Jurnal Pembelajaran IPA dan Aplikasinya (QUANTUM)
e-ISSN: 2798-9194
Volume 6, No. 1, Februari 2026, hal. 42-49
DOI: 10.46368/qjpia.v6i1.4973

University Student Responses to the Maluku Culture-based Ethnophysics e-Module on Measurement Material

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Received:28 Februari 2026 Revised: 4 Maret 2026 Accepted: : 10 Maret 2026

Abstract

The problem with learning today is that it is often irrelevant to students' needs and characteristics. This study aims to identify university students' responses to an ethnophysics e-module on measurement material. The researcher analyzed university students' responses before and after the introduction of the e-module. The research method used was quantitative descriptive. Data were analyzed using descriptive techniques, focusing on the categories of availability of teaching materials, student participation and understanding, integration of the ethnophysics context (Maluku region), responsiveness to student needs, material comprehensibility, and student motivation and engagement. The sample in this study consisted of 10 university students from the Physics Education study program studying measurement concepts in the Basic Physics course. The results of the study showed a positive response to the developed e-module. Students stated that the e-module was responsive to the needs, easy to understand, and encouraged motivation and engagement in learning. Several students' suggestions and opinions were used as a reference point for improving the developed module. Based on the research results, the development of teaching materials should consider the characteristics, needs, and relevance of the material to students' environment and experiences.
Keywords: e-module, ethnophysics, measurement, students' responses, teaching material

INTRODUCTION

Effective classroom student learning activities should be designed with consideration of various aspects to create a learning environment that can enhance students' understanding. The main goal of student learning is students' knowledge and skills. Students are expected to understand the material well and acquire the required knowledge and skills. The goal can be achieved if learning is well-designed, and one of the things that needs to be well-designed is teaching materials for students. However, classroom learning requires teaching materials that are relevant to the needs and learner characteristics. Teaching materials should also be contextual. Muniroh et al. (2023) stated that effective teaching materials should improve students' cognitive, affective, and psychomotor abilities. If teaching materials are monotonous and non-interactive, students will feel bored and lack motivation in learning. Additionally, many teaching materials are available in print form, which tend to have simple illustrations and contain only material exercises.

Teaching materials should consider students' needs, characteristics, and contextual factors, such as relating learned concepts to the real world or the students' surrounding environment, and be easily accessible and integrate issues related to the local wisdom or culture of the community around the students. In addition, the teaching materials need to include examples or illustrations to facilitate understanding, such as those related to their backgrounds and prior knowledge. Therefore, teaching materials can create a meaningful learning experience for students.

However, classroom instruction, specifically instruction for students in the Physics Education study program, has not fully used teaching materials that are relevant to students' needs and characteristics. The availability of teaching materials that integrate the local wisdom or ethnophysics of the community around the student's environment and that aim to

meet students' needs and characteristics, as well as contextual, remains limited. The most frequently used teaching materials by lecturers in the Physics Education Study Program are PowerPoint presentations and textbooks. Therefore, developing teaching materials is needed to facilitate a connection or relevance between the material learned and the students' environment. The availability of these teaching materials can be impactful in improving students' understanding of the material and engagement in the classroom. Consequently, this may improve the accomplishment of learning objectives in the course.

Physics Education Study Program Students in Pattimura University generally come from the Maluku region. Only a small number of students come from regions outside Maluku, such as Papua and Southeast Sulawesi. Despite this, these regions share the same characteristics as Maluku. Thus, students in these regions have similar needs and characteristics to those in the Maluku region. They live in the archipelagic region. Meanwhile, the Physics Education study program at Pattimura University has established program-specific courses, namely, marine resources and small island territories management, and archipelagic education and disaster mitigation. These courses address knowledge related to the achipelagic area and education for the achipelagic area. Integrating ethnophysics relevant to the archipelagic area across all courses would be better than integrating it only in a few. Thus, not only do the specific program courses integrate with ethnophysics, but other courses do as well. This integration can improve the course's relevance to students' environments and experiences.

