



## Life skills-based modules for Grade 6 Science

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### Abstract

*This research focused on the developing life skills-based modules in Grade 6 Science using the Research and Development approach with three stages: planning, developing, and validating. The Needs Assessment Survey was conducted to understand better the 4As - agtagibalay (doing household chores), agtaraken (raising animals), agmula (planting), and agliwliwa (quality time to relax and unwind), which can be integrated into Grade 6 Science topics from third and fourth quarters. Elementary science teachers were chosen as respondents. The instrument used in determining the validity of the developed life skills-based module consists of three aspects: content validity, design validity, and level of acceptability. Frequency and percentages were used to determine the topics that were integrated into 4As. Furthermore, the study reveals that all the developed life skills-based modules are Very Highly Valid in content, design, and level of acceptability. However, it is recommended that further research be undertaken on the reliability of the modules and other variables influencing the development of life skills-based modules in elementary science.*

### Keywords:

Four pillars of learning, life skills-based, social learning theory, 4A's

### Article History

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### Introduction

Education is central in the development of people who are productive members of the society. The K to 12 Basic Education Program in the Philippines seeks to produce scientifically wise persons that are able to make independent decisions when it comes to scientific issues as well as use scientific knowledge in the appropriate manner (DepEd Order No. 021, 2019; Tan, 2019). Nevertheless, the pandemic, especially COVID-19, has greatly impacted traditional instructional delivery system and forced students and teachers to embrace online learning across the globe (Alaklabi et al., 2021). In response, many educational institutions including those in the Philippines have developed self-learning modules based on the most essential learning competencies which include the knowledge competencies.

Nevertheless, changes described above has been made, there are still concerns and complaints from learners and parents regarding the discussion and practical activities which they prefer modules rather than activity sheets because the explanation and number of activities are complete and diverse (Bagoood, 2020). For instance, the implementation of 4As Program, which includes agtagibalay (doing household chores), agtaraken (raising of animals), agmula (planting), and agliwiwa (quality time to relax), was said to be missing in the subsequent modules, therefore, a better integration of the program is recommended. In order to provide solutions to the challenges experienced around the globe the division started the 4A's program as a way of life and as part of the divisions Basic Education Learning Continuity Plan. To be specific, Agtagibalay stresses on the notion of finishing all the chores that are expected of the family members in order to assist the family. With Agmula, specific emphasis is placed on planting with consideration of food and nutrition security as well as environmental conservation. Agtaraken provides a considerable significance to rearing of animals for purpose of consumption or business. Finally, agliwiwa provided the possibility to spend quality nonworking time to rest and to enhance the psychological and spiritual status of the respondents. The ordinance is presently pending at its third and last reading with the Draft Ordinance No. SSP 2021-5.

In line with this, the study focuses on developing life skills-based modules for Grade 6 Science, incorporating the 4As Program, validated through content, design validity, and level of acceptability by Science Teachers in Batac City. This approach aims to enhance learning effectiveness and align with the division's Basic Education Learning Continuity Plan.

### Framework of the Study

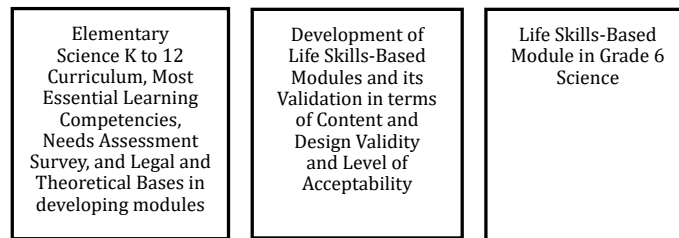
In this case, this study will utilise both Bandura's Social Learning Theory and UNESCO's Four Pillars of Learning. Bandura's theory focuses at the outside and inside reinforcements as important resources in learning process where observational learning and behavior alteration takes root (Bandura, 1997). Also, UNESCO's approach of learning embraces academics, skills, personal growth and social competencies.

