MEDIATION OF MOTIVATION AND ENVIRONMENT ON EFFECT OF TEACHERS TECHNOLOGY CAPABILITIES ON THE MATHEMATICS TEACHERS PERFORMANCE IN INDUSTRIAL ERA

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Abstract. This study aims to describe the effect of the ability of mathematics teachers on teacher performance which is mediated by work motivation and work environment variables. This research was quantitative research with a correlational approach. The population was all mathematics teachers in Pekanbaru City. The sample was partly mathematics teachers who are taken by accidental technique. The accidental technique was chosen because during the COVID-19 pandemic it was not possible to collect data directly. Data retrieval is done only with a Google form and filled in by teachers who can use technology well. Sampling only distributed the instrument in the Google form to a group of elementary school teachers in Pekanbaru City. Data analysis using the path analysis approach. The results of the analysis show that there is a significant effect of technological ability on teacher performance in the Industrial Revolution 4.0 era through work motivation and the teacher's work environment. The results of the analysis are evidenced by a T-value greater than 1.96.
Keywords: Technology Capability, Teachers' Performance

1. INTRODUCTION

Activities use technology in this era both education, economics, and others field have to use technology. Somebody wants to do the meeting, they don't need a face-to-face meeting in the meeting room because they can use zoom meeting, Google Meet, or other support platforms. Somebody wants to shop, they can use the online shop and everything can be acquired and arrived at home. If teachers want to teach students, they can upload the teaching material in Google Classroom or other platforms and they don't teach their students in the classroom.

In the education field, Technology needs a special ability where teachers or students must be able to operate computers [3]–[5]. This ability needs time to learn because operating a computer is something difficult for done. Teachers and students usually use the computer for writing a report, writing an article, or filling out the assessment to students every semester. This problem becomes a big problem if teachers don't want to upgrade or improve themselves because the challenge in revolution industrial is very complex.

Teachers can follow the current development or answer the current challenge by improving their ability on technology. With the high technology, ability teachers can make something

excellent such as attractive learning media based on technology and other products for increasing the teaching quality [6]. Technology ability will make teachers solve their tasks whenever and wherever [7]. Therefore teachers must have big motivation and a good work environment for doing something the best in their lives because motivation and a good work environment will support teachers to success in adapting to the revolution industrial [8]–[10]. For this reason, the research about the effect of teacher technology capabilities on the mathematics teachers' performance in the industrial revolution era, motivation, and environment as mediation.

2. RESEARCH METHOD

This research was quantitative research with a correlational statistics approach. The population was the mathematics teachers at Pekanbaru City. The sample was part of mathematics teachers at Pekanbaru City. The sampling technique in this research was the accidental sampling technique. The accidental sampling technique was used in this research because the data collecting can't take direction. After all, Pekanbaru City is still in the red zone of the COVID-19 Pandemic. Data collection used a questionnaire that was converted into Google Form. Data collection in this research by disseminating to teachers mathematics group each school at Pekanbaru City. Data analysis in this research uses the path analysis approach because path analysis will show where significant variables affected directly or indirectly mathematics teachers' performance in the 4.0 industrial revolution.

3. FINDINGS AND DISCUSSION

Normality assumption was important to check so that all regulations to analyze data with path analysis were fulfilled. Normality Assumption can be seen in Table 1

Table 1. Normality Assumption

Variables	Z Skewness	Decision	Z-Kurtosis	Decision	Conclusion
Technology Capability	2.06	Normal Moderate	-1.29	Normal	Normal
Motivation	0.10	Normal	-2.12	Moderate	Normal
Environment	1.41	Normal	-1.54	Moderate	normal
Teachers Performance	-0.38	Normal	-1.61	Moderat	Normal

From Table 1, it can be concluded that four variables were normally based on Z Skewness and Z kurtosis analysis so that the normality assumption has been fulfilled. The next assumption test was multicollinearity that can be seen in Table 2.

Table 2. Multicolinieriry Assumption

Variables	Technology_Ability	Motivation	Evnironment	Performance
Technology Ability	1	.869[**]	.796[**]	.853[**]
Motivation	.869[**]	1	.794[**]	.870[**]
Environment	.796[**]	.794[**]	1	.793[**]
Performance	.853[**]	.870[**]	.793[**]	1

From Table 2, correlation analysis showed that the correlation between every variable was not perfect. Gozali & Fuad (2008) stated that multicollinearity will be fulfilled if every variable had coefficient correlation was not perfect (0.9-1). Because the normality and multicollinearity tests have been met, the path analysis can be analyzed and interpreted. The path analysis results can be seen in Table 3.

Table 3. Direct Effect of Variable Endogenous to Exogenous

Variables	Standardized	T-Value	Conclusion
Technology Capability*Performance	0.22	5.07	Significant
Motivation*Performance	0.45	7.23	Significant
Environment*Performance	0.19	3.66	Significant
Technology Capability*Motivation	0.65	12.87	Significant
Technology Capability*Environment	0.80	20.07	Significant

Table 3 showed that there was a significant effect variable technology capability of teachers with teachers' performance at industrial revolution with T-value 5.07. There was a significant effect of variable motivation of teachers with teachers' performance at industrial revolution with T-value of 7.23. There was a significant effect variable environment with teachers' performance at industrial revolution with T-value of 3.66. There was a significant effect variable technology capability of teachers with motivation faced industrial revolution with T-value 12.87. There was a significant effect variable technology capability of teachers with the environment with a T-value of 20.07.

