EDUCATION MANAGEMENT RESEARCH DATA ANALYSIS: COMPARISON OF RESULTS BETWEEN LISREL, TETRAD, GSCA, AMOS, SMARTPLS, WARPPLS, AND SPSS FOR SMALL SAMPLES

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Abstract

Abstract - The purpose of this study is to compare the results of quantitative research data processing in the field of education management using Lisrel, Tetrad, GSCA, Amos, SmartPLS, WarpPLS, and SPSS software for small samples or respondents. This research method is quantitative and research data analysis uses the four types of software to obtain a comparison of the results of the analysis. The analysis in this study focuses on the analysis of hypothesis testing and regression analysis. Regression analysis is used to measure how much influence the independent variable has on the dependent variable. The field of this research is education management and the research data uses quantitative data derived from questionnaire data for a small sample of 32 respondents with three research variables, namely the independent variable of transformational leadership and job satisfaction, while the dependent variable is teacher performance. Based on the results of the analysis using Lisrel, Tetrad, GSCA, Amos, SmartPLS, WarpPLS, and SPSS software, the results showed that for a small sample there was no significant difference in the significance value of p-value and t-value. There is also no significant difference in the determination value, and the correlation value in the resulting structural equation also has no significant difference in results, while for CB-SEM represented by Lisrel, Tetrad cannot process data with a small sample size.

Keywords: Education Management, Data analysis, Tetrad Amos, SmartPLS, WarpPLS,

INTRODUCTION

Many researches in the field of education management use statistical software tools such as Lisrel, Tetrad, GSCA, Amos, SmartPLS, WarpPLS, and SPSS. Many researchers in the field of education management are still hesitant in choosing which software to use. There are many researches in the field of education that use SmartPLS, such as those conducted by Budi Santoso, P., Asbari, M., Siswanto, E., & Fahmi, K. (2021). examines the role of job satisfaction and organizational citizenship behavior on performance. Putra, F., Asbari, M., Purwanto, A., Novitasari, D., & Santoso, P. B. (2021) investigated linking social support and performance in college. Johan, M. (2021) examines the effect of knowledge sharing and interpersonal trust on innovation. Purwanto, A., Santoso, PB, Siswanto, E., Hartuti, H., Setiana, YN, Sudargini, Y., & Fahmi, K. (2021) the effect of hard skills, soft skills,

organizational learning and innovation capability on performance lecturer. Novitasari, D., Asbari, M., Purwanto, A., Fahmalatif, F., Sudargini, Y., Hidayati, L. H., & Wiratama, J. (2021). examined the effect of social support factors on the performance of elementary school teachers. Anas Ahmadi, E., Herwidyaningtyas, F.B., & Fatimah, S. (2020) examined the influence of organizational culture, work motivation, and job satisfaction on lecturer management performance. Jayus, J.A. (2021). Examining the effect of distributive justice, procedural justice and interactional justice on teacher involvement and teacher performance. Ahmed, U., Umrani, W. A., Qureshi, M. A., & Samad, A. (2018). examined the relationship between teacher support, academic efficacy, academic resilience, and student engagement in Bahrain. Ahmed, U., Umrani, W. A., Qureshi, M. A., & Samad, A. (2018) examined the relationship between teacher support, academic efficacy, academic resilience, and student engagement in Bahrain. Purwanto, A., J.T. Purba, I. Bernardo, and R. Sijabat. (2021) examines the effect of management innovation, transformational leadership and knowledge sharing on performance. Purwanto, John Tampil Purba, Innocentius Bernarto, Rosdiana Sijabat (2021) examined the role of organizational citizenship behavior (OCB), transformational and digital leadership on performance through mediating organizational commitment.

