Academic Supervision: Analysis of Lecturer Professionalism Based on Digital Competence

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Abstract. This study aims to analyze the needs of lecturer professionalism based on aspects of digital competence in relation to academic supervision. Quantitative research method uses factor analysis with junior lecturers of the Faculty of Computer Science as respondents at Brawijaya University. The research results obtained in the field are the digital competence of professional lecturers in the aspect of using digital technology is 16%; data information and knowledge is 10 %; communication and collaboration is 6%; digital content creation is 31%; integrating digital pedagogy is 23%; and ethics using digital technology is 14%.

Keywords: Academic supervision, lecturer professionalism, digital competence

1   Introduction

Academic supervision is implemented through activities that focus on providing assistance with the aim of increasing the professionalism of lecturers in tertiary institutions. Providing this assistance can be in the form of performance appraisal in relation to the learning process, conducting training in the form of workshops or seminars, and monitoring and controlling each lecturer which is carried out by educational supervisors [1]. Supervision activities apart from helping improve the professional abilities of lecturers, also function to check and ensure learning is carried out in accordance with the provisions and objectives so that it will encourage educators to improve competence, carry out their duties wholeheartedly and have a high commitment as educators and teachers in a professional manner [2]. So that it is articulated that through these supervision activities it has a contribution in monitoring the teaching and learning process and encouraging lecturers to maximize abilities that increase their professionalism.

The concept of academic supervision is very suitable in supporting the implementation of a differentiated learning process that aims to achieve optimal student well-being. Students' well-being is an indicator that provides an overview of their effectiveness in accepting the learning process without coercion or heavy hearts when receiving material delivered directly by lecturers at tertiary institutions [3]. The concept of well-

being embodies the necessity for universities as educational institutions to be able to manage effective learning processes that support the realization of well-being in students [4]. The learning process is the main factor that can influence the success of the educational institution itself. Based on this study, it is known that the learning process has a strong influence in realizing learning that achieves student well-being [5]. Maximum implementation of academic supervision can realize effective learning by developing academic supervision instruments that pay attention to the elements of learning in the digital era.

The current phenomenon of digitalization makes all kinds of things that were previously manual or traditional digitalized, both in terms of learning media and teaching abilities that educators in the 21st century must have [6]. One of them can also be seen from the competency aspect of digital lecturers who in the future must continue to be trained professionally. The need for lecturer professionalism related to the learning process in academic supervision can be linked to several aspects of lecturer competence. The use of digital media, especially for educators, is an obligation because they play a role as active users in the educational environment [7].
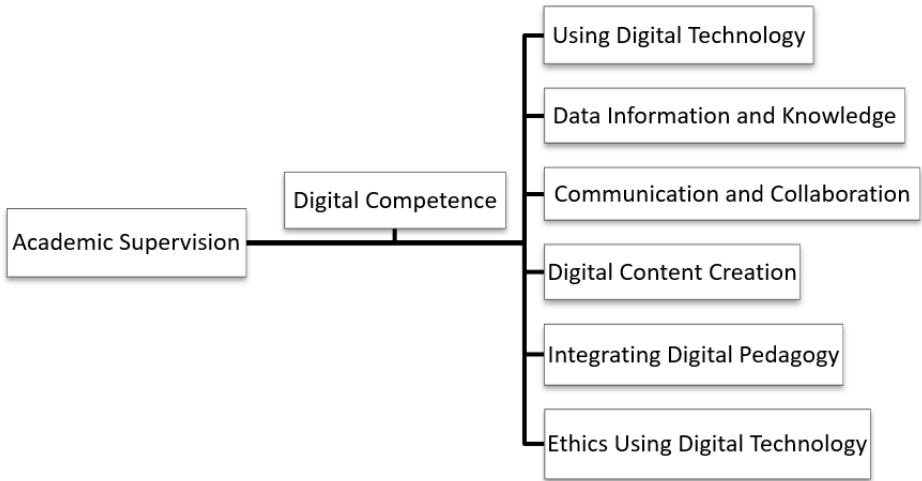
The urgency seen in the need for digital competence is increasingly prominent when viewed from an educational perspective, so that this has become one of the main competencies that digital era educators must master. Teachers in higher education realize that they have a relatively moderate to low level of digital competency and this is coupled with a lack of certain competencies related to the evaluation of educational practices, so this problem should be addressed so that they can deepen the assessment of digital competency and design more practical training programs. to respond to the needs of digital era educators [8]. Based on this, the aim of this research is to analyze the needs of lecturers related to digital competence in a professional manner so that training programs through academic supervision in higher education can be realized optimally.

