satisfactory. The rating implies that the audio and video materials incorporated in Project i-CoNEQ will enable learners to participate in the best learning environment and achieve the best learning outcome.

Visual effects should not distract the learner from e-learning itself, and audio should seamlessly blend with the video to ensure maximum learning. More importantly, high-quality audio is considered a tool for a successful e-learning course (Pappas 2014, 1).

Table 3: The Extent to Which Expert Validators Validate Project i-CoNEQ in Terms of Technical Quality

Factor C Technical Quality	*Mean*	*SD*	*Interpretation*
1. The audio enhances understanding of the concept.	4.00	0	Very Satisfactory
2. The speech and narration (correct pacing, intonation, and pronunciation) are precise and easily understood.	4.00	0	Very Satisfactory
3. There is complete audio synchronization with the visuals, if any.	4.00	0	Very Satisfactory
4. The music and sound effects are appropriate and effective for instructional purposes.	4.00	0	Very Satisfactory
5. The screen displays (text) are uncluttered, easy to read, and aesthetically pleasing.	4.00	0	Very Satisfactory
6. The visual presentations (non-text) are clear and easy to interpret.	4.00	0	Very Satisfactory
7. The visuals sustain interest and do not distract the user's attention.	4.00	0	Very Satisfactory
8. The visuals provide an accurate representation of the concept discussed.	4.00	0	Very Satisfactory
9. The user support materials (if any) are effective.	4.00	0	Very Satisfactory
10. The design allows the target user to navigate freely through the material.	4.00	0	Very Satisfactory
11. The learners can use the material quickly and independently.	4.00	0	Very Satisfactory
Overall	**4.00**	**0**	**Very Satisfactory**

Mean Range: 1.00-1.74-Not Satisfactory; 1.75-2.49-Poor; 2.50-3.24—Satisfactory and 3.25-4.00-Very Satisfactory

Table 4 shows that the expert validators approve that no errors are found *(Mean=4, SD=0)* in Project i-CoNEQ. It concludes that Project i-CoNEQ is free from errors; hence it can be strongly recommended to be utilized by the target users who are Grade 7 students of Tawagan Sur National High School.

Table 4: The extent to which Expert Validators Validate Project i-CoNEQ in terms of Other Findings

Factor D Other Findings	*Mean*	*SD*	*Interpretation*
1. Conceptual errors	4.00	0	Not present
2. Factual errors	4.00	0	Not present
3. Grammatical and, or typographical errors	4.00	0	Not present
4. Other errors (i.e. computational errors, obsolete information, errors in the visuals, etc.	4.00	0	Not present
Overall	4.00	0	Not present

Mean Range: 1.00-1.74-Does not evaluate further; 1.75-2.49- Present and requires major redevelopment; 2.50-3.24-Present but very minor & must be fixed, and 3.25-4.00- Not present

Learning materials should be free from grammatical and typo errors that lead to meaningless sentences and unclear messages (Kid Sense n.d., 1). Correct grammar is considered the main feature of communication for messages to be understood. Moreover, correct grammar strengthens the need to eliminate any form of error in learning material.

Comments and Suggestions of Expert Validators to Improve Project i-CoNEQ. After the final validation conducted by the expert validators of the LRMDS utilizing the tool for evaluation and review for the development of new non-print materials, the researchers were able to draw three (3) significant comments and suggestions: (1) Stable internet connectivity should be secure, (2) Teacher should supervise students during the use of Project i-CoNEQ and (3) Minimum system requirement is used to run Project i-CoNEQ.

Theme 1: Stable internet connectivity should be secured. Using Project i-CoNEQ needs stable internet connectivity to ensure that student learning will be free from interruptions brought by lagging connectivity. Expert validators who served as research participants (RP) disclosed:

"Your school should provide stable internet connectivity." – RP1
"Stable internet connectivity should be accessible to students who are end-users of this website." – RP2

Theme 2: The teacher should supervise students using Project i-CoNEQ. Using Project i-CoNEQ requires a teacher to closely monitor and supervise the students while performing the different tasks in the web quest. Any technical problems and difficulties will be quickly and immediately addressed. The expert validators who served as research participants (RP) disclosed:

"In completing the tasks, the teacher should be available to guide students in case of technical difficulties."-RP1
"Teacher should be ready to respond to issues and concerns of students in doing the tasks."- RP3

Theme 3: Project i-CoNEQ needs minimum system requirements. The theme implies that Project i-CoNEQ uses any operating system, including smartphones, tablets, and other mobile devices. The expert validators who served as research participants (RP) disclosed:

