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Designing Graded Grammar Modules for Autonomous Language Learning

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***Abstract*—This research focused on creating grammar learning modules for a learning centre (LC) based on a self-directed learning (SDL) approach. The primary objective was to design learning materials following the 4-D framework: define, design, develop, and disseminate. Two groups of students participated in the study, contributing to material collection, module design, and trial sessions. Data were gathered through students' test scores from each trial session, along with their feedback on the learning experience. The findings indicated that the LC model for grammar learning using an SDL approach was effective. This conclusion was supported by two key factors: the steady improvement in students' scores across sessions and their positive engagement with the learning model.**

***Index Terms*—developing grammar graded modules, self-directed learning, project-based learning, 4-D development stages**

I. Introduction

Undeniably, English proficiency has become essential in the era of globalization. It is not only important in academic

settings but also serves as a key factor for professional success. Weak language skills contribute significantly to graduate unemployment rates (Ngadiran et al., 2021). Apart from communicative ability, grammatical competence plays a vital role in ensuring that one's English is adequate, standardized, and widely accepted. Moreover, strong grammar skills help prevent misunderstandings among listeners. Mastering grammar also boosts speakers' confidence, as it ensures their English is grammatically correct, universally understood, and free from ambiguity.

Mastering grammatical competence presents significant challenges. Grammar is the foundation of English language proficiency, influencing all key skills—speaking, listening, reading, and writing (Ahmad, 2018). However, students often struggle to grasp it effectively. Many perceive grammar instruction as particularly demanding, and learners frequently report finding grammar lessons stressful. Additionally, limited class time dedicated to grammar, insufficient learning materials, and unsuitable teaching methods further compound the issue, as these approaches often fail to align with students' actual needs.

Contemporary language pedagogy has integrated grammar instruction within communicative approaches, employing implicit teaching methodologies during verbal communication activities. Within the Communicative Language Teaching (CLT) framework, which emphasizes fluency prior to accuracy, grammatical elements have been incorporated through various instructional methods. These include task-based language teaching activities, project-based learning implementations, and problem-based learning scenarios. However, this integrated approach has demonstrated limited efficacy in adequately preparing students for standardized assessments such as the TOEIC examination. Empirical evidence from trial examinations at Politeknik Negeri Bali (PNB) reveals that student performance generally falls below the established marks. A detailed analysis of examination results indicates that grammatical competence constitutes a significant factor contributing to this suboptimal performance.

Current pedagogical challenges necessitate the implementation of exclusive grammar instruction to achieve optimal learning outcomes. This specialized instruction should be conducted during designated periods in specifically designated learning spaces, carefully selected to maximize student convenience and accessibility. The learning environment must be intentionally designed to minimize distractions and enhance concentration on grammatical acquisition. The allocated instructional time should be exclusively reserved for grammar study, ensuring learners are not encumbered by competing academic obligations. Furthermore, this initiative requires the development of purpose-designed instructional materials specifically tailored for grammatical instruction. To effectively meet these essential criteria for comprehensive grammar education, the establishment of a dedicated grammar Learning Center (LC) is proposed. This specialized facility would serve as an exclusive venue for student-centered grammatical study. The center would be equipped with appropriate furnishings and comprehensive grammar modules to facilitate effective self-directed learning opportunities.

The grammar Learning Center (LC) is specifically designed to facilitate autonomous grammar acquisition among students. This innovative learning space operates without temporal constraints, enabling learners to engage with materials at their discretion. The self-directed learning paradigm employed in the LC enhances the meaningfulness of the educational experience by allowing students to actively construct their understanding of grammatical concepts through self-regulated study. Empirical evidence from multiple research studies has established the LC as an effective framework for supporting independent learning. The center maintains an optimal learning environment through the presence of on-site tutors who fulfill several critical functions: facilitating module-based instruction, evaluating student work, and recording progress metrics on individual assessment cards. For optimal LC implementation, a systematic developmental approach is essential. A key prerequisite is the availability of carefully structured instructional materials. The grammar modules should employ a graded approach, systematically organized according to increasing complexity. This hierarchical structure promotes comprehensive and coherent understanding of grammatical systems. This study addresses two primary research questions: (1) How was the grammar modules developed? and (2) To what extent did the LC program impact student learning outcomes?