Digital literacy competence for educators will certainly have a positive impact on understanding and skills in using digital media which are always used in every learning process [9]. Digital competence and digital literacy are becoming a concept that is increasingly being used in public discourse, because it has the goal of creating knowledge about reference strategies for competence and digital literacy from the increasingly rapid development of the digital era and the increasing number of scientific disciplines [10]. Various kinds of digital skills and competencies that are very diverse make educators required to always learn in academic supervision activities in the form of lecturer training so that in the future teaching and learning activities will obtain satisfactory results as can be seen from the periodic increase in student learning outcomes.

2   Method

The method used in this research is quantitative with a factor analysis to get precise and informative findings. Considering that research methods must answer and adapt to research questions, quantitative research emphasizes internal control of the research process [11]. The research process begins by asking a question or a series of questions related to a problem that the researcher will try to answer by applying the scientific

method. Measurement and statistics are very important for quantitative research because they are the link between observed data and explanatory theoretical models [12]. Digital competency has six aspects including using digital technology, data information and knowledge, communication and collaboration, digital content creation, integrating digital pedagogy, and ethics using digital technology [13]. The conceptual framework of this study can be seen in Figure 1.

Fig. 1. Conceptual framework

The procedure in this quantitative approach begins with identifying needs based on digital competencies and preliminary studies. Data analysis uses the IBM SPSS Statistics 22 program to obtain accurate research results. The output of the data analysis obtained is then interpreted to make research findings that are easy to understand, then draw research conclusions. The background of quantitative research is one of many research methods used to help educators advance their understanding of the questions asked [14]. This research requires several respondents to be able to obtain initial needs analysis data in academic supervision. Respondents in this study were junior lecturers from the Faculty of Computer Science at Brawijaya University. Respondent data was obtained from distributing online questionnaires which were carried out in stages. The instruments in the research have been adapted to the analysis of the needs of lecturer professionalism in the current aspect of digital competence.

3   Result and Discussion

The research conducted obtained several findings regarding the need for aspects of digital competence, including using digital technology, data information and knowledge, communication and collaboration, digital content creation, integrating digital pedagogy, and ethics using digital technology. Results of the Anti-image Matrices with code letter (a) mean that Measure of Sampling Adequacy (MSA) can be seen in Figure 2.

Anti-image Matrices

		Using Digital Technology	Data Information and Knowledge	Communication and Collaboration	Digital Content Creation	Integrating Digital Pedagogy	Ethics Using Digital Technology
Anti-image Covariance	Using Digital Technology	.624	-.119	.111	-.090	-.173	-.076
	Data Information and Knowledge	-.119	.505	-.209	.113	-.075	-.257
	Communication and Collaboration	.111	-.209	.594	-.107	-.119	-.026
	Digital Content Creation	-.090	.113	-.107	.478	-.230	-.180
	Integrating Digital Pedagogy	-.173	-.075	-.119	-.230	.442	.172
	Ethics Using Digital Technology	-.076	-.257	-.026	-.180	.172	.577
Anti-image Correlation	Using Digital Technology	.772[a]	-.213	.183	-.164	-.330	-.127
	Data Information and Knowledge	-.213	.645[a]	-.381	.229	-.160	-.477
	Communication and Collaboration	.183	-.381	.750[a]	-.200	-.232	-.044
	Digital Content Creation	-.164	.229	-.200	.671[a]	-.500	-.343
	Integrating Digital Pedagogy	-.330	-.160	-.232	-.500	.641[a]	.341
	Ethics Using Digital Technology	-.127	-.477	-.044	-.343	.341	.567[a]

a. Measures of Sampling Adequacy(MSA)

Fig. 2. Anti-image matrices

The interpretation of Figure 2 shows that the MSA value is > 0.50, which means that the requirement has been fulfilled properly. The MSA value of using digital technology is 0.772; data information and knowledge is 0.645; communication and collaboration is 0.750; digital content creation is 0.671; integrating digital pedagogy is 0.641; and ethics using digital technology is 0.567. Communalities which will show the value of each component studied, whether it is capable of explaining the factors or not. Results of the Communalities are shown in Figure 3.

Communalities

	Initial	Extraction
Using Digital Technology	1.000	.523
Data Information and Knowledge	1.000	.758
Communication and Collaboration	1.000	.514
Digital Content Creation	1.000	.700
Integrating Digital Pedagogy	1.000	.829
Ethics Using Digital Technology	1.000	.755

Extraction Method: Principal Component Analysis.

