

## Research article

# Ethno-STEM to Develop Student's Entrepreneurial Characters at Islamic Boarding School

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**ORCID**Budi Haryanto: <https://orcid.org/0000-0003-4694-048X>**Abstract.**

Ethno-STEM to Reduce the Phenomenon of Saturation and Develop Student Entrepreneurial Character Society 5.0 is a human-centered and technology-based concept that integrates virtual and physical spaces through a system. The world of education must continue to innovate. Islamic boarding schools are educational institutions that combine religious learning with general education to instill intelligence, skills, good character, and moral values in students without drifting away from Islamic values. The 24-hour learning system is a source of student learning saturation. The approach used in carrying out active learning and fostering learning motivation is Ethno-STEM. A systematic literature review was conducted by documenting and reviewing all articles related to active learning for increasing learning motivation that were published in national and international accredited journals between 2018 and 2021, accessed from Science Direct, Google Scholar, SINTA, DOAJ, and lens.org. The results showed that the Ethno-STEM approach can effectively increase students' learning motivation through active learning that stimulates students to improve their thinking skills, especially the critical, creative, innovative, and entrepreneurial characters.

**Keywords:** Ethno-STEM, interest in learning, the phenomenon of saturation, entrepreneurship character, boarding school

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## 1. Introductions

As time goes on, human life becomes more progressive and complex, including changes in the orientation, perception, and level of selectivity of the Indonesian people towards education [1][2]. The world of education is required to continue innovating and finding new concepts in a tight quality competition with human resources ready to face any challenges. Education is essential in survival, where education can make individuals knowledgeable and have character [3]. Education is closely related to environmental conditions, where external factors significantly influence student learning outcomes. The environment taken in this literature research is a school environment with a nuance

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of boarding school. A boarding school is where students, teachers, and school administrators live in dormitories within the school environment for a certain period [4].

Schools by implementing a boarding school system are not new in Indonesia. The application of the pesantren education system, which developed into an Islamic boarding school in its teaching system, combines the values of traditional pesantren learning with modern general learning in an integrative and selective manner. Education with nuances of boarding school is expected to effectively educate intelligence, skills, character development, and moral values so that students have a complete and distinctive personality without leaving Islamic values [5][6][7].

The Islamic boarding school learning system lies in all student activities that have been programmed, regulated, and scheduled for 24 hours. Boring routines and learning methods are considered a source of triggering learning saturation [8]. Limited movement or even not being able to carry out activities outside the dormitory, so some programs are not implemented due to the pandemic, causing learning to be monotonous, and the teaching was given by teachers both at school and in dormitories tends to be very serious and unpleasant [9].

One approach that using to overcome learning saturation is STEM [2][10][11][12]. STEM is an approach in education in increasing the perspective of global technology in the industrial era 5.0 [13][14][15]. STEM is a scientific discipline that requires mathematics as a tool in data processing and technology and engineering as an application of science [16]. The Ethno-STEM approach is a learning method that integrates four fields with the basis of the local culture so that it can increase interest and provide meaningful learning to students [12][17].

The research question of this study is: how can the Ethno-STEM approach improve the entrepreneurial character of students in the Islamic boarding school environment?

## 2. Methods

This scientific article was prepared using the Systematic Literature Review (SLR) method. In Indonesia, this systematic review has been carried out using a modified procedure adopting the PRISMA (Optional Items for Systematic Review and Meta-Analysis) design, consisting of four steps: identification, screening, eligibility, and inclusion [18]. The flowchart of the research procedure in this paper shown in Figure 1.

At the identification stage, articles were collected with the keywords being Ethno-STEM (2554 articles), interest in learning (543 articles), the phenomenon of boredom at boarding schools (80 articles), and Ethno-stem to foster entrepreneurial character (66