II. Related Studies

A. Some Prior Studies

Recent years have witnessed a growing body of research examining self-directed learning (SDL) methodologies. Hiemstra's (2006) investigation into internet-facilitated SDL in American communities demonstrated the efficacy of this learning approach. The findings indicated that online platforms significantly enhanced learning outcomes by providing broad information access, ultimately enabling participants to implement positive life transformations. These results align with earlier studies by Mok and Lung (2005) and Scott (2006), which established SDL's effectiveness in fostering problem-solving skills and improving academic performance. Scott's (2006) research, involving participants aged over 50, further revealed that autonomous learning approaches contributed substantially to developing learners' self-confidence. This psychological empowerment subsequently led to stronger personal commitment in actualizing their potential. Candy's (1991) theoretical framework emphasizes that SDL cultivates essential character traits through its dual focus on process and outcomes, including personal initiative, self-regulation, and the capacity for independent learning in authentic contexts. SDL model which prioritizes responsibility and self-initiative, long distance learning, personally programmed, independence and students’ critical thinking and meaning construction (Stockdale, 2003).

Research has demonstrated the effectiveness of self-regulated learning (SRL) models in Indonesian language education. Chiakrawati's (2010) development of an SRL-based Indonesian language program confirmed its pedagogical efficacy, particularly when learners possess adequate self-confidence and the ability to optimize their learning potential (Bandura, 1997; Schunk, 1996; Zimmerman, 2004). Successful implementation requires supporting factors such as learner self-efficacy and volition (Widodo, 1994). Alternative instructional approaches have been explored for teaching Indonesian to non-native speakers. Siroj (2015) implemented a tutorial model featuring individualized out-of-class sessions with tutor guidance, which proved effective through initial diagnostic assessment of learner weaknesses. Suyanto (2007) developed an ICT-integrated model incorporating multimedia listening exercises and blog-based activities, demonstrating effectiveness for technologically proficient students. In materials development, Suyatno (2007) created comprehensive modules for Indonesian language learners using Dick and Carey's (1990) instructional design model, combining dialog practice, listening comprehension, reading exercises, and grammatical analysis with immersion techniques. Similarly, Putra (2009) established a Learning Center (LC) for TOEIC grammar preparation at Bali State Polytechnic's Business Administration program, while Widanta et al. (2015) developed specialized English modules for TOEIC preparation featuring instructional content and practice tests. In line with materials development, Oranggaga (2022) identified both advantages and challenges in grammar module implementation within distance learning systems, including: learner attitude variations, reduced instructor-learner interaction, technological limitations, restricted social media access, assessment format constraints, perceptions of feedback credibility, excessive workload demands, concentration difficulties, as well as explicit instructional approaches.

Recent educational innovations have seen the development of online learning modules designed to address evolving student requirements (Ngadiran, 2021). Various digital platforms have emerged as viable foundations for creating interactive grammar modules. Joksimović (2015) demonstrated the effectiveness of Learning Management Systems (LMS) in developing module-based instructional materials, highlighting their capacity to facilitate meaningful interactions that positively influence learning outcomes. These systems enable crucial communication channels between students, instructors, and more advanced peers. LMS platforms offer significant advantages in streamlining the administration, delivery, and assessment of educational programs. Advanced systems incorporate robust data collection capabilities and support mobile learning (m-Learning) environments that foster active student engagement (Emelyanova & Voronina, 2014). Beyond serving as knowledge acquisition tools, these platforms create accessible and flexible learning ecosystems (Yuan et al., 2013). They further enhance educational experiences by facilitating knowledge sharing and community development, thereby promoting critical thinking and higher-order cognitive skills through collaborative discourse-essential competencies in contemporary education (Zanjani et al., 2016). Ngadiran's (2021) research findings corroborate these advantages, particularly noting students' strong preference for smartphone accessibility when engaging with TutorMe platforms. This preference reflects the growing importance of mobile-compatible learning solutions in modern education.