Moral and social skills education prepares the individuals for assuming their roles in society and enable them cope with real life situations. The study employs the Input-Process-Output (IPO) Model to depict educational inputs (K to 12 Science Curriculum, MELCs, legal bases), the processing activities (the development of modules anchored on the Social Learning Theory, 4A's) and the expected outcomes or outputs (validated modules that incorporate life skills for Grade 6 Science).

Through the establishment of such frameworks, this research seeks to publish scientifically correct and instructionally appropriate learning resources that promote the acquisition of life skills in order to realize relevant and effective educative achievements in the face of dynamic international and national environments.

**Figure 1**

*The Research Paradigm.*



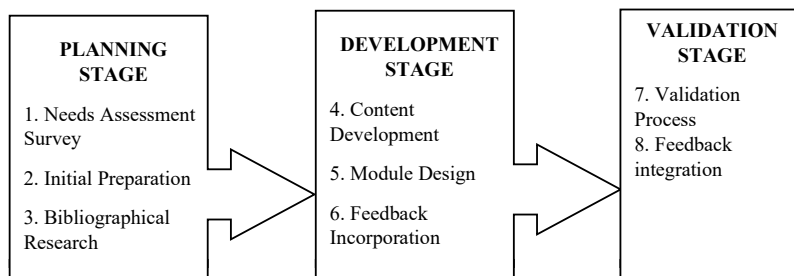
**Methodology**

**Research Design**

Type 2 Design and Development Research forms the basis of this study and this is a type of research that combines descriptive quantitative research elements with the aim of developing life skills-based modules for Grade 6 Science. This approach encompasses three main stages namely Planning, Development, and Validation as shown in the figure 2 below.

**Figure 2**

*Steps in the Development of Life Skills-Based Module*



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For the planning stage, the researcher conducted a needs assessment survey to identify relevant life skills (4As: *agtagibalay, agtaraken, agmula, agliwliwa*) applicable to Grade 6 Science topics for the third and fourth quarters. This was followed by initial preparation outlining the module's general design, analyzing Most Essential Learning Competencies (MELCs), and aligning activities with identified life skills. Further, they conducted a comprehensive review of other literature on life skills-based education and relevant learning theories that support their application in the teaching-learning process.

In the development stage, content development refers to the process of creating the content of each module in line with MELCs and guarantee the coverage from scientific concepts and integration of the identified life skills. Also in relation to module, aspects such as designing the cover master page, choosing illustrations to be included in the material according to the topics and themes to be taught, and using insights from the needs assessment survey to inform activities to be undertaken. Subsequently, collaboration was provided to the members of the advisory committee for input and modifications, to make them in line with the educational objectives and sound teaching and learning practices were provided.

Lastly, for the validation, the research engaged 76 teachers in science to validate the content validity, design validity and acceptability level of the life skills-based module. In addition, the researchers integrated the feedback and suggestions from the validators in the last version of the modules in compliance with a set of educational principles in order to facilitate constructive learning experiences.

Through the use of the Type 2 Design and Development Research approach, this study taps into an efficient approach of developing as well as piloting education materials that complement life skills with what has been set as the Grade 6 Science curriculum goals and aims. This approach not only benefits with augmentation of the modules' relevancy and utility, but also provides even a better match to the present-day educational needs and models.

#### ***Locale of the Study***

This study was conducted within the Schools Division of the City of Batac and focused on the public elementary schools only. The division comprises four zones for the Elementary Level, each with a varying number of schools: It is worthy to note that Zone I consist of five schools, and Zone IV also consists of five schools, whereas Zone II consist of four schools and Zone III consists of four schools only. While undertaking the data collection, it was observed that these schools mainly adopted Modular Distance Learning as the main means of teaching delivery due to the current pandemic.