There have been many studies in the field of education using AMOS, such as Mustafa, M. B., Nordin, M. B., & Razzaq, A. B. A. (2020) researching structural equation modeling using AMOS: confirmatory factor analysis for the workload of teachers in special

education integration programs. Fathema, N., Shannon, D., & Ross, M. (2015) extending the technology acceptance model (TAM) to examine the use of faculty learning management systems (LMSs) in higher education institutions. Standage, M., & Treasure, D. C. (2002) the relationship between achievement goal orientation and multidimensional situational motivation in physical education. Kulinna, P. H., & Cothran, D. J. (2003) self-reported physical education teacher use and perceptions of various teaching styles. Skaalvik, E. M., & Skaalvik, S. (2010) teacher self-efficacy. Iordanoglou, D. (2007) relationship between emotional intelligence and leadership effectiveness, commitment, and satisfaction. Kokkinos, C. M., Charalambous, K., & Davazoglou, A. (2009) interpersonal teacher behavior in elementary school classrooms on teachers. Mustafa, M. Z. B., Nordin, M. B., Razzaq, A. R. B. A., & bin Ibrahim, B. (2020) organizational commitment of SMK teachers. Woolley, M. E., Strutchens, M., Gilbert, M. C., & Martin, W. G. (2010) The mathematical success of black middle school students is a direct and indirect effect of teacher expectations and reform practices.

There are many researches in the field of education that use SPSS, such as those conducted by ebjan, U., & Tominc, P. (2015) on the impact of teacher support and conformity with learning needs on the use of SPSS by students. Murtiningsih, M., Kristiawan, M., & Lian, B. (2019) correlation between principal supervision and interpersonal communication with teacher work ethic. Espelage, DL, Polanin, JR, & Low, SK (2014) Teacher and staff perceptions of the school environment as predictors of

student aggression, victimization, and willingness to intervene in bullying situations Comparative study of attitudes, attention, and interaction levels of elementary school teachers and students teacher candidates towards Inclusive Education. Chong, W. H., Klassen, R. M., Huan, V. S., Wong, I., & Kates, A. D. (2010) relationship between school type, teacher efficacy beliefs, and academic climate of Asian secondary schools. There are many researches in education that use WarpPLS, such as that done by Kock, N. (2010) using WarpPLS in e-collaboration studies. Kock, N. (2011) used WarpPLS in an e-collaborative study of descriptive statistics, settings, and key analysis results. Mahipalan, M., & Sheena, S. (2019) workplace spirituality, psychological well-being and the mediating role of subjective stress. Ifinedo, E., Rikala, J., & Hämäläinen, T. (2020) Factors influencing teacher educator technology integration Nigeria considers the characteristics, knowledge constructions, practices and beliefs of ICT. Lim, S. C., & Thien, L. M. (2020) Chinese academic leadership from the perspective of Confucian virtues and their effect on teacher commitment. Thien, L. M., & Adams, D. (2021) distributing teacher affective leadership and commitment to change in Malaysian primary schools: contextual effects of gender and teaching experience. Manalo, R. A., de Castro, B., & Uy, C. (2020) the mediating role of job satisfaction on the effect of motivation on organizational commitment and work involvement of private secondary school teachers. Ali, G. (2017) moderating effect of organizational identification on the relationship between teachers' perceived organizational justice and burnout behavior at

the college level. Matriadi, F., Salim, S. R. A., Dalimunthe, R. F., & Gultom, P. (2019) The effect of compensation and supply chain management on the educational system mediating role of work motivation.

There have been many educational studies using the GSCA, such as those conducted by Sturman, E. D., & Zappala-Piemme, K. (2017) the development of grit scales for children and adults and their relationship to student success, exam anxiety, and academic performance. Kusumawati, A., Pribadi, A., & Astuti, H. M. (2013) analyzed the effect of information system quality, user satisfaction and the net benefits of E-Learning users. Idrus, S., Alhabji, T., Al Musadieq, M., & Utami, H. (2015) the effect of psychological empowerment on self-efficacy, saturation, emotional intelligence, job satisfaction, and individual performance. Ismail, N. A., & Awang, H. (2008) mathematics achievement among students. Djati, A. H. S. M. S., & Setyoleksono, A. (2014) learning attitudes and awareness of students in the success of a cultured environment. Webb-Landman, E. (2012) used group counseling to increase attendance of elementary school students with high absenteeism. Hermawati, A., & Mas, N. (2017) the mediating effect of quality of work life, work involvement, and organizational citizenship behavior in the relationship between transglobal leadership and employee performance. Safarudin, A., Astuti, E. S., Raharjo, K., & Al Musadieq, M. (2015) The effect of transactional leadership style and work environment on computer self-efficacy, job satisfaction, behavior and performance of computer operators. Owens, D., Stewart, T. A., & Bryant, R. M. (2011) perceptions, attitudes, and experiences of urban African

American high school girls with professional school counselors.

