
PROFILE OF CRITICAL AND CREATIVE THINKING SKILLS OF STUDENTS OF BIOLOGY EDUCATION STUDY PROGRAM OF UIN ALAUDDIN MAKASSAR: NEEDS ANALYSIS DEVELOPMENT OF STILLALI MODEL

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Abstract:

This study aims to analyze the development needs of the STILLaLI Model. This study discusses the students' profile of critical thinking skills and creative thinking skills in the Biology Study Program at UIN Alauddin Makassar. This study used quantitative descriptive research with 46 students as respondents. Critical thinking skills data was collected using a test technique, and creative thinking skills data was collected through surveys. The results showed that critical thinking skills were in the less critical category with an average score of 53.09, while creative thinking skills were in the creative enough category with an average score of 58.02. It is necessary to develop a learning model that is able to improve the critical and creative thinking skills of students of the Biology Education study program at UIN Alauddin Makassar, namely the STILLaLI Model.

Abstrak:

Penelitian ini bertujuan untuk menganalisis kebutuhan pengembangan Model STILLaLI. Penelitian ini membahas profil ketrampilan berpikir kritis dan keterampilan berpikir kreatif mahasiswa Program Studi pendidikan Biologi UIN Alauddin Makassar. Penelitian ini merupakan penelitian deskriptif kuantitatif dengan 46 mahasiswa sebagai responden. Data keterampilan berpikir kritis dikumpulkan dengan teknik tes. Data keterampilan berpikir kreatif dikumpulkan melalui survey. Hasil penelitian menunjukkan keterampilan berpikir kritis pada kategori kurang kritis dengan nilai rata-rata 53,09, sedangkan keterampilan berpikir kreatif berada pada kategori cukup kreatif dengan nilai rata-rata 58,02. Perlu dilakukan pengembangan model pembelajaran yang mampu meningkatkan keterampilan berpikir kritis dan kreatif mahasiswa program studi Pendidikan Biologi UIN Alauddin Makassar yakni Model STILLaLI.

Keywords:

Critical Thinking Skills, Creative Thinking Skills, the STILL-aLI Model

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INTRODUCTION

The 21st century is the century of scientific and technological progress (Science and Technology), rapidly covering all areas of human life. Demands for innovative skills have accompanied these advances. There are several skills needed for the 21st century, which are abbreviated as 4C (critical thinking, creativity, collaboration, communication) (Irham, Tolla, and Jabu, 2022; Isbandiyah & Sanusi, 2019; Supena, Darmuki, and Hariyadi, 2021; Wahyuddin, Ernawati, & Satriani, 2022). Isbandiyah & Sanusi (2019) further explain these skills, namely, critical thinking aims to enable students to solve various contextual problems using critical and rational logic; creativity encourages students to be creative in finding various solutions, designing new strategies, or finding ways that are not commonly used before; collaboration or cooperation facilitates students to have the ability to work in teams, be tolerant, understand differences, be able to live together to achieve a goal; and communication facilitate students to be able to communicate broadly, the ability to capture ideas/information, to interpret information, and to argue in a broad sense.

21st century skills are closely related to Higher Order Thinking Skills (HOTS), which require students to adapt and develop. Therefore, HOTS ability is a must-have competency (Sharif & Cho, 2015; Talmi, Hazzan, & Katz, 2018; Urbani, Roshandel, & Michaels, 2017). Equipping students with 21st century skills is the obligation and responsibility of educators at all levels, from elementary school to middle school to university. However, there is still a lot of learning that is not based on HOTS, including critical and creative thinking skills (Ichsan, Sigit, & Miarsyah 2019; Syafryadin, Eka, & Noermanzah, 2022). The results showed that students' HOTS abilities from elementary to university levels were still very low (Husamah, Fatmawati, & Setyawan, 2018; Ichsan, Rahmayanti, & Purwanto, 2020).

Other skills are collaboration and communication. Collaboration can, of course, be established through good communication. Collaborative processes provide important benefits in terms of socializing individuals and developing their academic skills, experiencing the feeling of getting help and helping others, and gaining more than working alone. Individuals have experience acting together for common goals in collaborative processes, and this experience also allows for the development of interpersonal communication. Students working in collaborative groups learn to exchange information, develop new understandings and perspectives, and communicate effectively (Mercer, 1996). Possessing these skills enables individuals to succeed in their educational, social, and work lives (Kocaman, 2022).

