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by Sigit Priatmoko

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Sudarmin
Universitas Negeri Semarang, Indonesia
Sudarmin@mail.unnes.ac.id

Sigit Priatmoko
Universitas Negeri Semarang, Indonesia
sigitwarsono@mail.unnes.ac.id

Skunda Diliarosta
Universitas Negeri Padang, Indonesia[3]
skunda@fmipa.unp.ac.id

Triya Ruliyanti
Universitas Negeri Semarang, Indonesia
ruliyanti@gmail.com

***Abstract*---Currently, Indonesia is experiencing a COVID-19 pandemic and a condition where all learning is directed towards online learning. This institutional research aims to design innovative learning models and process evaluation instruments and learning outcomes for secondary metabolites topics with the Google Form application. This research is a type of development research with data analysis techniques through qualitative quantitative descriptive. The learning model applied is Ethnoscience and STEM integrated inquiry by modifying it from the Wening inquiry model to the "Sudarmin Inquiry Model". In this research, the stages are (1) developing the Sudarmin Integrted ethnoscience and STEM inquiry model through the stages of define, design, and development, (2) compiling rubrics and grids on the topic of secondary metabolites, (3) implementing evaluation tools assisted by google form for processing and learning outcomes. In this study, the Google Form application contains a response questionnaire and evaluation of secondary metabolites. The results of this study also concluded that students understand the stages of the Integrated Ethno-STEM Sudarmin Inquiry Model well, the evaluation of learning outcomes for secondary metabolites is in the medium category. The overall results of learning activities give a positive response to the developed evaluation models and tools.**

Keywords: Google Form application, Sudarmin Inquiry model, Ethnoscience, STEM.

I. INTRODUCTION

Technology and information-based learning is an inevitable necessity in the era of revolution 4.0 (Ariyatun & Octavianelis, 2020). In the world of education, there are many applications created specifically to support education, or applications that are already available and can be used by education activists. One application that is often used by education is google form. Google forms are part of google drive. Google Form or in Indonesian called google form is an application that is useful for helping plan events, sending surveys, giving quizzes, or gathering information in a concise, easy and efficient way (Slamet, 2016). The use of technology such as the Google Form application media can be used as an evaluation tool that has been implemented by several researchers (Batubara, 2016). Google forms can also be used to conduct surveys with the help of a questionnaire instrument. By using google the survey filling form is faster, easier, and can be accessed by anyone without having to meet face to face. Some of the Google Form functions for the world of education are as follows: 1) Providing online training / test assignments via a website page, 2) Collecting other people's opinions through website pages, 3) Collecting various student / teacher data through website pages, 4) Creating forms online registration for schools, 5) Distributing questionnaires to people online (Savitri, 2019; Febriadi & Nasution, 2017). In general, it gives an idea that Google Form is one of the media that can be used in the learning process.

STEM (Science, Technology, Engineering and Mathematics) is a four-aspect approach to solving real problems and also for problem-based learning. This approach is able to create an atmosphere of active learning because these four aspects are very much needed in solving problems (Capraro et al., 2013). The application of the STEM learning approach can teach several problems for students. STEM learning is learning that involves all four disciplines at once, so that it can help students think critically and creatively (Utami, 2018; Suryani, 2020; Han et al., 2016; Reeve, 2015). The fields of science contained in STEM are science, technology, engineering / engineering, and mathematics. Science is the study of the natural world including natural laws related to physics, chemistry and biology (Bruton, 2017). In addition, STEM is an approach that can be integrated into several scientific learning models, including inquiry.

