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Original Article

Supporting Factors of Tri Dharma Performance during Work from Home

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Abstract: The COVID-19 pandemic challenges the education system to continue executing learning activities optimally. This study aimed to analyse the effect of the physical work environment and knowledge-sharing behaviour on implementing the Tri Dharma of Higher Education for lecturers working from home during the COVID-19 pandemic. To collect data, the study formulated questionnaires distributed to 100 lecturers in Higher Education across West Kalimantan Province. The data were analysed using PLS-SEM with the SMARTPLS program. The result showed a positive and significant effect of the physical work environment on lecturer performance in implementing the Tri Dharma of Higher Education. In addition, a positive and significant effect of knowledge-sharing behaviour was also reported on lecturer performance in implementing the Tri Dharma of Higher Education.

Keywords: physical work environment; knowledge-sharing; tri dharma of higher education.

1 Introduction

When the COVID 19 pandemic hit the world, educational institutions (schools and universities) were forced to carry out activities remotely through online school and lectures. In Indonesia, this new trend, so-called Work From Home (WFH), not only forced lecturers in Higher Education to conduct online lectures from home but also affected the other elements of Tri Dharma (the Threefold Mission) of Higher Education stated by the government. Tri Dharma of Higher Education is a vision of all Indonesian universities to produce people with high enthusiasm, critical thinking, creativity, independence, and innovation. Tri Dharma of Higher Education is the primary objective to be achieved by universities. It consists of three elements: Education and Teaching, Research and Development, and Social Service. These elements are the responsibility of students, lecturers, academic staff, and other parties involved in a university's teaching and learning process.

While meeting the Tri Darma elements alone is considered a high workload for some lecturers, fulfilling them from home is even more challenging. First, performing work-related things from home requires lecturers to have additional skills, i.e., those related to information and communication technology. Furthermore, the work environment also changes. Lecturers, who previously gave a lecture in class, conducted research, and carried out social services on campus, currently must work from home in a different atmosphere. Therefore, the sudden implementation of the remote

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learning system raises many issues, including the lecturer's unpreparedness to use information technology and a non-optimized work environment. Previous studies stated that the work environment affects the performance of human resources. It comprises various factors that serve as the key roles of employee performance (Hafee et al., 2019). One example is the physical work environment elements that must be appropriate to avoid employees' stress when performing their jobs (McCoy & Evans, 2005; Vischer, 2007).

Naharuddin and Sadegi (2013) and Mathews and Khann (2016) claimed that the work environment affects human resource performance. The environment contrasting the office is the physical environment, e.g., workspace, internet facility, stationery, and others. When working on campus, lecturers are supported by various facilities, such as excellent Internet access, a private workspace, a comfortable classroom, and a supportive academic atmosphere. Sudden remote learning implementation causes lecturers not to prepare a comfortable and supportive work environment to perform their duties. Not all lecturers have excellent Internet access at home. Additionally, it is difficult to afford a private work environment separated from other family members and a house situation that prevents them from being involved in daily house tasks. No strict supervision from superiors also causes non-optimized lecturer performance. However, in their research, Samson, Waiganjo, & Koima (2015) reported an opposite finding: the physical environment does not significantly affect human resource performance.

A lecturer must have competencies in their field of knowledge. However, it is difficult to hope all lecturers be competent in using information technology. Heretofore, the technology used in Tri Dharma of Higher Education is limited to PowerPoint for delivering lectures, Microsoft Word to type, and email to receive and reply to electronic messages. Meanwhile, in remote learning, lecturers are expected to use various types of technologies to support electronic learning or e-learning, such as Moodle, Google Classroom, Google Meet, Google Form, and others. To minimize lecturers' challenges in using remote learning technologies, lecturers with good technological abilities usually try to help their teaching partners conduct remote learning with electronic learning. On the other hand, those who lack technology skills can also ask their partners to teach them to operate effective remote learning. This relationship is typically known as knowledge-sharing and is perceived as the solution to improving lecturer capability.

Knowledge-sharing is an individual contribution to collective organizational knowledge, which is gradually accepted as a critical research topic. Several studies have examined the importance of knowledge-sharing on human resource performance (Huie et al., 2020; Islam, 2017). Other studies discuss this issue in educational institutions (Gunawan & Herachwati, 2016; Muda & Yusof, 2015; Nguyen et al., 2019). Akram & Bokhari (2011) concluded that knowledge-sharing behavior greatly improves human resource performance. In line with the above studies, this study analyzed the effect of work environment and knowledge-sharing behavior on lecturer performance during the Tri Dharma of Higher Education implementation. This study differs from previous studies because work environment, knowledge-sharing behavior, and lecturer performance were examined when working from home during the COVID-19 pandemic era. It is vital to allow higher education management to prepare human resources for various situations.