Currently, access to information from unlimited resources is possible. Information can be accessed quickly using computers, smartphones, laptops, tablets, etc. Educators involved in developing students' digital literacy must be prepared to have good digital literacy (Rizal, Rusdiana, & Setiawan, 2020). On the other hand, educators need to develop digital awareness to choose the best environment for digital learning and teaching (Hall, Atkins, and Fraser, 2014). Educators are expected to become digital leaders in the classroom with their digital competencies. This becomes necessary by

increasing the need for educators to be digitally literate (Garcia-Martin and Garcia-Sanchez, 2017). The learning needs of students in the digital era must be met with innovative learning models. Traditional learning models are already difficult to implement (Gündüzalp, 2021).

Given the ease of access to unlimited information, students must be equipped with digital literacy integrated with religious values to sort, select, and filter information so that they are not easily consumed by hoaxes that can cause uproar or conflict in society. In addition to the spread of hoax cases, the internet also provides space for the spread of hateful content in the name of religion. Those cases even infiltrate content containing religious education. In the current era of social media, many people are tempted to use various information and opinions that are spread on the internet as shortcuts for reference materials and knowledge on religious matters without verifying them. Many have good intentions to study Islam through the internet and other social media. Still, because they are careless or there is no one to guide them, they fall into choosing and selecting content that should be avoided (Moderation, 2019). Therefore, the cultivation of theoretical and practical learning about digitalization must begin at the undergraduate level in their field of specialization and continue to go through the professional stages they may be in (Erikoğlu & Akgün 2022).

Responding to this 21st century phenomenon, a learning model that improves students' 4C skills accompanied by digital literacy based on religious values is urgently needed. Thus, we can prepare the next generation of a nation that is not out of date but still upholds diversity and maintains harmony among religious communities.

Based on the previous explanation, researchers developed a learning model that is able to improve 4C skills (Critical Thinking, Creative Thinking, Collaboration, and Communication) and student digital literacy, namely the Science Teaching Integrated Learning Literacy, Life Skills, and Islamic Learning model, abbreviated as STILL aLI.

The STILL aLI learning model is a modification of the Problem-Based Learning (PBL) model. Many studies have been conducted regarding PBL with increased critical thinking (Hidayati, Zubaidah, & Amnah, 2021; Nurtanto, Sofyan, & Fawaid, 2019; Palennari, 2017; Rijal, Mastuti, & Safitri, 2021; Siritwat & Katwibun, 2017; Suhirman, Prayogi, & Asy'ari, 2021; Zhou, 2018). Previous research studied PBL more on students' critical thinking. Several of them modified PBL, for example, by integrating it with Islamic values (Anshori, 2021) and blended PBL with music (Lindvang & Beck, 2015). Ersoy & Başer (2014) examined PBL on creative thinking skills. The study of other skills of communication, collaboration, and creative thinking is still limited.

Learning with the PBL model has so far been dominantly carried out in the classroom or the laboratory. Many studies have suggested that PBL is effective in enhancing learning outcomes (Anshori, 2021). However, this is often viewed as an individual learner's output. The utility of the knowledge gained should ideally be disseminated and beneficial to the broader community, even though the current learning demands must integrate learning with research and community service (Education & Culture Ministry of Indonesia, 2020). The STILL aLI model accommodates government

policies regarding the Indonesian curriculum called MBKM by getting students involved directly in the community by providing training or teaching and solving problems that occur in the community through research/practicum on campus. In addition, the application of the STILL aLI model in each learning step is integrated with Islamic values.

RESEARCH METHOD

This study used quantitative descriptive research to find out the profile of critical and creative thinking skills of students of the Biology Education Study Program, UIN Alauddin Makassar. Data collection used survey methods and test techniques (Creswell, 2015). The research subjects were 46 students of the Biology Education study program at UIN Alauddin Makassar. The data collected was in the form of data on students' critical thinking skills (Ennis, 2011) and on students' creative thinking skills (Greenstein, 2012). The instrument for critical thinking skills is a test with 12 validated questions, while creative thinking skills use a questionnaire. Data were analyzed descriptively by calculating the average score of critical thinking skills, while creative thinking skills were the percentage of respondents' answers. The criteria used are as follows:

