

Student's professional competence development using the blended learning

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ABSTRACT

This research is motivated by the low level of competence of graduates from universities which results in low professionalism in the world of work in the current era of globalization. This research aims to show the relationship of increasing professional competence through a blended learning model. The sample of this study was forty-five students majoring in Mining ISTP FY 2021/2022 who were made into two sample groups. The control group (CG) of 20 students was the group that was not treated with the blended learning model, while the experimental group (EG) of 25 students was treated with the blended learning model. This research was conducted using a quantitative descriptive method. A test is used for each competency criterion to determine students' professional competence level. The results control group obtained a level of competence in the cognitive at 0%, andragogical competence at 25%, and social competence at 35%. In the experimental group, cognitive 48%, andragogical competence 72%, and social competence 64%. The results of this study concluded that the blended learning model could improve and develop the professional competence of graduate students so that they are competent in the world of work in the era of globalization.

Keywords: blended learning development, professional competence.

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INTRODUCTION

The current development of a country that requires acceleration to balance the flow of globalization requires reliable and competent human resources in their field. This is because the development of science and technology is growing rapidly and rapidly. Therefore, it is necessary to modernize the education system to balance the flow of globalization. The modernization of the higher education system is an essential factor in national development (Zhienbayeva et al., 2019). The target of higher education has led to the development of professional competence. Professional competence will answer the problems and challenges of human resources in the era of modernization. The quality of higher education dramatically

determines the professionalism of graduates in responding to challenges in the world of work and the flow of technological globalization. Of course, this is not easy to do, but like it or not, it must be implemented so that the process can continue to be developed. According to Prusakova, professional competencies include cognitive/ intellectual, andragogical, and social competencies.

Professional competence is closely related to the quality of a person who has received education at a particular stage and is ready to enter the world of work and the social environment (Orazbayeva, 2016). Professional competence has specific skills, knowledge, and life experiences that enable you to judge something, do something, or decide something (Ismuratova et al., 2018). Besides that, professional competence is a substantial generalization of empirical and theoretical knowledge presented in the form of principles, concepts, and things that make sense in a person's possession of relevant competencies, which includes a personal attitude towards the subject of activity and competence. Professional competence has the characteristics of personal qualities that integrate cognitive, motivational, empirical, value-based, and social (Kunanbayeva, 2016).

In the learning process, lecturers are the main component in practicing the development of professional competencies to be achieved. Therefore, professional lecturers must implement, evaluate, direct and develop professional competencies. Therefore, we need experienced lecturers characterized by high-flying hours and an adequate level of education. Professional lecturers are also needed to realize quality education to produce students who are competent in their fields. A teacher's competence can be found in Law No. 14 of 2005. Five of them include: (1) having a commitment to improving the quality of education, faith, piety, and noble character, (2) having academic qualifications and educational background that are by the field of work, (3) having the necessary competencies according to with the field of duty, (4) having responsibility for the implementation of professional duties, and (5) having the opportunity to develop professionalism sustainably by lifelong learning.

Besides lecturers who must be professional, the learning model must also support the achievement of professional competence development. A supportive learning model must synergize with the competency levels that must be achieved, such as cognitive, andragogical, and social competencies. The appropriate learning model is the blended learning model. Blended learning is a learning model that encourages students to be active in gathering information in the form of such knowledge. The blended learning model combines conventional learning with e-learning. This learning is no longer limited by space and time because learning can be done through distance, combining synchronous and asynchronous learning. Students can study anywhere and anytime with many Media sources. Blended Learning has encouraged the use of a wide range of knowledge sources. Teachers and lecturers are encouraged to achieve a good understanding and analysis of what is being learned. The blended learning model has also encouraged learners to interact with other learners regarding the relationship between cognitive processes and learning motivation. Based on the above background, the formulation of the problem in this study is whether the blended learning model can improve the professional competence of university graduates. This research is limited to the competency model, according to Prusakova. This study shows the relationship between increasing professional competence through a blended learning model.

RESEARCH METHODS

This research was conducted using a quantitative descriptive method. The sample from this study was forty-five students majoring in Mining ISTP FY 2021/2022 who were made into two sample groups. The control group (CG) of 20 students is a group that is not treated with the blended learning model, while the experimental group (EG) of 25 students is treated with the blended model. This research was conducted for one semester during the Covid-19 Pandemic when the University implemented a health protocol policy for students. TD Pardede Institute of Science and Technology Medan. A test is used for each competency criterion to determine students' professional competence level. The test material used to see cognitive competence is engineering mechanics courses at the university level. Competency levels are interpreted in table 1.

