

Development of Critical Thinking-Infused Localized Learning Module for Alternative Learning System (ALS) Learners

Nhoemy Adriana B. Capila^a, Julie Fe D. Panoy^b

^a 0319-3120@lspu.edu.ph

^bLaguna State Polytechnic University, San Pablo City Laguna 4000, Philippines

Abstract

This study developed a localized learning module for Alternative Learning System (ALS) Learners focusing on the improvement of critical thinking skills, which is the overall purpose of their science learning strand.

In developing the localized module, the researcher gathered data about the locals' knowledge of herbal medicine through interviews and used resources to relate the content to the learners' local setting and curriculum. The samples of the plants they commonly use were sent to the University of the Philippines-Diliman Campus for plant authentication.

After the module was developed, it was sent to thirty (30) validators, including ALS and science teachers for validation. Based on the mean and standard deviation of the validators' responses, it was concluded that the localized module is highly acceptable in terms of its content, format, presentation and organization, assessment tools, usability, adaptability, and consistency.

Moreover, the junior high school ALS learners also evaluated the developed localized module according to its text, illustrations, design, and layout. Using Independent-Samples Mann-Whitney U Test and Independent-Samples Kruskal-Wallis Test, it was found that there was no significant difference in the student-respondents' perceived level of acceptability of the localized module when grouped according to sex and age.

The following recommendations are suggested according to the findings and conclusions of the study: ALS learners may use the localized learning module as supplementary learning material; ALS science teachers may also develop learning modules with localized content; and future researchers may utilize the localized learning module in subsequent studies related to this topic.

Keywords: Localize; Learning Module; Critical Thinking Skill; Validation

1. INTRODUCTION

Alternative Learning System (ALS) gives out-of-school youth and adult (OSYA) learners the chance to improve their functional and basic reading skills as well as access comparable pathways to finish their basic education. ALS includes both informal and non-formal sources of knowledge and skills. As a second chance education initiative, it seeks to allow OSYA students to continue their education enabling them to better their quality of life and contribute positively to society.

ALS programs are both flexible and modular and according to the convenience and availability of the learners. Learning can occur anywhere and whenever it is most convenient for them. The indicators of

functional literacy in ALS are reflected in six interconnected learning strands namely: English, Filipino, Science, Mathematics, Life and Career Skills, Understanding the Self and Society and Digital Citizenship.

This study focused primarily on the Science Learning Strand of the ALS curriculum with the overall purpose to equip students with the ability to apply critical thinking skills in real-world scenarios to enhance their own lives and the quality of life of their communities and the nation as a whole. Critical thinking involves the ability to process and synthesize knowledge to enable them to apply it judiciously to decision-making and problem-solving tasks (Heard, et al., 2020).

Moreover, as stated in the recent study of Belen (2022), learning materials of the ALS junior high school level have a higher degree of complexity. Also, according to Bustillo (2022), one of the challenges in modular learning is the difficulty in understanding module contents. These challenges are similar to those faced by junior high school ALS learners in Nagcarlan, Laguna, particularly in their science learning strand, which is driving them to perform poorly.

According to the ALS Education and Skills Training (ALS-EST) handbook as cited by Belen, teachers are encouraged to try new and innovative teaching and learning strategies that are most appropriate to learners. As a transitory provision of DepEd order no. 19 s 2019 (Enhanced ALS 2.0), for a better understanding of the K-12 Basic Education Curriculum, learners may utilize supplemental instructional materials.

Further, a more effective approach, according to Labindao (2022), is to use real-life scenarios that have been contextualized for the learner to use as resources. The learning module's adaptation or localization might aid students in overcoming learning difficulties. Utilizing localized relevant content can help learners have a thorough knowledge of that content and foster effective skill transfer. Thus, the localization of resources may present a chance for producing authentic learning that may lead to improved critical thinking skills.

In addition, the research conducted by Tindowen, et al. (2017) revealed that the learning of 21st-century abilities, such as critical thinking, by ALS learners is poor. Their research confirms the findings of Jimes, et al. (2013) and Cheng (2002), which suggest that teachers should emphasize the significance of content that is anchored in the cultural context or local setting. Therefore, they advised that ALS teachers should adopt localized educational materials to accommodate the learners' localized environment.