Many educational studies using tetrads such as those conducted by Yatim, N. A. M., Kelana, B. W. Y., & Mohd, Z. H. (2020) the effect of dark tetrad personality traits in cyber aggression behavior among teachers.Moore-Russo, D., & Viglietti, J. M. (2012) using the K5 connected cognition diagram to analyze teachers' communication and understanding of regions in three-dimensional space. Chambers, F. C., & Armor, K. M. (2011) teacher educators supporting student teachers to learn on teaching practice. Xulu, PS (2018) to investigate the effectiveness of Japanese lesson study as a collaborative professional development activity for teachers at school level (Doctoral dissertation). Inayati, D., & Emaliana, I. (2017) the relationship among Pre-Service EFL teachers' beliefs about language learning, Jones, E., & Bergin, C. (2019) evaluating teacher effectiveness using classroom observations. Zhonghua, L. (2012) using contemporary education strategies to improve teaching and learning in a Botany course at Beijing Forestry University. Kenny, R. F., & McDaniel, R. (2011) the role teachers' expectations and value assessments of video games play in their adopting and integrating them into their classrooms. Sarnacchiaro, P., Scippacercola, S., & Malafronte, P. (2019) a statistical model for the self-evaluation of teacher satisfaction in school management: a study in the Italian Secondary School.

Many educational studies use Lisrel such as Dorman, J. P. (2003) relationship between school and classroom environment and teacher burnout: A LISREL analysis. Yuen, A. H., & Ma, W. W. (2008) exploring teacher acceptance of e-learning technology.

Mahdizadeh, H., Biemans, H., & Mulder, M. (2008) determining factors of the use of e-learning environments by university teachers. Geijsel, F., Sleegers, P., Leithwood, K., & Jantzi, D. (2003). Transformational leadership effects on teachers' commitment and effort toward school reform. Lee, M. H., & Tsai, C. C. (2010) exploring teachers' perceived self efficacy and technological pedagogical content knowledge with respect to educational use of the World Wide Web. Karabenick, S. A., & Sharma, R. (1994) perceived teacher support of student questioning in the college classroom: Its relation to student characteristics and role in the classroom questioning process. Kheruniah, A. E. (2013) teacher personality competence contribution to a student study motivation and discipline to fiqh lesson. Ellis, K. (2000) perceived teacher confirmation. The development and validation of an instrument and two studies of the relationship to cognitive and affective learning. Al-Ruz, J. A., & Khasawneh, S. (2011) Jordanian pre-service teachers' and technology integration: A human resource development approach. Zeinabadi, H. (2010) job satisfaction and organizational commitment as antecedents of organizational citizenship behavior (OCB) of teachers. Bolkan, S., Goodboy, A. K., & Griffin, D. J. (2011) teacher leadership and intellectual stimulation: Improving students' approaches to studying through intrinsic motivation.

METHOD

This research method is quantitative, research data analysis uses Lisrel, Tetrad, GSCA, Amos, SmartPLS, WarpPLS, and SPSS software to obtain a comparison of the results of the analysis. The analysis in this study

focuses on the analysis of hypothesis testing and regression analysis. Regression analysis is used to measure how much influence the independent variable has on the dependent variable. The data from this study used quantitative data derived from questionnaire data with a small sample of 32 respondents. In the data there are 3 variables, namely three