In the middle of these education difficulties, schools in the division also provided *Online-Kamustahan* sessions. These sessions served dual purposes: to inform the learners on other supplementary lessons that they may have missed and to help the teachers to understand how students are dealing with or struggling with in the era of pandemic online learning interruptions.

Secondly, the division focused on providing the most important webinars and workshops to enhance the skills and knowledge of the teachers and meet current needs of educational progress.

The above contextual background therefore provides a background to the ever-changing education environment in which the study on the development of life skills-based modules for teaching and learning of Science at Grade 6 was conducted. It focuses on the measures undertaken by the schools in Batac City in order to deliver education in a continuous manner and also, assist both students and teachers in a manner to overcome the challenges posed by the pandemic.

### ***Research Instruments***

In this study, four instruments were utilized to collect the data: 1) the Needs Assessment Survey Questionnaire, 2) the Content Validity Rating Tool, 3) the Design Validity Rating Tool, and 4) the Level of Acceptability Rating Tool.

The Needs Assessment Survey Questionnaire was structured to gather essential information regarding the integration of 4As (*agtagibalay, agtaraken, agmula, agliwliwa*) into Grade 6 Science modules for the third and fourth quarters. It includes sections on teacher profiles, a list of topics per quarter, and specific items related to each of the 4As. The questionnaire's content validity was ensured by adapting it from Calzada (2018), aligning questions with educational objectives, and ensuring clarity and relevance. This adaptation process involved expert review and pilot testing to refine the questionnaire. Reliability in this context refers to the consistency of responses over time and across different samples. The questionnaire's reliability could be enhanced by conducting test-retest reliability analysis, assessing how consistent responses are when the same group of teachers completes the survey at different times.

The content validity rating tool, on the other hand, aims to determine the content validity of the Grade 6 Science life skills-based modules. This validates the modules in terms of the subcategories, which are the content objectives, activity relevance, instructional quality, and assessment appropriateness. This was an adaptation from Tan-Espinar and Ballado 2017. The tool was revised to tailor the specific needs to rate life skills-based modules. Experts' feedback validated the ability of the tool to determine how closely the modules align with the educational goal and objective. Furthermore, the reliability of the Content Validity Rating Tool can be done through inter-rater reliability. When multiple raters are used, a measure is provided to determine whether the ratings of each instrument align with each other. This inter-rater agreement between the various instruments determines the rating's reliability and helps identify how consistent these raters were in their rating.

Furthermore, the design validity ratio tool measures the design validity of the life skills-based modules including illustration quality, layout and organization, and overall presentation. The tool was adopted from Ramos et al., 2021 in which the tool was modified to accommodate the specific parameters and criteria that were used to evaluate the design of each module. The

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reliability of the tools was determined using expert review to determine the measure design variables. This means that like the Content Validity Rating Tool, the Design Validity Rating Tool can also be subjected to inter-rater reliability testing to define the measure design variables. This tool also is used to assess the module in terms of presentation and organization of the whole content.

Finally, the acceptability rating tool gauges the level of acceptability of the life skills-based modules among teachers. It includes sub-categories such as clarity, usefulness, adequacy, and style/format. This was adapted from Tan-Espinar and Ballado (2017) and was adjusted to reflect specific criteria for evaluating educational materials' acceptability. Expert input and pilot testing ensured the tool effectively measures teacher perceptions. To establish reliability, internal consistency measures such as Cronbach's alpha can be employed, assessing how well items within each sub-category correlate with one another. Higher alpha values indicate greater reliability in measuring acceptability dimensions.

In addition, each instrument utilized a Likert-type scale ranging from 1 to 5 for assessing validity and acceptability, where higher scores indicate stronger alignment with criteria and greater acceptability among teachers. By detailing each instrument's structure, content validity considerations, and potential reliability indices, the study ensures robust data collection and evaluation of the developed life skills-based modules in Grade 6 Science.

