The Influence of Leadership, Conscientiousness, Vision, and Openness on the Performance of a Lecturer via Technological Pedagogical Content Knowledge as Intervening Variable using Structural Equation Model

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Abstract: The performance of lecturers in Indonesia is impacted upon by internal factors, such as individual factors of lecturers, e.g. personality, and external factors including support from universities. This study employs an SOR (Stimulus-Organism-Response) a model which acts as a link for stimulus factors that will impact thelecturers' behaviours which in turn affect their performance. The behaviours of lecturers are focused on the application of pedagogy and technology in the discharge of their duties. Stimulus factors utilize four variables, namely college vision and leadership as external factors, conscientiousness and openness as internal factors. The variables of technological-pedagogy become mediator variables or organisms while performance is a response factor which is divided into three latent variables, namely education, research, and the performance of community service. This study employs questionnaire which has 8 variables that are measured by Likert scale and analysed using Structural Equation Model. The respondents were 101 lecturers from 5 private universities outside Java who took part in the PTS coaching program paid for by the Ministry of Research, Technology and Higher Education. The result of SEM testing indicates that the most significant stimulus factor for pedagogical-technological   mastery is openness with a path coefficient value of 0.50.

1 INTRODUCTION

The role played by lecturers in universities is very significant because they are the major actors in the process of knowledge transformation to their students. Their performance is a major determinant of the quality of university education programs (Anra and Yamin, 2017). According to the Law of the Republic of Indonesia Number 14 of 2005, lecturers are professional educators and scientists whose main tasks are to transform, develop, and disseminate science, technology and art via education, research and community service. With reference to 2017 statistics on higher education issued by the Ministry of Research, Technology and Higher Education, the number of lecturers in Indonesia was 247269 with 173662 of them teaching in Private Universities and 73606 of them teaching in State Universities. The number of lecturers varies in accordance with the level of education and functional position. Indonesia is still faced with the problems relating to the performance of lecturers (Sukirno, 2017).

The performance of lecturers is also impacted upon by institutional factor. Augustus, et al. (2005) reported that leadership is a very vital success factor to sustain quality improvement and performance in university. Also, leadership is intimately related to the vision of the university which incorporates two of the 11 critical factors involved in the implementation of total quality management in universities (Asif et al, 2013).

With reference to the European Commission (2014), leadership and strategic vision are required to better engage staff to exploit the potential of different new models of teaching and learning. Integrating new technology as well as pedagogy requires being placed at the center of institutional teaching and learning strategies and have to be an integral part of daily activities in universities. Livingston et al. (2017) stated that a major factor in

pedagogy is developing different approaches which can work in different local and national contexts.

The technological development and innovation in education, particularly the application of information and communication technology, needs to be looked forward to by lecturers to ensure that they are used in the learning process. This information age is a period of knowledge which provides a number of strong and incomparable potentials for discovery, communication, information exchange, and exploration which is capable of strengthening both processes of teaching and learning (Husain and Safdar, 2008). Research regarding the use of innovative information and communication technologies for academic purposes is also advancing rapidly (Glowatz and O'Brien, 2017). Different frameworks or models on the application of technology by lecturers are broadly studied, including the Technological Pedagogical and Content Knowledge (TPACK) model. In the words of Koehler and Mishra (2009), the model is an understanding which arises from the interaction among content, pedagogy, as well as technological knowledge.

The performance of the lecturer is also impacted upon by personality factors. These factors are predictors which play a vital role for lecturers (Hakim and Fernandes, 2017). This study analyzes the effect of institutional factors and individual factors on the performance of teaching, research, and community service through TPACK using structural equation models. Particularly, the respondents who come from universities that are included in the 3T area are one of the urgencies of this research so that the challenges or problems faced by lecturers in the region can be identified through them. Through the mastery of technology, pedagogy, and content from their disciplines, lecturers can improve the performance of Tri Dharma University.

