Design and Validation of a Contextualized Developmental Reading Module for Industrial Technology Students

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DOI: https://doi.org/10.47772/IJRISS.2026.100600575

Received: 05 June 2026; Accepted: 10 June 2026; Published: 30 June 2026

ABSTRACT

This study focused on the development and validation of a contextualized Developmental Reading module for first-year Industrial Technology students at North Eastern Mindanao State University (NEMSU) Cantilan Campus. It aimed to design instructional material that addressed least-learned competencies in Developmental Reading while aligning with the academic and vocational context of Industrial Technology students. The study was anchored on the ADDIE Model, Gagné's Conditions of Learning Theory, Schema Theory, and Literacy for Specific Purposes, which guided the systematic design, development, validation, and refinement of the module. A quantitative developmental research design was employed, supported by curriculum analysis, teacher consultation, expert validation, teacher evaluation, student evaluation, limited field tryout, assessment of students' learning performance, and survey-based assessment of perceived learning outcomes.

The respondents included five expert validators, five Developmental Reading teachers, and fifty-eight first-year Industrial Technology students. Findings revealed that the module was generally rated acceptable in terms of content relevance, format and design, presentation and organization, and accuracy and up-to-datedness of information. Expert validators and teachers provided higher ratings in selected areas, while students gave comparatively lower ratings in some indicators, particularly in terms of content relevance and engagement. The perceived learning outcomes showed that students generally viewed the module as supportive of knowledge acquisition, competence development, self-efficacy, clarity and relevance, and integration and synthesis.

The learning performance results described the students' level of performance after exposure to the selected lesson of the module. However, these results were not interpreted as evidence of improvement because the study did not include a pretest. The correlation analysis revealed no significant relationship between students' learning performance and perceived learning outcomes. Meanwhile, the analysis of variance revealed significant differences in selected validation areas, but no significant difference in accuracy and up-to-datedness of information. The study concluded that the contextualized Developmental Reading module was a valid and relevant supplementary instructional material for Industrial Technology students, with recommended refinements to further support learner engagement, application, and higher-order reading tasks.

Keywords: Contextualized Module, Developmental Reading, Industrial Technology, Learning Performance, Module Validation, Perceived Learning Outcomes

INTRODUCTION

Reading comprehension is an important academic and workplace competence for Industrial Technology students. They are expected to interpret manuals, safety instructions, diagrams, procedures, technical terms, and workplace-related materials. Since students from Automotive, Computer, Culinary, Drafting, Electrical, Electronics, Fashion, and Mechanical Technology encounter different field-based texts, reading materials should be contextualized according to their academic training, technical skills, and future workplace roles. Thus, this

study focused on the development and validation of a contextualized Developmental Reading module for first-year Industrial Technology students at North Eastern Mindanao State University (NEMSU) Cantilan Campus.

Recent studies support the use of skill-based, reader-centered, and contextualized reading materials. For reading skill development, Duc and Lan (2023) noted that instructional materials designed around specific skills can support students' engagement in comprehension and vocabulary tasks. For alignment with target readers, Abiog (2022) emphasized that readable and appropriate materials are important because students may struggle when texts do not match their reading level and academic needs. For contextualization, Torrefranca (2021), Idulog et al. (2023), and Villanueva (2022) highlighted that localized and context-based materials help learners connect new information with prior knowledge and real-life situations. These studies suggest that Developmental Reading materials for Industrial Technology students should be readable, skills-oriented, discipline-related, and aligned with school and workplace texts.

Despite these studies, limited attention has been given to Developmental Reading materials designed for Industrial Technology students. Existing materials often focus on general reading instruction and may not fully address students' need to interpret technical vocabulary, procedures, safety instructions, diagrams, manuals, and workplace-related texts (Torrefranca, 2021; Idulog et al., 2023; Villanueva, 2022). In the local setting, teacher consultations and student feedback revealed that first-year Industrial Technology students at NEMSU Cantilan Campus still experience difficulty in understanding technical and discipline-specific texts. This shows the need for a contextualized module aligned with their academic and vocational experiences.

This study is significant because it developed and validated a contextualized Developmental Reading module for first-year Industrial Technology students. Guided by the ADDIE framework, Gagné's Conditions of Learning, and Schema Theory, the module was designed based on identified competencies, expert validation, teacher assessment, and student feedback. The module provides localized and discipline-specific texts and activities that may support students' comprehension, vocabulary development, engagement, and interpretation of technical and workplace-oriented materials.

