

SYSTEMATIC LITERATURE REVIEW: STUDENTS' CONCEPT UNDERSTANDING ABILITY IN SOLVING ETHNOMATHEMATICS-BASED PROBLEMS

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ABSTRACT

Ethnomathematics is a concept that contains the value of mathematics in culture. A mathematician from Brazil named D'Ambrosio first introduced ethnomathematics. According to D'Ambrosio, generally, ethnomathematics is mathematics in identifiable cultural groups, such as tribes within the national scope, community groups from workers to professional classes, and children of a certain age. The existence of mathematics in culture will make the objectives of learning mathematics practically. So learning mathematics is not only limited to theory but spreads to mathematical concepts. Therefore, the purpose of this study was to conduct a literature review regarding students' conceptual understanding abilities in solving ethnomathematics-based questions. The research method used is SLR (Systematic Literature Review), which is carried out by identifying, reviewing, evaluating, and interpreting the various available studies. The data obtained from summarizing, reviewing, and analyzing ethnomathematics articles with Q2 and Sinta reputations were obtained from Google Scholar, Research Gate, SINTA, and Scopus. Based on this research, it is proven that ethnomathematics can help students understand concepts in learning mathematics.

Keywords: ethnomathematics, the ability to understand mathematical concepts, solve problems

INTRODUCTION

Mathematics is an important subject because it is learned from the elementary school level up to university (Amir MZ, 2013; Anderha & Maskar, 2021; Mulyati & Evendi, 2020). Therefore, students are expected to be able to use mathematical concepts and thought processes in everyday life (Amir MZ, 2013; Arifah & Saefudin, 2017; Prabawati et al., 2019). However, most people think that mathematical concepts have a different meaning from reality (Nuryadi et al., 2021). This is because mathematics has abstract properties (Priatna & Yuliardi, 2018). As well as learning mathematics that has been carried out so far has only been limited to memorizing concepts and working on existing problems without knowing the purpose of mathematics in everyday life (Novitasari, 2016; Nurapriani et al., 2020; Rismawati & Hutagaol, 2018; Rismayanti & Pujiastuti, 2020; Sari & Yuniati, 2018). This resulted in students only copying the answers when working on the questions and not doing the analysis first (Rismayanti & Pujiastuti, 2020), which impacts students' ability to understand low concepts (Rismayanti & Pujiastuti, 2020).

Therefore, there is a need for mathematics learning related to the real life it encounters (Zulkarnain & Sari, 2014). Because as expressed by Bishop that mathematics is a form of culture (Bishop, 1994). Because in a culture, you can find mathematical concepts, there is a link between mathematics and culture which can be used as learning resources (Setiana et al., 2021). By using culture in learning mathematics, mathematics education is enriched; this culture in

mathematics or ethnomathematics is widely known and studied in formal educational institutions (Sopamena et al., 2018).

Ethnomathematics was first introduced by a mathematician from Brazil named D'Ambrosio (Risdiyanti & Prahmana, 2020). D'Ambrosio revealed that ethnomathematics could be interpreted as mathematics by a cultural group whose existence can be identified (D'Ambrosio, 1985). Ethnomathematics covers various fields such as architecture, ornaments, sewing, weaving, agriculture, interactions with nature, and religious activities (D'Ambrosio, 1985). So, ethnomathematics is the formation of mathematical thinking in a multicultural society in culture (Sopamena et al., 2018). Ethnomathematics aims to prove that there are different ways in the mathematical process, namely by considering the diversity of mathematics that develops in society, for example, traditional games, measuring, designing buildings, classifying, counting methods, and others (D'Ambrosio, 1985).

METHOD

The method used in writing this scientific article is the Systematic Literature Review (SLR) method. A systematic literature review in Indonesia is a method that identifies, reviews, evaluates, and interprets all existing research (Nuryadi et al., 2021). Using the SLR method, review activities and identification of articles can be carried out systematically with steps according to provisions (Triandini et al., 2019). Based on the steps above, the researcher searched for journal articles that matched the keywords, namely ethnomathematics in traditional snacks in the Special Region of Yogyakarta. The journal articles used to complete this research were obtained by researchers from Google Scholar, SINTA, Research Gate, DOAJ, and Scopus. The articles used are articles published in the period from 2018 to 2022. In this study, there were 14 accredited articles used. The selection of articles used is based on similar research then the articles are analyzed and summarized. The results of the research conducted are then made into a complete discussion.

RESULTS AND DISCUSSION

The results of this study are in the form of an analysis and summary of the findings obtained from various databases such as Google Scholar, SINTA, Research Gate, DOAJ, and Scopus, which have been documented as related to the ability to understand mathematical and ethnomathematics concepts. Based on the searches that have been carried out, fourteen (14) related articles were obtained, which can be seen in Table 1. Table 1 contains the influence of ethnomathematics on the ability to understand mathematical concepts consisting of 6 quantitative research, three qualitative research, and five development research.

