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APPLICATION OF COGNITIVE DIAGNOSTIC ASSESSMENT TO MEASURE THE READINESS OF MATHEMATICS LEARNERS AT THE JUNIOR HIGH SCHOOL LEVEL WITH THE SMART APPS CREATOR APPLICATION

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Abstract

Background. Students' learning readiness is an important factor in supporting the success of mathematics learning at the junior high school (SMP) level. However, the implementation of cognitive diagnostic assessments in schools remains suboptimal in terms of methodology, accuracy, and sustainability.

Purpose. This study aims to apply technology-based cognitive diagnostic assessment using the Smart Apps Creator application to measure students' readiness for mathematics learning in a more systematic and integrated manner. This activity was carried out at SMP Negeri 2 Plumbon and SMP Negeri 2 Plered in Cirebon Regency, involving teachers and students as the main participants.

Method. The methods used include the observation stage, planning, data collection, product design, validation, trial, revision, and implementation. The assessments developed are integrated with Microsoft Excel to facilitate the processing and analysis of learning outcome data.

Results. The results of the activity showed that the application of cognitive diagnostic assessments based on Smart Apps Creator increased the effectiveness of measuring students' learning readiness and assisted teachers in identifying learning characteristics and needs more accurately.

Conclusion. The use of this technology also improves teachers' competence in designing and analyzing assessments in a sustainable manner.

Implementation. The application of cognitive diagnostic assessments through digital applications can be an innovative solution to support more adaptive, needs-oriented mathematics learning.

Keywords: cognitive diagnostic assessment, learning readiness, math learning, Smart Apps Creator, educational technology.



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INTRODUCTION

Observation of the school environment is an important step in understanding the conditions and problems that exist there. The purpose of this observation is to provide a deeper understanding of environmental conditions and to identify problems in the school environment. One problem often encountered is that students' readiness to learn has not been measured properly.

To overcome this problem, the application of diagnostic assessments, both cognitive and non-cognitive, is very important. Diagnostic assessments are used to measure students' readiness to learn and to determine their learning characteristics and needs, such as interests, motivation, and learning styles. However, the application of this diagnostic assessment requires teachers' readiness and competence in designing and implementing it.

In addition, sufficient time is required for the preparation, implementation, and analysis of diagnostic assessments. Therefore, diagnostic assessments must be implemented consistently and continuously to obtain accurate and useful results.

For example, at SMP Negeri 2 Plumbon and SMP Negeri 2 Plered, which stated that these schools, especially in mathematics, have implemented differentiated learning, not all aspects can be addressed in one meeting. This shows teachers' efforts to adapt learning methods to students' needs, although there are still limitations in their implementation. In addition, cognitive diagnostic assessments have been implemented at the school, but they are conducted only orally at the beginning of the new school year. This method lacks accuracy, so the assessment results tend to be generalized across the entire school year. This has the potential to provide a deep understanding of students' ability development.

On the other hand, SMP Negeri 2 Plumbon and SMP Negeri 2 Plered have utilized technology in non-cognitive diagnostic assessments. By using the Google Form application that is integrated with Ms. Excel. This integration allows teachers to collect and analyze students' noncognitive data in a more easy and structured manner.

We aim to implement integrated, sustainable cognitive diagnostic assessments using the Smart Apps Creator application. It is hoped that every teacher can more easily access and apply the assessment, making the learning process more effective in line with students' needs. We focus on developing cognitive diagnostic assessments because schools have implemented non-cognitive diagnostic assessments that are integrated with technology.

Therefore, "The Application of Cognitive Diagnostic Assessment to Measure the Readiness to Learn Mathematics of Junior High School Students with the Smart Apps Creator Application" can provide solutions to problems in learning and help teachers understand the characteristics and needs of students so that teachers are able to design learning in the classroom to be more effective.

METHODS

The objectives of community service activities include: to measure students' learning readiness, to find out the characteristics and learning needs of students, to develop teachers' competencies in designing, implementing, and analyzing diagnostic assessment results, and to use the platform *Smart Apps Creator* to make it easier for teachers to access diagnostic assessments so that they can be used in continuous learning. Expected outcomes include participants Educators who have well-measured learning readiness, teachers who can accurately identify learning characteristics and needs, teachers who have adequate

competence in designing, implementing, and analyzing diagnostic assessment results, Smart Apps Creator platform that helps make it easier for teachers to access diagnostic assessments to be used in continuous learning, so that technology can be properly integrated in the educational process.

Participants

The participants/targets of the activities for our project are SMP Negeri 2 Plumbon and SMP Negeri 2 Plered, which are schools in the Cirebon area

Implementation Time

This activity, God willing, will be carried out on:

Day/Date: in May

Venue: SMP Negeri 2 Plumbon and SMP Negeri 2 Plered

DISCUSSION

This activity was organized by the Leadership Project Team "SACDAS" (Smart App Creator for Diagnostic Assessment), students of Teacher Professional Education at the University of Muhammadiyah Cirebon.