Research Questions

The study aims to develop and validate a contextualized developmental reading module for Industrial Technology students in North Eastern Mindanao State University (NEMSU) Cantilan Campus.

Specifically, the study answers the following:

1. What specifications and design considerations are required to produce a contextualized developmental reading module in Industrial Technology?

1.1. Identification of least learned competencies;

1.2. Target learning outcomes;

1.3. Lesson structure and architecture and

1.4. Assessment framework or blueprint

2. What are the results of the content validation as evaluated by the three groups of respondents in terms of:

2.1. Content relevance and adequacy;

2.2. Format and design;

2.3. Presentation and organization;

2.4. Accuracy and up-to-datedness of information

3. What is the extent of the perceived learning outcomes after utilizing the module in terms of:

3.1. Knowledge acquisition;

3.2. Competence development;

3.3. Self-efficacy;

3.4. Clarity and relevance;

3.5 Integration and synthesis

4. Is there a significant relationship between learning performance and perceived learning outcomes after utilizing the module?

5. Is there a significant difference of the validation rating as perceived by the three groups of respondents?

6. What enhancements or improvements to the module can be recommended based on the findings of the study?

METHODOLOGY

The study employed a quantitative research approach grounded in Developmental Research, as described by Mariappan et al. (2022), which focuses on the systematic design, development, validation, and refinement of instructional materials. This design was appropriate because the study aimed to develop and validate a contextualized Developmental Reading module for Industrial Technology students. As a developmental study, it emphasized the process of identifying instructional needs, designing appropriate learning materials, validating the module, and gathering evidence on its acceptability and usefulness within the intended learning context.

The study adopted a learning performance test as part of its quantitative approach. This design was suitable because the study did not intend to measure improvement or learning gains over time, since no pretest was administered before the exposure to the module. Instead, the posttest served as a basis for describing students' reading-related performance after their exposure to selected lessons from the contextualized Developmental Reading module. This approach aligned with the purpose of the study, which was to determine how students performed after using the developed module rather than to compare their performance before and after the intervention.

In the development phase, the researcher identified the least-learned competencies based on curriculum standards, particularly the course outcomes and learning competencies outlined in the Developmental Reading syllabus, as well as through consultation with teachers. These competencies guided the selection of learning outcomes, lesson content, reading texts, and activities included in the module. The module was then subjected to validation by different groups of evaluators to determine its quality in terms of content, format, presentation, organization, accuracy, and contextual relevance.

Since the study was conducted through a limited field tryout of selected lessons due to time and curricular constraints, the findings were limited to the students' performance and perceptions after exposure to the selected parts of the module, rather than the results of a full course implementation.

Scope And Limitation of the Study

This study focused on the development and validation of a contextualized Developmental Reading module for first-year Industrial Technology students at North Eastern Mindanao State University, Cantilan Campus, during the first semester of Academic Year 2025–2026. It identified least-learned competencies as the basis for designing the module and evaluated it in terms of content validity, format, presentation, organization, and accuracy through the assessments of experts, teachers, and students. Selected lessons were implemented through

a limited field tryout, and students' learning performance, as well as teachers' and students' perceptions, were gathered.

The study was limited to one campus, one group of student-users, and selected lessons due to time and curricular constraints. It did not include a pretest or measure improvement over time, as its main purpose was to develop, validate, and refine a practical and discipline-specific reading module suited to the needs of Industrial Technology students.

RESULTS

Specifications and Design Considerations of a Contextualized Developmental Reading Module

This section presents the specifications and design considerations required to produce the contextualized Developmental Reading module. The ratings were provided by the Developmental Reading teachers, who assessed the alignment of the module with the course requirements, instructional needs, and learning context of Industrial Technology students.

Table 2. Developmental Reading Teachers' Specifications and Design Considerations in crafting the Module

Indicators	Mean	Adjectival Rating
Identification of Least Learned Competencies	4.60	Strongly Agree
Target Learning Outcomes	4.56	Strongly Agree
Lesson Structure and Architecture	4.20	Strongly Agree
Assessment Framework	4.47	Strongly Agree
Over-all Mean	4.45	**Strongly Agree**

The Developmental Reading teachers gave the highest rating to the Identification of Least-Learned Competencies, indicating that they found this component highly relevant in guiding the development of the module. This suggests that the module was anchored on the actual reading-related needs of Industrial Technology students and provided a clear basis for selecting objectives, reading texts, activities, and assessments.