research variables, namely the independent variables of transformational leadership and job satisfaction, while the dependent variable is the performance developed from Purwanto et al. (2020); Asbari et al. (2021) and Novitasari et al (2020) with the following research model:
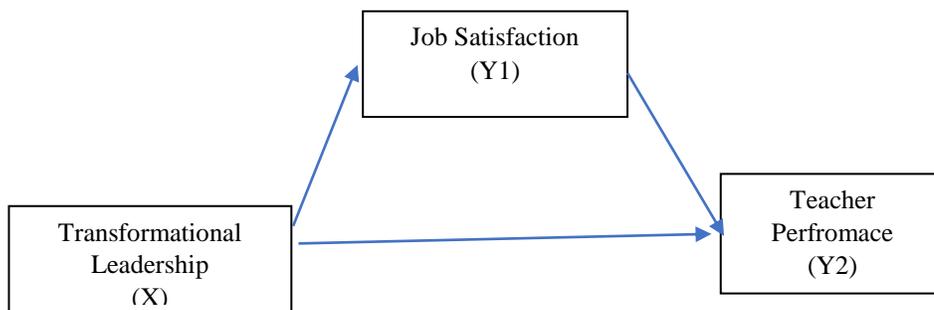
Fig 1. Research Model

X is Transformational Leadership, Y1 is Job Satisfaction and Y2 is Teacher Performance. The relationship models to be analyzed are as follows:

1. The relationship between Transformational Leadership (X) and Teacher Performance (Y2).
2. The relationship between Transformational Leadership (X) and Job Satisfaction (Y1).
3. The relationship between job satisfaction (Y1) and teacher performance (Y2).
4. The relationship between Transformational Leadership (X) and Teacher Performance (Y2) through Job Satisfaction (Y1).

Result and Discussion

A. Testing the Significance of t-Value

The first stage of data analysis is testing the significance of the relationship

between the independent variable transformational leadership (X), job satisfaction (Y1) with the dependent variable teacher performance (Y2) by looking for t-Value using Lisrel, Tetrad, GSCA, Amos, SmartPLS, WarpPLS, and SPSS, the decision criteria if the t-Value value is greater than 1.96 or > 1.96 then the relationship is significant, if less than 1.96 or < 1.96 then the relationship is not significant. For WarpPLS does not produce a t-statistic value, the significance test can be seen on the p-value, so that the t-statistic value will be obtained.

The test results with 4 software for a direct relationship can be seen in Table 1 below:

Table 1. Comparison of t-Value Result Direct Relationship

	Amos	Lisrell	GSCA	Tetrad	SmartPLS	WarpPLS	SPSS	Result
X-Y1	N/A	N/A	-	-	89.509	-	21.424	Significant
X-Y2	N/A	N/A	-	-	1.960	-	2.125	Significant
X-Y1-Y2	N/A	N/A	-	-	0.822	-	1.051	Not Significant

Relationship between transformational leadership (X) and job satisfaction (Y1) Based on the results of the software analysis, the results of the t-Value using Amos data cannot be processed. The t-Value using SmartPLS is 89,509, which is greater than 1.96, so it can be concluded that the relationship between X and Y1 is significant. The result of t-Value using SPSS is 21.424 which is greater than 1.96 so that it can be concluded that the relationship is significant so that it can be concluded that SmartPLS and SPSS give the same results.

Relationship between transformational leadership (X) and performance (Y2). Based on the results of the software analysis, the results of the t-Value using Amos using Amos data cannot be processed. The t-Value using SmartPLS is 1.960, which is greater than 1.96, so it can be concluded that the relationship between X and Y2 is significant. The results of the t-Value using SPSS of 2.125 are greater than 1.96 so that it can be concluded that the relationship between X and Y2 is significant, so it can be concluded that SmartPLS and SPSS give the same results.

The relationship between transformational leadership (X) and performance (Y2) through job satisfaction (Y1)

Based on the results of the software analysis, the results of the t-Value using Amos data cannot be processed. The result of t-Value using SmartPLS is 0.822 which is smaller than 1.96 so that it can be concluded that the relationship between X and Y2 through Y1 is not significant. The result of t-Value using SPSS of 1.051 is smaller than 1.96, so it can be concluded that the relationship between X and Y2 through Y1 is not significant, so it can be concluded that SmartPLS and SPSS give the same results.