Table 1. Competency levels

Score	Interpretation
0 - 54	Not Competent
55 - 64	Less Competent
65 - 79	Quite Competent
80 - 89	Competent
90 – 100	Very Competent

This research was conducted in three stages (figure 1), namely the first stage of analyzing the background of the problem, literature study, and needs analysis of the development of this research. The second stage is where formative tests are carried out to obtain the required data and test the implementation of the experimental process. The third stage of this research is data management and data analysis to see an overview of the research results.

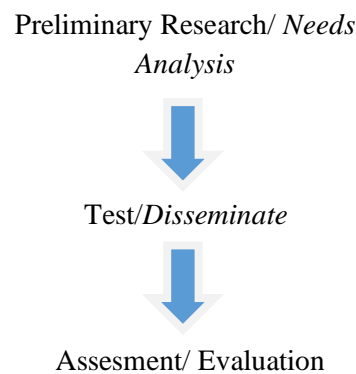


Figure 1. Stage of this research

Processing research data using a comparison of results between the control and experimental groups.

RESULTS AND DISCUSSION

The research data were taken from formative test results to students regarding the tested components. A formative test is used to see the results of the level of competence. Cognitive tests are given to see the achievements in the mastery of knowledge from the results of the blended learning model. The andragogical test is given to see students' ability to develop potential expertise. The social competence test is used to see the ability and flexibility of relationships with other people and external developments. After the test, the data obtained from the research results are in the table 2.

Table 2. Level Competence Professional

Group	Component	Not		Less		Quite		Very			
		competencies		competencies		competencies		competencies			
		Man	%	Man	%	Man	%	Man	%		
CG	Cognitive	2	10 %	11	55 %	7	30 %	-	-	-	-
	Andragogical competencies	1	5 %	3	15 %	11	55 %	5	25 %	-	-
	Social competencies	-	-	2	10 %	11	55 %	7	35 %	-	-
EG	Cognitive	-	-	1	4 %	8	32 %	12	48 %	2	8 %
	Andragogical competencies	-	-	-	-	3	12 %	18	72 %	4	16 %
	Social competencies	-	-	-	-	1	4 %	16	64 %	8	32 %

The research data for the control group (CG) For quiet competencies, the cognitive level is 30%, the andragogical component is 55%, and social competence is 55%. This illustrates that the student's professional ability is below the standard level of competence. For the experimental group (EG), the percentage of students at the competency level was 35% for the cognitive component, the andragogical component 48%, and the social competence component 72%. For quiet competencies, the cognitive level is 32%, the andragogical component is 12%, and social competence is 3%. In the experimental group, after being treated with the blended learning model, some students reached the very competent level in cognitive terms at 8%, andragogical competencies at 8%, and social at 32%. This is very much needed in the world of work.

After paying attention to the research data, the results were different between the control and experimental groups. In the control group, the distribution of student competencies is spread from not competencies, fewer competencies, Quite competencies, and competence levels. This is due to the conservative model of learning patterns. Some students do not have competence in terms of cognitive, andragogical, and social cognition. The lack of productivity in learning outcomes is caused by a pattern that focuses on lecturers and the lack of student involvement in seeking knowledge, developing their potential, and social relations with others. The nonparametric Mann-Whitney U test was used to see the impact of the learning model in this study. After paying attention to the research table that the critical values were 1.65 ($p \leq 0.05$) and 2.30 ($p \leq 0.01$). From these results, it was found that there was a median difference between

the competency levels in the control group and the experimental group. This difference shows that with the increasing average number due to blended model learning, the average value is getting better

For the experimental group, the results show that the distribution of competencies is in Fewer competencies, Quite competencies, competence levels, and very competencies. The existence of students obtaining the same competent level is influenced by the treatment of the blended learning model, which prioritizes student activity in learning. In terms of achieving cognitive competence, searching for scientific materials, media use, and interactive relationships between learners can improve student cognition. Learning resources and time are used to collect study materials. The blended learning model supports this. In this study, the ability to master the basic concepts of physics that will be applied through technical mechanics can be improved because the mastery of material that is quite broad and deep can be stimulated through problem-based learning in the blended learning model (Simangunsong & Trisna, 2021) Table 2, it is obtained differences in terms of social competence. This is because interactive activities in blended learning stimulate learner interaction. The influence of motivation in the blended learning model is vast because this model accommodates creative learning. Creating creations in the blended learning process has trained students to develop their professional potential in a professional work environment (Guseynova, 2020).

In the blended learning model, learning activities that stimulate both students and lecturers can affect cognitive, andragogical, and social productivity. The relationship between students and lecturers in conventional learning is complemented by learning through electronic and non-electronic media. Activities that spur productivity can increase student competence. However, the teacher must manage and control activities in blended learning. This is where the competence of qualified teachers is needed. From table 2, there is a very competent level is 8%. This level indicates that blended learning has a positive effect on increasing student competence. These results can be expected that the readiness of students in the professional world of work that demands mastery of knowledge and creation can meet the demands of professionalism.