2. Literature Review

2.1. Work Environment

A work environment comprises various factors as the key determinant of employee performance (Hafee et al., 2019), including physical and non-physical (behavioral) environments. Oppermann (2002) defines the working environment as a composite of three major sub-environments: technical, human, and organizational environments. Technical environment refers to tools, equipment, technological infrastructure, and other physical or technical elements. This environment creates elements that enable employees to perform their respective responsibilities and activities. Meanwhile, the human environment refers to peers, teams and work groups, interactional issues, leaders, and management. According to McCoy & Evans (2005), the physical elements of the environment must be appropriate to prevent employees from being stressed while doing their job. Physical elements play an important role in developing networks and working relationships. It must support employee performance. For this reason, this research focuses on the technical or physical environment that affects the performance of lecturers during the COVID 19 pandemic. The physical environment refers to equipment, technological infrastructure, and other physical or technical elements. This environment creates elements that enable employees to carry out their respective responsibilities and activities.

2.2. Knowledge-sharing

Knowledge is an important asset for companies to win the competition. While other resources are easy for competitors to imitate, this is not the case with knowledge resources embedded in innovation. The importance of knowledge makes many organizations aware of the importance of knowledge management. Knowledge management enables the creation, transfer, and reception of knowledge more effectively. Knowledge sharing is an individual's contribution to an organization's collective knowledge that is gradually being accepted as an important research topic. In organizations, knowledge exists in various forms of work-related documents, organizational rules, work procedures, personal experiences, and shared ways between workers (Hansen, 2002; Jabar et al., 2010; Mcdermott & O'Dell, 2001).

Anand, Muskat, Creed, Zutshi, & Csepregi (2020) suggest that for organizational success, people should share tacit knowledge with others. Sharing knowledge is happening in everyday life without realizing it. For example, the knowledge sharing process occurs when someone asks a question, and the other party answers. According to Kunthi et al. (2018), the benefits of sharing knowledge include saving time and increasing productivity, helping solve work problems, and receiving knowledge about proven solutions. Besides, from the author's point of view, this process can build reputation and self-actualization, maximize knowledge creation, and open opportunities for exploring and creating new knowledge.

2.3. Lecturer Performance: The Tri Dharma of Higher Education

In Indonesia, lecturer performance is measured by the elements of the Tri Dharma (the Threefold Mission) of Higher Education, which consists of education and teaching, research, and community service. This is in accordance with the Law of the Republic of Indonesia number 12 of 2012 concerning the obligation of higher education institutions to provide education, research, and community service. Education and teaching are the first and main points of the Tri Dharma of Higher Education. These points have a vital role in the learning process. The law on higher education states that education is a conscious and planned effort to create a learning atmosphere and learning process. Thus, students actively develop their potential to have religious and spiritual strength, self-control, personality, intelligence, noble character, and the skills they need for society, nation, and state.

Another key point is research and development. It also plays a very important role in the progress of higher education, society's welfare, and the nation's advancement. From research and development, science and technology can be developed to give benefits to society and the country. In conducting research and development, lecturers and students must be smarter, more critical, and more creative in carrying out their roles as agents of change. In addition, universities must be able to take advantage of this research and development and bring the results into a learning process to lead Indonesia in a more advanced direction. Finally, according to the Law on Higher Education, community service is an activity of the academic community that utilizes science and technology to advance the welfare of the community and educate the nation's life. Community service can be carried out with various positive activities that benefit the community. In this case, lecturers and students must be able to socialize with the community and make a real contribution.

2.4. Relationship Between Work Environment and Employee Performance

The physical work environment elements must be appropriate to avoid employee stress when performing their jobs (McCoy & Evans, 2005). Legal elements play a vital role in developing networks and relationships at work. The physical work environment must support the expected performance. A conducive work environment must be prioritized since it supports employees in doing their jobs (Vischer, 2007). Naharuddin and Sadegi (2013); Mathews and Khann (2016) claimed that the work environment affects human resource performance. The environment contrasting the office is the physical environment, e.g., workspace, internet facility, stationery, etc. Moreover, Lankeshwara (2016) asserted that the physical work environment is the primary predictor of human resource performance. It is similar to the studies of Hafee et al (2019), Patil & Kulkarni (2017) and Rorong (2016). However, in their research, Samson, Waiganjo, & Koima (2015) suggested a contrasting finding: the physical environment does not significantly affect human resource performance.