One teaching material that can be developed is a module. The modules were developed in electronic form to facilitate access and were integrated with the Maluku culture. It can be more relevant to the learner's needs and characteristics. An electronic module (e-modul) is a digital teaching resource that is modified from basic materials using technology to make it more engaging. The e-module must aim to improve students' knowledge. Thus, it would be best to integrate ethnophysics in module content. The results show that ethnophysics-based learning has several advantages, such as enhancing students' positive-character (Maharani & Muhtar, 2022), reading comprehension (Fatmawaty et al., 2024), learning motivation where students learn more enthusiastically (Susanti & Nurhayati, 2025), learning outcomes (Ramdiah et al., 2020), and knowledge and social behavior (Uge et al., 2019). In line with previous studies, the e-module shows flexibility that allows students to learn independently, anywhere and anytime, overcoming the limitations of space and time in conventional instruction (Hartatiana & Wardani, 2024a).

Several research have studied students' responses towards the e-module integrated with ethnophysics. For example, the e-module contains the ethno-physics of Kalimantan (Mahesa et al., 2024) and that of Sumatra Selatan (Hartatiana & Wardani, 2024b). Widayanti et al. (2022) dan Azmi Zakiyah (2022) conducted a study focusing on students' responses toward the ethnoscience e-module on non-renewable resources and vibration, wave, and sound in traditional musical instruments. Generally, they applied a qualitative method to analyze the results. Meanwhile, several researchers conducted research to analyze science materials in the Maluku culture. The culture of Central Maluku, Timba Laor, on the topic of force and energy, the culture of North Maluku, Papeda, on chemistry concepts, and the culture of the Noaulu ethnic group have been analyzed (Limba & Jamarua, 2021; Nanuayo et al., 2023; Tohe et al., 2024). Nevertheless, these studies have not explored university students' responses to the ethnophysics e-module. Therefore, this study aims to analyze university students' responses to the Maluku culture e-module.

The ethnophysics e-module can help students better understand the course content. The responses are either positive or negative. As educators, we can use these responses to provide feedback and evaluate instruction. Hence, this research intends to analyse university students' responses toward the local wisdom e-module on measurement material.

RESEARCH METHOD

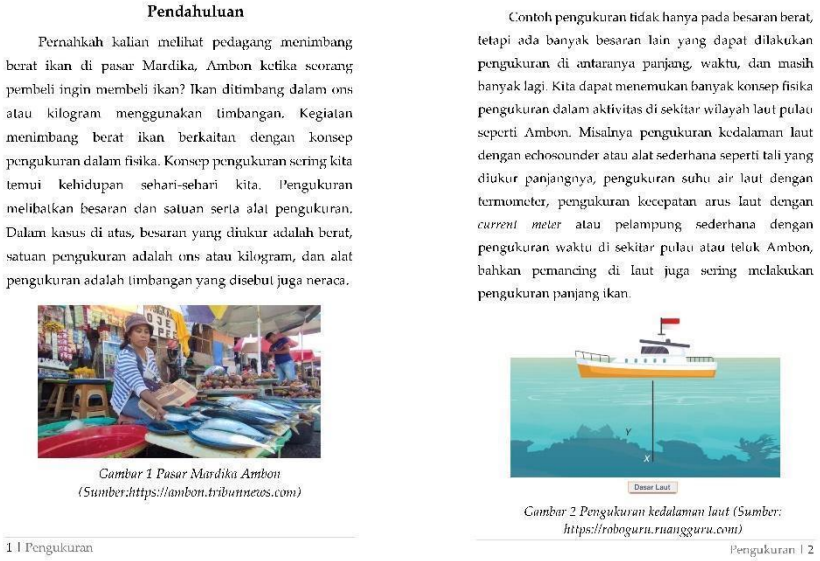
This study was qualitative and aimed to learn university students' responses to the ethnophysics e-module on measurement materials. The data collection technique was non-

test by using a questionnaire instrument. A questionnaire was administered to assess the relevance of the developed e-module to its intended purposes. The e-module was evaluated by examining the alignment of the content with physics concepts.

Before administering the questionnaire on students' opinions to the e-module, we administered another questionnaire to gather students' opinions on the ongoing courses in the physics education study program. The respondents were undergraduate students from the physics education study program who were assigned to the Basic Physics course. The total number of respondents was 10 out of 19 who responded at the end of basics physics course. The questionnaire was given to gather feedback on their opinions of the e-module on Maluku culture. Then, students' responses were categorized. The questionnaire was distributed via a Google Form and included several statements about the feasibility of the e-module. Specifically, this study explores students' responses when using the e-module. E-module content emphasizes instances of local wisdom from Maluku. In particular, the researcher was interested in students' responses to: the availability of teaching materials, student participation and understanding, the integration of the ethnophysics context (Maluku region), responsiveness to student needs, the comprehensibility of the material, and student motivation and engagement.