B. Testing the Significance of p-Value

The second stage is data analysis, namely testing the significance of the relationship between the independent variable transformational leadership (X), job satisfaction (Y1) with the dependent variable teacher performance (Y2) by looking for p-value using SPSS, Amos, SmartPLS, WarpPLS and SPSS software. The decision is that if the p-value is less than 0.050 or <0.050 then the relationship is significant, if it is more than 0.050 or >0.050 then the relationship is not significant.

The test results with 4 software for direct connection are as follows:

Table. 3. Comparison of P Value

	Amos	Lisrel	GSCA	Tetrad	SmartPLS	WarpPLS	SPSS	Result
X1-Y1	-	-	-		0.000	< 0.010	0.000	Sig
X1-Y2	-	-	-		0.046	< 0.010	0.042	Sig
X-Y1-Y2	-	-	-		0.411	0.450	0.302	Not Sig

Relationship between transformational leadership (X) and job satisfaction (Y1)
Based on the results of the software analysis, the p-value results using Amos data cannot be processed. The p-value using SmartPLS is 0.000 less than 0.050 so it can be concluded that the relationship between X and Y1 is significant. The p-value using WarpPLS is 0.000 less than 0.050 so it can be concluded that the relationship is significant. The p-value using SPSS is 0.000 less than 0.050, so it can be concluded that the relationship between X1 and Y1 is significant, so it can be concluded that WarpPLS, SmartPLS and SPSS give the same results.

The relationship between transformational leadership (X1) and performance (Y2)

Based on the results of the software analysis, the p-value results using Amos data cannot be processed. The p-value using SmartPLS is 0.046 which is smaller than 0.050, so it can be concluded that the relationship between X and Y2 is significant. The result of p-value using WarpPLS is 0.410 less than 0.050 so that it can be concluded that the relationship between X and Y2 is significant. The result of the p-value using SPSS is 0.042 less than 0.050 so it can be concluded that the relationship between X and Y2 is significant t so that it can be

concluded that WarpPLS. SmartPLS and SPSS give the same result.
The relationship between transformational leadership (X1) and performance (Y2) through job satisfaction (Y1)

Based on the results of software analysis, the p-value using SmartPLS was 0.411 more than 0.050, so it was concluded that the relationship between X and Y2 through Y1 was not significant. The result of p-value using WarpPLS is 0.450 which is greater than 0.050 so that it can be concluded that the relationship between X and Y2 through Y is not significant. The results of the p-value using SPSS of 0.302 is greater than 0.050 so that it can be concluded that the relationship between X and Y2 through Y is not significant.

Coefficient of Determination Test

Testing the coefficient of determination to calculate the influence of the independent variable on the dependent variable. In this study, the R Square termination coefficient was calculated for the independent variables of transformational leadership (X), Job Satisfaction (Y1) and Performance (Y2). The results of the R Square test using Amos, SmartPLS, WarpPLS and SPSS are as follows:

Table. 4 Comparison of R Square: Research Result

	Amos	Lisrel	Tetrad	GSCA	SmartPLS	WarpPLS	SPSS
Y1	-	-	-	0.945	0.941	0.95	0.939
Y2	-	-	-	0.859	0.852	0.85	0.844

Based on the results in Table 4, the R Square value for Job Satisfaction (Y1) using Amos cannot be run. The value of R Square for Job Satisfaction (Y1) using SmartPLS is 0.941 or 94.1%, meaning that the Job Satisfaction variable (Y1) is influenced by the transformational leadership variable (X) of 94.1% while the remaining 5.9% is influenced by other variables that are not discussed in this study. The R Square value for Job Satisfaction (Y1) using WarpPLS is 0.95 or 95%, meaning that the Job Satisfaction variable (Y1) is influenced by the transformational leadership variable (X) by 95% while the remaining 5% is influenced by other variables not discussed in this section. this research. The R Square value for Job Satisfaction (Y1) using SPSS is 0.939 or 93.9%, meaning that the Job Satisfaction variable (Y1) is influenced by the transformational leadership variable (X) by 93.9% while the remaining 6.1% is influenced by other variables not discussed in this study. . Based on the results in Table 4, the R Square value for Performance (Y2) using Amos cannot be run. The value of R Square for Performance (Y2) using SmartPLS is 0.852 or 85.2%, meaning that the performance variable (Y2) is influenced by transformational leadership variables (X) and job satisfaction (Y1) is 85.2% while the remaining 14.8% is influenced by other variables not discussed in this study. The R Square value for