2.5. Relationship Between Knowledge Sharing and Employee Performance

Knowledge-sharing is an individual contribution to collective organizational knowledge, which is gradually accepted as a critical research topic. In an organization, knowledge can take the form of work documents, organizational rules, work prosecutors, personal experiences, and methods commonly shared between employees (Gould & Scott, 2003; Hansen, 2002; Jabar et al., 2010; Mcdermott & O'Dell, 2001). The knowledge-sharing and knowledge-transfer terms are commonly used interchangeably. Knowledge-sharing is different from knowledge transfer. Knowledge-sharing occurs between individuals in a community, where individuals interact and share knowledge online or offline. Therefore, the analysis unit of knowledge-sharing is individuals. Knowledge transfer occurs between groups or organizations, where one group interacts with other groups to share knowledge. Hence, the analysis unit of knowledge transfer is groups or organizations (Paulin & Suneson, 2011). Ramayah, Ignatius, & Leen (2009), in a study on higher education institutions, suggested that academics perceive knowledge-sharing activity as meaningful. It takes a massive effort to awaken academics to the importance of knowledge-sharing for better performance. Precedent studies on the importance of knowledge-sharing on human resource performance were conducted by Islam (2017); and Huie, Cassaberry, Rivera, & Amari (2020). Akram & Bokhari (2011) concluded that knowledge-sharing behavior greatly improves human resource performance.

In education, a predecessor study by Muda and Yusof (2015) revealed that higher education institutions must motivate education staff by providing challenging jobs since experienced human resources are always available to share knowledge. Gunawan & Herachwati (2016) found that knowledge-sharing plays a role in creating creative teaching. Nguyen et al. (2019) state that an individual factor that plays a role in improving performance is the willingness to share knowledge possessed. Therefore, higher education institutions must strive to improve the knowledge-sharing behavior of both teachers and administrative staff. Based on the above discussion, this study formulates the following hypotheses:

H1: Physical work environment has a significant impact on lecturer performance.

H2: Knowledge-sharing behavior has a significant impact on lecturer performance.

