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# Collaboration Skill Of Biology Students At Universitas Islam Riau, Indonesia

**Nurkhairo Hidayati**

**Abstract**: Collaboration skill is known as the ability of someone to work both effectively and take responsibility for making the commitments that are necessary to achieve a common goal. Collaboration skills are important for students because, through collaboration skills, students are expected to achieve meaningful results when they experience real life in the community. The purpose of this research is to identify the collaboration skill of biology students at the Universitas Islam Riau in the human anatomy and physiology class. The research method used was a survey of 112 participants. Data collection is done by observation using observation guidelines. The collaborative skill indicators studied include responsibility, respect others, contributes, organizes work, works as a whole team. The results show that the indicators of collaboration skills from the lowest to consecutive are works as a whole team (58.5), organizes work (60.1), contributes (64.9), respects others (75), responsibility (76.4). In general, student collaboration skill is still in the good category (66.98), and therefore, a proper learning strategy is needed to improve student collaboration skill.

**Index Terms**: biology education, collaboration skill, human anatomy and physiology, student Minimum 7 keywords are mandatory,

## 1. INTRODUCTION

Today's society is considered by many to be a knowledge society [1, 2]. Anderson [3] defined knowledge society as a society where ideas and knowledge function as commodities. This commodity is used to combine the knowledge available in order to achieve success. Therefore, the impact of globalization and increasing public knowledge has led students to have the skills to succeed in the workplace and the community [3]. Students cannot expect to succeed if they can only do manual labor or job that could be replaced by machine work. Instead, success lies in the ability to communicate, share, and use the information to solve complex problems, able to adapt and innovate in response to new demands and changing circumstances. A number of studies and reports have identified the skills needed to succeed in the 21st century. Mccoog [5] argued that to acquire 21st-century skills; students must be encouraged to come up with new ideas, evaluate and analyze the material presented, and apply that knowledge to their previous academic experience. 21st Century skills are crucial to preparing students for the knowledge society. These skills include critical thinking and problem solving, communication, collaboration, creativity and innovation, information management, careers and life skills [1, 2, 6]. Collaboration is considered a skill that is a common requirement in today's world of work. Collaboration is a collaboration that provides experience to understand each other's strengths and weaknesses. Collaboration enables people to solve problems that they face and achieve common goals [7]. Collaboration is a group action to get things done together. A group is made up of two or more individuals interacting with one another, interdependent, defining themselves and defined by others as members of a group.

Collaboration involves sharing rules around common interests and participating in their roles, influencing each other, finding helpful groups, and pursuing common goals [8]. Collaboration is a skill that is very important in the learning process. Vygotsky's sociocultural theory [9] explained that an important aspect is the proximal development zone. The proximal development zone means that the learner cannot reach a new concept or idea unless he or she receives help or feedback from an educator or colleague. Peer interactions are an important way to facilitate cognitive growth and knowledge acquisition. It is further explained that peer collaboration can assist learners in problem-solving. Learners engaged in collaborative learning enhance their critical thinking and problem-solving skills [10]. Collaboration is very important in learning because with collaboration skills students can use it when they are in the working world. Furthermore, collaboration is increasingly being identified as an important educational outcome and is one of the key skill of the 21st-century [4, 11, 12]. Research shows that people with good collaboration skills enjoy better performance [13], have the ability to mobilize and energize others to create a shared vision of problem solving [14], facilitating the work of others, can identify and leverage various team members' capabilities [15]. Other studies have found that training students on how to work together (e.g., planning, group decision-making, setting goals, setting time, accepting roles, and creating a positive group environment) enhances learning effectiveness [16]. In other words, having better collaboration skills produces better results. Juceviciene & Vizgirdaite [17] see four key challenges in achieving collaboration skills: context, content, educators, learners. Collaboration is not just a means to develop or evaluate knowledge learned through engagement in learning and practice [18, 19]. Collaboration skills have been described as skills that drive learning mechanisms, such as induction, deduction, and associative learning [20, 21]. Some of the benefits of collaboration are effective job sharing; the integration of information from various sources of knowledge, perspectives, and experiences; and increased creativity and quality of solutions stimulated by the ideas of other group members [22]. Collaboration skills can also enhance students' social competencies, including conflict resolution skills and academic self-concept [23]. Given the importance of collaboration skills in learning, it is imperative to do research to find out collaboration skills in students. In addition, information on student collaboration in the Biology education program of the Universitas Islam Riau has never been explored. Based on this research, this study aims to find out the collaboration skills of biology students at Universitas Islam Riau, Indonesia.