Thus, this study aimed to develop a localized learning module in science learning strand designed to enhance the critical thinking skills of the ALS junior high school learners.

2. METHODOLOGY

2.1 Participants

The respondents of this study were composed of informants (herbolarios) from Nagcarlan, Laguna, validators of the localized module from the district of Nagcarlan and San Pablo, Laguna, and junior high school ALS learners.

The informants were composed of 10 herbolarios from Nagcarlan, Laguna who shared their knowledge about the commonly used herbal medicine in their town. They were chosen through snowball sampling or chain-referral sampling which is a nonprobability sampling approach in which existing study participants acquire new participants from among their acquaintances (Goodman, 1961).

On the other hand, validators of the developed localized module were composed of thirty (30) Junior High School Science and ALS Teachers. Also, a total of twenty (20) junior high school learners enrolled at ALS Learning Center Nagcarlan, Laguna during the School Year 2022-2023. evaluated the localized module's format according to its texts, illustration, design, and layout.

2.2 Research Design and Procedures

This study employed a descriptive-developmental research design enabled by standardized instruments used to gather the data.

A descriptive research design was used in the conduct of this study to analyze the acceptability of the localized learning module in the science learning strand. This type of research design was used to determine the level of acceptability of the developed localized module as supplementary material for junior high school ALS learners. Moreover, a developmental research design as its primary goal is to develop a localized learning module in the science learning strand. Developmental research, as opposed to simple instructional development, has been defined as "the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet the criteria of internal consistency and effectiveness" (Seels & Richey, 1994, p. 127).

The researcher sought permission from Laguna's Schools Division Superintendent, Nagcarlan Laguna's District Supervisor and from the school head of ALS Learning Center in Nagcarlan, Laguna to conduct the study. The following procedures were taken in this study:

Development and Design of the Localized Module. The K TO 12 Basic Education Curriculum for the Alternative Learning System (ALS-K TO 12), Nagcarlan's background, ACER's Critical Thinking Skill and Elements of a Learning module also served as the basis for making the localized learning module.

Localization of the Module's Content. The researcher gathered data through interviews about the locals' knowledge of herbal medicine. The samples of the plants which they commonly use were sent and authenticated by the University of the Philippines-Diliman Campus. Moreover, the researcher read books, magazines, and online articles to gain a deeper understanding of Nagcarlan's town in preparation for writing the module's content.

Localized Module's Validation. After the module was finalized, it was distributed online in PDF format to the validators, who utilized Google Forms to submit their evaluations. They examined the localized module based on its content, format, presentation and organization, assessment tools, usability, adaptability, and consistency in order to determine its level of acceptability.

Determining the Junior High School ALS Learners' Perceived Acceptability of the Localized Module's Format. The localized module was also distributed to junior high school ALS learners. They evaluated the localized module's format based on its text, illustrations, design and layout.

Revisions and Finalization. The validators and the junior high school ALS learners found the localized module highly acceptable. Also, there was no significant difference in the student-respondents' perceived level of acceptability of the localized module when grouped according to sex and age. Moreover, the researcher revised the localized module in response to the comments and suggestions of the validators, which focused primarily on correcting technical mistakes. The finalized and validated critical thinking-infused localized learning module could be used by ALS learners as their supplementary learning material.

2.3 Instrument

The researcher used an interview guide to gather data about the commonly used herbal plants in Nagcarlan Laguna and adapted the Evaluation Rating Sheet for Print Resources (DepEd) in evaluating and validating the localized learning module.

The interview guide was composed of three (3) questions about the commonly used herbal plants, their uses, and preparation in Nagcarlan Laguna. Follow-up questions were also added during the interview (see Appendix I).

The questionnaire used to evaluate and validate the localized module was composed of seven (7) parts which are dedicated to the criteria in determining the localized module's acceptability in terms of its content,

format, presentation and organization, assessment tools, usability, adaptability, and consistency (see Appendix J).