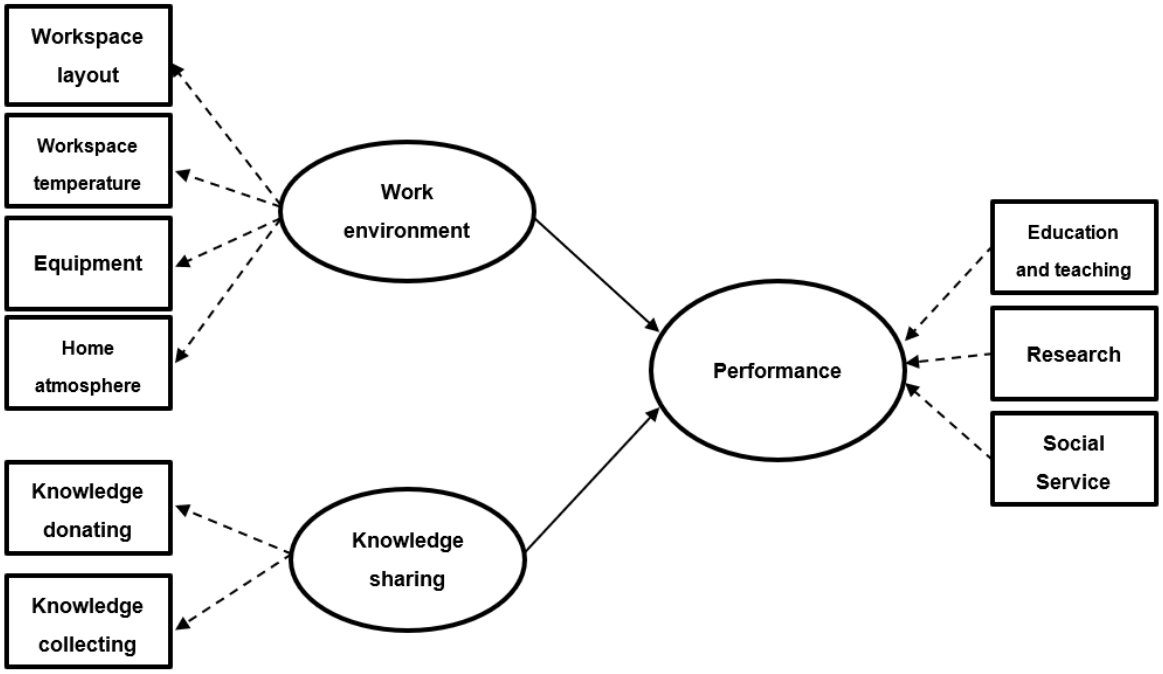

Figure 1. Research Framework

3. Materials and Methods

The current study employed an explanatory research design with a quantitative approach. It examined the relationship between work environment, knowledge-sharing behaviour, and lecturer performance. The variables included work environment, knowledge-sharing behaviour, and lecturer performance. Physical work environment measurement includes workspace layout, temperature, equipment, and home atmosphere adapted from (Vischer, 2007). These elements were adjusted to the work environment during work from home. Meanwhile, knowledge-sharing behaviour measurement refers to the attempts to provide and receive knowledge (Jain et al., 2015); (Yi, 2009). Finally, lecturer performance is measured using the principles of Tri Dharma (the Threefold Mission) of Higher Education, i.e., Education and teaching, research, and social service. All study variables were analysed using a five-point Likert scale, where 1 indicated “strongly disagree” and 5 indicated “strongly agree.”

The study was conducted in universities in West Kalimantan. The population covered all lecturers in universities who have possessed the National Lecturer Registration Number (NIDN) distributed across West Kalimantan, with as many as 3,060 people. According to Ulum et al (2008), obtaining some sample guidelines can be used to determine the sample size, including the indicator multiplied by 5 to 10 times. Based on the explanation above, the sample of this study referred to the indicator formula that was multiplied by 10, generating 9x10 = 90 samples. In anticipating the non-return of the questionnaire, the sample was set at 100 respondents. The sampling technique used in the study was two-stage sampling. In the first stage, samples were selected based on area. Area-based sample selection was conducted with the convenient sampling technique. In the second stage, an individual lecture was selected using stratified area random sampling. Data were collected by distributing a questionnaire. The data were then analyzed using two types of data analysis: descriptive-statistics analysis and PLS-SEM analysis using SMARTPLS 3. PLS is a structural equation modeling (SEM) based on component or variance. It can be used to confirm theories and explain the relationship between latent variables.

4. Results and Discussion

Questionnaires distributed in this study have been tested to examine the validity and reliability via the questionnaire trial on 30 respondents. The validity test was conducted with Pearson's Product Moment Correlation. The test showed that all study indicators were valid, with correlation values over 0.5 and a significance level of 0.01 mark. Meanwhile, a reliability test was examined using Cronbach's Alpha. The result showed that each variable was reliable, with an alpha coefficient value of over 0.6. It indicates that the instrument is reliable (Hair et al., 2006). Tables 1 and 2 show the validity and reliability of the test results.

Table 1. Result of Validity Testing

Variable(s)	Indicator(s)	Correlation	Decision
Physical Work Environment	Workspace layout	0.8635	Valid
	Workspace temperature	0.8374	Valid
	Equipment	0.8395	Valid
Knowledge-sharing	Home atmosphere	0.8995	Valid
	Knowledge donating	0.9348	Valid
	Knowledge collecting	0.9133	Valid
Lecturer Performance	Education and teaching	0.9608	Valid
	Research	0.9498	Valid
	Social service	0.8672	Valid

Table 2. Reliability Test Result

Variable(s)	Cronbach Alpha	Decision
Physical Work Environment	0.709385	Reliable
Knowledge-sharing	0.755951	Reliable
Lecturer Performance	0.738995	Reliable

Following that, the study analyzed the respondent characteristics. Based on their responses to the questionnaires, their characteristics can be concluded as follow:

Table 3. Respondent Characteristics

Characteristic(s)	Category	Frequency	Percentage
Gender	Male	51	51
	Female	49	49
Age	25-35 years	16	16
	36-45 years	46	46
	46-55 years	33	33
	>56 years	15	15
Academic Background	Master (S2)	62	62
	Doctor (S3)	38	38
Working Period	>5 years	5	5
	6-15 years	40	40
	16-25 years	32	32
	>25 years	23	23
Academic Ranks	Professor	5	5
	Associate Professor	22	22
	Assistant Professor	44	44
	Instructor	29	29

Table 3 shows that respondents in this study were dominated by males (61%), whereas 49 people were females (49%). Regarding age, the respondents were dominated by those aged 36-45 (46%), followed by 46-55 (33%). Further, most respondents held a master's degree (S2) by 62 people or 62% with a working period of 6-15 years, 40 people (40%). Meanwhile, the respondent's academic ranks were dominated by Lektor (Assistant Professor). The partial least square analysis result can be categorized into two stages, i.e., indicator measurement (Outer model) and structural model test (inner model). In this research, the validity and reliability analyses were conducted on the outer model stage.