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## 2 METHODOLOGY

The research was carried out at the biology education program of the Universitas Islam Riau with a total of 121 participants taking part in human anatomy and physiology courses. Collaborative skills data were collected by observing during the learning process. Observations are made based on the observation sheet. The observed collaboration skill indicators adapted from the NEA [24] and P21 [25] consist of responsibility, respect others, contributes, organizes work, works as a whole team. Observation guidelines were created on a descriptive scale ranging from 1 to 4 for each indicator. The data obtained were then analyzed to determine the level of student collaboration skills. Data analysis was performed using the following formula:

$$N = \frac{SC}{SM} x100$$

Description:
N = Value
SC = Accessed score
SM = Maximum score

The results of the calculation of collaboration skill values are grouped into several categories: excellent (80-100), good (60–79), sufficient (40-59), poor (20-39) and very low (0-19).

## 3 RESULTS AND DISCUSSION

The results of the research collaboration skills of biology students at Universitas Islam Riau in Human Anatomy and Physiology can be seen in Figure 1. Based on Figure 1, it can be seen that the indicator of collaboration skill with the highest value is responsibility (76.4, good category) and the respects indicator is only slightly related to the responsibility of 75 with the good category. Other collaboration skill indicators such as contributes and organize work are also in the good category with values being 64.9 for contributes indicator and 60.1 to organize work indicators. Of the five indicators of collaboration skill measured, the indicators works as a whole team with the lowest scores (58.5, sufficient category). The indicator of responsibility is higher than the other indicators because of the observation made when the student is given the task, and the task is collected according to the time specified. During the course of lectures, lecturers also need not be reminded to submit assignments on time. Students share responsibility as they work in groups to complete assigned tasks. Sharing responsibilities is more than just helping each other because students have to work collectively and take responsibility for their results [26]. One is said to have a responsibility when he is emotionally bound for whatever purpose he has set, works very hard to fulfill all responsibilities, and has the urge to do the right thing [27].

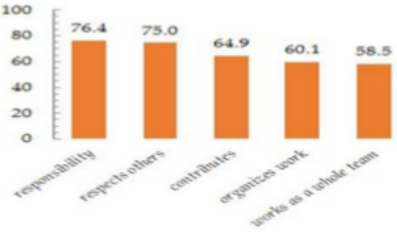


***Fig. 1**. Students' Collaboration Skill Score on Each Indicator*

The indicator works as a whole team lower than the other indicators because when a student is assigned a group assignments, then not all team members are involved. Besides, it is found that the group performs the task separately so that the task performed is a set of individual tasks. The maximum achievement of a given task can be achieved through teamwork. This means that each member of the group must be involved in teamwork. In this study, during the observation there were still groups that did not show teamwork. Teamwork is a collaborative process that enables ordinary people to achieve extraordinary results [28]. A team has shared goals, and team members can develop effective reciprocal relationships to achieve the team's goals [29, 30] Teamwork requires the ability of individuals working together to achieve shared team goals by sharing knowledge and skills. The literature consistently highlights that one important element of a team is its focus on common goals [26]. Teamwork can help people share the same goals and responsibilities for results. The low value of collaboration skills on the indicators works as a whole team is also due to the fact that students are not accustomed to recognizing the capabilities of each team member and can use those skills in completing tasks. The experiences students have had over the years have also influenced their ability to collaborate. Collaboration doesn't always come easily to learners. For example, Dewey noted that learners come up with past habits that may hinder working together. If learners are responsible for their learning, social, and interpersonal skills need to be taught [31]. Indicators of respect for others have a value of 75 and fall into enough categories. This indicator is only slightly different from the indicator of responsibility which is the indicator of the highest value (76.40). Observations using observational guidelines generally show that members of the group appreciate other members of the group when expressing their opinions. An important component of collaboration is giving and receiving feedback. Peer feedback in building knowledge has many benefits; for example, it can serve as a checkpoint between the quality and direction of a colleague's work on existing criteria [32]. Feedback can also provide opportunities to identify the strengths and weaknesses a colleague's work, suggest improvement in the job, and serve as a self-assessment tool to determine the gaps that are being made [32, 33]. The value that students gain for respectful indicators of others has not reached the good category as it is still found that members of the group maintain their opinions when other members of the group have different opinions. Each learner in the group supports the process of members of the other group while monitoring the goals set. In the learning process, learners are engaged in the joint planning, monitoring, evaluation, and regulation of the social, cognitive, and behavioral aspects of their learning [34]. The next indicator of collaboration skill observed is contributes. Data analysis results show that student achievement on these indicators is still in a good enough category (64.90). The form of contribution a group member makes during a discussion is to provide opinions and to look for references to complete the assigned task. Evaluation results are still visible to students who do not offer feedback or feedback after other members of the group have expressed their opinions. They are tired of just listening, and even some are busy playing with their phones. The purpose of collaboration in educational settings is to learn and unify shared content to develop shared understanding. The process of learning should be social action [35]. When