Table 1. Critical Thinking Skills Assessment Category

Scale	Category
>81.25 - ≤100	Very critical
> 62.50 - ≤ 81.25	Critical
> 43.75 - ≤ 62.50	Less Critical
≤ 25.00 - ≤ 43.75	Very less critical

Source: (Supriyatno, Susilawati, & Hassan, 2020)

Table 2. Creative Thinking Skills Assessment Category

Scale	Category
81%-100%	Very Creative
61%-80%	Creative
41%-60%	Creative Enough
21%-40%	Less Creative
0 %-20 %	Not Creative

Source: (Satriawan, Rosmiati, & Widia, 2020)

RESULTS AND DISCUSSION

Profile of Critical Thinking Skills of Biology Education Study Program Students

Skills of Biology Education students were measured based on indicators of critical thinking skills by Ennis (2011), consisting of 5 indicators. Table 3 shows the critical thinking skills of Biology Education students in terms of each indicator.

Table 3 Critical Thinking Skills of Biology Education Students

No.	Indicator	Average score	Category
1.	Give a simple explanation	56.09	Less Critical

No.	Indicator	Average score	Category
2.	Build basic skills	53.77	Less Critical
3.	Making Inferences	60.14	Less Critical
4.	Provide further explanation	42.83	Less Critical
5.	Set strategy and tactics	52.61	Less Critical
	Average	53.09	Less Critical

Table 3 shows that the critical thinking skills of Biology Education Study Program students for each critical thinking indicator were still in the less critical category. Most students had not been able to explain all concepts properly, correctly, and specifically. The explanation given is still general. The data on critical thinking skills, when viewed per student, is presented in Figure 1.

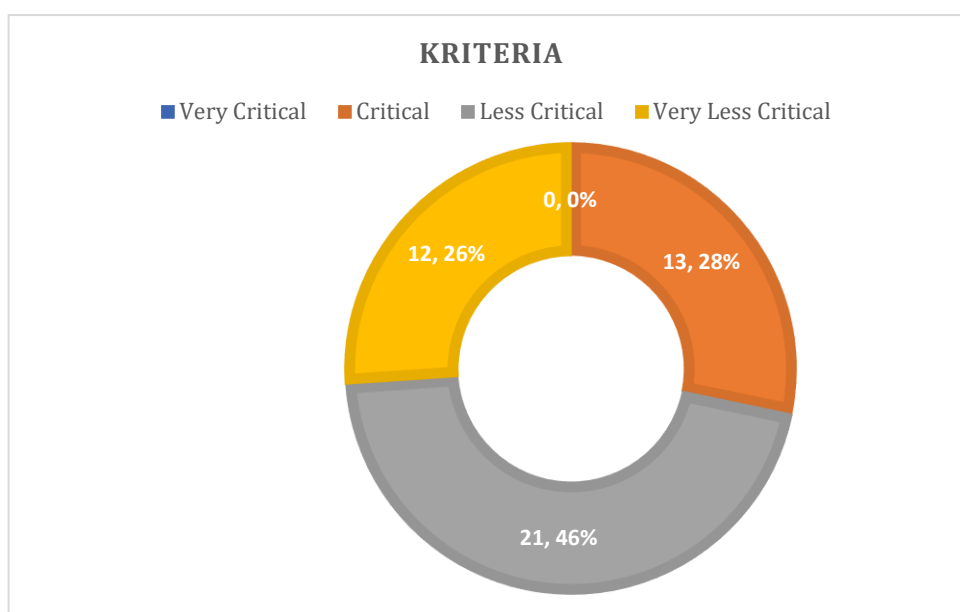


Figure 1. Percentage of Students' Critical Thinking Skills Category

Figure 1 shows that the critical thinking skills of Biology Education Study Program students still need to be improved because only 28% are in the critical category, and none are in the very critical category. The remaining 72% are in the less critical and very less critical categories. One of the reasons is that the lecturer does not choose the right method of teaching. Based on the results of observations, it is known that 88% of students stated that the method most often used by lecturers was the group discussion method, where every week, each group presented their respective material and then asked to discuss material they did not understand.