Indicator reliability aims to assess whether the indicators to measure latent variables are reliable. A loading value over 0.7 shows that the construct can explain more than 50% of the indicator variance (Wong, 2013; Sarstedt et al., 2020). From the outer loading value table above, it could be discovered that all indicators had outer loading values > 0.7. Therefore, based on the outer loading validity, all indicators were valid by convergent validity. Table 3 also shows that no indicators had outer model VIF value > 5. Thus, there was no multicollinearity in the outer model level. The next step was to measure the construct reliability of latent variables. The value is considered reliable if it is above 0.70.

Table 4. Cronbach's Alpha and Composite Reliability Values

Variable(s)	Cronbach's Alpha	rho_A	Composite Reliability	Average Variance Extracted
Physical Work Environment	0.886	0.893	0.921	0.744
Knowledge-sharing	0.830	0.874	0.920	0.852

Internal consistency reliability measures the ability of an indicator to measure its latent construct. The instruments are composite reliability and Cronbach's Alpha. A composite reliability value of 0.6 to 0.7 is considered to have good reliability (Sarstedt et al., 2020), and the expected Cronbach's Alpha value is over 0.7 (Ghozali, 2015). As provided in Table 5 above, all constructs have Cronbach's Alpha values > 0.7. Thus, all constructs are reliable. The next test was the unidimensionality test. The test aimed to ensure no problems occurred in the measurement. The unidimensionality test was carried out using composite reliability indicators and Cronbach's alpha. For these two indicators, the cut-value was 0.7. Based on Table 5 above, all constructs have met the unidimensionality requirements because the composite reliability value is > 0.7.

Convergent validity is determined based on the principle that a construct measurement must be highly correlated (Ghozali, 2015). The convergent validity of a construct with the reflective indicator is evaluated with Average Variance Extracted (AVE). The AVE value should be 0.5 or more. An AVE value of 0.5 or more means that the construct can explain 50% or more of its item variance (Wong, 2013); (Sarstedt et al., 2020) To determine the achievement of convergent validity requirements, all constructs have met the convergent validity requirements of the AVE value of all reflective variables > 0.50, as presented in Table 5.

Table 5. Cross Loading Values

Variable(s)	Physical Work Environment	Knowledge Sharing	Lecturer Performance
Physical Work Environment			
Workspace layout	0.847	0.101	0.473
Workspace temperature	0.870	0.197	0.576
Equipment	0.856	0.093	0.476
Home atmosphere	0.877	0.192	0.573
Knowledge-sharing			
Knowledge donating	0.055	0.902	0.317
Knowledge collecting	0.242	0.944	0.417
Lecturer Performance			
Education and teaching	0.567	0.339	0.903
Research	0.569	0.325	0.896
Social service	0.576	0.412	0.961

The output path coefficient, as shown in Table 6, is to see the magnitude of the direct effect of each independent variable (exogenous) on the dependent variable (endogenous). The magnitude of the parameter coefficient for the physical work environment variable on performance was 0.560, indicating a positive effect of the physical work environment on performance. It can be interpreted that the better the physical work environment, the higher the performance. An increase in one unit of the physical work environment will increase the lecturer's performance by 56.0%. The test result of the estimated coefficient of physical work on the performance of the bootstrap result was 0.559 with a t-count value of 8.690. Based on calculations using bootstrap or resampling, the p-value was 0.000 < 0.05. Hence, H1 was accepted, where the physical work environment significantly affected overall statistics performance. The magnitude of the parameter coefficient for the knowledge-sharing variable on performance was 0.306, meaning that knowledge-sharing positively affected performance. It can be interpreted that the better the knowledge-sharing, the higher the performance.