"The Project i-CoNEQ is user-friendly because it can run smoothly and efficiently even on mobile phones."- RP2
"The website does not require gadgets with high specifications."-RP3

Feedback from the Students as End Users to the Project i-CONEQ. The researchers used students' feedback from a Focus Group Discussion after exposing the student respondents to three (3) topics in Project i-CoNEQ. The researchers were able to draw three (3) common feedbacks: (1) Learning using Project i-CoNEQ is exciting and challenging, (2) Project i-CoNEQ enriched their prior knowledge on the topics, and (3) Project i-CoNEQ is easy to navigate and control.

Theme 1: Learning using Project i-CoNEQ is exciting and challenging. The student respondents found the Project i-ConEQ engaging and exciting because the games and challenges incorporated into the web quest stimulated their interest in learning about the lessons. The student respondents who served as research participants (RP) disclosed:

"I enjoyed using Project i-CoNEQ."- RP1.
"Answering the questions made my experience exciting."-RP3.
"I enjoyed Project i-CoNEQ because of the different interactive activities."- RP5.
"I hope for more lessons in the web quest."- RP6.
"There were challenging games and tasks which added excitement in using Project i-CoNEQ."- RP8.
"I liked Project i-CoNEQ because there are a lot of unique and exciting tasks for each lesson."-RP9.
"I enjoyed learning using Project i-CoNEQ."- RP10.

Theme 2. The Project i-CoNEQ enriched their prior knowledge. Student respondents gave feedback that Project i-CoNEQ reinforced their understanding of the lessons as they learned vague concepts. The student-respondents who served as research participants (RP) disclosed:

"Project i-CoNEQ has enriched my understanding of the lesson on algebraic expressions and polynomials."- RP1.
"The videos used Tagalog as a medium of instruction, which I find helpful and preferable in understanding the lessons."-RP2.
"What I like about the video lesson is that it answers the questions about the lessons I have for my teacher, which I am hesitant or shy to ask. I can easily review the videos to clear out some misunderstood concepts."-RP4.
"I find Project i-CoNEQ helpful because I can easily review the concepts and control the pacing of the video lessons."-RP8.

Theme 3: Project i-CoNEQ is easy to navigate and control. The student respondents found Project i-CoNEQ easy to manipulate and control. The student respondents who served as research participants (RP) disclosed:

"*All the buttons and links of quizzes are clickable and load immediately."- RP5.*
"You can easily return to videos and tasks."- RP6.
"The font size is readable, which helps me easily follow instructions and navigate the site."-RP10.

The Enhancement Made to the Project i-CoNEQ. The researchers draw that the Project i-CoNEQ does not need further enhancement due to the very satisfactory rating that the validators of LRMDS rated in all the four (4) factors stipulated in the utilized tool for evaluation and review for the development of new non-print materials. The student respondents gave positive feedback based on their experience navigating the site. The researchers find it necessary to conduct pilot testing of the Project i-CoNEQ to target users who are Grade 7 students with low levels of numeracy to ascertain its effectiveness in improving the students' numeracy.

Conclusion and Recommendations

Based on the results obtained from the descriptive statistics and thematic analysis, the researchers of this study conclude that Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest) is a highly acceptable intervention to enhance the numeracy skills of Grade 7 students. The Project i-CoNEQ will enable learners to deepen their understanding of the competencies specified by the Department of Education while meeting their interest in navigating an online environment to improve their ICT skills. With this, the researchers recommend the pilot testing of Project i-CoNEQ to establish its effectiveness in improving the numeracy skills of learners. In addition, the researchers also recognized the need to cascade the use of this Project i-CoNEQ not only in Tawagan Sur National High School but even on a broader scope. However, the researchers have to conduct pilot testing to ensure effective use of this platform.

Republic of the Philippines
Department of Education
REGION IX, ZAMBOANGA PENINSULA
DIVISION OF PAGADIAN CITY
EAST DISTRICT
TAWAGAN SUR NATIONAL HIGH SCHOOL
TAWAGAN SUR, PAGADIAN CITY

Action Plan on Testing the Effectiveness of Project i-CoNEQ (Interactive Computer-Aided Numeracy Enhancement Quest)

Subject Focus	Program Description	Objectives	Strategies/ Activities	Time Frame	Persons Involved	Sources of Fund	Expected Outcome
Mathematics	Pilot Testing of Project i-CoNEQ to Grade 7 students with low level of numeracy	To measure the level of effectiveness of Project i-CoNEQ in increasing the level of numeracy of Grade 7 students of TSNHS for S.Y. 2023-2024	Pilot Testing of Project i-CoNEQ	August 2023-December 2023	Proponent/ Select Student Respondents	Personal Fund	Enhanced Level of Numeracy of Students through the use of Project i-CoNEQ

References

APA PsycNet. 2022. *Developmental Research: Studies of instructional design and development*. http://psycnet.apa.org/record/2004-00176-041.