Independently inquiry learning can encourage students to be responsible in learning. In addition, through scientific principles and methods in inquiry learning, students can observe a phenomenon, synthesize research questions, test

questions repeatedly and finally analyze and communicate their findings (Nashrullah, 2015). This means that inquiry is a way of teaching students how to learn using skills, processes, attitudes, and knowledge of rational thinking (Ristanto et al., 2017). The inquiry learning model integrates logical ethnoscience and makes it possible to develop local cultural values in problem solving in learning (Imansari et al., 2018). This learning model has the potential to educate students to interact directly with local culture and explore, explore, verify, reduce, conceptualize, and document scientific knowledge based on community knowledge (Indegenous Science) from community cultural activities that contain concepts or knowledge. science (Sudarmin et al., 2019).

The integration of the ethno-STEM approach with the inquiry learning model will provide solutions to existing problems. This learning model is integrated with four STEM areas based on local culture to develop critical, creative, innovative and collaborative thinking skills. Moreover, ethnoscience is also very important to develop character students (Kun, 2013; Sudarmin et al., 2019). One of the characters that is needed in the current era of globalization is the character of entrepreneurship. Therefore, this study designed an innovative learning model with an Ethno-STEM approach with the integration of the Inquiry Sudarmin model. The concept of the Etho-STEM approach with the Sudarmin Inquiry model is a chemical learning approach that is associated with real objects so that in addition to educating, the CEP approach allows students to learn the process of processing a material into a product that is useful, has high economic value and fosters an entrepreneurial spirit (Supartono, 2009). The existence of a CEP approach to chemistry lessons will be more fun and provide opportunities for students to optimize their potential to produce a product. When students are accustomed to such learning conditions, it is possible that participants will be motivated to become entrepreneurs (Mulyasa, 2004). With the CEP approach to learning, students will better understand chemistry subject matter in real terms. Because in the learning process, students are treated to a lot of theories related to events in everyday life either through practicum inaugurations that contain life skills or through formal discussions that can trigger students' thinking. The Ethno-STEM approach to the Sudarmin Inquiry model (CEP) is one of contextual teaching and learning which helps teachers link the material they teach to students' real situations and encourages students to make connections between their knowledge and its application in everyday life.

In this study, the inquiry model is integrated with ethnoscience in the STEM context where the 21st century learning system becomes the reason for changing lecturer-centered learning into student-centered learning so that future generation participants are able to think critically, innovatively, deductively and inductively, solve problems, collaborative, communicative, and independent or entrepreneur in today's global era. This thinking ability is finally able to deliver students as the younger generation to transform for solving problems in everyday life, without leaving the nation's culture; and this is the important essence in integrated inquiry learning Ethnoscience and STEM (Sudarmin, 2019). The ethnoscience to be developed in this study is the secondary metabolites of the Taxus Sumatrana plant. This plant is better known as a local plant, namely the Sumatran pine (Frianto & Novriyanti, 2017).

II. METHODS

This research is part of a series of R&D studies whose main focus is to increase student motivation to understand STEM literacy and local culture through online learning and Google forms. Sources of data from this study were participants from 69 universities, 14 schools, and 4 non-educational institutions. The research instrument used was a response questionnaire with a measurement scale on the questionnaire instrument using a Likert scale. Which consists of four answers where the score 1 states the answer "disagree", score 2 states "disagree", score 3 states "agree", and score 4 states "strongly agree". The form of the questionnaire is in the form of a check list along with the respondent's reasons for choosing the score. The questionnaire instrument was prepared using a grid in the form of a table containing indicators, item numbers, and number of items. Next, add up the scores for each indicator in each aspect and then convert them into a range of values

Table 1. Conversion Criteria

Average Score	Criteria
1,00 - 1,75	Disagree
1,75 - 2,50	Disagree Less
2,51 - 3,25	Agree
3,25 - 4,00	Strongly Agree

as in Table 1. developed from Sugiyono, (2014 & 2015). The data analysis technique used is quantitative and qualitative descriptive analysis techniques, namely describing the results of the observation of the development of the Ethno-STEM learning model with the integration of the Sudarmin Inquiry model on secondary metabolite bioactive compounds.