An increase in one unit of knowledge-sharing will increase the lecturer's performance by 30.6%. Based on calculations using bootstrap or resampling, where the test result of the estimated knowledge-sharing coefficient on the performance of the bootstrap result was 0.302 with a t-count value of 3.464, the *p*-value was 0.001 < 0.05. Hence, H1 was accepted, indicating that knowledge-sharing had a significant effect on overall statistics performance. The coefficient of determination (R^2) is a way to assess how much an exogenous construct can explain an endogenous construct. The value of the coefficient of determination (*R-square*) is expected to be between 0 and 1. The R^2 values of 0.75, 0.50, and 0.25 indicate that the model is strong, moderate, and weak (Sarstedt et al., 2020). The criteria for the *R-square* values of 0.67, 0.33, and 0.19 is strong, moderate, and weak (Ghozali, 2015).

Table 6. Coefficient of Determination and Predictive Relevance

Variable	R^2	Q^2
Lecturer Performance	0.467	0.314

The model of the influence of the physical work environment and knowledge-sharing on performance has an R-square value of 0.467. In other words, the variability of the lecturer performance variable, which can be explained by the variability of the physical work environment and knowledge-sharing variable, is 46.7%, while other variables explain 53.3% outside the research model. The Q-square test was then used to assess predictive relevance. The prediction of performance is relevant or accurate if the value of Q-Square is 0.314 > 0.05 (Sarstedt et al., 2020). The study result revealed a positive effect of the physical work environment on lecturer performance. The results confirm previous studies that claimed a positive and significant effect of the physical work environment on human resource performance (Hafee et al., 2019; Lankeshwara, 2016; Mathews & Khann, 2016; Naharuddin & Sadegi, 2013; Patil & Kulkarni, 2017; Rorong, 2016). However, it contrasts with a study by Samson (2015), claiming that the physical environment did not significantly affect human resource performance.

Moving the work environment from an office with complete facilities to a home creates difficulties in working. Lecturers cannot carry out some things personally, especially in a conducive work atmosphere. It could be, in one house, more than one person working from home because children are learning from home. The lecturers should also share the internet network and electronic devices and deal with noise if everyone at home is carrying out virtual classes. Lecturers at home often make it impossible not to get involved in homework, which can interfere with carrying out the Tri Dharma of Higher Education from home. Knowledge-sharing had a positive and significant effect on performance. It can be interpreted that the better the knowledge sharing, the performance of lecturers in implementing the Tri Dharma of Higher Education will increase. The results of this study support previous research, which believes that knowledge-sharing behavior has a significant effect on improving human resources performance (Akram & Bokhari, 2011; Huie et al., 2020; Islam, 2017).

There are still many lecturers who are not familiar with technological hardware and software. Unfortunately, during the pandemic, they were frequently used to carry out the Tri Dharma of Higher Education online. From the results of interviews, these lecturers considered information technology as 'just a tool'. If needed, the lecturers could ask other people to help operate it. Indeed, it is almost impossible to ask for help during work from home. The prohibition to do mass gatherings forces them to run the hardware and software themselves needed for teaching, seminars, final assignments, and filling attendance.

Knowledge-sharing can foster good collaboration between colleagues and create a successful work team to achieve organizational goals. With knowledge-sharing, every obstacle faced by human resources will be easily resolved. Therefore, it will help improve their performance (Kartono et al., 2020). The sudden implementation of working from home also makes it impossible to learn through courses and training. Therefore, it is necessary to share knowledge between lecturers during this time. Lecturers who master the required information technology operations are willing to share their knowledge with lecturers who do not understand and even actively ask what they do not understand. Likewise, lecturers who do not understand are willing to accept the information and do not hesitate to ask colleagues who are more familiar with the technological devices.

5. Conclusions

This study draws several conclusions. First, the physical work environment positively and significantly affects lecturer performance: the better the physical work environment, the better the lecturer's performance in implementing Tri Dharma of Higher Education during the COVID-19 pandemic. Second, knowledge-sharing behavior positively and significantly affects lecturer performance. In other words, if lecturers have better knowledge-sharing behavior, their performance in implementing the Tri Dharma of Higher Education will be better too. It will make the obstacles found in the implementation of working from home during the COVID-19 pandemic can be easily overcome. The variability of the lecturer performance variable can be explained by the variability of the physical work environment and knowledge-sharing variables by 46.7%. Meanwhile, other variables outside the research model explain 53.3%. Further research is

recommended to explore other variables that affect the Tri Dharma of Higher Education implementation during the COVID-19 pandemic. The object of this research is limited to lecturers in the province of West Kalimantan, so the results cannot be generalized. Further research is recommended to expand the population at a national scale, e.g., universities throughout Indonesia.

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