Barikzai, Siddiqullah. 2009. "The role of an educational website in providing better opportunities for Kabul education university." 1-56.

Betarmos, John Myco E., Trisha Mae P. Diaz, Menard F. Coloma, Carl Joshua D. Lima, and May Angel L. Teh. 2020. "Negative effects of cellular phones on academic performance of JHS students in Saint Gregory College of Valenzuela." https://www.academia.edu/40715458/Negative_Effects_of_Cellular_Phone_in_Academic_Performance_of_Junior_High_School_Students_in_St_Gregory_College_of_Valenzuela.

Bochniak, Joseph Scott. 2014. "The effectiveness of computer-aided instruction on math fact fluency." 1-146. https://tinyurl.com/en3rzvhr.

Clark, Ruth. 2007. "Leveraging multimedia for learning." *Captive, Adobe Systems Incorporated, California*: 1-10. http://cdi.com.my/download/captivate_leveraging_multimedia.pdf.

Das, Kaushik. 2019. "Role of ICT for Better Mathematics Teaching." *Shanlax International Journal of Education* 7, no. 4: 19-28. https://tinyurl.com/2s3seajy.

Ivankova, Nataliya V., John W. Creswell, and Sheldon L. Stick. 2006. "Using mixed-methods sequential explanatory design: From theory to practice." *Field methods* 18, no. 1: 3-20. https://bit.ly/3TpCfQx.

Kid Sense (n.d.). *Using grammar*. https://childdevelopment.com.au/areas-of-concern/using-speech/using-grammar/.

Kiger, Michelle E., and Lara Varpio. 2020. "Thematic analysis of qualitative data: AMEE Guide No. 131." Medical teacher 42, no. 8: 846-854. DOI: 10.1080/0142159X.2020.17550303.

Layug, Girlie D., Julie Pearl V. Velario, and Josephine G. Capones. 2021. "Teachers' Interventions in Improving Numeracy Skills of Grade 7 Students in Baguio City National High School." In *4th International Conference on Advanced Research in Teaching and Education*. 14-22. https://www.dpublication.com/wp-content/uploads/2021/08/22-4022.pdf.

Miller, Tess. 2018. "Developing numeracy skills using interactive technology in a play-based learning environment." *International Journal of STEM Education* 5, no. 1: 1-11. https://doi.org/10.1186/s40594-018-0135-2.

Mutiara, Dewi, Aminudin Zuhairi, and Sri Kurniati. 2007. "Designing, developing, producing and assuring the quality of multi-media learning materials for distance learners: Lessons learnt from Indonesia's Universitas Terbuka." *Turkish Online Journal of Distance Education* 8, no. 2: 95-112.

Pappas, Christopher. 2014. *Audio in eLearning: Top 10 tips for eLearning professionals*. eLearning Industry. https://tinyurl.com/tsnhsjvj.

Vagias, Wade M. 2006. "Likert-type scale response anchors." *Clemson International Institute for Tourism and Research Development, Department of Arts, Recreation and Tourism Management.Clemson University*. https://bit.ly/3CZb4al.

Yang, Angelica. 2022. *DepEd urged to prioritize better literacy, and numeracy in early school years*. Philstar.com. https://tinyurl.com/35r4dw9r.

Yildiz, Ezgi Pelin, and Aytekin Isman. 2016. "Quality content in distance education." *Universal Journal of Educational Research* 4, no. 12: 2857-2862. DOI: 10.13189/ujer.2016.041220.

Financial Report

The table below shows the cost expended before, during, and after conducting this action research.

General Descriptions	Quantity	Unit	Unit Price	Total Estimated Costs
Short Bond paper Sub 20	1	ream	275	275
Ink for the printer (black)	1	bottle	350	350
Internet Cost			1000	1000
Transportation			1000	1000
Snacks (Expert Validators, Student Participants, and their Parent)			2 375	2 375
Total				Php 5,000