III. RESULTS AND DISCUSSION

3.1. Model Design Development

This research begins with the analysis of various research reference sources to produce product findings of Blended Learning with an integrated STEM ethnoscience approach. The instruments used in this study were observation

sheets, questionnaires and tests. Observation sheet, conservation character assessment, and justification to determine the suitability of research implementation with the research design. Data analysis techniques with descriptive qualitative and quantitative. This research begins with several stages of research as follows: 1) Research on scientific scientific reconstruction, and a learning model with an ethnoscience approach with achievement indicators that have carried out international seminars and publications in the Journal of Physics Conf Series, an ISBN book; 2) FGD to determine the schedule, integration model, and document analysis of learning tools, learning potentials and problems and practicum activities, along with their evaluation tools; 3) FGD to design ethno-STEM draft, draft RPS and ethnoscience integrated teaching materials, draft Guidelines for practicum on secondary metabolites bioactivity testing from tropical forest plants; 4) Validation and Expert Justification Expert Team validates and justifies products; 5) Development: Innovative Learning Model integrated ethno-STEM; 6) Implementation and Evaluation. This shows that all research products and research products have been produced after the ethno-STEM Innovative Learning Model design (STEAM, teaching materials, RPS, research instruments, and student conservation character measurement results) have been applied.

3.2. Results of the Development of the STEM Learning Model Design

Learning with the ethnoscience integrated STEM model in this study, combines science or mathematics in authentic problem-solving activities in social, cultural, and functional contexts. Integrity in the STEM learning system can be said to be successful if all aspects of STEM are contained in every learning process for each subject. Meanwhile, the inquiry learning model provides opportunities for students to develop active learning methods by finding and investigating through lesson-based inquiry activities, laboratories, the real world independently in finding their knowledge or hypotheses. This step is taken so that students are able to explore critical, innovative, creative, collaborative thinking skills and try to solve the problems themselves through scientific performance methods and scientific attitudes. This is in line with the research of Liliawati et al., (2018) which concluded that STEM implementation in learning can develop conceptual understanding. Meanwhile, the inquiry learning model facilitates students to be interested in scientific work in gaining procedural knowledge. This inquiry learning model also spurs students to get new findings and ideas. Some research results have also proven that the inquiry model has been shown to be able to develop student potential both cognitively, affective, and psychologically (Sudarmin et al., 2019). The study of original science is a must in an effort to develop positive characters such as appreciating and preserving culture which has implications for the conservation of Natural Resources, reconstructing them, documenting them, and developing them in culture-based science education. In Table 2., the ethnoscience content related to secondary metabolites of medicinal plants is presented.

Table 2. Ethnoscience content and context regarding bioactive compounds secondary metabolites of medicinal

Jamu Turmeric Acid	Ethnoscience	Ethnotechnology	Ethnoengineering	Ehtnomathematics
Jamu kunir tamarind is referred to as Jamu 'cool or fresh'	The main ingredient: Tamarind, turmeric, temu-lawak, kedawung and lime juice, brown sugar mixed with white sugar and a little salt.	Method of processing: all ingredients are coarsely ground (mechanical dispersion concept) using a mortar and pestle or thinly sliced (turmeric) (touch surface area), put into water (extraction concept) and boiled until boiling for a while.	Turmeric is chosen instead of masters rhizome, to get a more efficacious extract. The acid was chosen kawak acid: an acid that is old and stored for a long time.	The formulation and composition of the ingredients are made in such a way as to not give rise to contra indication, even be selected Type of potion Which support each other against a the desired effect

Measurement of student motivation interest is carried out by distributing google form questionnaires which are carried out after a workshop on learning the chemistry of secondary metabolite compounds. The results of the recapitulation of the results of the questionnaire analysis via google form are described in Table 3

Table 3. Results of an Integrated Chemistry Learning Workshop Questionnaire Ethno-STEM