Fig. 3. Communalities

The interpretation of Figure 4 shows that the final value of Extraction > 0.50 fulfills the requirement well. Extraction value from using digital technology is 0.523; data information and knowledge is 0.758; communication and collaboration is 0.514; digital content creation is 0.700; integrating digital pedagogy is 0.829; and ethics using digital technology is 0.755. Research findings for analysis of lecturer competencies can be seen from Figure 4.
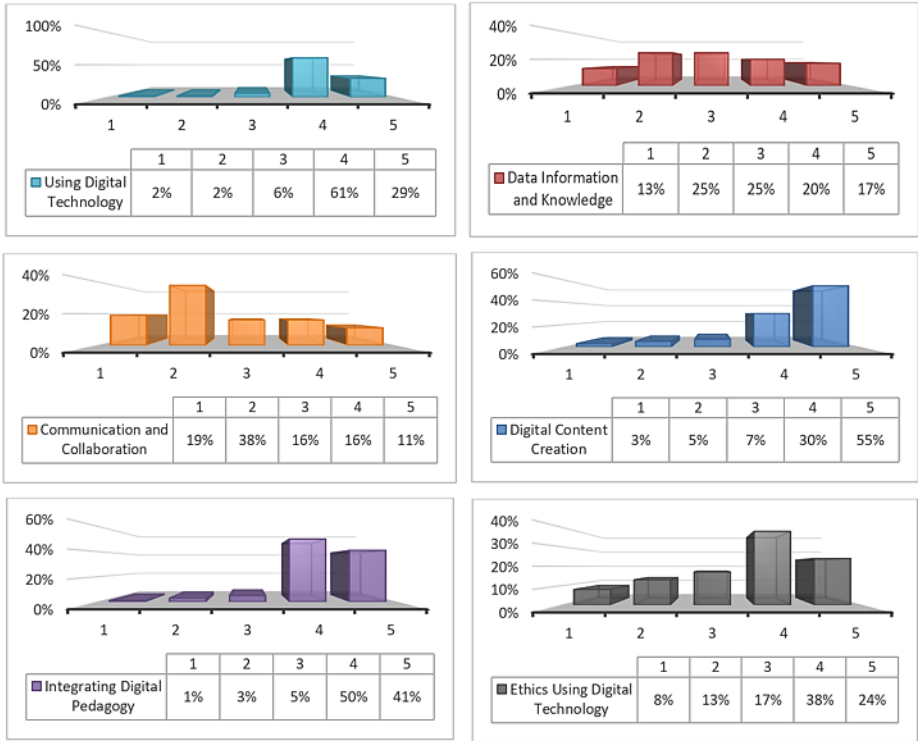
Fig. 4. Needs analysis of lecturer competencies

The research results obtained so that academic supervision is carried out properly based on the professionalism needs of lecturers in aspects of their digital competence can be seen in Figure 5.
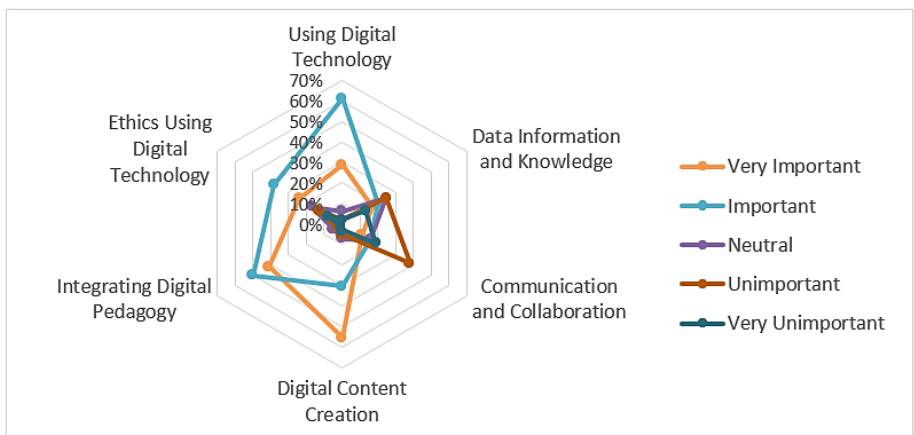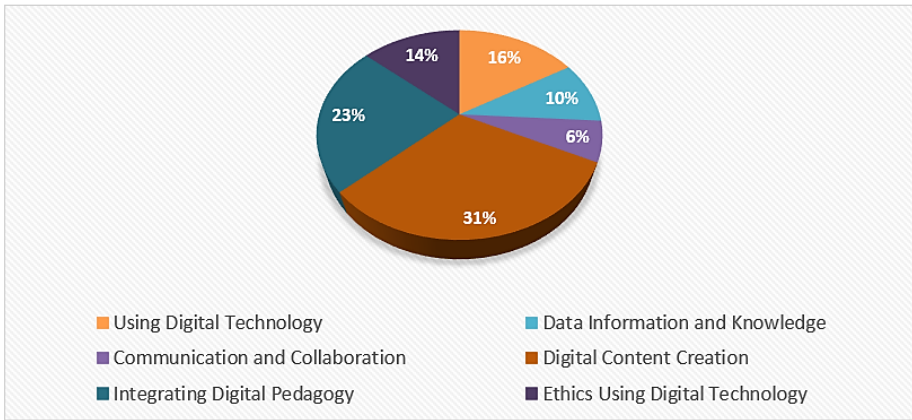