Table 4. Indirect Effect of Endogenous to Exogenous Variable

Variables	Standardized	Error	Conclusion
Technology Capability*Motivation*Performance	0.61	0.22	Significant
Technology Capability*Environment*Performance	0.47	0.37	Significant
Environment*Motivation*Performance	0.503	0.19	Significant

Table 4 showed the indirect effect of variable motivation and environment as mediation on variable technology capability with teachers' performance. The results showed that motivation and environment were significant mediation on technology capability with teachers' performance. The motivation was a significant mediation variable on the environment with teachers' performance.

The technology capability of teachers gave a significant effect on Teachers' Performance in industrial revolution 4.0. Technology capability will help the teachers to design the learning media to give the learning interest to students [2]. Teachers can do more for developing the learning media or instrument so that students can have a good experience in the classroom [12]. Teachers' motivation gives a significant effect on teachers' performance. Teachers' motivation will support teachers to do something the best for themselves and the institution. Teachers' motivation will direct the teachers to work with achievement goals [13]. Teachers' motivation will enable teachers to think about all contributions to their institution so that their institution to be the best in serving the students [10]. The learning environment gave a significant effect on teachers' performance in facing the industrial revolution 4.0. The learning environment was a condition where teachers and their friends in the office that affect teachers' performance. The best friend in the offices will advise, motivate and evaluate other teachers to do the best in their work

[12]. The work environment will support the teacher because psychologically the teacher will get peace with the work environment so that the teacher can work optimally.

4. CONCLUSIONS

Teachers' technology capability affected teachers' performance in facing the industrial revolution 4.0 with a T-value of 5.07. Teachers' motivation affected teachers' performance in facing the industrial revolution 4.0 with a T-value of 7.23. Environment affected teachers' performance in facing the industrial revolution 4.0 with a T-value of 3.66. Teachers' technology capability affected teachers' motivation with a T-value of 12.87. Teachers' technology capability affected teachers' motivation with a T-value of 20.07. Motivation and environment can be mediation significantly on effect teachers' capability on teachers' performance in facing the industrial revolution 4.0

REFERENCES

[1]   M. Sintawati and F. Indriani, "Pentingnya Technological Pedagogical Content Knowledge (TPACK) Guru di Era Revolusi Industri 4.0," Semin. Nas. Pagelaran Pendidik. Dasar Nas., vol. 1, no. 1, pp. 417–422, 2019, [Online]. Available: http://seminar.uad.ac.id/index.php/ppdn/article/view/1355.

[2]   S. Pfeiffer, "Robots, Industry 4.0 and Humans, or Why Assembly Work Is More than Routine Work," Societies, vol. 6, no. 2, p. 16, 2016, doi: 10.3390/soc6020016.

[3]   M. Prameswari et al., "The impacts of leadership and organizational culture on performance in indonesian public health: The mediating effects of innovative work behavior," Int. J. Control Autom., vol. 13, no. 2, pp. 216–227, 2020.

[4]   A. Hamid, S. Saputro, Ashadi, and M. Masykuri, "Analysis of critical-creative thinking styles and their implications on self efficacy teacher pree service," J. Phys. Conf. Ser., vol. 1760, no. 1, pp. 8–11, 2021, doi: 10.1088/1742-6596/1760/1/012033.

[5]   D. Andrian and A. Wahyuni, "Student Readiness Model Facing the Industrial Revolution 4.0," in Second International Conference on Social, Economy, Education andHumanity(ICoSEEH 2019) - Sustainable Development in Developing Country forFacing Industria, 2020, no. ICoSEEH 2019, pp. 302–306, doi: 10.5220/0009128703020306.

[6]   S. Rezeki, D. Andrian, and Y. Safitri, "Mathematics and cultures: A new concept in maintaining cultures through the development of learning devices," Int. J. Instr., vol. 14, no. 3, pp. 375–392, 2021, doi: 10.29333/iji.2021.14322a.

[7]   J. R. Star and Æ. S. K. Strickland, "Learning to observe : using video to improve preservice mathematics teachers ' ability to notice," vol. 11, pp. 107–125, 2008, doi: 10.1007/s10857-007-9063-7.

[8]   S. K. Tan and S. Rajah, "Evoking Work Motivation in Industry 4.0," SAGE Open, vol. 9, no. 4, pp. 1–10, 2019, doi: 10.1177/2158244019885132.

[9]   D. Agustini, B. Lian, and A. P. Sari, "School's Strategy for Teacher's Professionalism Through Digital Literacy in the Industrial Revolution 4.0," Int. J. Educ. Rev., vol. 2, no. 1, pp. 70–88, 2020.

[10]   B. Lastariwati, K. Komariah, E. Mulyatiningsih, and M. G. Kartika, "Exploration of the determining factors of successful online learning in the industrial revolution 4.0 era," J. Phys. Conf. Ser., vol. 1833, no. 1, pp. 0–6, 2021, doi: 10.1088/1742-6596/1833/1/012069.

[11]   I. Gozali and Fuad, Structural Equation Modeling; Teori, Konsep, dan Aplikasi Dengan Program LISREL 8.80. Semarang: Badan Penerbit Universitas Diponegoro, 2008.

[12]   Z. Nuraen and H. Retnawati, "THE POST-CERTIFICATION PERFORMANCE OF MATHEMATICS TEACHERS," Online J. New Horizons Educ., vol. 6, no. 2, pp. 143–154, 2016.

[13]   C. Roure, G. Kermarrec, and D. Pasco, "Effects of situational interest dimensions on students' learning strategies in physical education," Eur. Phys. Educ. Rev., vol. 25, no. 2, pp. 327–340, 2019, doi: 10.1177/1356336X17732964.