Moreover, the questionnaire used to describe the perceived level of acceptability of the localized module’s format by the junior high school ALS learners was composed of three (3) parts: text, illustrations, and design and layout.

The scores were interpreted through verbal interpretation of 3.50-4.00 strongly agree/highly acceptable; 2.50-3.49 agree/acceptable; 1.50-2.49 disagree/low acceptable; and 1.00-1.49 strongly disagree/not acceptable.

2.4 Data Analysis

Frequency and Percentage were used to describe the informant’s local knowledge of herbal medicine common in Nagcarlan, Laguna. On the other hand, mean and standard deviation were used to describe the level of acceptability of the localized learning module according to the validators and the junior high school ALS learners’ perceived acceptability of the localized module’s format.

Moreover, Independent-Samples Mann-Whitney U Test and Independent-Samples Kruskal-Wallis Test were used to determine the significant difference in the student respondents' perceived level of acceptability of the localized module when grouped according to sex and age.

3. Results and Discussion

The data gathered from this research was analysed and interpreted thoroughly. The following tables illustrate the findings of this study.

3.1 Profile of the Students

Table 1. Profile of Student-Respondents as to Sex

Sex	Frequency	Percentage (%)
Male	8	40
Female	12	60
Total	20	100

Table 1 shows the profile of the student-respondents as to sex. It indicates that there was a total of twenty (20) student-respondents composed of eight (8) males (40%) and twelve (12) females (60%) which indicates that there were more females than males enrolled in ALS Learning Center, Nagcarlan Laguna.

Table 2. Profile of Student-Respondents as to Age

Age	Frequency	Percentage (%)
15 below	2	10
16-18	16	80
19-21	2	10
Total	20	100

Table 2 shows the profile of the student-respondents as to age. It indicates that among the twenty (20) student-respondents, two (2) of them were from 15 below age bracket (10%); sixteen (16) student-respondents were 16-28 years old (80%); and two (2) student-respondents were 19-21 years old (10%).

The ALS junior high school program is designed for out-of-school children and adults (15 years of age or older) who need basic literacy skills, notably in reading, writing, and simple math (DepEd, 2020).

3.2 Localized Module's Level of Acceptability According to the Validators

Table 3. Level of Acceptability of the Localized Module as to Content

Statements	Mean	SD	Verbal Interpretation
1. The localized module is suitable to the student's level of development.	3.93	0.25	Highly Acceptable
2. The localized module contributes to the achievement of specific objectives of the subject area and grade/year level for which it is intended.	3.87	0.35	Highly Acceptable
3. The localized module provides for the development of critical thinking.	3.73	0.45	Highly Acceptable
4. The localized module has the potential to arouse the interest of target readers.	3.93	0.25	Highly Acceptable
Overall	3.87	0.23	Highly Acceptable

Legend: 3.50-4.00 (Strongly Agree / Highly Acceptable); 2.50-3.49 (Agree / Acceptable); 1.50- 2.49 (Disagree / Lowly Acceptable); 1.00-1.49 (Strongly Disagree / Not Acceptable)

Based on the composite mean of 3.87 (SD=0.23), it shows that the majority of the respondents strongly agree that the localized module is suitable to the student's level of development, contributes to the achievement of specific objectives of the subject area, and grade/year level for which it is intended provides for the development of critical thinking and has the potential to arouse the interest of target readers. Their responses imply that the localized module's content is highly acceptable and was able to meet the standards of ideal learning material.

According to Hessey (2016), the material's content must be curriculum-relevant and it should be aligned with the objectives of a specific subject matter. Also, a learning resource that encourages critical thinking in students enables them to acquire knowledge efficiently, digest information effectively, and intelligently analyze data.

Table 4. Level of Acceptability of the Localized Module as to Format

Level of Acceptability of the Localized Module	Mean	SD	Verbal Interpretation
1. Text	3.85	0.23	Highly Acceptable
2. Illustrations	3.90	0.23	Highly Acceptable
3. Design and Layout	3.89	0.20	Highly Acceptable

Legend: 3.50-4.00 (Strongly Agree / Highly Acceptable); 2.50-3.49 (Agree / Acceptable); 1.50- 2.49 (Disagree / Lowly Acceptable); 1.00-1.49 (Strongly Disagree / Not Acceptable)

Based on the composite mean of 3.85 (SD= 0.23), it shows that the majority of the respondents strongly agree that the localized module's text is appropriate to the intended user; illustrations are simple and easily recognizable; and the design and layout are attractive and pleasing to look at. Their responses imply that the localized module's format is highly acceptable and was able to present appropriate texts and visuals for its users.