contributing to collaborative work, learners need to organize themselves, others, and groups [36]. Collaborating with others in groups and teams is a lifelong learning skill. When collaborating, people on the team can explore different ideas and experiences. This requires involvement in the exploration of ideas, knowledge, and mutual understanding [21]. The last collaboration skill indicator is organizing work. The value of collaboration skill on the indicator is 60.1 (sufficient category). Observations show that when a student is assigned a task, only a few people write it in a notebook about their to-do list and complete it with completion time. To facilitate collaboration, it is best for each student when a note or draft has been created to complete the task, so the draft and note need to be well organized. Once organized each member of the group can utilize to complete various tasks. Based on the results of the observations made, it has not been done. The findings show that in schools and universities, learners are not often taught teamwork or collaboration skills so the best way to learn to collaborate is to engage in activities that require learners to collaborate [36]. The benefits of teaching and learning collaboration when learners are given the opportunity to work together toward academic goals can be done by improving the quality of learning. In general, the University of Riau Islamic is quite good. Out of five indicators of collaboration skill studied, responsibility, respects others, contributes, organizes work, works as whole team responsibility indicators occupy the top order followed by aspects others, contributes, organizes work, works as a whole team. Collaboration skills are critical to identifying and prioritizing unfulfilled goals and determining the right course of action. Therefore, in the process of learning, it is necessary to determine the right learning strategies for students to have a good and useful collaboration when they are in work and the community.

## 4 CONCLUSION

Collaboration skills of biology students of the University of Riau are at the 66.98 for Human Physiology course which falls into the category. The highest indicator of collaboration skill is responsibility (76.4, good category) while the lowest is work as a whole team (58.5, category enough). The other three indicators of collaboration skills that are respects others (75) contributes (64.9) and organizing work (60.1) all fall into one category. Based on the research findings, educators need to think carefully about changing learning strategies so that choosing the right learning strategies is expected to enhance learners' collaboration skills. Related strategies such as assignments, troubleshooting, and other strategies aimed at building student skill collaboration. In turn, having good collaboration skills can prepare students for the working world.

## REFERENCES


[1] Dede, C. Comparing frameworks for 21st century skills. 21st Century Skills: Rethinking How Students Learn, 51–76, 2010.

[2] Chu, S. K. W., Reynolds, R. B., Tavares, N. J., Notari, M., & Lee, C. W. Y. 21st Century Skills Development through Inquiry-Based Learning, 2017, https://doi.org/10.1007/978-981-10-2481-8

[3] Anderson, R. E. Implications of the information and knowledge society for education. In International handbook of information technology in primary and secondary education, Springer, Boston, MA. Chicago, pp. 5-22, 2008.

[4] Boholano, H. Smart Social Networking: 21st Century Teaching and Learning Skills. Research in Pedagogy, 7(1), 21–29, 2017, https://doi.org/10.17810/2015.45

[5] Mccoog, I. J. 21 ST Century Teaching and Learning, 2, 1–6, 2008, Retrieved from https://files.eric.ed.gov/fulltext/ED502607.pdf

[6] Fong, L. L., Sidhu, G. K., & Fook, C. Y. Exploring 21st Century Skills among Postgraduates in Malaysia. Procedia - Social and Behavioral Sciences, 123:130–138, 2014.

[7] Sahin, A., Ayar, M. C., & Adiguzel, T. STEM Related After-School Program Activities and Associated Outcomes on Student Learning. Educational Sciences: Theory and Practice, 14(1), 309- 322, 2014.

[8] Collins, J. Higher-order thinking in the high- stakes accountability era: Linking student engagement and test performance. Unpublished doctoral dissertation, University of Missouri, 2009.

[9] Habets, oemar. 21 st century skills and the preparation for the labour market. Thesis University Netherlands, 2017.

[10] Neo, M. Developing a collaborative learning environment using a web-based design. Journal of Computer Assisted Learning, 19(4), 462–473, 2003.

[11] Pellegrino, J. W. Assessment as a positive influence on 21st century teaching and learning: A systems approach to progress. Psicologia Educativa, 20(2), 65–77, 2014. https://doi.org/10.1016/j.pse.2014.11.002

[12] Trilling, B., & Fadel, C. 21st century skills: Learning for life in our times. San Francisco, CA: Jossey-Bass, 2009.

[13] Druskat, V.U., & Kayes, D.C. Learning versus performance in short-term project teams. Small Group Research, (31), 328–353, 2000.