2 METHOD

Research respondents were 101 lecturers who worked in 5 private universities outside Java, which are two academies in the province of West Kalimantan and three universities in the province of North Maluku. The university is an institution which is included in the coaching program paid for by the Ministry of Research, Technology and Higher Education in 2018. The questionnaire measures 8 variables which comprise four predictor variables, one mediator variable, and three endogenous variables. The theoretical model which influences the relationship of the research variable is the S-O-R (Stimulus-Organism-Response) model. Individual and institutional factors are stimulus, TPACK is an organism, and the performance of lecturers is a response. The reliability and validity of quizzers were tested using Cronbach Alpha and Kaiser-Meyer-Olkin. The hypothesis of the research was tested by Structural Equation Model, including determining the direct and indirect impacts of four exogenous variables on the performance of lecturers through TPACK variables.

3 RESULT AND DISCUSSION

3.1 Reliability and Validity

The aim of the first stage of this research is to develop the instruments of research and test models on university lecturers outside Java, particularly those in the 3T region or clusters 3 or 4 based on the rank of universities made available by the Ministry of Research, Technology and Higher Education in 2018. Testing of reliability and validity was undertaken before the distribution of questionnaire to lecturers from five universities. The results of complete reliability and validity testing are shown in Table 1.

Table 1: Reliability and Validity.

No.	Variable	Item	Alpha	KMO	Keterangan
1.	Leadership	13	0.920	0.902	Three invalid items (L8, L9 and L11)
2.	Vision	6	0.905	0.825	An unreliable item (V6)
3.	Conscientiousness	6	0.822	0.814	An unreliable item (C6)
4.	Openness	6	0.800	0.720	All items are valid and reliable
5.	TPACK	5	0.790	0.657	One invalid and unreliable item (T5)
6.	Teaching Performance	7	0.911	0.885	One invalid and unreliable item (TP3)
7.	Research Performance	9	0.855	0.784	An invalid item (RP5)
8.	The Performance of Public Services	6	0.904	0.867	An unreliable item (PP1)

3.2 Variable Description

Some of the descriptions of research variables are closely related to the demographics of respondents which are presented in Figure 1.