RESULTS AND DISCUSSION

The module was developed in electronic form and contains ethnophysics in Maluku on measurement materials, as shown in Figure 1. It included two activities, with the first on physics measurement and the second on quantities and units. Every activity has an explanation of each subtopic, a practice section, a summary, and a key answer to the practice.



Pendahuluan

Pernahkah kalian melihat pedagang menimbang berat ikan di pasar Mardika, Ambon ketika seorang pembeli ingin membeli ikan? Ikan ditimbang dalam ons atau kilogram menggunakan timbangan. Kegiatan menimbang berat ikan berkaitan dengan konsep pengukuran dalam fisika. Konsep pengukuran sering kita temui kehidupan sehari-sehari kita. Pengukuran melibatkan besaran dan satuan serta alat pengukuran. Dalam kasus di atas, besaran yang diukur adalah berat, satuan pengukuran adalah ons atau kilogram, dan alat pengukuran adalah timbangan yang disebut juga neraca.

Gambar 1 Pasar Mardika Ambon (Sumber:https://ambon.tribunnews.com)

1 | Pengukuran

Contoh pengukuran tidak hanya pada besaran berat, tetapi ada banyak besaran lain yang dapat dilakukan pengukuran di antaranya panjang, waktu, dan masih banyak lagi. Kita dapat menemukan banyak konsep fisika pengukuran dalam aktivitas di sekitar wilayah laut pulau seperti Ambon. Misalnya pengukuran kedalaman laut dengan echosounder atau alat sederhana seperti tali yang diukur panjangnya, pengukuran suhu air laut dengan termometer, pengukuran kecepatan arus laut dengan *current meter* atau pelampung sederhana dengan pengukuran waktu di sekitar pulau atau teluk Ambon, bahkan pemancing di laut juga sering melakukan pengukuran panjang ikan.

Gambar 2 Pengukuran kedalaman laut (Sumber: https://roboguru.ruangguru.com)

Pengukuran | 2

Figure 1. Ethnophysics e-Module on Measurement

Student response categories related to the availability of teaching materials, student participation and understanding, the integration of the ethnophysics context, responsiveness to student needs, the comprehensibility of the material, and student motivation and engagement. Students' responses regarding the availability of teaching materials are shown in Table 1.

Table 1. University Students' Responses Results toward the Availability of Teaching Material

No	Statements	Yes (%)	No (%)
1	The lecturer provides teaching materials	100	0
2	The lecturer provides Basic Physics course materials	100	0
3	The lecturer provides course materials that integrate the context into the local environment (island and marine region)	58,3	41,7
4	Relevant learning resources are available	58,3	41,7

The researcher aims to find out the extent to which lecturers provide teaching materials relevant to the Maluku region's context. Based on Table 1, it can be concluded that all lecturers provide the teaching materials during classroom learning. However, only half of the total respondents state that the provided teaching materials are connected to students' surrounding environment. Those statements show that the contextual teaching materials have not yet been optimized for learning. Similarly, the availability of relevant teaching materials is not yet optimal (58,3%). The remaining respondents (41,7%) stated that the teaching materials were not available. This result suggests that students still perceive that the relevance of learning sources is low. Even though the teaching materials are available, they are less contextual and relevant to the students' characteristics in the marine and island regions.

Students living in a maritime area have distinctive characteristics, such as a marine area that is more extensive than the land area. Hence, examples related to the maritime context should be integrated into learning. Contextual learning can make students participate more actively and become more motivated (Putri et al., 2025a; Widyaswarani et al., 2024), as well as enhance their conceptual understanding (Dewi & Primayana, 2019; Wahyuningtyas & Wuryadi, 2018). Moreover, contextual learning can create meaningful, adaptive, and inclusive learning. Repeated contextual learning enables learners to develop competence in relating course content to their lived experiences over time (Junarti & Rauf, 2025).