According to Suryosubroto (1997), the discussion method has many weaknesses, including: 1) A discussion cannot be predicted in advance about how the results will be because it depends on student leadership and the participation of its members. 2) A discussion requires certain skills that have never been learned before. 3) A few

outstanding students can dominate the course of the discussion. 4) Not all topics can be the subject of discussion, but only problematic matters can be discussed. 5) In-depth discussions require a lot of time. 6) If the atmosphere of discussion is warm and students dare to express their thoughts, it is usually difficult to limit the subject matter. 7) It often happens that in discussions, students lack the courage to express their opinions. 8) The number of students who are too large will affect the opportunity for each student to express their opinion.

Point 4 of the weaknesses can be inferred that learning Biology through paper presentations does not follow the characteristics of Biology, which are dominated by theories and facts that are certain or final, so it is not appropriate to be used as a topic of discussion. For example, the subject of anatomy and structure of plants and animals is material that is not properly taught using the discussion method. To train students' critical thinking skills in Biology Education Study Program, it is more appropriate to teach them through direct involvement in exploring learning resources and then elaborating them through practical/discovery activities both in the laboratory and in the natural surroundings. Practicum activities can improve students' critical thinking skills (Hamidy & Nuraini, 2023; Royani, Mirawati, & Jannah, 2018; Sandi & Fatisa, 2023). Familiarizing learners can also improve critical thinking skills by conducting a critical analysis of articles (Susilo, Zubaidah, & Rahman, 2020) or through innovations in the use of digital media such as game education, digital comics, etc (Jannah & Atmojo, 2022).

Creative Thinking Skills of Biology Education Study Program Students

The creative thinking skills of Biology Education Study Program students are measured based on indicators of creative thinking skills by Greenstein (2012), which consist of 8 indicators. Table 4 shows the creative thinking skills of Biology Education Study Program students in terms of each indicator.

Table 4 Creative thinking skills of Biology Education Study Program students

No.	Indicator	Average score	Category
1.	Curiosity	78.26	Creative
2.	Fluency	58.15	Creative Enough
3.	Authenticity	50.54	Creative Enough
4.	Elaboration	55.43	Creative Enough
5.	flexibility	55.98	Creative Enough
6.	Different	55.98	Creative Enough
7.	Risk Taking	63.04	Creative
8.	Working with Others	46.74	Creative Enough
	Average	58.02	Creative Enough

Based on Table 4, it is known that of the 8 indicators of creative thinking skills, there is no very creative category. Only the curiosity and risk-taking indicators are in the creative category, and the other indicators are in the creative enough category. The data on creative thinking skills, when viewed per student, is presented in Figure 2.

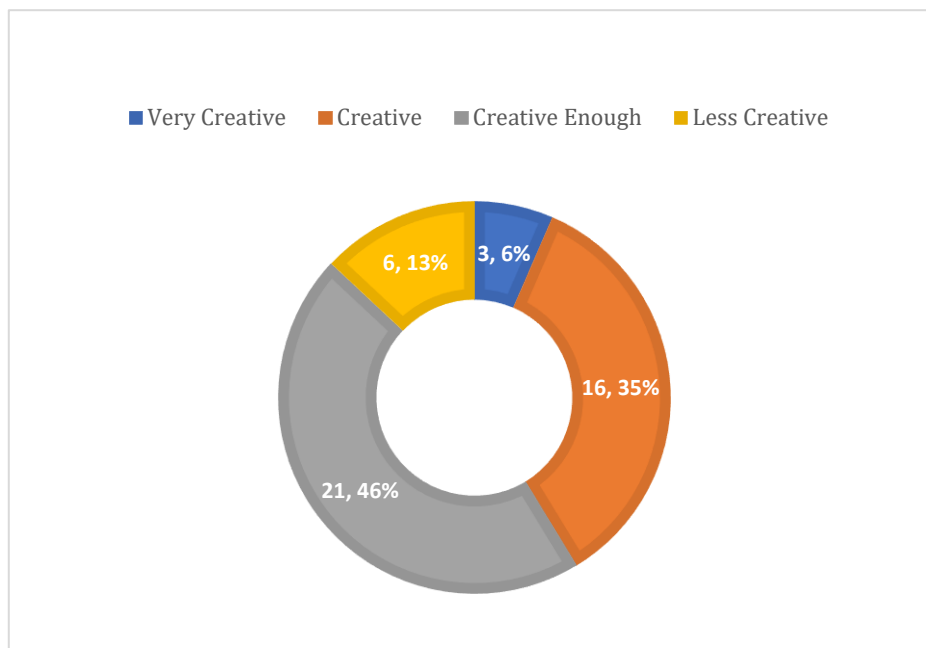


Figure 2. Percentage of students' creative thinking skill categories

Figure 2 shows the percentage of creative thinking skills of Biology Education Study Program students at UIN Alauddin Makassar using self-assessment. The data shows that only 6% of students are in the very creative category, 35% creative, 46% creative enough, and 13% less creative.