According to Purdue Global University (2015), formatting facilitates the document's readability and comprehension for the reader. If the presentation is not clear and constant, the reader will either misunderstand the document's message or quit reading it. On the other hand, as stated by Earle (2022), people

are significantly more likely to comprehend, retain, and disseminate information when accompanied by engaging visuals. A good visual will encourage students and enhance their understanding. Furthermore, layout and design must be dynamic and precise, establishing visual points of interest that direct the reader through the information. The use of pictures and illustrations can significantly increase comprehension and retention of complex concepts (Carson, 2021).

Table 5. Level of Acceptability of the Localized Module as to Presentation and Organization

Statements	Mean	SD	Verbal Interpretation
1. Presentation is engaging, interesting, and understandable.	3.87	0.38	Highly Acceptable
2. Vocabulary level is adapted to the target reader's likely experience and level of understanding.	3.90	0.31	Highly Acceptable
3. Length of sentences is suited to the comprehension level of the target readers.	3.90	0.31	Highly Acceptable
4. Sentences and paragraph structures are varied and interesting to the target readers.	3.77	0.43	Highly Acceptable
Overall	3.85	0.25	Highly Acceptable

Legend: 3.50-4.00 (Strongly Agree / Highly Acceptable); 2.50-3.49 (Agree / Acceptable); 1.50- 2.49 (Disagree / Lowly Acceptable); 1.00-1.49 (Strongly Disagree / Not Acceptable)

Based on the composite mean of 3.85 (SD=0.25), it shows that the majority of the respondents strongly agree that the localized module's presentation and organization is engaging, interesting, and understandable, vocabulary level is adapted to the target reader's likely experience and level of understanding, length of sentences is suited to the comprehension level of the target readers, and sentences and paragraph structures are varied and interesting to the target readers. Their responses imply that the localized module's presentation and organization are highly acceptable. It presents lessons that are interesting and suitable for the target learners.

According to Burge (2019), the most important considerations while designing a module are: clarifying the module's objectives and student's expectations; ensuring that the module is aligned constructively and considering the course context.

Table 6. Level of Acceptability of the Localized Module as to Assessment Tools

Statements	Mean	SD	Verbal Interpretation
1. The localized module utilizes varied assessment tools to assess students' progress.	3.77	0.43	Highly Acceptable
2. The localized module uses HOTS (Higher Order Thinking Skills) questions to measure the mastery of the students.	3.73	0.45	Highly Acceptable
3. The localized module provides pre and post-assessments.	3.93	0.25	Highly Acceptable
4. The localized module attains objectives effectively through the assessment.	3.90	0.31	Highly Acceptable
Overall	3.83	0.26	Highly Acceptable

Legend: 3.50-4.00 (Strongly Agree / Highly Acceptable); 2.50-3.49 (Agree / Acceptable); 1.50- 2.49 (Disagree / Lowly Acceptable); 1.00-1.49 (Strongly Disagree / Not Acceptable)

Based on the composite mean of 3.83 and (SD=0.26), it shows that the majority of the respondents strongly agree that the localized module utilizes varied assessment tools to assess students' progress, uses HOTS (Higher Order Thinking Skills) questions to measure the mastery of the students, provides pre and post-assessments, and attains objectives effectively through the assessment. Their responses imply that the localized module's assessment tools are highly acceptable and were able to provide different kinds of assessments to track the students' understanding and progress.

Assessment tools play a crucial part in the learning and motivation processes. The types of assessment tasks assigned to the students dictate how they will approach the learning task and what study behaviors they will employ. According to higher education professor John Biggs (1999), "What and how students learn largely depends on how they believe they will be evaluated." Assessment tools help in the evaluation and assessment of student learning and can provide alternatives to the typical exam for assessing the students (Center for Teaching Innovation, 2022). The localized module utilized varied assessment tools which are relevant to each lesson and may help monitor the learners' progress.