Sarrab et al. (2014) conducted research demonstrating how mobile learning (mLearning) enables ESL learners to study diverse language components according to their interests and needs, unrestricted by temporal or spatial limitations. This technological advancement has significantly impacted educational paradigms, catalyzing the evolution of mobile education and electronic learning (eLearning) platforms. The study revealed a distinct preference among university students for mobile devices over personal computers for learning purposes, suggesting their readiness to adopt mobile-based learning solutions. Particularly during independent study sessions, learners showed greater inclination toward utilizing mobile-accessible learning modules.

Complementing these findings, Ngadiran et al. (2021) emphasized that self-directed learning approaches through mobile platforms offer dual benefits: they allow learners to progress at their individualized pace while simultaneously creating personalized learning environments. This research underscores the pedagogical value of mobile technologies in facilitating autonomous language acquisition.

B. Needs Analysis

Needs Analysis (NA) constitutes an essential component in the development of new learning materials, serving as a systematic methodology to identify discrepancies between existing conditions and desired educational outcomes. This process enables organizations and individuals to precisely determine the requirements for achieving their objectives. Widanta (2023) conducted comprehensive NA through both direct and indirect approaches when developing a Nursing English Competency Test. The study employed a benchmarking process involving multiple stakeholders: primary users (the English Competency Test Foundation administering the examination) and secondary users (including nursing academy lecturers, the Indonesian National Nurse Board, and vocational nursing school instructors). These stakeholders provided crucial input regarding competency standards, curriculum development, scoring rubrics, and test design. Complementing direct stakeholder engagement, the research team implemented indirect NA by analyzing relevant documents, including syllabi, lesson plans, and instructional materials from various nursing programs across higher education institutions and vocational schools. This comprehensive approach successfully established standardized content for nursing competencies, assessment criteria, curricular frameworks, and examination components. Recognizing limitations in previous NA methodologies, the current study adopts the CIPP evaluation model (Stufflebeam & Zhang, 2017; Gupta, 2014), which systematically examines: Context evaluation by identifying gaps between current and desired conditions; Input evaluation by determining optimal procedural designs and instructional

strategies; Process evaluation by monitoring implementation fidelity through continuous feedback; and Product evaluation by assessing both intended and unintended outcomes. The CIPP framework addresses critical questions at each stage. Process evaluation examines implementation quality ("Is it being executed properly?"). Product evaluation measures overall effectiveness ("Did the intervention succeed?"). This comprehensive approach enables thorough assessment of both short-term and long-term outcomes, including cost-benefit analyses and identification of positive/negative consequences.

C. Module

Module is a specially designed book that enables students to learn on their own, either with or without a teacher's assistance (Prawoto, 2012). It is structured systematically to support students in reaching their learning objectives and includes various theoretical components such as definitions, concepts, exercises, assignments, and assessments—complete with answer keys. These elements make modules more comprehensive than standard textbooks. Well-designed learning modules can enhance student engagement by presenting fresh instructional content (Lubis et al., 2015). A module should typically consist of: an overview (subject description, objectives, structure, and study guide), an introduction (learning outcomes, scope, benefits, instructional sequence, and specific instructions), Learning materials (topic explanations, subtopics, and sample tasks), Exercises or assignments (targeted tasks, problem-solving activities, and performance-based assessments), a summary**,** and a formative test. additionally, tasks should incorporate activities that develop cognitive, affective, and psychomotor skills to ensure holistic learning.