### ***Data Gathering Procedure***

#### *Phase 1: Needs Analysis*

In this study, the researcher provided the advisory committee's approval before administering the Needs Assessment Survey. After that, the study was reviewed and approved by the University Research Ethics Review Board (UERB) in order to maintain the participants' safety as well as maintain the ethical standards. The researcher secured written letters of endorsement from the adviser and sent them to the Schools Division of the City of Batac for permit to conduct the study. On approval, the researcher created a Google Form link and disseminated it through the assistance of school principals, for data collection. The researcher then briefed the participants on the general information about the research study involving the terms and conditions of the study. This orientation reduced participant role ambiguity and boosted the participants' involvement in the study during June. Participation did not pose much risk because the participants responded to the sets of exercises through Google Forms at their leisure, in school or at home.

#### *Phase 2: Design and Development*

Data gathered from the Needs Assessment Survey informed the development of life skills-based modules for Grade 6 Science. The survey focused on identifying 4As (*agtagibalay, agtaraken, agmula, agliwliwa*) suitable for integration into the curriculum's third and fourth quarters.

*Phase 3: Validation*

After development, the researcher shared the developed modules through a secured Google Drive link to the validators which includes 76 Science teachers. This step also helped to strengthen the validation process of the modules, where the content, design and acceptability was subject to input from a wide range of stakeholders. Google Forms were used to complete the assessment by the validators on the content validity, design efficiency and acceptability of the modules. All the data collected was properly sorted, analyzed and interpreted by using the right statistical tools to assess the effectiveness of the modules put forward and correlation with the educational objectives. Last of all, informed consent forms/ questionnaires were kept secure over our study period. Subsequently, these documents were either shredded or deleted, thus preserving the identity of the participants and meeting the principles of ethical research.

*Data Analysis*

Frequency, percentage, and mean were the statistical tools used in analyzing the gathered data.

In the Needs Assessment Survey, to pass each indicator (*agtagibalay, agtaraken, agmula and agliwliwa*), it must obtain a percentage of at least 75% for it to be integrated into the third and fourth quarters of the developed life skills-based modules in Science. Furthermore, the validity of the modules was described using composite mean and overall mean along the following indicators: content validity, design validity, and level of acceptability.

**Results and Discussion***Needs Analysis***Table 1***Frequency Distribution of Life Skills Integrated in the Modules*

*Table 1 presents the frequency distribution of 4As integrated into Grade 6 Science modules for Quarters 3 and 4.*

<b>Topics</b>	<b>Agtagibalay</b>	<b>Agtaraken</b>	<b>Agmula</b>	<b>Agliwliwa</b>
Friction and Gravity	91%	53%	68%	86%
Energy Transformation	88%	86%	92%	97%
Characteristics and Uses of Simple Machines	93%	57%	69%	67%
Effects of Earthquakes and Volcanic Eruptions	68%	59%	73%	89%
Weather Patterns and Seasons in the Philippines	61%	69%	91%	97%
Earth's Rotation and Revolution	88%	94%	93%	94%
Characteristics of Planets in the Solar System	92%	61%	68%	73%

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This section presents the results and discusses the needs analysis conducted to identify the integration of the 4As (*agtagibalay*, *starken*, *ligula*, and *agliwliwa*) in Grade 6 Science modules.

The data in Table 1 illustrates the varying degrees of integration of 4As across different Science topics. For instance, topics like “Energy Transformation” and “Earth’s Rotation and Revolution” demonstrate high percentages across all 4As, indicating comprehensive integration. In contrast, topics such as “Characteristics and Uses of Simple Machines” and “Effects of Earthquakes and Volcanic Eruptions” show varying degrees of integration, particularly strong in *agtagibalay* and *agliwliwa*.

Further, the high percentages in *agtagibalay* and *agliwliwa* suggest these life skills are well-suited for integration into the Science curriculum, aligning with learner-centered and inquiry-based approaches (Mangali, 2019). This underscores the curriculum’s adaptability to fostering life skills among Grade 6 students.