Table 7. Level of Acceptability of the Localized Module as to Usability

Statements	Mean	SD	Verbal Interpretation
1. The localized module contains lessons that are relatable to the target learners' personal experiences.	3.93	0.25	Highly Acceptable
2. The localized module illustrates localized lessons.	3.90	0.31	Highly Acceptable
3. The localized module substitutes modules which may be difficult to process.	3.83	0.38	Highly Acceptable
4. The localized module provides learning tasks designed to develop the target learners' critical thinking skills.	3.83	0.38	Highly Acceptable
Overall	3.88	0.23	Highly Acceptable

Legend: 3.50-4.00 (Strongly Agree / Highly Acceptable); 2.50-3.49 (Agree / Acceptable); 1.50- 2.49 (Disagree / Lowly Acceptable); 1.00-1.49 (Strongly Disagree / Not Acceptable)

Based on the composite mean of 3.88 (SD=0.23), it shows that the majority of the respondents strongly agree that the localized module contains lessons that are relatable to the target learners' personal experiences, illustrates localized lessons, substitutes modules that may be difficult to process, and provides learning tasks designed to develop the target learners' critical thinking skills. Their responses imply that the localized module is highly acceptable in terms of usability and was able to present lessons based on the students' local setting which could help them relate to and easily understand the lessons.

According to Labindao (2022), a more effective approach is to use a real-life scenario that has been contextualized for the learner to use as a resource. The learning module's adaptation or localization might aid students in overcoming learning difficulties. Utilizing localized relevant content can help learners have a thorough knowledge of that content and foster effective skill transfer. Thus, the localization of resources may present a chance for producing authentic learning that may lead to improved critical thinking skills. The localized module related the content to the local context and incorporated the commonly used medicinal plants in Nagcarlan Laguna, which could pique the learners' interest and improve retention.

Table 8. Level of Acceptability of the Localized Module as to Adaptability

Statements	Mean	SD	Verbal Interpretation
1. The localized module serves as a tool that can be used across the curriculum.	3.87	0.35	Highly Acceptable
2. The localized module provides activities that are aligned with the various learning styles of the students.	3.70	0.47	Highly Acceptable
3. The localized module is designed to enhance the skills using various cultural and native awareness.	3.80	0.41	Highly Acceptable
4. The localized module contains varied challenging tasks that can be done by target learners.	3.80	0.41	Highly Acceptable
Overall	3.79	0.25	Highly Acceptable

Legend: 3.50-4.00 (Strongly Agree / Highly Acceptable); 2.50-3.49 (Agree / Acceptable); 1.50- 2.49 (Disagree / Lowly Acceptable); 1.00-1.49 (Strongly Disagree / Not Acceptable)

Based on the composite mean of 3.79 (SD=0.25), it shows that the majority of the respondents strongly agree that the localized module may serve as a tool that can be used across the curriculum, provides activities that are aligned with the various learning styles of the students, is designed to enhance the skills using various cultural and native awareness and contains varied challenging tasks that can be done by target learners. Their responses imply that the localized module is highly acceptable in terms of adaptability and was able to present lessons that promote cultural awareness while providing suitable tasks for the learners and attaining the objectives of each lesson.

Adapting instruction is the process of modifying instruction so that all students have equal access to the curriculum and have the opportunity to comprehend and demonstrate what they have learned. The adaptability of instructional materials allows learning in accordance with the student's specific learning style which may help them retain more information and gain a larger grasp of knowledge (Ability Path, 2020). If the content does not make sense or is not relevant enough, it will be more difficult for students to learn (Srinivas, 2017). Therefore, it is essential that the course content is related to the learners' experience and their local setting.