Table 2. University Students' Participation and Understanding

No	Statements	Yes (%)	No (%)
1	Students feel less active when the lectures are not engaging	75	25
2	Students find it difficult to understand the material if it is not related to their environment	75	25

Table 2 aims to demonstrate the urgency of developing an ethnophysics e-module. Based on Table 2, 75% of students felt less active when lecturers were not interesting and found it difficult to understand the material when it was not related to their environment. It means that the majority of students are influenced by the attractiveness of learning and needed contextual learning approach to comprehend the course content. Unengaging lectures negatively affect students' participation in learning. This result highlights the importance of the learning approach. The learning approach should be contextual and based on real experiences. Similar research findings indicate that contextual learning is effective because it associates learning content with real-world experience (Putri et al., 2025b)**.** Various physics concepts can be linked to the real world, among them are ocean waves, buoyant forces acting on boats, and sea breeze. Thus, it is necessary to design learning based on local problems and case studies. The findings of this study indicate that designing learning materials is important for engaging students in learning activities. Additionally, students find it difficult to grasp the material if it is not related to daily life examples. This finding aligns with the concept of contextual learning, which emphasizes the importance of linking material to real-life experiences to create meaningful learning (Solin, 2024).

Another finding of this study relates to the integration of the context of island marine areas. The results of the study showed a gap between the need for the material in learning

and its implementation. Half of the students (50%) reported that the material was connected to the island marine environment, whereas the rest (50%) reported that the material did not integrate the island marine context. It means that not all courses cover ethnophysics. The content depends on the particular lecturers or the course, and there is a gap between students' needs and implementation.

The main objective of this study was to analyze students' responses to the developed ethnophysics e-module. The two forms of student response are closed response, in which students respond to statements with provided answer choices, and open response, in which students respond freely. The statements are shown in Table 4. Results show that all students responded positively to the developed ethnophysics e-module. Students agreed that the e-module addressed their needs and was linked to real-life examples in their surrounding environment. In the development stage of teaching materials, the materials' responsiveness to students' needs is an important consideration. For example, in the ADDIE development model (Analysis, Design, Development, Implementation, and Evaluation). At the Analysis stage, developers of teaching materials need to identify students' needs and characteristics (Hidayat et al., 2021). Additionally, students argue that the material in the e-module promotes students' understanding. It shows that e-modules are not only a source of learning, but also a means of improving students' understanding. This finding is supported by Piaget's theory, which states that knowledge is constructed by individuals through active interaction with their environment. When physics concepts are linked to real situations around students, as in the developed e-module, then students' understanding processes become more optimal (Pakpahan & Saragih, 2022). Furthermore, e-modules encourage student motivation, activity, and participation. Students stated that they will be more motivated and active when learning with the e-modules. Lestari & Sumartiningsih (2025) noted that motivation is stimulated when individuals are interested in what they learn. The results of the study revealed that the developed e-module was able of drawing students' interest. Meanwhile, learning materials that align with students' experiences can encourage them to participate actively in learning activities. Thus, the developed ethnophysics e-module is feasible to use as a learning resource for physics.

Table 3. Questionnaire Items for University Students' Responses to the Ethnophysics e-Module

No	Statements
1	The e-module serves as a learning resource that addresses my needs as I live in an island-marine region
2	The e-module provides material related to the island's marine area.
3	The material in the e-module is related to a lot of examples around the environment I live in (island-marine region)
4	The physics e-module provides learning materials that are relevant/appropriate to my local environment
5	The learning material in the e-module provides local environment examples of measurement concepts
6	I will understand the material more easily when the learning material is connected to examples from my environment.
7	I will be active in lectures when the learning material is connected to examples from my environment.
8	e-modules shared/given by lecturers make me interested
9	The e-modules can help me actively participate in a basic physics course.
10	The e-modules shared by lecturers can make me motivated to learn the basic physics course

The most common teaching materials used in lectures are modules, PowerPoint presentations, and books. There is already an integration of the local context into the lecture, but it remains limited to certain courses. The integration of ethnophysics in learning needs to be enhanced. Some students' suggestions regarding e-modules: e-modules should use or add original images as illustrations to explain concepts. Students also suggested making the module look more appealing. For instance, the original measuring device is shown in the

original picture. Students' comments on the e-module were incorporated into the lecture process of the Basic Physics I course to make the lectures more relevant by including examples and cases relevant to the island marine area. Another comment was that students wish these kinds of e-modules continue to be developed.