D. Development

This study utilized the developmental framework proposed by Thiagarajan et al. (1974), known as the 4D model, which consists of four stages: Define, Design, Develop, and Disseminate. Several factors contributed to the selection of this model, including its structured and systematic approach (Bano, 2018; Arywiantari et al., 2015). Additionally, this model has been widely applied in various educational material developments, such as in mathematics (Nurmanita et al., 2019), chemistry (Andromeda et al., 2018; Sakdimah & Dewata, 2018), and 21st-century learning (Djamahar et al., 2018). The 4D model has gained popularity among educational researchers. For example, Nurmanita et al. (2019) successfully developed project-based mathematics learning materials, demonstrating the model's adaptability despite differences between mathematical and language learning (which involves productive and receptive skills). Similarly, Sakdimah and Dewata (2018) created an effective chemistry module using the 4D approach, while Andromeda et al. (2018) integrated it with a guided inquiry model, yielding supportive learning materials. These studies provide valuable insights and serve as a foundation for developing grammar learning materials. Therefore, this research adopts the 4D development model as outlined by Thiagarajan et al. (1974), supported by the works of Bano (2018) and Arywiantari et al. (2015).

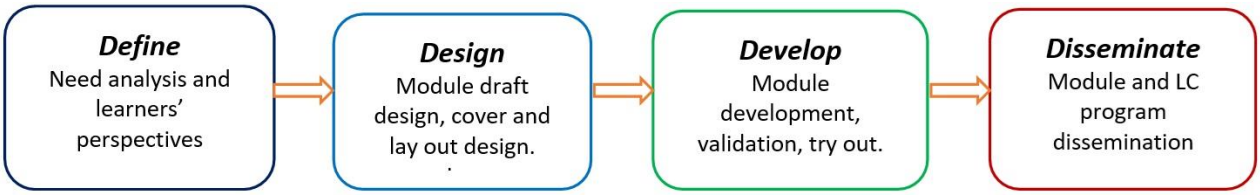

Figure 1. Development Stages

Similarly, Widanta et al. (2023) had implemented this framework on developing English for Nurses competence test. The entire activities respectively included needs and students' perspective analysis, module draft and lay out design, module development, validation and try out, as well as module and LC program dissemination.

E. Project-Based Learning

Project-Based Learning (PjBL) is an innovative instructional approach that emphasizes collaboration and student-centered learning. In this model, students engage in solving real-world problems through project work, solution design, and presentation of results (Thomas & Mergendoller, 2000; Larmer et al., 2003; Bell, 2010). PjBL focuses on activating students' prior knowledge, enabling them to independently explore and construct new concepts (Weegar & Pacis, 2012). Additionally, it encourages hands-on learning (Kriwas, 2007), incorporates authentic, real-world materials (Ndon, 2011), and emphasizes meaningful learning experiences (Kotti, 2008). According to Gu Ven (2014), PjBL activities—such as exploration, group discussions, report writing, and presentations—help students enhance their communication skills (Harun, 2006) and develop self-directed learning abilities (Imtiaz & Asif, 2012).

Over the past twenty to thirty years, research by Imtiaz and Asif (2012) and Rochmahwati (2016) has demonstrated that Project-Based Learning (PjBL) effectively enhances students' English proficiency. Beyond developing cognitive abilities, PjBL has also proven successful in fostering essential soft skills, including motivation, self-assurance, creativity, teamwork (Astawa et al., 2017), emotional intelligence, learning capacity, and engagement in the learning process (Fragoulis, 2009). Additionally, it promotes autonomous learning and integrated curriculum development (McCarthy, 2010; Lam, 2011), critical thinking (Allan & Stoller, 2005), and vocabulary acquisition (Shafaei & Rahim,

2015). These findings suggest that PjBL empowers students to leverage prior knowledge and enhance language skills through collaborative activities such as group discussions and presentations. By actively engaging with their existing schemata, learners construct new knowledge, concepts, and propositions, ultimately achieving pragmatic competence—the ability to use language appropriately and effectively (Widanta et al., 2018). Furthermore, successful language acquisition depends significantly on the quality of teacher-provided input. For optimal learning, inputs must be clear, comprehensible, and deliberately structured through problem clarification, explicit concept formation, and learner awareness development (Widanta et al., 2020). The more intelligible the input, the more efficiently it is processed into intake, leading to improved linguistic output. In this context, teachers play a crucial role in ensuring learners consciously notice and internalize language features (Schmidt, 1990; Widanta, 2017).