Table 9. Level of Acceptability of the Localized Module as to Consistency

Statements	Mean	SD	Verbal Interpretation
1. The localized module contains topics that are logically related to each other.	3.97	0.18	Highly Acceptable
2. The localized module gives a range of ideas and activities aligned with the curriculum.	3.83	0.38	Highly Acceptable
3. The localized module provides learning tasks which are congruent to the objectives of the lessons.	3.93	0.25	Highly Acceptable
4. The localized module focuses on the main goal which is the improvement of learners' critical thinking skills.	3.80	0.41	Highly Acceptable
Overall	3.88	0.23	Highly Acceptable

Legend: 3.50-4.00 (Strongly Agree / Highly Acceptable); 2.50-3.49 (Agree / Acceptable); 1.50- 2.49 (Disagree / Lowly Acceptable); 1.00-1.49 (Strongly Disagree / Not Acceptable)

Based on the composite mean of 3.88 (SD=0.23), it shows that the majority of the respondents strongly agree that the localized module contains topics that are logically related to each other, gives a range of ideas and activities aligned with the curriculum, provides learning tasks which are congruent to the objectives of the lessons and focuses on the main goal which is the improvement of learners' critical thinking skills. Their responses imply that the localized module is highly acceptable in terms of consistency and was able to provide lessons, activities and assessments aligned with the curriculum and the objectives stated.

Aligning the lessons is essential since it gives a method to determine what is significant and relevant in the lesson and ensures that everything that students complete is related to the curriculum. Moreover, research conducted by Tindowen, et al. (2017) suggested that using locally relevant instructional materials to meet the localized context of their students may improve the student's critical thinking skills which is one of the primary goals of ALS' science learning strand.

3.3 Junior High School ALS Learners' Perceived Acceptability of the Localized Module's Format

Table 10. Junior High School ALS Learners' Perceived Acceptability of the Localized Module's Format

Level of Acceptability of the Localized Module	Mean	SD	Verbal Interpretation
1. Text	3.94	0.03	Highly Acceptable
2. Illustrations	3.94	0.03	Highly Acceptable
3. Design and Layout	3.96	0.02	Highly Acceptable
Total	3.95	0.03	Highly Acceptable

Legend: 3.50-4.00 (Strongly Agree / Highly Acceptable); 2.50-3.49 (Agree / Acceptable); 1.50- 2.49 (Disagree / Lowly Acceptable); 1.00-1.49 (Strongly Disagree / Not Acceptable)

Based on the composite mean of 3.95 (SD= 0.03), it shows that the majority of the student-respondents strongly agree that the localized module's text is appropriate to them; illustrations are simple and easily recognizable; and the design and layout are attractive and pleasing to look at, have adequate illustration concerning the text, and have harmonious blending of elements. Their responses imply that the localized module's text is highly acceptable and was able to present appropriate texts and visuals for its users.

According to Adler & Ljungdahl (2018), the fonts and text spacing used in educational materials have an impact on how well students understand the material. Modifying the font type of a text can and almost certainly will influence reading comprehension, reading speed, and text perception.

On the other hand, the illustrations in learning materials make lessons interesting, make learning easy and enable teachers to express concepts clearly. The use of proper illustrations can significantly increase learners' understanding of the material (The Open University, 2020).

Moreover, according to Saunders (2020), written and visual instructional resources are essential components of education and, when used properly, may engage students and deepen learning. Reducing cognitive load and improving learning can be accomplished by integrating visual elements so that they complement rather than duplicate the lectures. The ideal learning materials are typically designed to be simple, neat, and easy to understand.

3.4 Test of Difference in the Student-Respondents' Perceived Level of Acceptability of the Localized Module

Table 11. Test of Difference in the Student-Respondents' Perceived Level of Acceptability of the Localized Module as to Sex

Null Hypothesis	Test	Sig.	Decision
1. The distribution of Text is the same across categories of sex.	Independent-Samples Mann-Whitney U Test	.384 ¹	Retain the null hypothesis
2. The distribution of Illustration is the same across categories of sex.	Independent-Samples Mann-Whitney U Test	.181 ¹	Retain the null hypothesis
3. The distribution of Design and Layout is the same across categories of sex.	Independent-Samples Mann-Whitney U Test	.384 ¹	Retain the null hypothesis

Asymptotic significances are displayed. The significance level is .05.