The results of this study affirm the importance of the relevance between the taught material and examples from students' surrounding environment or experiences. With the integration of the ethnophysics context into the course material, students no longer view learning material as abstract or difficult to understand. In addition, teachers need to develop and implement ethnophysics-based teaching materials and reinforce contextual examples to ensure learning is responsive to students' needs and relevant to them. Nevertheless, this study did not use a large number of research subjects. Therefore, further research is recommended to explore opinions more deeply regarding e-modules and their influence on students, with a larger number of respondents.

CONCLUSION

Etnophysics e-modul on measurement material received a positive response from the students. Students stated that the e-module was responsive to the needs, easy to understand, and encouraged motivation and engagement in learning. This suggests that integrating the ethnophysics of island marine areas can make the material more relevant to students' experiences. The study revealed that the development of teaching materials should consider the characteristics, needs, and relevance of the material to students' environment.

REFERENCES

Azmi Zakiyah, N. (2022). Development of E-Module STEM integrated Ethnoscience to Increase 21st Century Skills. *International Journal of Active Learning*, *7*(1), 49–58.

Dewi, P. Y. A., & Primayana, K. H. (2019). Effect of Learning Module with Setting Contextual Teaching and Learning to Increase the Understanding of Concepts. *International Journal of Education and Learning*, *1*(1), 19–26. https://doi.org/10.31763/ijele.v1i1.26

Fatmawaty, R., Farih, A., & Ningsih, W. H. (2024). The Effect of Local Wisdom-based Material on Student's Reading Ability. *Jurnal Pendidikan Bahasa Inggris Undiksha*, *11*(2), 220–227. https://doi.org/10.23887/jpbi.v11i2.51103

Hartatiana, H., & Wardani, A. K. (2024a). Bagaimana Respon Siswa terhadap E-Modul Matematika dengan Konteks Budaya Sumatera Selatan? *SJME (Supremum Journal of Mathematics Education)*, *8*(1), 73–86. https://doi.org/10.35706/sjme.v8i1.10787

Hartatiana, H., & Wardani, A. K. (2024b). Bagaimana Respon Siswa terhadap E-Modul Matematika dengan Konteks Budaya Sumatera Selatan? *Supremum Journal of Mathematics Education*, *8*, 73–86. https://doi.org/10.35706/sjme.v8i1.10787

Hidayat, Fitria, & Nizar, M. (2021). Model ADDIE (Analysis, Design, Development, Implementation and Evaluation) dalam Pembelajaran Pendidikan Agama Islam. *Jurnal Inovasi Pendidikan Agama Islam*, *1*(1), 28–37. https://www.academia.edu/Download/111186059/Pdf.Pdf

Junarti, J., & Rauf, I. (2025). Contextual Teaching and Learning for Teacher Professionalism in Inclusive Early Childhood Education. *Journal of Innovation and Research in Primary Education*, *4*(4), 3671–3681. https://doi.org/10.56916/jirpe.v4i4.2476

Lestari, E., & Sumartiningsih, S. (2025). Faktor-Faktor yang Mempengaruhi Motivasi Belajar Siswa Sekolah Dasar: Sebuah Systematic Literature Review. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *10*(4).

Limba, A., & Jamarua, C. L. (2021). Perangkat Pembelajaran Usaha dan Energi Berbasis STEM Terintegrasi Kearifan Lokal Timba Laor di Desa Allang Kabupaten Maluku Tengah. *PUBLIC POLICY (Jurnal Aplikasi Kebijakan Publik & Bisnis)*, *2*(1), 75–87. https://doi.org/10.51135/publicpolicy.v2.i1.p75-87

Maharani, S. T., & Muhtar, T. (2022). Implementasi Pembelajaran Berbasis Kearifan Lokal untuk Meningkatkan Karakter Siswa. *Jurnal Basicedu*, *6*(4), 5961–5968.

https://doi.org/10.31004/basicedu.v6i4.3148

Mahesa, R. A., Silitonga, H. T., & Hidayatullah, M. S. (2024). Respon Peserta Didik terhadap Penggunaan e-Module Berbasis Kearifan Lokal pada Materi Gelombang Bunyi. *Jurnal Pendidikan Dan Pembelajaran Khatulistiwa (JPPK)*, *13*(5), 1080–1087. https://doi.org/10.26418/jppk.v13i5.79245

Muniroh, J., Pratiwi, S., Ariswan, A., Jumadi, J., & Wilujeng, I. (2023). SETS-Based Electronic Module Innovation: Analysis of Students Responses on Waves and Sound Materials. *Jurnal Penelitian Pendidikan IPA*, *9*(8), 6701–6706. https://doi.org/10.29303/jppipa.v9i8.4131