[14] O'Leary, R., Choi, Y., Gerard, C.M. The Skill Set of the Successful Collaborator. Public Administration Review, 72(SUPPL.1), 83–84, 2012. https://doi.org/10.1111/j.1540-6210.2012.02639.x

[15] Keast, R., & Mandell, M. P. Collaborative competencies/capabilities. Collaboration Evidence Prevention, 1–4, 2013.

[16] Prichard, J. S., Stratford, R. J., & Bizo, L. A. Team-skills training enhances collaborative learning. Learning and Instruction, 16(3), 256–265, 2006, https://doi.org/10.1016/j.learninstruc.2006.03.005.

[17] Juceviciene, P., & Vizgirdaite, J. Educational Empowerment of Collaborative Learning at the University. Social Sciences, 75(1), 41–52, 2012, https://doi.org/10.5755/j01.ss.75.1.1589

[18] Kuhn, D. Thinking together and alone. Educational Researcher, 44(1), 46–53, 2015

[19] Lai, E. R. Collaboration: A Literature Review, (2011). Retrieved from http://images.pearsonassessments.com/images/tmrs/Collaboration- Review.pdf

[20] Dillenbourg, P. What do you mean by 'collaborative learning?' In P. Dillenbourg (Ed.), Collaborative-learning: Cognitive and Computational Approaches (pp.1–19). Oxford: Elsevier, 1999

[21] Hunter, D. Assessing collaborative learning. British Journal of Music Education, 23(1), 75–89, 2006
[22] OECD Programme for International Student Assessment (PISA) 2015: Draft Collaborative Problem Solving Framework, 2013, Retrieved from http://www.oecd.org/pisa/pisaproducts/Draft%20PISA%202015%20Collaborative%20Problem%20Solving%20Framework%20.pdf
[23] Ginsburg-Block, M. D., Rohrbeck, C. A., & Fantuzzo, J. W. A meta-analytic review of social, self-concept, and behavioral outcomes of peer-assisted learning. Journal of Educational Psychology, 98(4), 732–749, 2006
[24] NEA. An Educator's Guide to the "Four Cs". Retrieved from http://www.nea.org/assets/ docs/A-Guide-to-Four-Cs.pdf, 2012.
[25] P21. Communication and Collaboration. Retrieved from https://www.p21.org/about-us/p21-framework/261-communication-and-collaboration, 2011.
[26] Tarricone, P., & Luca, J. Successful teamwork: A case study. Proceedings of the 25th HERDSA Annual Conference, Perth, Western Australia, 640–646, 7-10 July 2002,
[27] D'Agostino, C. Collaboration as an Essential School Social Work Skill. Children & Schools, 35(4), 248–25, 2013. https://doi.org/10.1093/cs/cdt021
[28] Scarnati, J. T. On becoming a team player. Team Performance Management: An International Journal, 7(1/2), 5-10, 2001
[29] Beal, B. Teamwork – The Key to Staff Development. Career Development International, 8/5, pp. 235-240, 2003
[30] Jiang, X. How to Motivate People Working in Teams. International Journal of Business and Management, 5(10), 223–230, 2010. https://doi.org/doi.org/10.5539/ijbm.v5n10p223
[31] Slavin, R. E. Research on Cooperative Learning and Achievement: What We Know, What We Need to Know. Contemporary Educational Psychology, 21, 70–79, 1995, https://doi.org/10.1006/ceps.1996.0004
[32] Lowell, V. L., & Ashby, I. V. Supporting the development of collaboration and feedback skills in instructional designers. Journal of Computing in Higher Education, 30(1), 72–92, 2018. https://doi.org/10.1007/s12528-018-9170-8
[33] Topping, K. Peer assessment between students in colleges and universities. Review of Educational Research, 68, 249–276, 1998
[34] Splichal, J. M., Oshima, J., & Oshima, R. Regulation of collaboration in project-based learning mediated by CSCL scripting reflection. Computers and Education, 125(June), 132–145, (2018). https://doi.org/10.1016/j.compedu.2018.06.003
[35] DeJarnette, A. F. Using student positioning to identify collaboration during pair work at the computer in mathematics. Linguistics and Education, 46, 43–55, 2018, https://doi.org/10.1016/j.linged.2018.05.005
[36] Splichal, J. M., Oshima, J., & Oshima, R. Regulation of collaboration in project-based learning mediated by CSCL scripting reflection. Computers and Education, 125(June), 132–145, 2018. https://doi.org/10.1016/j.compedu.2018.06.003 36 Gentry, R. (2012). Collaboration Skills Pre-service Teachers Acquire in A Responsive Preparation Program. Journal of Instructional Pedagogies, 8, 1–10.

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