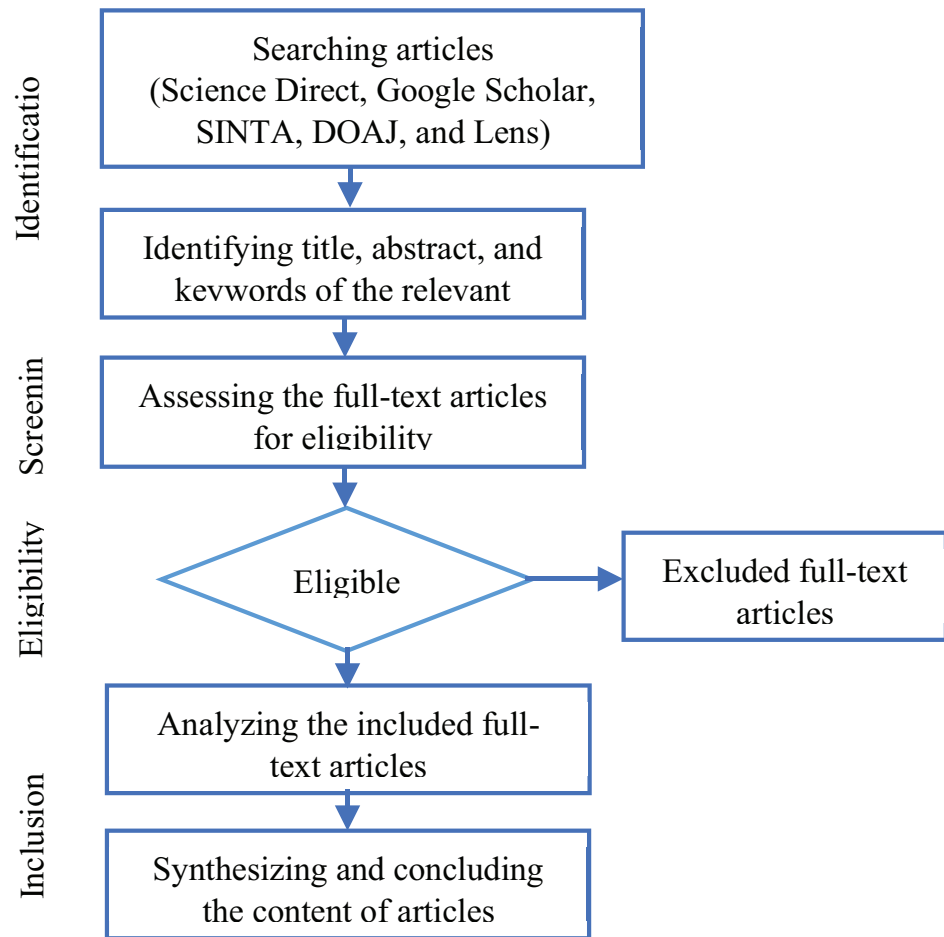


Figure 1: The research procedure.

articles). The articles used relevant to the keywords published from 2018 to 2021 totaled 52 articles used as references.

In the screening and eligibility stage, 52 articles that have been identified based on title, abstract, keywords, and topic relevance are downloaded. Full-text articles were scanned to check the suitability of the topic for research purposes. Papers of the 'editorial,' 'commentary,' 'responses,' 'book chapters,' and 'book reviews' types were excluded from the analysis. In addition, full-text articles written in 'non-English languages' are also excluded.

In the next step, the included step, all the eligible articles are studied and analyzed to get a synthesis or conclusion. Researchers selected 25 papers from various reports related to the keywords used. In the next stage, the researcher categorizes articles associated with the Ethno-STEM approach to increase interest in learning, Ethno-STEM system develops entrepreneurial character and builds entrepreneurial character in Islamic boarding schools.

### 3. Finding and Discussion

The initial activity carried out was to conduct a literature review of boredom that occurred in learning at Islamic boarding schools [4]. Furthermore, the Ethno-STEM approach is an effort to overcome learning boredom while at the same time fostering the entrepreneurial character of students within the scope of Islamic boarding school education. This review shows that dense and monotonous routines cause students to experience boredom, which causes lethargy and loss of interest in learning [8]. In addition, the phenomenon of saturation also hinders the distribution of student demands and talents. This is contrary to the aim of the Islamic boarding schools in preparing militant cadres who are independent and have high social skills.

Ethno-STEM is an exciting thing and is a current issue in the approach used in learning, especially in the industrial era 5.0. The application of Ethno-STEM is a learning activity by utilizing local wisdom, which is connected with Science, Technology, Engineering, and Mathematics. The approach used allows students to know local knowledge and is expected to be able to carry out learning optimally. This approach can also overcome student saturation because the implementation of learning carried out is active learning with stimulation to improve thinking skills, especially critical, creative, innovative, and entrepreneurial characters. The articles reviewed in this study are contained in Table 1.

Learning local wisdom, which is closely related to scientific concepts, needs to be emphasized, especially in the industrial era, to provide meaningful learning. The implementation of the Ethno-STEM approach in learning that integrates four essential areas with the local culture can train students' abilities in critical, creative, innovative, and collaborative thinking because the learning model connects classroom learning with everyday life experiences [1][2][10][11][15][17][19][20][21][22][23]. The Ethno-STEM approach can increase the average critical, creative, innovative, and collaborative thinking skills of students on all learning indicators that vary in an integrated manner from low to moderate categories [14][19][29]. This innovative learning model can be developed mainly in Islamic boarding school nuances because it can eliminate learning saturation and motivate students to actively participate in the learning process [12][26].

A life skills program is a collection of skills programs that include social skills, personal skills, academic skills, and vocational skills. These skills are taught at boarding schools to equip students to live independently and have Islamic entrepreneurial behavior in facing the development and progress of the times [7]. Islamic boarding schools can design economic empowerment programs based on potential, interests, and resources in a participatory manner by involving students, parents, alumni, educators, and dormitory

TABLE 1: References of Ethno-STEM to Develop Student's Entrepreneurial Characters.