Table 1. Ethnomathematics on Ability to Understand Mathematical Concepts

Author/s	Journal/Proceeding	Title	Conclusion
(Ma'Rifah et al., 2019)	Journal of Physics: Conference	The students' mathematics understanding through ethnomathematics based on Kejei	Based on the research results from ethnomathematics-based mathematics learning based on the Kejei dance, it is found that students can understand mathematics by re-applying knowledge in the form of

		dance	mathematical concepts and formulas using their own language in solving problems. The mathematical concept contained in the Kejei dance is in the form of geometry.
(Suherman et al., 2021)	Journal of Physics: Conference	SQ3R method assisted by ethnomathematics-oriented student worksheet: The impact of mathematical understanding	The application of the SQ3R method assisted by ethnomathematics-based worksheets has a better impact on students' conceptual comprehension skills than the SQ3R method without the assistance of ethnomathematics-based worksheets.
(Widada et al., 2019)	Journal of Physics: Conference	The ability to understand the concept of derivative functions for inter-level students during ethnomathematics learning.	Students can apply the properties of derivatives during ethnomathematics learning on students' abilities between levels in the form.
(Widada, Herawaty, Beka, et al., 2020)	Journal of Physics: Conference	The mathematization process of students to understand the concept of vectors through learning real mathematics and ethnomathematics.	Based on the study's results, it was obtained an increase in the effectiveness of learning by applying practical mathematics learning using an ethnomathematics approach.
(Widada, Herawaty, Andriyani, et al., 2020)	Journal of Physics: Conference	The thinking process of students in understanding	The application of ethnomathematics is proven to help improve students' conceptual understanding skills related to

		g the concept of graphs during ethnomathematics learning	graph theory material with the right thought processes and produce good definitions.
(Widada, Herawaty, Rahman, et al., 2020)	Journal of Physics: Conference	Overcoming the difficulty of understanding systems of linear equations through learning ethnomathematics	Based on the description of the results of the research and discussion, it is obtained that ethnomathematics-based learning can overcome difficulties in understanding concepts in the material of a two-variable linear equation system, namely, difficulty understanding principles, difficulty understanding problems and solving problems. This is proven by the increase in the number of students who can understand the concept of a system of two-variable linear equations, from 56% to 87%.
(Andriani & Septiani, 2020)	□ELTA: Jurnal Ilmiah Pendidikan Matematika	Etnomatematika motif ceplokan batik Yogyakarta dalam peningkatan pemahaman konsep matematika siswa	By using the pattern of the Ceplokan Batik Motif in learning mathematics, it can improve students' ability to understand mathematical concepts related to geometric material because the making of the Ceplokan Batik Motif is inseparable from the presence of geometric elements in the form of displacement (translation), reflection (reflection), rotation (rotation), and magnification (dilation). This helps students to associate the concepts learned with reality.
(Ulya & Rahayu, 2020)	AKSIOMA: Jurnal Program Studi Pendidikan Matematika	Kemampuan representasi matematis field intermediate dalam menyelesaikan soal etnomatematika	The profile of students' FDI mathematical representation is quite good, but students still face some obstacles.

(Buyung & Hendriana, 2020)	MES: Journal of Mathematics Education and Science	Kemampuan pemahaman konsep matematika mahasiswa menggunakan lembar kerja mahasiswa (LKM) berbasis etnomatematika	Through learning using ethnomathematics-based LKM, it was found that the average student's conceptual understanding ability reached classical and individual mastery. And there are differences in the final results of the control and experimental classes. This shows that learning using ethnomathematics-based LKM is effective.
(Sumarsono et al., 2022)	MARISEKOLA: Jurnal Matematika Riset Edukasi dan Kolaborasi	Analisis kemampuan pemahaman konsep dan pemecahan masalah bangun ruang sisi lengkung berbasis etnomatematika pada jajanan tradisional	Research conducted at MTsN 3 Kota Kediri class IX using ethnomathematics-based worksheets on traditional Klepon snacks found that the ability to understand students' concepts was relatively high. This is proven by the results of the students' work in groups 1, 3, 4, and 5, which follow the steps for working on curved side chambers.
(Mei et al., 2021)	AKSIOMA: Jurnal Program Studi Pendidikan Matematika	Efektivitas model pembelajaran kontekstual berbasis etnomatematika ditinjau dari kemampuan pemahaman konsep matematika dan sikap disiplin	Contextual learning based on ethnomathematics has proven effective and can improve students' understanding of concepts and disciplinary attitudes in geometry material.
(Nugroho et al., 2019)	Jurnal Pendidikan Matematika Raflesia	Pemahaman konsep matematika melalui media <i>youtube</i> dengan	There are differences in the ability to understand concepts when learning is oriented in ethnomathematics with those without ethnomathematics. Also, there is an effect of orientation on mathematical material and the