Meanwhile, Lesson Structure and Architecture received the lowest rating, although it was still assessed positively. This implies that while the lesson organization was acceptable, some parts may still be refined to make the sequence of activities clearer and more systematic. Strengthening the flow from simple to complex tasks may help students follow the learning process more easily and engage more confidently.

Overall, the result highlights that relevant content must be supported by a well-organized lesson structure. Recent studies emphasize that instructional materials shape instructional design by guiding how lessons, activities, and learning experiences are structured (Garay Abad & Hattie, 2025). Similarly, Huang (2025) found that clear instructional design is associated with students' motivation and engagement, especially when learning materials provide organized activities and opportunities for active participation.

Content Validation of Instructional Material for Developmental Reading

Table 3 presents the content validation results of the instructional material for Developmental Reading as evaluated by the expert validators, teachers, and students. The module was assessed in terms of content relevance, format and design, presentation and organization, and accuracy and up-to-datedness of information.

Table 3. Content Validation as evaluated by the three groups of respondents

Indicators	**Expert Validators**		**Teachers**		**Students**	
	Mean	Adjectival Rating	Mean	Adjectival Rating	Mean	Adjectival Rating
Content Relevance	4.83	Strongly Agree	4.93	Strongly Agree	4.16	Agree
Format & Design	4.84	Strongly Agree	4.76	Strongly Agree	4.27	Strongly Agree
Presentation & Organization	4.93	Strongly Agree	4.66	Strongly Agree	4.20	Strongly Agree

Accuracy & Up-to-datedness	1.10	Strongly Disagree	1.15	Strongly Disagree	1.17	Strongly Disagree
Over-all Mean	3.92	**Agree**	3.87	**Agree**	3.45	**Agree**

The expert validators gave the highest rating to Presentation and Organization, indicating that the module was clearly presented, well-arranged, and properly sequenced according to the intended flow of instruction. For the teachers, the highest rating was given to Content Relevance, suggesting that the module was aligned with the Developmental Reading course and suited to the learning needs of Industrial Technology students. Meanwhile, the students gave the highest rating to Format and Design, showing that they found the module's layout, visual presentation, and design readable, manageable, and engaging.

All three groups gave a Strongly Disagree rating to Accuracy and Up-to-datedness of Information. Since this indicator focused on the presence of errors, the rating means that the respondents strongly disagreed that the module contained inaccurate, outdated, or erroneous information. Thus, the module was generally viewed as accurate, updated, and free from major content errors.

These results support the importance of validating instructional materials to ensure their clarity, relevance, accuracy, and appropriateness before classroom use. Suryanti et al. (2024) emphasized that module development requires careful evaluation of both content and presentation to ensure suitability for learners. Similarly, Ondrada et al. (2024) noted that the ADDIE model supports the systematic development and evaluation of instructional materials by aligning content with learners' needs and instructional objectives. Overall, the findings suggest that the Developmental Reading module was valid and acceptable for Industrial Technology students.

Perceived Learning Outcomes after Utilizing a Developed Module

This section presents the students perceived learning outcomes after their exposure to the contextualized Developmental Reading module. The goal of this part of the study was to determine how the student-respondents perceived the module in terms of knowledge acquisition, competence development, self-efficacy, clarity and relevance, and ability to integrate and synthesize. Since the students were the direct users of the module during the field tryout, their responses provided important information on how they experienced the selected lesson and its learning activities.

Table 4. Perceived learning outcomes of students after exposure to the module

Indicators	Mean	Adjectival Rating
Knowledge Acquisition	4.27	Strongly Agree
Competence Development	4.27	Strongly Agree
Self-Efficacy	4.08	Strongly Agree
Clarity and Relevance	4.27	Strongly Agree
Integration and Synthesis	4.08	Agree
Over-all Mean	4.18	**Agree**

The highest ratings were given to Knowledge Acquisition, Competence Development, and Clarity and Relevance. These results indicate that the students perceived the module as helpful in supporting their understanding of the lesson content, development of related competencies, and recognition of the relevance of the activities to their academic context. The high rating for clarity and relevance suggests that the module presented the lesson in a way that was understandable and connected to the students' field of study.