III. Methodology

This study employs a mixed-methods approach, combining qualitative and quantitative analysis. The participants consisted two-semester-students specializing in English for Business Communication and Professional within the Business Administration of Business Administration Department at Politeknik Negeri Bali (PNB). The selection criteria were based on their English major status, demonstrated learning motivation, and accessibility for research coordination. The study was conducted within the Business Administration program, focusing on the English for Business Communication and Professional track. The participants were easily accessible due to the existing professional relationship between the researcher and the instructors. Research data was gathered from students' performance scores across five trial sessions. Two primary data types were collected: assessment scores from the trial sessions and students' feedback regarding the learning model. Data was acquired through standardized tests and structured questionnaires. Quantitative analysis involved aggregating student scores and calculating performance improvement percentages. Qualitative analysis focused on thematic interpretation of student perceptions about the instructional model. Findings were presented through descriptive statistics and narrative analysis.

IV. Result and Discussion

A. Grammar Modules Development

Development of grammar module for self-directed learning covered development of the modules themselves and the LC. The development relied on the stages of 4-D. The detailed activities are broken down as follows.

(a). Result of Needs Analysis

Based on the NA using CIPP model, the tendency to be discussed was The Present Tense. The present tense provides various topics and could be graded. The determination gave a conclusion that there were five main topics exposed which were sub-divided into different number of smaller topics. The sub-divisions of the present tense included: (1) Present Tense with Be – Adj (Adjective); (2) Present Tense with Be – N (Noun); (3) Present Tense with Be – Adv. (Averb); (4) Present Tense with V1 (Auxilliary DO); (5) Present Tense with V1 (s/es) (Auxilliary DOES). Each sub-division was sub-divided into different number of modules as detailed in the tables beneath.

TABLE 1
NUMBER OF MODULE DEVELOPED

SUB-TOPIC	MODULE
1. Simple Present Tense with Adj.	1. S – BE – Pure Adjectives 2. S – BE – Derivational Adj. 3. S – BE NOT Pure Adjectives 4. S – BE NOT– Derivational Adj 5. BE - S - Pure Adjectives 6. BE – S – Derivational Adj. 7. Negative Interrogative Structure 8. Tag Questions Structure
2. Simple Present Tense with Adv.	1. S _BE – Adverb. 2. S – BE NOT - Adverb 3. BE – S – Adverb? 4. Negative Interrogative 5. Tag-Questions
3. Simple Present Tense with N.	1. S _BE – Noun. 2. S – BE - Noun Phrase 3. S -BENOT – Noun/Noun Phrase 4. Gerund – BE – N/Noun Phrase 5. Wh-Q – BE – N/ Noun Phrase. 6. Negative Interrogative 7. Tag-Questions
4. Simple Present Tense with V1 - Complement	1. S – V1 – Comp. 2. S – Do NOT – V1 – Comp. 3. Do – S – V1 – Comp? 4. Wh-Q- Do – S – V1 – Comp.? 5. Negative Interrogative 6. Tag Questions
5. Simple Present Tense with V1 (s/es)- Complement	1. S – V1 (s/es) – Comp. 2. S – Does NOT – V1 – Comp. 3. Does – S – V1 – Comp? 4. Wh-Q- Does – S – V1 – Comp.? 5. Negative Interrogative 6. Tag-Questions.

(b). Designing Format and Cover

Module format and cover were designed upon need analysis. As the format will provide guidance based on which the module is developed, format was designed adequately. The format included some aspects such as content of the module, number of topics, number of modules in accordance with the topics, titles of each module, levels or grades, and the graded title or sub-topics.

(c). Modules Development

During this stage, three key activities were carried out: module development, module validation, and module try-out. These activities were completed over a period of approximately five months. The process was driven by the time constraints of the project. The development stage began with compiling grammar materials from various sources. Several students were involved in this material-gathering process. The grammar content was sourced from grammar textbooks, English course books, online resources, English test preparation books, and other relevant materials. These materials were then organized based on their respective topics. The students assisted in collecting the initial raw materials, performing tasks such as taking notes, digitally filing the data, and copying the necessary content. Before data collection began, the students received an orientation on proper data collection methods, note-taking techniques, digital filing procedures, and the specific types of raw data required. Once collected, the materials were handed over to the researcher for further organization.