No	Statement	Average Score	Criteria
1	Participants understand the Workshop material	3,37	Strongly Agree
2	The workshop went well	3,39	Strongly Agree
3	The Workshop increases curiosity	3,54	Strongly Agree
4	The Workshop encourages to design 21st century learning	3,50	Strongly Agree
5	The Workshop encourages STEM literacy and local culture	3,46	Strongly Agree
6	The Workshop Workshop encourages application in chemistry learning	3,45	Strongly Agree

7	The Workshop encourages seeking more information	3,46	Strongly Agree
8	The workshop encouraged more knowledge about study materials/chemical materials	3,44	Strongly Agree
9	The woekshop encourages designing teaching materials	3,38	Strongly Agree
10	The workshop encouraged me to design a learning evaluation tool	3,39	Strongly Agree
11	The workshop makes understanding related to STEM/Ethno-STEM	3,35	Strongly Agree
12	The workshop made to search for related approach videos	3,41	Strongly Agree
13	The workshop makes to search for related text books	3,36	Strongly Agree
14	STEM/Ethno-STEM learning can be applied to all fields of study	3,12	Agree
15	STEM/Ethno-STEM can be applied to instill a conservation character	3,50	Strongly Agree
	Average Score	3,41	Strongly Agree

The results of the questionnaire analysis in this study showed that overall students and workshop participants stated that they strongly agreed with the application of the innovative Ethno-STEM integrated learning model of the Sudarmin inquiry model which was indicated by a mean score of 3.41 in the category of strongly agree. Furthermore, this study also conducted a final evaluation of the chemical learning material for secondary metabolite compounds. The results of the evaluation of the tests on the chemical learning material for secondary metabolite compounds are presented in Figure 1.

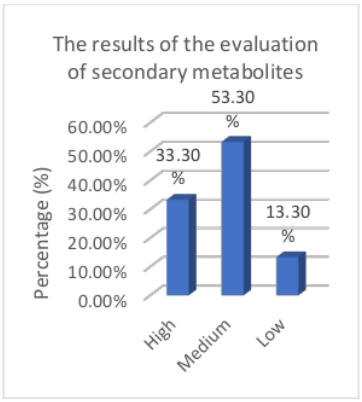

Figure 1. Analysis of the results of the evaluation of secondary metabolites

Figure 1 shows that the average percentage of the evaluation results of secondary metabolite compounds in the highest percentage gets an average of 53.30% in the moderate category. And overall the results of this evaluation analysis are in the medium category. This is in line with Ariyatun & Octavianelis 'research, (2020) that STEM integrated learning is effective in improving students' thinking skills because knowledge (science) requires mathematics for data processing, while technology and engineering are applications of science itself. Another relevant research is belonging to Hamdan Husein Batubara (2016) with the title "The Use of Google Forms as a Tool for Assessing Lecturer Performance in the Uniska PGMI Study Program Muhammad Arsyad Al Banjari". The results of this study indicate that the procedure for developing a lecturer performance appraisal questionnaire in the learning process using Google Form starts from planning, creating, publishing and providing instructions for use to a conclusion in the form of a Google Form which is very useful for lecturers and students to collect lecturer performance data. Research by Ruliyanti et al., (2018) concluded that learning that applies the CEP approach in it can improve student learning outcomes and soft skills.

IV. CONCLUSION

The results of the research found that Model of Inquiry *Sudarmin* Integrated ethnoscience and STEM, includes the stages (a) Present the problem regarding secondary metabolites, (b) Perform independently to find solutions with the help of technology, (c) Discussion in groups to find and find the best solution, (d) Analysis of solutions to determine the best and as a hypothesis, (e) Establish the hypothesis with relevant references and theories, (f) Implement it to prove truth and effectiveness, (g) Value and feedback on the results of implementation. The results of this research also concluded that students understand the stages of the Model Inquiry

Sudarmin Integrated Ethno-STEM well, the learning outcomes of secondary metabolites topics are in the medium category. The overall results of the learning activities show a positive response to the developed models and evaluation tools.

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