Meanwhile, the lowest ratings were given to Self-Efficacy and Integration and Synthesis. Although these areas were still part of the students perceived learning outcomes, the results suggest that students may need more support in building confidence and applying ideas across tasks. The lower rating for ability to integrate and synthesize also indicates the need to provide more activities that require students to organize information, connect ideas, draw conclusions, and apply learning to practical or field-related situations.

This result supports the view that contextualized instructional materials can help learners engage with content that is more meaningful, understandable, and connected to their academic field. Suryanti et al. (2024) emphasized that developed modules should provide organized and relevant learning experiences that respond to

learners' needs. Similarly, Nguyen (2024) noted that learning becomes more meaningful when new information is connected to students' prior knowledge and learning context. Therefore, the students perceived learning outcomes suggest that the contextualized Developmental Reading module was useful in supporting their learning experience after exposure to the selected lesson.

Significant relationship between Learning Performance and the Perceived Learning Outcomes after Utilizing the Module

Table 5 presents the relationship between students' learning performance and their perceived learning outcomes after utilizing the contextualized Developmental Reading module. The results show that learning performance was positively related to all indicators of perceived learning outcomes, including knowledge acquisition, competence development, self-efficacy, clarity and relevance, and integration and synthesis. However, the relationships were not statistically significant.

Table 5. Relationship between learning performance and Perceived Learning Outcomes

Variables Tested		Computed r	P-value	Decision	Conclusion
Performance	Knowledge Acquisition	0.055	0.681	Failed to Reject Ho	Not Significant
	Competence Development	0.044	0.740	Failed to Reject Ho	Not Significant
	Self-Efficacy	0.052	0.700	Failed to Reject Ho	Not Significant
	Clarity and Relevance	0.047	0.728	Failed to Reject Ho	Not Significant
	Integration and Synthesis	0.052	0.700	Failed to Reject Ho	Not Significant

Among the indicators, knowledge acquisition showed the highest computed relationship with learning performance, suggesting that students perceived knowledge gained from the module had the strongest association with their actual performance. However, since the relationship was not significant, this indicates that students perceived knowledge acquisition did not necessarily correspond to their measured learning performance after using the module.

In contrast, competence development obtained the lowest computed relationship with learning performance. This suggests that students' perception of developing competencies through the module had the least association with their actual performance, meaning that the competencies they believed they developed were not directly reflected in the measured results.

Overall, the non-significant relationship implies that positive perceptions of the module did not automatically translate into higher learning performance. Students' performance may have been influenced by other factors such as prior knowledge, assessment difficulty, learning habits, and the limited duration of module exposure. Nguyen (2024) emphasized that meaningful learning depends on how learners connect new information with existing knowledge, while Suryanti et al. (2024) noted that modules should be evaluated not only through users' perceptions but also through learning outcomes. Thus, while the module was perceived positively, students perceived learning outcomes were not directly associated with their measured learning performance after utilization.

Significant Differences in Validation Ratings Among the Three Groups of Respondents

This part of the study examined whether the validation ratings of the contextualized Developmental Reading module significantly differed among the expert validators, Developmental Reading teachers, and student-users. Testing the difference was necessary because the three groups evaluated the module from different perspectives. The expert validators assessed the module based on technical quality and content standards, the teachers evaluated it based on instructional usefulness and classroom applicability, while the students rated it based on their experience as the intended users of the material. Comparing their ratings helped determine whether the module was viewed consistently across groups or whether certain aspects required further refinement based on the needs of a specific group.

Table 6. Perceptions of Expert Evaluators, Developmental Reading Teachers and Students in the Contextualized Module

Sources of Variation	Computed F	P-value	Decision	Conclusion
Content Relevance	29.070	0.000	Reject Ho	Highly Significant
Format & Design	10.350	0.000	Reject Ho	Highly Significant
Presentation & Organization	19.610	0.000	Reject Ho	Highly Significant
Accuracy & Up-to-datedness	0.080	0.927	Failed to reject Ho	Not Significant

The ANOVA results showed significant differences in the ratings for Content Relevance, Format and Design, and Presentation and Organization. This indicates that the expert validators, teachers, and students evaluated these areas differently based on their roles and experiences with the module. Experts and teachers may have focused more on curriculum alignment, instructional design, and technical quality, while students may have considered readability, ease of use, and connection to their learning experiences.