Fig. 5. Digital lecturer competency aspects

Figure 5 shows that the highest very important category is in the aspect of digital content creation by 55%. In the highest important category, there is the aspect of using digital technology, which is 61%. For the neutral category, the highest is in the aspect of information and knowledge data by 25%. Then in the unimportant category which has the highest level is the communication and collaboration aspect of 38%. Meanwhile, the very unimportant category has the highest level of communication and collaboration aspect of 19%. These results state that the need for academic supervision in relation to the learning process in tertiary institutions requires more training on digital content creation aspects so that teaching and learning activities and student learning outcomes are increasing due to the delivery of material informatively, creatively, and innovatively. As for the results from the analysis of lecturer professionalism based on digital competence can be considered in Figure 6.

Fig. 6. Lecturer professionalism based on digital competence

Figure 6 explains that digital competence in the aspect of digital content creation gets the first percentage ranking is 31%; aspect of integrating digital pedagogy get the second percentage ranking of 23%; aspect of using digital technology get the third percentage ranking is 16%; aspect of ethics using digital technology get the four percentage ranking is 14%; aspect of data information and knowledge get the five percentage ranking is 10%; and then aspect of communication and collaboration get the six percentage ranking is 6%.

Research results show that the most supervisory need for lecturers in universities based on data is digital competency in the aspect of digital content creation. This is reinforced by several studies which say that the presence of information and communication technology in the atmosphere and situation of education has led to the development of educators' digital competence which is one of the educational challenges that must be faced by holding a lot of training for educators such as digital content creation workshops so that they can support the learning process properly [15]. The development of information and communication technology can change the way of life and even education that is carried out at various levels. As a result, not only students but

educators also need to improve their digital competence, especially in the context of higher education [16]. The presence of information and communication technology in the atmosphere and situation of education has led to the development of educators' digital competence which is one of the educational challenges that must be faced by holding a lot of training for educators such as digital content creation workshops so that they can support the learning process properly [15]. In the findings of this research, if we look at the need for training regarding digital competencies in the digital content creation aspect, there are 65% males and 35% females detected based on the gender of the lecturer. In line with research results which show that women tend to have a higher level of creative and innovative digital content creation than men, where the sample was taken from 520 Spanish language educators. [17]. Developing the field of digital competence in an era of modern technology like today is a major need, especially regarding the creation of digital content which is felt to be promoted more so that it can be a solution to the problems of teaching and learning activities [18].

Lecturers' needs related to digital competency are the highest after the digital content creation aspect, namely integrating digital pedagogy, reaching 23%, where this must also be given more attention when planning to carry out academic supervision through workshops, seminars, and so on. It has been proven in research that integrating digital pedagogy can prove to be a distinct approach in integrating technology more effectively to improve student exam performance so that [19]. It is certain that when lecturers receive competency training regarding aspects of integrating digital pedagogy, it really helps improve the evaluation results of teaching and learning activities. The entire learning cycle experienced by students needs to be integrated with digital pedagogy in order to be able to present maximum learning outcomes by exploring various kinds of learning methods used. The advancement of an educational model that is oriented towards digital competence has represented the effectiveness that has been integrated with pedagogical technology and other digital-based learning tools specifically through the features of the education system that contribute to the development of the main competencies of the teaching and learning process [20].

Results of the analysis of lecturers' needs for further competency training, followed by the aspect of using digital technology which reached a percentage of 16%, means that it must continue to be refined and improved periodically. This finding is of course supported by several studies which show that the majority of university lecturers have a positive attitude towards the use of digital technology in education [21]. In addition, the attitude of prospective teachers towards the use of digital technology has been shown to have an important role when viewed from their level of proficiency in using and utilizing digital technology in an educational environment [22]. It can be seen that even though the average lecturer in higher education can use technology well, it is possible that they still need updates related to the latest digital technology that supports learning so that lecturers can interact with students through using technology in a professional and not outdated manner. In the world of educators, this can also be used to measure four digital technologies such as digital resources, communication tools, digital tools, and online learning tools [23].