		pendekatan etnomatematika	interaction of learning models on the ability to understand concepts.
(Sarwoedi et al., 2018)	Jurnal Pendidikan Matematika Raflesia	Efektifitas etnomatematika dalam meningkatkan kemampuan pemahaman matematika siswa	In this study, the effect on students' understanding of concepts was obtained through ethnomathematics-based learning.
(Febriani et al., 2019)	Jurnal Pendidikan Matematika Raflesia	Pengaruh pembelajaran matematika realistik berbasis etnomatematika terhadap kemampuan pemahaman konsep matematika siswa SMA Kota Bengkulu	There are differences in the ability to understand mathematical concepts in students who are given ethnomathematics-based learning materials and those not based on ethnomathematics. This is evidenced by the difference in the average ability to understand mathematical concepts of students who were given ethnomathematics material which was higher than those who were not given ethnomathematics material.

Based on the results presented in table 1, it can be concluded that ethnomathematics can help bridge students' understanding based on the surrounding culture and existing mathematical concepts and significantly influence students' understanding of mathematical concepts.

DISCUSSION

The ability to understand concepts is an essential foundation and must be owned by students because mastering concepts will help students understand mathematics (L. Agustina et al., 2021; Kharis et al., 2021; Sumarni et al., 2018). Mathematics is one of the crucial subjects in which some concepts are related (A. Agustina & Fuadiah, 2018). Because mathematical concepts are interrelated and hierarchical, learning mathematics should be done orderly and systematically with no mathematical concepts or stages being skipped (A. Agustina & Fuadiah, 2018).

Understanding mathematical concepts is an essential foundation in solving problems and thinking about mathematics and everyday problems. Understanding concepts is vital in mathematics (A. Agustina & Fuadiah, 2018). Understanding of mathematical concepts has several indicators, including restating a concept, grouping objects based on specific properties according to the concept, giving examples and non-examples of concepts, presenting them in various forms of mathematics, developing necessary and sufficient terms of concepts, selecting, using, and utilizing operations or specific procedures, applying algorithms or concepts to problem solving (A. Agustina & Fuadiah, 2018; Istihapsari, 2017). More information regarding the ability to understand concepts can be seen in Table 2.

Table 2. Definition of Ability to Understand Concepts

Penulis	Tahun	Definisi
(L. Agustina et al., 2021)	2020	Mathematical concepts can be understood as the initial basis for achieving other learning objectives because, being able to understand a concept, mathematics is considered capable of realizing achievements in the ability to reason, communicate, and solve mathematical problems.
(Kharis et al., 2021)	2020	Understanding the concept is a vital foundation because mastering it will make it easier for students to understand mathematics. With good mastery of concepts, students also have a reasonable basis for achieving other essential abilities. The concepts in mathematics are arranged systematically, logically, and hierarchically from the simplest to the most complex. Understanding mathematical concepts are the basis for learning mathematics in a meaningful way. Concept mastery is the level of student learning outcomes so that they can define or explain part of or define learning material using their sentences.
(Sumarni et al., 2018)	2019	Understanding the concept of learning mathematics is a vital ability that students must possess. Through conceptual understanding, students can understand comprehensively and more easily remember the material. Understanding concepts is the ability to understand something and transform information into meaning. Understanding concepts is a competency shown by students in carrying out procedures (algorithms) in a flexible, correct, efficient, and precise manner.
(Utami, 2021)	2021	Understanding the concept can make it easier for students to solve various problems following the concepts that have been given.
(A. Agustina & Fuadiah, 2018)	2018	Understanding mathematical concepts is an essential foundation in thinking and solving math problems and problems in everyday life.
(Yufentya et al., 2019)	2019	Understanding the concept is important for students to have so that in the learning process, students do not just work on questions and memorize but gain meaning in learning.
(Istihapsari, 2017)	2017	Concept understanding is understanding and understanding related to an abstract idea, notion, or view that allows one to differentiate, give examples, to generalize an object according to specific indicators.
(Sefrinal et al., 2021)	2021	Understanding mathematical concepts are one aspect of learning outcomes.

Mathematics is used as a benchmark in measuring a person's intelligence. Therefore mathematics is fundamental (Priatna & Yuliardi, 2018). In learning mathematics, habits are formed so students can understand through an introduction to the properties that a set of objects

has or does not have (abstract) (Wandini & Banurea, 2019). Therefore, the right approach can help students to learn mathematics. With an approach that links actual events to student experiences, it is expected to help students (Widyastuti & Pujiastuti, 2014). Therefore, an appropriate approach is an ethnomathematics approach because, with ethnomathematics, the material being taught is related to real life, such as local culture, daily activities, or existing cultural practices (Nuryadi et al., 2021).

CONCLUSION

Based on a literature study conducted by the authors regarding the ability to understand concepts and ethnomathematics, it can be concluded that ethnomathematics has a positive and significant influence on students' conceptual understanding abilities because ethnomathematics is directly related to the life around students in the form of culture. So that students can apply their understanding obtained from their surroundings with existing mathematical concepts.

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