For Content Relevance, the significant difference suggests varied perceptions of how well the module matched the needs of Industrial Technology students. For Format and Design, the difference indicates that the groups viewed the module's layout, readability, and user-friendliness differently. For Presentation and Organization, the result suggests that the sequencing and flow of lessons may still be refined to make activities clearer, more connected, and easier for students to follow.

Meanwhile, Accuracy and Up-to-datedness of Information showed no significant difference among the three groups, $F = 0.080$, $p = 0.927$. This means that the respondents had a similar assessment of the module's correctness, currency, and absence of major errors. Since this indicator used an error-checking interpretation, the result suggests that the module was consistently viewed as generally accurate and reliable.

These results highlight the importance of considering different evaluator perspectives in module development. Suryanti et al. (2024) emphasized that module evaluation should examine both the suitability of the material for learners and the quality of its content and presentation. Similarly, Ondrada et al. (2024) explained that instructional materials developed through the ADDIE model require evaluation to ensure that they are appropriate, organized, and aligned with instructional goals. Thus, the findings suggest that while the module was generally acceptable, some areas may still be refined to strengthen its clarity, organization, and learner usability.

CONCLUSIONS

The development of the contextualized Developmental Reading module was guided by the actual reading-related needs of first-year Industrial Technology students. Its emphasis on least-learned competencies shows that the module was not developed as a generic reading material, but as a response to specific areas where students needed support. However, the organization of lessons may still be strengthened to ensure a clearer and more systematic learning flow.

The validation results indicate that the module has the essential qualities of an acceptable supplementary instructional material. Its content, design, presentation, and accuracy make it appropriate for use in Developmental Reading. However, the variation in ratings among expert validators, teachers, and students shows that future revisions should balance technical quality, classroom usefulness, and student usability.

The students' responses suggest that the module was able to provide a clear and relevant reading experience after utilization. However, the lower areas point to the need for activities that build confidence and help students connect ideas more deeply. This means that the module may still be enhanced by adding more guided practice, reflective tasks, and activities that promote integration of concepts.

The learning performance result should be understood only as a description of students' performance after exposure to the selected lesson. Since the study used a posttest-only design, it cannot establish improvement or learning gains. Therefore, the result should be interpreted within the limits of the research design.

The absence of a significant relationship between learning performance and perceived learning outcomes shows that students' experiences with the module did not automatically translate into higher performance scores. This implies that perceived learning outcomes and test performance measure different aspects of the learning experience. Thus, both should be treated as separate but useful sources of evidence.

The differences in validation ratings suggest that the module was viewed from different evaluative lenses. Experts may focus on instructional quality, teachers on classroom applicability, and students on ease of use. Meanwhile, the consistent assessment of accuracy and up-to-datedness strengthens the reliability of the module's content.

RECOMMENDATIONS

Based on the findings of the study, it is recommended that the administration and curriculum developers of NEMSU Cantilan Campus consider integrating the contextualized Developmental Reading module as an instructional resource for Industrial Technology students. The module may be included in course syllabi, teaching plans, and reading intervention activities to support students' academic and technical reading needs.

Teachers and curriculum developers are also encouraged to enhance the module by incorporating interactive and practical learning activities such as group discussions, real-life application tasks, and hands-on reading exercises. These activities may help students apply reading strategies such as scanning, skimming, and SQ4R in contexts related to their field of specialization.

It is further recommended that continuous monitoring and feedback be conducted to improve the module. Regular feedback from teachers, students, and evaluators may help identify areas for refinement in terms of content, design, presentation, and teaching strategies. Post-test assessments may also be used in future implementation to determine students' progress in reading comprehension, vocabulary development, and engagement.

Professional development activities may also be provided for Developmental Reading teachers to strengthen their skills in contextualized reading instruction and interactive teaching strategies. Through training and collaboration, teachers and curriculum developers can ensure that the module remains relevant, updated, and responsive to the needs of Industrial Technology students.

Lastly, future researchers may conduct longitudinal, experimental, or quasi-experimental studies to determine the long-term effectiveness of the module in improving students' reading performance, technical vocabulary acquisition, engagement, and critical thinking skills. Future studies may also involve larger samples and multiple campuses to strengthen the generalizability of the findings.

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