Table 11 shows the test of difference in the student-respondents' perceived level of acceptability of the localized module as to sex. It reveals that the distribution of text, illustration and design and layout are the same across categories of sex. Therefore, the null hypothesis "there is no significant difference in the student-respondents' perceived level of acceptability of the localized module when grouped according to sex" was retained.

It indicates that regardless of sex, the localized module was highly acceptable as perceived by the junior high school ALS learners. Making lessons engaging, facilitating learning, and enabling teachers to clearly communicate concepts are the goals of teaching and learning materials. By promoting learning, instructional materials can greatly raise students' achievement. In order to promote an equal learning environment in the classroom, gender-sensitive resources must be used (VOA Learning English, 2017).

Table 12. Test of Difference in the Student-Respondents' Perceived Level of Acceptability of the Localized Module as to Age

Null Hypothesis	Test	Sig.	Decision
1. The distribution of Text is the same across categories of age.	Independent-Samples Kruskal-Wallis Test	.117	Retain the null hypothesis
2. The distribution of Illustration is the same across categories of age.	Independent-Samples Kruskal-Wallis Test	.658	Retain the null hypothesis
3. The distribution of Design and Layout is the same across categories of age.	Independent-Samples Kruskal-Wallis Test	.148	Retain the null hypothesis

Asymptotic significances are displayed. The significance level is .05.

Table 12 shows the test of difference in the student-respondents' perceived level of acceptability of the localized module as to age. It reveals that the distribution of text, illustration and design and layout are the same across categories of age. Therefore, the null hypothesis "there is no significant difference in the student-respondents' perceived level of acceptability of the localized module when grouped according to age" was retained.

It indicates that regardless of age, the localized module was highly acceptable as perceived by the junior high school ALS learners. According to Gosalia (2018), age needs to be considered in choosing educational materials for it to be most effective. Age-appropriate activities and materials are those that encourage social, cognitive, communicative, and emotional growth and push the user to apply their skills in these areas while taking into account the individual's developmental stage and physical capabilities.

4. Author's Artwork

This research was anchored on several theories and frameworks which entails: Theory of Cognitive Development, Creger and Murray's Theory on Localization, Constructivist Theory, The Australian Council for Educational Research (ACER)'s Framework for Developing Critical Thinking Skills, Learning Resources Management and Development System (LRMDS) and Elements of a Learning Module.

The theory of Cognitive Development (Bruner, 1960, as cited in Zhou, 2020) states that learning is more effective when the student is introduced to new learning materials. This calls for well-organized courses and resources, and it's crucial to our grasp of how students learn. This also posited that students learn concepts with the right instructional support.

According to Creger and Murray's (2012) theory, localization is the option for schools or local authorities to adjust the curriculum to local conditions and relate the context of the curriculum and the teaching and learning process to the local environment. Jean Piaget's Constructivist Theory, also stated that localization improves authentic learning wherein learners may organize and integrate newly acquired knowledge with their existing information in a way that makes sense to them.