The researchers were responsible for organizing the module. The arrangement followed a pre-approved module format, progressing systematically from the first sub-division to the last. The process began by stating the title of each module, followed by defining the key variables or subject matter. Next, examples were provided, and finally, an evaluation section—comprising at least ten questions—was included. Completing all modules took several weeks.

The next phase involved validating the module, which was conducted by an expert in learning module development. Prior to validation, necessary instruments—including a module validation checklist and a validation rubric—were prepared. To ensure functionality, the rubric itself underwent validation before being applied to the module. Revisions were made to the instrument to guarantee its validity. The validation process identified areas requiring improvement, such as language use, spelling, content coherence, alignment between definitions and sample questions, and consistency between exercises, theory, and assessments. After revisions, the updated sections were resubmitted to the validator for final approval.

The final stage was the try-out, where selected validated modules were tested. Two groups of students from Politeknik Negeri Bali (PNB) participated in the 5-sessions try-out each of which was carried out for 45 minutes. This stage was initiated with a pre-test (T1) and post-test (T2) involving the entire research participants. Those tests

comprise materials derived from materials of grammar modules in the LC. Both tests were undertaken to measure students' grammar competence prior to and upon the try out. The try-out involved 50 second-semester students of Business Administration Department, PNB. The results of students' tests were compared and analyzed using descriptive statistic fostering effectiveness of the modules and LC program.

(d). Dissemination

A dissemination campaign was conducted to promote the tests and their accompanying learning tools. This initiative was carried out on a small scale, targeting students at Politeknik Negeri Bali (PNB), with the goal of raising awareness about the newly developed modules and the LC program. The LC is housed in the language laboratory, and several classes participated in the dissemination process. Assigned by the research team leader, the researchers visited selected classrooms to introduce the LC program and the self-directed grammar module. Each session lasted 30 minutes, consisting of a 20-minute presentation followed by a Q&A segment. This activity aimed to effectively inform students about the LC, encouraging them to take advantage of the opportunity for independent, intensive grammar practice in the LC facility.

B. Effectiveness of the LC Program Toward Students' Achievement

The effectiveness of the modular LC program was evaluated through a trial implementation involving a group of students. A second-semester class specializing in English for Business and Professional Communication, Business Administration Department of PNB participated in the trial, where they were invited to use the LC and freely engage with the modules. Each student completed five modules across five sessions, each of which took 45 minutes. The sessions included learning, exercises, and a final module test, after which the instructor assessed and scored their work.

An analysis of student performance revealed scores ranging from the mean of 62.56 (T1) increased to 75.68 (T2), demonstrating clear improvement over time. An increase of 13.12 points indicates a substantial improvement in the average student performance after the intervention. This serves as a primary indicator of the Learning Centre program's effectiveness.

Interviews with participants highlighted strong enthusiasm for the LC program. Students appreciated: (1) the flexibility to manage their own study schedule; (2) the ability to learn grammar at their own pace; (3) the structured module system, which provided clear learning targets and efficient time use; (4) the time-bound tasks, which encouraged punctuality and discipline; and (5) the sense of accomplishment from achieving measurable progress, making learning more meaningful. The effectiveness of LC program is also fostered through statistical analysis beneath.