a. *Performance and certification*

b. *Personality, TPACK, and academic position*

c.Personality, TPACK, and Gender

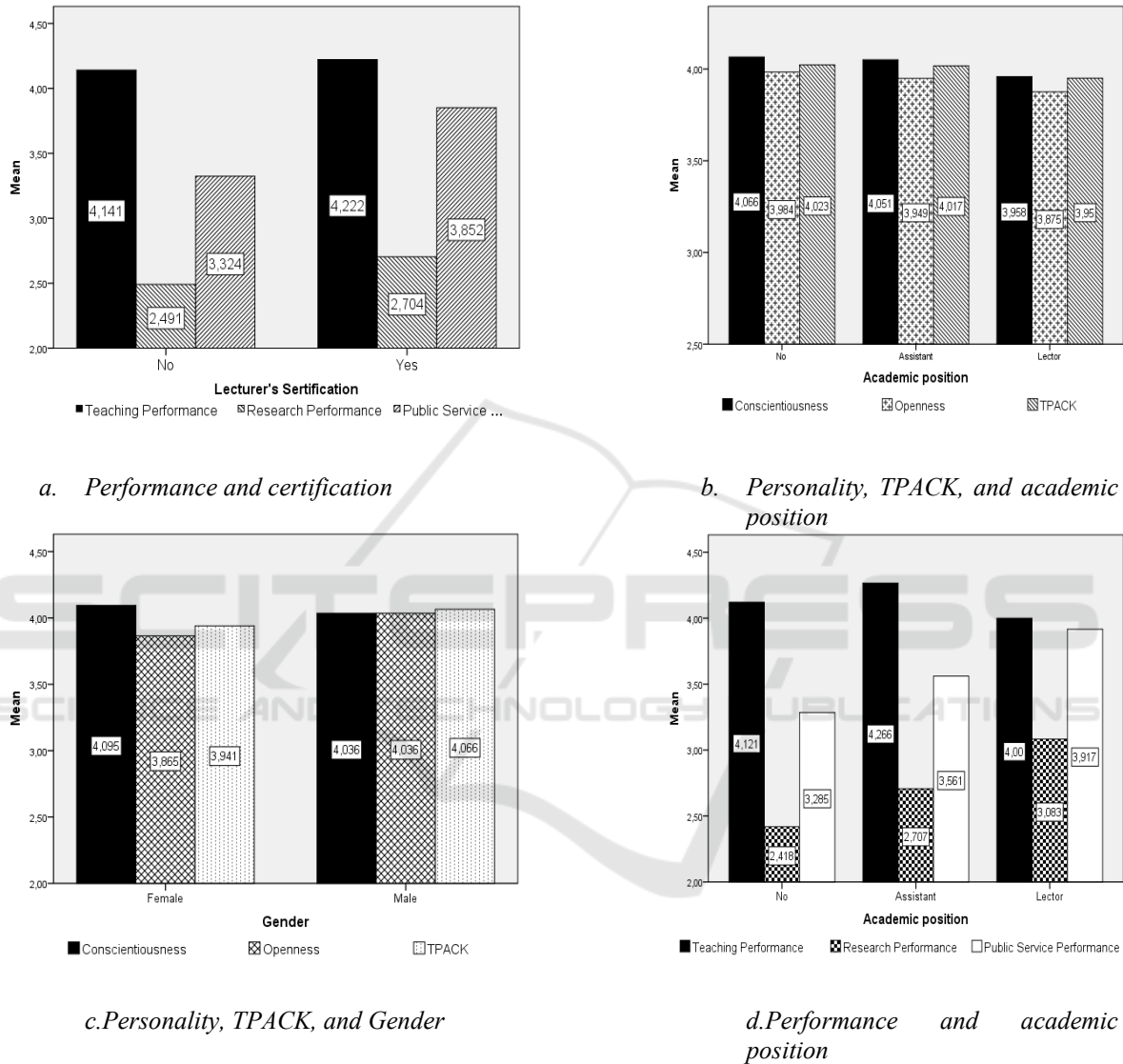

d.Performance and academic position

Figure 1: Research Variables and Demographics of the Respondent.

Female lecturers have a tendency to show higher conscientiousness but lower openness than male lecturers. Comparison of the performance of lecturer reveals that certified lecturer manifest higher research performance than those who have not been certified. It has not been established whether lecturers from the field of engineering have higher TCAPK than lecturers from the social and humanities fields.