CONCLUSION

Based on the research data and discussion above, it can be concluded that the blended learning model can improve and develop students' professional competence. Professional competence needed in today's world of work is a must. Through blended learning, cognitive competence, andragogical competence, and social competence can be improved through extensive knowledge search by the media, interaction between learners, and self-competence upgrades. The blended learning model allows competency development for other competencies to be achieved because it opens up much information students need. In this study, the lecturer's competence is also an inseparable unit because the competence of the lecturer can control the activities and productivity of the learner. So, lecturers must continue to learn to improve their professional competence and must be able to keep pace with the progress of the current era of technological globalization.

REFERENCES

- Antera, S. (2021). Professional Competence of Vocational Teachers: a Conceptual Review. *Vocations and Learning*, 14(3), 459–479. <https://doi.org/10.1007/s12186-021-09271-7>
- Asmarani, A., Sukarno, & Widdah, M. El. (2021). The Relationship of Professional Competence With Teacher Work Productivity In Madrasah Aliyah. *Nidhomul Haq : Jurnal Manajemen Pendidikan Islam*, 6(2), 220–235.
- Bautista, A., & Oretga-Ruiz, R. (2017). Teacher Professional Development: International Perspectives and Approaches. *Psychology, Society, & Education*, 7(3). <https://doi.org/10.25115/psye.v7i3.1020>
- Burhendi, F. C. A., Abdurrozak, A., & Soenarto, S. (2020). The implementation of blended learning models based liveboard against affective aspects in modern physics course. *Gravity : Jurnal Ilmiah Penelitian Dan Pembelajaran Fisika*, 6(1), 1–6. <https://doi.org/10.30870/gravity.v6i1.7106>
- Darminto, B. P., & Sugandi, B. (2021). Analysis of Professional Competence of Mathematics Education Students during the Covid-19 Pandemic. *Hipotenusa : Journal of Mathematical Society*, 3(1), 80–96. <https://doi.org/10.18326/hipotenusa.v3i1.80-96>
- Daryati, N. (2016). Pengaruh Kompetensi Profesional dan Motivasi Berprestasi Siswa Terhadap Hasil Belajar Matematika. *Jurnal Penelitian Pendidikan Dan Penilaian Pendidikan*, 1(1), 76–91. <https://doi.org/10.22236/JPPP>
- Djajadi, M., Sumintono, B., & Mislan, N. (2013). Enhancing knowledge and skills competencies: A case study of physics teachers professional development in Makassar, Indonesia. *International Journal of Science Commerce and Humanities*, 1(1), 20–27. <http://www.ijsch.com/journaluk>
- Guseynova, E. L. (2020). *Motivation as a Factor of Professional Competence Development in Students*. 447(Pelseg), 152–155. <https://doi.org/10.2991/assehr.k.200723.031>
- H Motlan, Sinulingga, K., & Siagian, H. (2016). Inquiry and Blended Learning Based Learning Material Development For Improving Student Achievement On General Physics I of Mathematics and Natural Science of State University of Medan. *Journal of Education and Practice*, 7(28), 171–176.
- Ismuratova, S. I., Slambekova, T. S., Kazhimova, K. R., Alimbekova, A. A., & Karimova, R. E. (2018). Model of forming future specialists' research competence. *Espacios*, 39(35).
- Jan, H., & Jrf, N. /. (2017). *Teacher of 21 st Century: Characteristics and Development*. 7(9), 2225–0484. www.iiste.org
- Jupri, A., & Rosjanuardi, R. (2020). An Investigation of Master Student Understanding on Mathematical Literacy Problems. *Jurnal Gantang*, 5(1), 1–7. <https://doi.org/10.31629/jg.v5i1.1828>
- Koichu, B., & Leron, U. (2015). Proving as problem solving: The role of cognitive decoupling. *Journal of Mathematical Behavior*, 40, 233–244. <https://doi.org/10.1016/j.jmathb.2015.10.005>
- Kunanbayeva, S. S. (2016). Educational paradigm: Implementation of the competence-based approach to the higher school system. *International Journal of Environmental and Science Education*, 11(18), 12699–12710.
- Lam, B. H. (2015). Teacher Professional development in Hong Kong compared to anglosphere: The role of confucian philosophy. *Psychology, Society and Education*, 7(3), 295–310. <https://doi.org/10.25115/psye.v7i3.521>
- Ling, L. M., & Mackenzie, N. M. (2015). An Australian perspective on teacher professional development in supercomplex times. *Psychology, Society and Education*, 7(3), 264–278. <https://doi.org/10.25115/psye.v7i3.517>
- Makhashova, P., Meirmanov, A., Zhunusbekov, Z., Makasheva, O., Mirzaliyeva, E.,