TABLE 2
STATISTICAL ANALYSIS RESULT

Metric	T1 (Initial)	T3 (Final)	Change
Mean	62.56	75.68	+13.12
Median	64	76	+12
Mode	60, 65	74, 76	-
Minimum	55	70	+15
Maximum	72	84	+12
Standard Deviation	3.67	2.49	-1.18
Variance	13.47	6.20	-7.27

The average score increased by 13.12 points (from 62.56 to 75.68). The minimum score rose by 15 points (55 to 70), indicating effectiveness across all proficiency levels. The mean reflects the central tendency or the overall performance of the data set. An increase of 13.12 points indicates a substantial improvement in the average student performance after the intervention. This serves as a primary indicator of the Learning Centre program's effectiveness. An increase of 13.12 points on a 100-point scale is considerable, suggesting that the majority of students improved, not merely a small subgroup. The higher mean in T3, combined with a lower standard deviation, demonstrates an overall uplift in student performance. Referring to its consistency, standard deviation decreased from 3.67 to 2.49, showing more clustered scores post-intervention. Variance dropped by 46% (13.47 to 6.20), confirming reduced score dispersion. The decrease of 1.18 points indicates that students' scores spread evenly upon the intervention. Student scores became more homogeneous. The variation between students decreased, indicating a more consistent performance across the cohort. This statistical figure implied that the Learning Centre (LC) program not only increased the average scores but also helped narrow the performance gap among students, contributing to a more equitable learning outcome.

The score distribution constitutes that in the initial test (T1), 60% of scores were between 60–65 (modes: 60 and 65) with wide score range between 55–72. However, upon the final test (T3) 86% of scores reached ≥74 (modes: 74 and 76) with narrower range (70–84). Overall, the Learning Centre program significantly improved grammar proficiency considering that the mean score increased by 13.12 points. Scores became more consistent (lower variance). The increase in the mean score (+13.12 points) indicates the Learning Centre program's effectiveness in raising overall student performance. The decrease in standard deviation (-1.18) suggests that student scores became more consistent and equitable. The 15-point increase in minimum scores highlights the program's success in uplifting lower-performing students. The shift in mode from 60–65 to 74–76 illustrates a significant upward shift in the distribution of student scores.

C. Discussion

The primary objective was the development of English grammar modules, following the same 4-D development model (Widanta et al., 2023) used for the English for Nursing assessment tool. While both projects shared identical developmental stages, the grammar module development focused solely on core materials without supplementary components like syllabi, learning outcomes, or competency standards. The 4-D model was selected for its clear, systematic approach (Bano, 2018; Arywiantari et al., 2015), which has been successfully implemented in various disciplines including mathematics (Nurmanita et al., 2019), chemistry (Andromeda et al., 2018; Sakdimah & Dewata, 2018), and 21st-century learning frameworks (Djamahar et al., 2018).

The trial implementation demonstrated the module's and LC program's effectiveness in improving students' grammatical competence. This was evidenced by the fact that the mean score increased by 13.12 points which is implicitly fostering a consistent score improvements, it's effectiveness in raising overall student performance**.** In addition, the standard deviation rate also showed more consistent and equitable toward scored of the students, and similarly pointing a success in uplifting lower-performing students as well as an indication of a significant upward shift in the distribution of student scores. The upward trajectory clearly indicates that repeated engagement with the program led to measurable academic gains. Beyond academic achievement, the modular grammar learning approach successfully increased students' motivation. Key factors contributing to this enthusiasm included: self-directed learning management; flexible study schedules; efficient time utilization; improved time management skills; meaningful learning experiences through measurable progress.

This grammar module development represents a novel contribution to the field, as previous research has addressed different specializations: Putra et al. (2019) focused on Business Administration students Widanta et al. (2015) developed TOEIC preparation materials Fadillah et al. (2018) concentrated on drawing skills for English tests Febrijanto et al. (2017) created nursing English materials using CLT approaches.

V. Conclusion

In conclusion, the LC with modular grammar learning and self-directed learning was effective. The development of this program was based on 4D model including define, design, develop, and disseminate. The grammar learning modules designed with the concept of autonomous learning in the flatform of LC was effective to motivate students' willingness and engagement of learning grammar. Apart from this condition, students were also assisted with the SDL learning model in the LC program. It was indicated with their increased learning enthusiasm, such as students' free learning management; students' learning flexibility; students' effective learning time; students' punctuation in learning; students' meaningful learning. This model of grammar learning is considered novel as it is different from learning model and materials developed by scholars above.

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