Performance (Y2) using SmartPLS is 0.85 or 85%, meaning that the performance variable (Y2) is influenced by transformational leadership variables (X) and job satisfaction (Y1) by 85% while the remaining 15% is influenced by other variables. which were not discussed in this study. The value of R Square for Performance (Y2) using SmartPLS is 0.844 or 84.4%, meaning that the performance variable (Y2) is influenced by transformational leadership variables (X) and job satisfaction (Y1) is 84.4% while the remaining 15.6% is influenced by other variables not discussed in this study.

Correlation Coefficient Test

The correlation coefficient shows the strength of the linear relationship and the direction of the relationship between variables. If the correlation coefficient is positive, then the two variables have a unidirectional relationship (Purwanto et al, 2020). This means that if the value of the variable X is high, then the value of the variable Y will be high as well. Conversely, if the correlation coefficient is negative, then the two variables have an inverse relationship. This means that if the value of the variable X is high, then the value of the variable Y will be low and vice versa. According to Hair et al (2017) to make it easier to interpret the strength of the relationship between two variables, the following criteria are provided:

• 0 means There is no correlation between two variables
• >0.00 – 0.25 means the correlation is very weak
• > 0.25 – 0.50 means enough correlation
• >0.50 – 0.75 means strong correlation

• > 0.75 – 0.99 means the correlation is very strong
• 1.00 means perfect correlation

The results of testing the correlation coefficient for structural equations using Amos, SmartPLS, WarpPLS and SPSS software are as follows:

Table 5. Comparison of Structural Equation Result

Software	equation
Amos	-
	-
SmartPLS	$Y1=a + 0.970X + e$
	$Y2=a + 0.642X1 + 0.287Y1 + e$
Lisrel	-
Tetrad	-
GSCA	$Y1=a+ 0.972X1 + e$
	$Y2=a+ 0.703X+ 0.229Y1 + e$
WarpPLS	$Y1=a + 0.973X + e$
	$Y2=a+ 0.658X + 0.271Y1$
SPSS	$Y1=1.83+ 0.950X + e$
	$Y2=0.219+ 0.642X1 + 0.324Y1 + e$

The results of structural equations using Lisrel, Tetrad and Amos software cannot be run. The results of the structural equation using SmartPLS software obtained the equation is $Y2 = 0.642X1+0.287X2+e$, meaning that the correlation coefficient value of the influence of transformational leadership variable (X) on performance (Y2) is 0.642, meaning that there is a strong correlation and indicates that if the value of transformational leadership (X) increases by 1 unit, while the value of job satisfaction (X2) remains, the performance value (Y2) will increase by 0.642 units. This means that the partial effect of transformational leadership on performance is

64.2%. The correlation coefficient value of the influence of job satisfaction variable (Y1) on performance (Y2) is 0.287, meaning that there is a sufficient correlation and shows that if the value of job satisfaction (Y1) increases by 1 unit, while the value of transformational leadership (X) remains, the performance value (Y2) will increase by 0.287 units . This means that the effect of job satisfaction (Y1) on performance partially is 28.7%.

The results of the structural equation using WarpPLS software obtained the equation is $Y2 = 0.658X1+0.271X2+e$, meaning that the correlation coefficient value of the influence of transformational leadership

variable (X) on performance (Y2) is 0.658, meaning that there is a strong correlation and shows that if the value of transformational leadership (X) increases by 1 unit, while the value of job satisfaction (X2) remains, the performance value (Y2) will increase by 0.658 units. This means that the partial effect of transformational leadership on performance is 65.8%. The correlation coefficient value of the effect of job satisfaction variable (Y1) on performance (Y2) is 0.271, meaning that there is a sufficient correlation and indicates that if the value of job satisfaction (Y1) increases by 1 unit, while the value of transformational leadership (X) remains, the performance value (Y2) will increase by 0.271 units . This means that the effect of job satisfaction (Y1) on performance partially is 27.1%.