Nanuayo, S., Sahusilawane, R. M., Sinmiasa, F. J., Andrea Tamaela, K., Studi Pendidikan Biologi, P., Gotong Royong Masohi Jln Trans Seram, S., Masohi, K., Maluku Tengah-Indonesia, K., & Artikel, I. (2023). Development of Ethnobotany E-Modules Based on Local Potential of Noaulu-Maluku Tribe for Senior High School Students (Pengembangan E-Modul Etnobotani Berbasis Potensi Lokal Suku Noaulu-Maluku untuk Siswa SMA). *Biodik: Jurnal Ilmiah Pendidikan Biologi*, *4*, 24–30. https://doi.org/10.22437/biodik.v9i4.29407

Pakpahan, F. H., & Saragih, M. (2022). Theory Of Cognitive Development By Jean Piaget. *Journal of Applied Linguistics*, *2*(2), 55–60. https://doi.org/10.52622/joal.v2i2.79

Putri, M. A., Suprapto, I., & Mahendra, Y. (2025a). Implementing the Contextual Teaching and Learning (CTL) Learning Model in Indonesian Language Learning in Elementary Schools. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *9*(2), 253–262. https://doi.org/10.23887/jppp.v9i2.93665

Putri, M. A., Suprapto, I., & Mahendra, Y. (2025b). Implementing the Contextual Teaching and Learning (CTL) Learning Model in Indonesian Language Learning in Elementary Schools. *Jurnal Penelitian Dan Pengembangan Pendidikan*, *9*(2), 253–262. https://doi.org/10.23887/jppp.v9i2.93665

Ramdiah, S., Abidinsyah, A., Royani, M., Husamah, H., & Fauzi, A. (2020). South Kalimantan Local Wisdom-Based Biology Learning Model. *European Journal of Educational Research*, *volume-9-2020*(volume-9-issue-2-april-2020), 639–653. https://doi.org/10.12973/eu-jer.9.2.639

Solin, L. (2024). Penerapan Model Pembelajaran Kontekstual dalam Menanamkan Sikap Hormat kepada Orang Tua di SDN 004 Teluk Nilap. *EduSpirit: Jurnal Pendidikan Kolaboratif*, *1*(2), 531–536. https://doi.org/10.57255/eduspirit.v1i1.17

Susanti, D., & Nurhayati, R. (2025). The Influence of Local Wisdom-Based Learning on Students' Learning Motivation. *Proceeding International Conference on Religion, Science, and Education*, *4*, 355–361.

Tohe, H. A., Sriyati, S., Liliawati, W., & Tohe, A. (2024). Ethnoscience Studies in Traditional Food of North Maluku "Papeda" and Its Implementation of Chemical Concepts in Science Learning. *Journal of Tropical Chemistry Research and Education*, *6*(2), 85–94. https://doi.org/10.14421/jtcre.2024.62-02

Uge, S., Neolaka, A., & Yasin, M. (2019). Development of Social Studies Learning Model Based on Local Wisdom in Improving Students' Knowledge and Social Attitude. *International Journal of Instruction*, *12*(3), 375–388. https://doi.org/10.29333/iji.2019.12323a

Wahyuningtyas, R. S., & Wuryadi, W. (2018). The Influence of Contextual Teaching and Learning (CTL) on Critical Thinking Ability and Conceptual Understanding of Skeletal System Materials. *AIP Conference Proceedings*, *2021*(1). https://doi.org/10.1063/1.5062828

Widayanti, W., Amaliah, K., Sholikhah, A. U., & Kurniawan, A. (2022). Ethnoscience-Based Interactive E-Module: E-Module Development on Nonrenewable Resources Topic. *Indonesian Journal of Science and Mathematics Education*, *5*(3), 261–270. https://doi.org/10.24042/ijsme.v5i3.13806

Widyaswarani, E., Saputra, F. A., Nurcholis, R. A., & Lutfiana, A. F. (2024). Implementasi Contextual Teaching Learning dalam Pembelajaran untuk Meningkatkan Keaktifan Siswa. *Paradigma: Jurnal Filsafat, Sains, Teknologi, Dan Sosial Budaya*, *30*(5), 58–65.

http://ejurnal.uibu.ac.id/index.php/paradigma/article/view/855