- Ermuratova, A., & Sakenov, J. (2016). On the development of professional competence in students of creative pedagogical specialties. *International Journal of Environmental and Science Education*, 11(11), 4660–4668.
- Mulder, M. (2014). *Professional Competence in Context – a Conceptual Study*. January 2015, 1–23.
- Mursyidto, M. I. (2014). Daftar Pustaka. In *Implementation Science* (Vol. 39, Issue 1, pp. 1–15).
<http://dx.doi.org/10.1016/j.biochi.2015.03.025><http://dx.doi.org/10.1038/nature10402><http://dx.doi.org/10.1038/nature21059><http://journal.stainkudus.ac.id/index.php/equilibrium/article/view/1268/1127><http://dx.doi.org/10.1038/nrmicro2577><http://>
- Mustafa, M. N. (2013). Professional competency differences among high school teachers in indonesia. *International Education Studies*, 6(9), 83–92.
<https://doi.org/10.5539/ies.v6n9p83>
- Nelson, B. (2016). Rethinking Higher Education. *ICERI2016 Proceedings*, 1(April), 5499–5499. <https://doi.org/10.21125/iceri.2016.2351>
- Orazbayeva, K. O. (2016). Professional competence of teachers in the age of globalization. *International Journal of Environmental and Science Education*, 11(9), 2659–2672.
<https://doi.org/10.12973/ijese.2016.714a>
- Osagie, E. R., Wesselink, R., Blok, V., Lans, T., & Mulder, M. (2016). Individual Competencies for Corporate Social Responsibility: A Literature and Practice Perspective. *Journal of Business Ethics*, 135(2), 233–252. <https://doi.org/10.1007/s10551-014-2469-0>
- Penerapan, P., Teki, T., Dalam, S., Terhadap, D. L., Belajar, H., Siswa, F., & Xi, K. (2017). *Jurnal riset fisika edukasi dan sains*. 3(2), 75–86.
- Pongkendek, J. J., Marpaung, D. N., Ahmar, D. S., & Rahmatia, S. (2021). The Professional Competence Analysis of Chemistry Teacher of Senior High School in Merauke. *Journal of Applied Science, Engineering, Technology, and Education*, 3(1), 46–52.
<https://doi.org/10.35877/454ri.asci103>
- Pozdniakova, S., & Dvorak, E. (2019). *Ways of assessing university teachers` professional competence*. 331(Ismge), 581–585. <https://doi.org/10.2991/ismge-19.2019.110>
- Simangunsong, S., & Trisna, I. (2021). Analisa Kognitif Model Blended Learning Dengan Pendekatan Kalkulus Dasar. *Jurnal Pendidikan Fisika Dan Teknologi*, 7(1), 11–16.
<https://doi.org/10.29303/jpft.v7i1.2580>
- Study, M., Madura, I., & Sumenep, U. (2022). *HIGHER EDUCATION RESOURCES MANAGEMENT IN IMPROVING LECTURERS ' COMPETENCE IN THE COVID-19 PANDEMIC*. 6(4), 4609–4621.
- Suwartini, E. A. (2017). Supervisi Akademik Kepala Sekolah, Profesionalisme Guru Dan Mutu Pendidikan. *Jurnal Administrasi Pendidikan*, 24(2), 62–70.
- Syamsuddin, R.-. (2019). Clinical Supervision Model for Building Sciences Teacher's Professionalism in Curriculum Implementation 2013. *Jurnal Pendidikan Fisika*, 7(3), 291–305. <https://doi.org/10.26618/jpf.v7i3.2335>
- Tirtayasa. (n.d.). *DI PROGRAM STUDI PENDIDIKAN MATEMATIKA UNTIRTA Anwar Mutaqin , Indiana Marethi , dan Syamsuri A BLENDED LEARNING MODEL*. 134–141.
- UNM. (2017). Educational Science and Technology UNM. *Jest*, 4(3), 173–177.
<http://ojs.unm.ac.id/JEST/index>
- Žeravíková, I., Tirpáková, A., & Markechová, D. (2015). The analysis of professional competencies of a lecturer in adult education. *SpringerPlus*, 4(1).
<https://doi.org/10.1186/s40064-015-1014-7>
- Zhienbayeva, S., Kalysh, A., Zhubandykova, A., Nabuova, R., Issayeva, A., Abilmazhinova, O., & Ahmuldinova, A. (2019). The model of professional competence development in

future Physical Education teachers at an entrepreneurial university. *Espacios*, 40(31), 1–12.