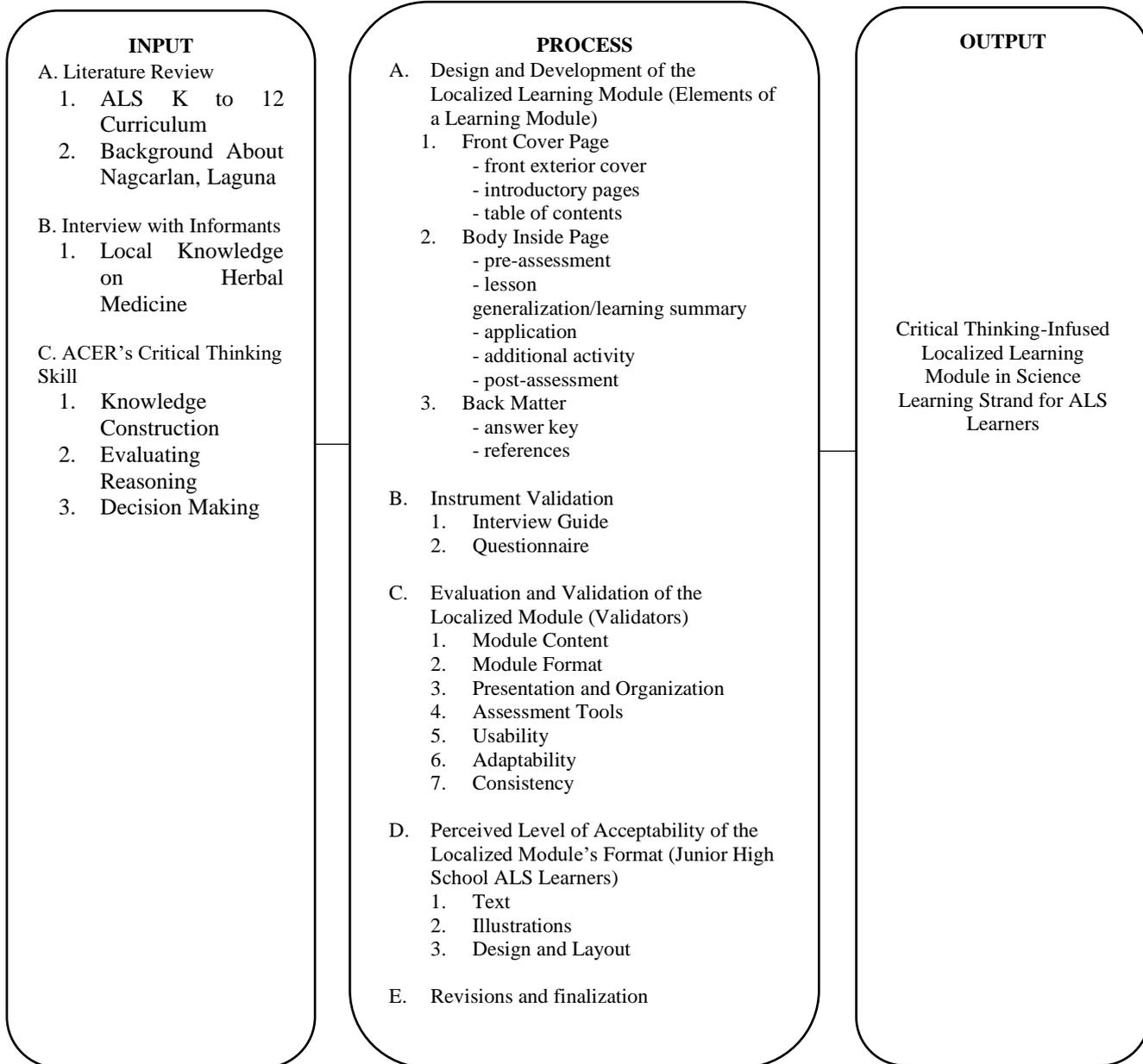
On the other hand, the ACER's framework for developing critical thinking skills categorizes critical thinking into three strands: knowledge construction, evaluating reasoning and decision-making. The set of information, abilities, and comprehension that are shared by the various definitions of critical thinking are included in the said strands (Heard, et al., 2020).

Further, the Elements of a Learning Module is based on the Elements and Technical Specifications of Learning Resource Module from Regional Memo No. 91 S. 2020 of the Department of Education which embodies: front outside cover page, body inside page and back matter. The front outside cover page contains the front exterior cover page, introductory pages, acknowledgments, and a table of contents. The body inside page includes a pre-assessment, the lesson itself, a generalization/learning summary, an application, a post-assessment, and an additional activity. The back matter consists of the answer key, a list of references, and the backside cover.

This study made use of the theories and frameworks outlined above in developing and validating a localized learning module for ALS junior high school learners.

4.1 Research Paradigm

Figure 1 shows the input-process-output model which served as the conceptual guide in developing the critical thinking-infused localized learning module in science learning strand for ALS Learners.



5. Conclusions and Recommendation

Since the developed localized learning module was found to be highly acceptable, the following recommendations are suggested: ALS learners may use the localized learning module as supplementary learning material; ALS science teachers may also develop learning modules with localized content; future researchers may utilize the localized learning module in subsequent studies related to this topic.

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