3.3 Structural Model

The testing of research hypothesis is done using structural equation model analysis and the estimation results for the standardized model are presented in Figure 2.
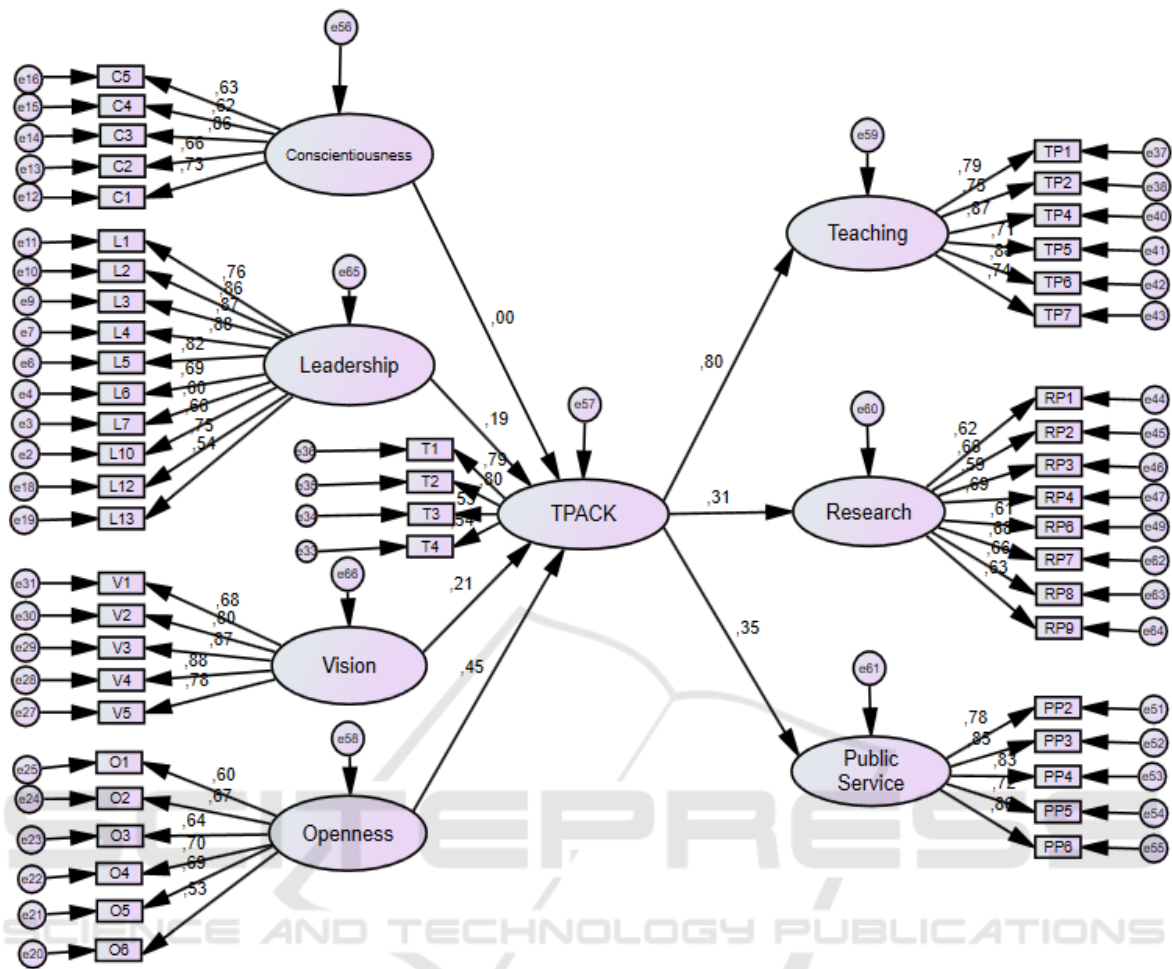
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Figure 2: Standardized Model.

The empirical model of this study has a goodness of fit which is not good if the parameters CMIN, RMSEA, CFI, and FMIN are used and is quite good if the parameters AIC and ECVI are used.

The outcomes of the measurement of the full goodness of fit parameter are shown in Table2 below.

Table 2: Model fit of TQM.

No.	Statistics	Independence Model	Default Model	Saturated Model
1.	CMIN	4667.820	2241.402	0
2.	CFI	0	0.674	1.000
3.	FMIN	46.678	22.414	0
4.	RMSEA	0.168	0.100	-
5.	AIC	4765.820	2549.402	2548.000
6.	ECVI	47.658	25.494	25.480

Institutional factor which has a very significant influence on TPACK is vision. The aforementioned results are in line with the research of Asif et al (2013) which stated that institutional vision is among the critical factors needed for the implementation of total quality management in universities. Five universities have made vision statements in the strategic plan document, even though the level of socialization or internalization varies. Development of facilities for ICT-based learning models has also become a strategic program of each university, but resource constraints are a cog in the wheel of the operational level. Mission and vision, are then translated into programs and aligning between individual goals and institutional goals. This is the essence of the significant relationship between TPACK and vision which further affects the performance of individuals whose aggregates become institutional performance.

The influence of significant openness on TPACK is positive, which implies that the open attitude of the lecturer to the new experience will raise TPACK. This experience in the context of research with the TPACK framework is the use of learning innovations or technology which can promote the success of the learning process. This influence backs up the research of Pouratashi and Zamani (2017) who tested two psychological characteristics, namely agreeableness and conscientiousness while the third has a significant influence on the direction of a positive relationship to the performance of lecturer research. The difference with this research is that the conscientiousness variable does not directly influence the performance of the research, but indirectly through TPACK.