The need for digital competency ethics training for lecturers for aspects of using digital technology is relatively low with a percentage of 14%. In contrast, if we compare it with previous research which states that even though digital competence is currently present in the world of modern education, most of the plans assessed are 78%, only 26.1% of the various existing teaching guides have included aspects of ethics using digital technology in activities. teaching and learning [24]. Based on this research, the conclusion that can be drawn is that 21st century educators receive very little ethical training related to developing digital competencies that they should receive more than what they currently receive. The comparison is further strengthened by several scientific works which state that ethical dimension of using digital technology in digital competence is proven to really need to be strengthened in educator training, because it can be a useful ethical guide when implementing digital technology-based learning is utilized [24]. The importance of highlighting ethics in the use of digital technology is also considered as one of the main dimensions for developing curriculum in tertiary institutions, so that communication and collaboration priorities during the teaching and learning process using digital resources can be facilitated properly according to the rules provided [25]. The social impacts and moral consequences of the development of digital technology require monitoring and further study so that the code of ethics in the use of digital tools is properly controlled according to the needs of education [26]. It can be concluded that although the level of lecturers' need for ethics training is not very high, universities should consider this scientific study so that morality is maintained in the world of education.

As for the data information and knowledge aspect, it was found that the percentage of lecturer training needs in tertiary institutions was 10%, which is still relatively low when compared with the previous aspects. In fact, if you look at issues in the world of education in the current digital era, information and knowledge data plays a quite important role so that universities can maintain their existence among society using optimal use of big data. As is the case in research which states that information and knowledge data are considered very important in the world of education, especially for building the construction of knowledge images for effective dissemination of information and often utilizing digital technology such as big data [27]. Data that contains a variety of information and knowledge from various disciplines is often neatly stored in big data both for reviewing the big data mining process in education, tools or applications [28]. Utilization of data information and knowledge in digital technology has become a separate revolution in the decision-making process in various fields, including education [29]. The incorporation of information and communication technology into the world of education creates many opportunities and allows us to collect various information about the teaching and learning process [30]. From this discussion, it can be seen that the role of digital competency training regarding data, information and knowledge is actually needed to be able to strengthen the performance of higher education institutions in processing and managing various kinds of data, both information and knowledge, which need to be obtained by academics who are actively involved in every educational process.

Even though in this scientific study the results of the need for digital competency training for educators in the communication and collaboration aspect were only 6% however, for several other educational fields it turns out that training is really needed. Education must maximize existing training experiences by adapting various kinds of educator competencies with the use of the latest digital technology while still prioritizing communication, collaboration, innovation, and flexibility [31]. This is also strengthen differences by research that electronic devices in relation to digital technology used often depend on communication and collaboration [32]. Therefore, academic supervision in higher education related to communication and collaboration aspects should be maintained in lecturers' digital competency training materials so that they continue to have innovation and creativity in teaching or learning to students. In line with research which states that communication and collaboration skills among students at ASEAN tertiary institutions often involve a Virtual Learning Environment (VLE) system to be able to enhance knowledge and learning experiences within the ASEAN cultural community [33]. The global need for digital technology that enables educators and students to communicate and collaborate in education is increasing regularly, especially in universities [34]. Recent advances in communication, collaboration and conferencing through digital technology can facilitate the continuity of teaching, research and community service activities [35].

4   Conclusion

The conclusion from the analysis of the professionalism needs of lecturers in relation to digital competence for academic supervision in the learning process is first seen from the aspect of digital content creation is 31%. Second, for aspect of integrating digital pedagogy is 23%. Third, it can be seen from the aspect of using digital technology is 16%. Four, for aspect of ethics using digital technology is 14%. Five, seen from the aspect of data information and knowledge is 10%. The last one, for aspect of communication and collaboration is 6%. Based on the results of the analysis obtained in this study, in the future it will become a reference for the needs of educators in the learning process by holding academic supervision activities so that the quality of education continues to develop and improve regularly.

The findings explain that the need for academic supervision for digital competence of lecturers is highest in digital content creation and integrating digital pedagogy, therefore further research can be carried out regarding the development of academic supervision models related to the importance of using digital technology in teaching and learning activities as well as guidance on digital content creation so that learning can run optimally using the use of technology in the digital era. This can also be a reference for supervisors to be able to develop their human resources to become more qualified regarding the learning process in higher education as well as in the framework of designing training activities for junior lecturers so that teaching skills in the digital era are even more superior.

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