Regarding the curiosity indicator, most students answered that they were curious about a number of things and were usually willing to explore new ideas. Several students admitted that they had never wondered about anything. To increase students' desire to explore new knowledge, it is necessary to provide the right stimulus. The stimulus given must pay attention to the students' condition (Fatmawati & Anjarsari, 2021). One good stimulus is to relate the subject matter to everyday life (Millah, Budipramana, & Isnawati, 2012).

In the fluency indicator, several students feel that if they work with other people, they can find other ways of seeing things. Students have not been able to see a different point of view of something if they do it themselves. By seeing things from others' perspectives, we can generate many new ideas compared to just relying on our own knowledge (Rahardhian, 2022). However, someone who has high creativity will be able to do things in various ways with clear goals.

The next is the authenticity indicator. Many students still need/see examples or guidance in doing something, so new ideas are still difficult for students to realize. Therefore, it is necessary to apply a learning model that can make students active so that they do not just imitate what is written in the book or what their lecturers do (Faturrohman & Afriansyah, 2020)

In the elaboration indicator, students are already able to elaborate things better, but it takes a long time to think about these details. Forms of elaboration activities that can be carried out to describe the cognitive elaboration model of a student making

reports can be done through group discussions, cooperative learning, exhibitions, making reports, works or products, competitions, literature studies, browsing the internet, and others that challenge the development of cognition and creativity (Mandasari, 2018).

Student answers in the flexibility indicator indicate that they sometimes find it difficult to adapt to change. Need someone to remind you to do something different. Someone who has high flexibility is able to adapt well to new situations and can see many possibilities in learning and everyday life. According to Chaplin (2006), a flexible person is characterized as a person who is easy to adapt and has unique characteristics that can quickly change his ways of thinking.

Relating to the different indicator, students are able to carry out one or two ideas, but it is still simple. They still find it difficult to incorporate ideas, modify and adapt them, and rearrange them to improve results (Prayitno, 2016). A person with a divergent mind is able to sort out all the knowledge and abilities he has and criticize them before applying them in solving problems.

The results of the risk-taking indicator analysis show that some students try to do new things even though they run the risk of making mistakes that make everything fall apart. By doing new things, mistakes that occur can be used as lessons to be even better. Students who do not dare to take risks in learning tend to be passive, do not have new ideas, and do not dare to ask questions and express ideas (Muqodas, 2015).

In the works with other people indicator, most students answer that they usually watch and listen before sharing their creative ideas. Some students doubt whether there are ideas worth sharing with others. Based on the description above, a learning model that can improve students' critical and creative thinking skills is needed. The learning model in question is STILLaLI model modified from the PBL.

PBL consists of 5 stages, namely (1) Student orientation on the problem; (2) Organizing students to learn; (3) Guiding individuals or groups; (4) Developing and presenting the group; (5) Analyzing and evaluating the problem-solving process (Astuti, Mardiyana, & Triyanto, 2020; Lestari, Yusuf, & Basri, 2020). In the STILLaLI model, there are two additional steps, namely learning society, where Lecturers guide students to the community to socialize and teach findings at the investigation stage, and Islamic Learning; at this stage, students integrate findings with Islamic teachings, both hadiths and verses of Al-Qur'an.

CONCLUSION

Based on the results of a preliminary analysis of the critical thinking skills and creative thinking of students of the Biology Education Study Program, UIN Alauddin Makassar, it is obtained that critical thinking skills are in the less critical category with an average score of 53.09, while creative thinking skills are in the creative enough category with an average score average 58.02. It is necessary to develop a learning model that is able to improve the critical and creative thinking skills of students of the Biology Education Study Program at UIN Alauddin Makassar, namely the STILLaLI Model.

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