In the context of the study, the findings stress the possibilities and the need to implement life skills within particular Science subjects and stress the importance of not only imparting the students with the theoretical knowledge but also with practical ways of applying it. Therefore, integration of 4A’s complements current theories on education reforms of learning by inquiry and learning with application (Mangali, 2019; Sridevi, 2020). Furthermore, the study implications suggest that moulding the regular Science education with life skills may foster the students’ involvement and use of scientific knowledge to affect the curriculum and the policies in the education sector (Branch & Kopcha, 2019; Conde, 2021).

### ***Product Design***

The Life Skills-Based Modules for the Science curriculum in Grade 6 is a set of teaching aids that are designed to integrate practical life skills into the content of the science syllabi with the intention of enriching the standard knowledge about science that students receive together with the beneficial life styles lessons to be acquired. These modules include the 4As framework: *agtagibalay* (household chores), *agtaraken* (raising animals), *agmula* (planting), and *agliwliwa* (quality time). The scientific knowledge is incorporated in the everyday tasks, where in cleaning, a chemical reaction identification is made, in taking care of the animals, a biological aspect is observed, in planting, an aspect of botany is studied and in stress management techniques.

The modules were evaluated for validity using three criteria: content validity, which ensured compliance with the Grade 6 scientific curriculum; design validity, which emphasized engaging and interactive components; and acceptability, which was confirmed by favorable comments from elementary science teachers. Hands-on activities, collaborative projects, and reflective practices are among the instructional tactics used, all of which are consistent with accepted educational theories.



There are theoretical foundations related to the modules such as Bandura’s Social Learning Theory that center on learning that occurs via observation and imitation, Piaget’s Constructivist Theory that supports learning which occurs within an experience, Kolb’s Experiential Learning Theory that focuses on the learning gained from experience and UNESCO’s Four Pillars of Learning that include Knowledge acquisition, Skill development, Emotional, and Social development, and Personal development.

Future study recommendations include reliability testing in a variety of educational settings, impact assessment on long-term academic and life skills development, and adaptation for multiple educational contexts to ensure ongoing efficacy and relevance. Overall, these modules offer a strong approach to combining scientific learning with practical life skills, backed up by rigorous assessment and theoretical foundation (Bandura, 1977; Piaget, 1973; Kolb, 1984; UNESCO, 1996).

**Validation and Evaluation**

This section integrates the validation and evaluation of the developed life skills-based modules for Grade 6 Science, focusing on content validity and design validity.

*Content Validity*

*The validators’ evaluation on content validity of the developed life skills-based modules in Science.*

<b>Indicators</b>	<b>Mean</b>	<b>Descriptive Interpretation</b>
Content Objectives	4.59	Very Highly Valid
Activity	4.60	Very Highly Valid
Instructional Quality	4.60	Very Highly Valid
Assessment Characteristics	4.62	Very Highly Valid
<b>Composite Mean</b>	4.60	<b>Very Highly Valid</b>

The high composite mean suggests that the modules exhibit strong content validity, effectively meeting educational objectives through well-defined, measurable, and relevant learning outcomes. Assessment characteristics received the highest mean score, highlighting the alignment with learners’ comprehension levels and the promotion of higher-order thinking skills. Validators’ perceptions underscore that the modules align well with educational goals, providing clear objectives and activities tailored to learners’ needs (Yazon, 2018; Conde, 2021). This validation supports the modules’ efficacy in enhancing instructional clarity and guiding effective assessment strategies, thereby improving curriculum alignment and educational quality assurance (Branch & Kopcha, 2019; Conde, 2021).