Features of Ethno-STEM to Develop Student's Entrepreneurial Characters	Ethnosains	STEM	Entrepreneur Character	School Boarding School
Analysis of Ethno-STEM Integrated Project Based Learning on Students' Critical and Creative Thinking Skills [1]	√	√		√
Review Analysis of Video Blogging, Ethnoscience and Social Media Literacy in the Era of the Industrial Revolution 4.0 [2]	√		√	
Life Skills Program Management in Improving Entrepreneurship [5]			√	√
Strategy of Cooperative Islamic Boarding School As Economic Empowerment Community [6]			√	√
The Role of Islamic Boarding Schools in Forming Entrepreneurship Values and Religious Leadership of Santri [7]			√	√
Teacher Variables and School Location as Predictors of Chemistry Teachers' Awareness of Ethnoscience Practices [10]	√			√
Evidence of STEM enactment effectiveness in Asian student learning outcomes [11]		√		
Three modes of STEM integration for middle school mathematics teachers [12]		√		
Is Integrated Science Book with Ethno-STEM Approach Needed by Secondary School Students? [14]	√	√		√
STEM Education Implementation in Indonesia: A Scoping Review [15]		√	√	
The effect of Ethnoscience-based direct instruction learning model in physics learning on students' critical thinking skill [17]	√			√
Ethno-stem project-based learning: Its impact to critical and creative thinking skills [19]	√	√		√
The development of PBL-based worksheets integrated with green chemistry and ethnoscience to improve students' thinking skills [20]	√			√
Developing Students' Entrepreneurial Characters through Downstreaming Research on Natural Product Learning with Ethnoscience Integrated Stem [21]	√	√	√	
Scientific reconstruction of indigenous knowledge of batik natural dyes using ethno-STEM approach [22]	√	√	√	

TABLE 2: References of Ethno-STEM to Develop Student's Entrepreneurial Characters.

Features of Ethno-STEM to Develop Student's Entrepreneurial Characters	Ethnosains	STEM	Entrepreneur Character	School Boarding School
Students' innovative and creative thinking skill profile in designing chemical batik after experiencing ethnoscience integrated science technology engineering mathematic integrated ethnoscience (ethno-stem) learnings [23]	√	√		
Implementing the model of project-based learning: integrated with ETHNO-STEM to develop students' entrepreneurial characters [24]	√	√	√	
Science Batik Ciwaringin: The Implementation of Ethno-STEM PjBL Model in learning Biotechnology at PGSD Students [25]	√	√	√	
Teachers' Role in Students' Learning at a Project-Based STEM High School: Implications for Teacher Education [26]		√		√
The instrument analysis of students' problem-solving ability on hybrid learning model using ETNO-STEM Approach through Quest Program in COVID-19 Pandemic [27]	√	√		
Students' Application of Concavity and Inflection Points to Real-World Contexts [28]		√		
Practicality and Effectiveness of Student Worksheets Based on Ethno science to Improve Conceptual Understanding in Rigid Body [29]	√	√		√
Economic Empowerment of Islamic Student Throught Optional Course Learning in Boarding School for Harmonization and Preventing Negative Stigma [30]			√	√
Entrepreneurship education through successful entrepreneurial models in higher education institutions [31]			√	√
The impact of entrepreneurship education and students' entrepreneurial mindset: the mediating role of attitude and self-efficacy [32]			√	√

administrators [5][6][31]. Economic empowerment can be carried out in integrated elective subject activities or specialization classes in the curriculum to affect entrepreneurial self-efficacy, entrepreneurial attitudes, and entrepreneurial mindset [27][32]. The program is expected to produce graduates who are not only experts and take part in the religious field but also have a master in Islamic economics for welfare by creating and developing entrepreneurial character [30].

Using the STEM approach, entrepreneurial character development in students has developed in small units. It has been proven to create many student skills to become a trigger for renewal in education [15]. The Ethno-STEM approach to developing and improve the entrepreneurial character of students based on the N-gain score [21][23][24] and the Delphi technique [25] from medium to high scores, as well as helping students to produce products that are creative, innovative, and has a sale value. This approach is very suitable for entrepreneurship learning and entrepreneurship practice in specialization classes to develop the talents and interests of students, especially in schools with Islamic boarding school nuances. Thus, the entrepreneurial behavior of Islamic boarding school students is expected to be able to foster social behavior in the form of creative, innovative, and collaborative attitudes that dare to take actions with measurable risks to create new things that are original and economical in value that does not violate the rules (syar'i) [5][30][31].

#### 4. Conclusion

Learning using the Ethno-STEM approach is a learning activity by utilizing local wisdom. This approach can train students' ability to think critically and creatively because the learning model connects learning in the classroom with everyday life experiences. The results of a literature review of 25 articles show that schools with Islamic boarding school nuances are expected to equip students to live independently and have Islamic entrepreneurial behavior by applying the Ethno-STEM approach. The Ethno-STEM approach to schools with nuances of Islamic boarding school can eliminate the saturation phenomenon because this approach model requires students to carry out active learning and cultivate the entrepreneurial character of students with their critical, creatively innovative, and collaborative thinking skills. Future research studies are expected to develop an Ethno-STEM approach in various learning systems that can provide meaningful learning and foster an entrepreneurial spirit that is environmentally sound in students.

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