The influences of insignificant leadership vary from those of Suryaman (2018) which stated that leadership, together with job satisfaction, motivation, and organizational commitment, has a significant influence on the performance of a lecturer.. The difference is likely to be due to the relatively poor institutional performance manifested by most of its study programs accredited C, including clusters 3 and 4 based on the ranking of ministries, and in the 3T region. The condition of the five universities informed the government's decision that those universities should engage in a coaching program which it financed.

TPACK has a very significant influence on lecturers' performance, including the performance in the field of research, teaching, and community service. The structural model is presented in table 3. The effect of TPACK on the performance in teaching is relatively greater than the effect of TPACK on the performance in research and community service. This difference was due to the fact that the TPACK framework was focused initially on the training process or education. Also, this research does not specifically and clearly mention the type of technology used in supporting research, teaching, as well as community service.

Table 3: Hypothesis test.

No.	Relation	Estimate	S.E.	C.R.	P	information
1.	Vision to TPACK	0.314	0.120	2.617	0.009	Effect
2.	Leadership to TPACK	0.095	0.083	1.148	0.251	No effect
3.	Openness to TPACK	0.636	0.180	3.534	0.000	Effect
4.	Conscientiousness to TPACK	-0.088	0.122	-0.721	0.471	No effect
5.	TPACK to Teaching Performance	0.845	0.126	6.722	0.000	Effect
6.	TPACK to Research Performance	0.470	0.177	2.658	0.008	Effect
7.	TPACK to Service Performance	0.542	0.172	3.144	0.002	Effect

Institutional factors which have not influenced TPACK require an in-depth study of other factors. However, from the results of field observations during the coaching program and the dissemination of research quizener, technology facilities and ICT, it was not sufficient enough to create a conducive academic atmosphere. It is surprising to note that three of the five colleges have no official website. Although there are two other universities which already have adequate ICT facilities and e-learning facilities, the use of them by lecturers has not been massively and systematically done. As stated by Dysart and Weckerle (2015), when technology support to lecturers is undertaken centrally, it is not followed by simultaneous professional development from the other two sides, pedagogy and content knowledge. Whereas, the TPACK framework is an integration of the three domains: technology, pedagogy, and content knowledge. Technology facilities will not be effective in supporting the role of lecturers in the implementation of Tridharma in higher education if there is availability of modern technology facilities without considering pedagogical aspects and mastery of content and discipline of knowledge from lecturers.

A significant implication of this research is the significant role of the lecturer in integrating the use of technology which supports their duties in universities by considering the pedagogical aspects and the knowledge in accordance with scientific fields. This integration facilitates the achievement of individual performance, which is ultimately the achievement of college performance. The success of achieving institutional and individual goals requires a vision and strengthening of leadership at the university level, and supported by the individual characteristics of the lecturer such as the nature of openness to new experiences in learning innovation. The balance between individual performance achievement and institutional performance is an important role of lecturers, including proportionally balancing the duties of the university's tridharma. According to Quiambao et al. (2016), lecturers play a very vital role in improving and sustaining academic excellence in higher educational institutions because they are people who are responsible for executing tasks which are directly related to institutional objectives.

4 CONCLUSION

Institutional factors and individual factors jointly serve as an incentive to raise technological capability in supporting the role of lecturers, but the level of integration among pedagogy, technology and relative knowledge content still varies among lecturers. This difference is as a result of the support of individual factors and different institutional factor, which are the components of the stimulus in the SOR model. Institutional factor with significant influence is vision, while the individual factor with significant influence is Openness. Other individual factors, such as conscientiousness, and institutional factors of leadership, have no influence on TPACK. The level of integration of the Pedagogic-Technological-Content then influences the performance of the Tridharma lecturer, including research performance, teaching performance, and community service performance.

The goodness of fit of the structural equation model which is regarded as poor is thought to be with relatively heterogeneous sample and the number of respondents is relatively small. Future research will expand the area covered by the research via the inclusion of several universities on the island of Java. The status of higher education was expanded including lecturers from state universities, in Java Island. Differences in the status and size of universities will be examined for the impact of the research variables by considering the characteristics of the college as a moderator. Other moderator variables which can be studied further as moderators are the demographic characteristics of the respondents.

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