*Design Validity*

*The validators' evaluation on the validity and acceptability of the developed life skills-based modules in Grade 6 Science.*

Indicators	Mean	Descriptive Interpretation
Illustration	4.55	Very Highly Valid
Paper Design and Layout	4.60	Very Highly Valid
Presentation and Organization	4.58	Very Highly Valid
<b>Overall Mean</b>	4.58	<b>Very Highly Valid</b>

The high design validity scores show the modules' visual attractiveness and effective organization. Paper Design & Layout obtained a good mean score, indicating that the modules are visually appealing and well-structured. Validators' positive feedback emphasizes the significance of these design aspects in improving student engagement and learning experiences (Branch & Kopcha, 2019; Conde, 2021). Effective design not only promotes instructional clarity but also engages students with its visually appealing and functional layout, emphasizing the importance of ongoing investment in instructional material enhancement (Branch & Kopcha, 2019; Conde, 2021).

Overall, the validation and evaluation results show that the life skills-based modules for Grade 6 Science are both content- and design-valid, indicating that they are effective in fulfilling educational goals and engaging students.

**Conclusion and Recommendation**

The primary objective of this study was to develop and validate life skills-based modules in Grade 6 Science, integrating the 4As (*agmula, agtaraken, agtagibalay, and agliwliwa*), and to evaluate their content validity, design validity, and level of acceptability. This study fills significant gaps in the literature by demonstrating the effectiveness of integrating life skills into Science education to enhance students' practical application of knowledge and skills.

The results show that amongst all the selected aspects of the Grade 6 Science curriculum only "Energy Transformation" and "Earth's Rotation and Revolution" incorporate all the 4As aspects to a greater extent. Also there is a friction element called "Friction and Gravity" which can be integrated with *agtagibalay* and *agliwliwa* and "Weather Patterns and Seasons in the Philippines" with *agmula* and *agliwliwa*. These studies indicate that it is possible for enriched educational experiences to occur as a result of integration of targeted life skills where theoretical knowledge is converted into practical use or application (Sridevi, 2020).

The study conducted among the Schools Division of the City of Batac showed Very Highly Valid in assessing content validity, design validity and acceptability of the life skills-based science modules developed. This emphasises the continuity of the modules with instruction and learning objectives together with pertinent educational standards and best practices in Science Education (Yazon, 2018; Conde, 2021).

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All in all, it has been observed that the developed life skills-based modules for Grade 6 Science consists of a very coherent framework which shares general scientific concepts along with life skills through the understanding of 4As perspective. By incorporating activities related to *agtagibalay* (household chores), *agtaraken* (raising animals), *agmula* (planting), and *agliwliwa* (quality time), the modules provide a comprehensive learning experience that connects theoretical knowledge with real-world applications. Data on the validity and acceptability of the modules' content and design have been obtained and are satisfactory. These attributes bear a promise to a number of important implications to teaching practices as they represent a meaningful engagement of learners with real life contexts integrated with formal schooling content. With regard to policy, the common implementation of life skills into the curriculum square measures within the programme's broader vision to produce informed, wholesome, realistic, and quality learners. Conceptually, the modules are developed in accordance to modern approaches to education such as learner-centered and discovery learning to stress on learning by doing and knowledge application outside the classroom. This integration does not only enrich the teaching/ learning practices /policies but also fosters education policies with the purpose of producing efficient and versatile learners who can perform tasks under different circumstances.

This study has some limitations which include; the study was conducted in one educational setting and few topics within Grade 6 Science Only. To generalize the results, future research should extend the study to other education settings and to other academic disciplines. Additionally, exploring the reliability of the modules and investigating other variables influencing the development and implementation of life skills-based modules would provide a more comprehensive understanding of their impact on educational outcomes.

More research should, therefore, be directed to tracking the impacts of teaching integrated life skills within subject-matter, at different class levels in the future. Further research concerning the potentiality of scale-up and embedding 4As in distinct educational settings would be significant for enhancing curriculum development and educational practice. Moreover, longitudinal designs could look at the applicability of the learned life skills on the

student's academic and socio emotional outcomes eventually serving to inform policies and practices in education.



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