Table 1. Leadership Project Activities

Stages	Output	Outcome	Target Time	Remarks
Observations	Students get information about problems in the environment School	Students help in designing solutions to problems in the school environment	February	Performed by all group members
Activity planning	Planning activities, arranging task divisions, and arranging Proposal	Ensure that the planned activities are effective and directed	February	Performed by all group members
Licensing	Taking care of a permit to the campus	Obtain a permit from the campus	March (1 day)	Performed by members Public Relations
Data collection and material validation	Collecting cognitive assessment questions on mathematics subjects from grades VII, VIII, and IX	Can produce an efficient, targeted, and beneficial assessment process for Evaluation and development of mathematics lessons	March – April	Performed by all group members

Product design	Create cognitive assessments that are integrated into Ms. Excel with in-app storage, Smart Apps Creator	For supporting efficiency, effectiveness, and ease in managing cognitive assessments and improving the quality of learning technology-based	April	Performed by all group members
Design validation	Validating the Mater and media development carried out by teachers, IT experts, and lecturers as a team Members	Providing quality assurance of the material and Media Development	April	Performed by all group members
Product trials	Conducting a trial by a mathematics subject teacher	Generate evaluations, identify shortcomings, and advantages. As well as specific feedback to ensure product suitability and needs Learners	May	Performed by all group members
Product revisions	Make improvements from the generated project feedback	Improvements ensure projects are better prepared for implemented	May	Performed by all members Groups
Trial use	Conducting a trial of use at school by students	Generate product evaluations, feedback, and refinements to ensure compliance with participants' needs Educate	May	Performed by all group members
Usage revision	Improving the product	Produce products that are of higher quality, as per user requirements, and ready for testing or implementation on a wider.	May	Performed by all group members
Mass Production	Doing mass production for Schools that require cognitive assessment products	Produce assessment products Cognitive by ensuring wide availability, consistent bag pans, and a positive impact on the learning process at school	May	Performed by all group members



Observations



Observations



Activity Planning



Activity Planning



Data Collection



Data Collection



Material Validation



Material Validation



Product Design



Product Design



Design Validation



Design Validation



Product Trials



Product Trials



Product Revision



Product Revision



Trial Use



Trial Use



Usage Revision

Usage Revision

Mass Production

Mass Production

CONCLUSION

The application of cognitive diagnostic assessments based on the Smart Apps Creator in mathematics learning at SMP Negeri 2 Plumbon and SMP Negeri 2 Plered has proven to be an innovative solution for measuring students' learning readiness in a more systematic, structured, and accurate manner. Prior to the implementation of the program, cognitive diagnostic assessments were conducted in a simple manner and had not been integrated with an effective data processing system, so the results were less than optimal in supporting differentiated learning. Through the stages of observation, planning, product development, validation, testing, revision, and implementation, the assessments developed assist teachers in identifying students' initial abilities, characteristics, and learning needs in greater depth. Integration with Microsoft Excel also simplifies data analysis, allowing assessment results to be used on an ongoing basis in learning planning.

In addition to increasing the effectiveness of measuring students' learning readiness, this activity also has an impact on improving teachers' competence in designing, implementing, and

evaluating technology-based assessments. Thus, the use of Smart Apps Creator not only serves as a measuring tool but also as a medium to strengthen digital transformation in mathematics learning.

Overall, the implementation of cognitive diagnostic assessments based on digital technology can support the creation of more adaptive, data-based, and student-oriented learning and has the potential to be developed and implemented more widely in various educational units.

BIBLIOGRAPHY

- Azis, S. (2025). Ai Ai as a Catalyst for Biological Literacy in the Digital Era as a Catalyst for Biological Literacy in the Digital Era. *AI and the Future of Teaching: A Multi-Disciplinary Perspective*, 42.
- Stephanie, I. (2025). *Analysis of the Implementation of Gamification-Based Learning Assessment Media at High School in Natar District* (Doctoral Dissertation, Uin Raden Intan Lampung).
- Ilah, A. (2025). *Development of Smart Apps Creator (Sac) Learning Media Based on Problem Based Learning to Improve Learning Outcomes in Social Studies* (Doctoral Dissertation, University of Lampung) subjects.
- Joko, S. (2025). *Development of Cognitive Diagnostic Assessment Instruments along with Cognitively Differentiated LKPD to Measure and Improve Scientific Literacy Skills in Phase B Scientific Lessons of the Independent Curriculum* (Doctoral Dissertation, University of Lampung).
- Maryani, T. (2023). *Analysis of Teacher Readiness in the Implementation of Smart Classroom at Sdit Ash-Shiddiqi* (Doctoral dissertation, University of Jambi).
- Putri, T. H. (2024). *Analysis of Students' Learning Needs through Diagnostic Assessment on Trigonometry Materials* (Doctoral Dissertation, Sultan Agung Islamic University Semarang).