The results of the structural equation using SPSS software obtained the equation is Y2=0.219+ 0.642X1 + 0.324Y1 + e, meaning that the correlation coefficient value of the influence of transformational leadership variable (X) on performance (Y2) is 0.642, meaning that there is a strong correlation and indicates that if the value of leadership transformational (X) increases by 1 unit, while the value of job satisfaction (X2) remains, the performance value (Y2) will increase by 0.642 units plus a constant of 0.219 units. This means that the partial effect of transformational leadership on performance is 64.2%. The correlation coefficient value of the influence of job satisfaction variable (Y1) on performance (Y2) is 0.324, meaning that there is a sufficient correlation and indicates that if the value of job satisfaction (Y1) increases by 1 unit, while the value of transformational leadership (X) remains, the performance value (Y2) will increase by 0.324

units plus the constant 0.219 units . This means that the effect of job satisfaction (Y1) on performance partially is 32.4%.

The results of the structural equation using the GSCA software obtained the equation is Y2=a+ 0.703X+ 0.229Y1 + e, meaning that the correlation coefficient value of the influence of transformational leadership variable (X) on performance (Y2) is 0.704, meaning that there is a strong correlation and shows that if the value of transformational leadership (X) increases by 1 unit, while the value of job satisfaction (X2) remains, the performance value (Y2) will increase by 0.703 units n. This means that the partial effect of transformational leadership on performance is 70.3%. The correlation coefficient value of the influence of job satisfaction variable (Y1) on performance (Y2) is 0.229 meaning that there is a sufficient correlation and indicates that if the value of job satisfaction (Y1) increases by 1 unit, while the value of transformational leadership (X) remains, the performance value (Y2) will increase by 0.229 units plus the constant 0.229 units . This means that the effect of job satisfaction (Y1) on performance partially is 22.9%.

CONCLUSION

Based on the results of the analysis using GSCA, SPSS, SmartPLS and WarpPLS software, the results showed that for a small sample there was no significant difference in the significance value of p-value and t-value. There is also no significant difference in the determination value produced, and the correlation value in the resulting structural equation also has no significant difference in results, while for CB-SEM represented by

Lisrel , tetrad and Amos cannot process data with a small sample size.

REFERENCES

Jahn, S. (2007). Strukturgleichungsmodellierung mit LISREL, AMOS und SmartPLS: eine Einführung (An introduction to structural equation modeling with LISREL, AMOS and SmartPLS). AMOS und SmartPLS: Eine Einführung (An Introduction to Structural Equation Modeling with LISREL, AMOS and SmartPLS).

Ong, M. H. A., & Puteh, F. (2017). Quantitative data analysis: Choosing between SPSS, PLS, and AMOS in social science research. International Interdisciplinary Journal of Scientific Research, 3(1), 14-25.

Darwin, M., & Umam, K. (2020). Analisis Indirect Effect pada Structural Equation Modeling: Studi Komparasi Penggunaan Software Amos dan SmartPLS. NUCLEUS, 1(2), 50-57.

Afthanorhan, W. M. A. B. W. (2013). A comparison of partial least square structural equation modeling (PLS-SEM) and covariance based structural equation modeling (CB-SEM) for confirmatory factor analysis. International Journal of Engineering Science and Innovative Technology, 2(5), 198-205.

Ong, M. H. A., & Puteh, F. (2017). Quantitative data analysis: Choosing between SPSS, PLS, and AMOS in social science research. International Interdisciplinary Journal of Scientific Research, 3(1), 14-25.

Purwanto, A., Asbari, M., & Santoso, T. I. (2021). Analisis Data Penelitian Sosial dan Manajemen: Perbandingan Hasil antara Amos, SmartPLS, WarpPLS, dan SPSS Untuk Jumlah Sampel Medium. International Journal of Social and Management Studies, 2(4), 43–53. https://doi.org/10.5555/ijosmas.v2i4.50

Purwanto, A., Purba,J.T, Bernarto,I., Sijabat,R.(2021). The Role of Transformational Leadership, Organizational citizenship behaviour, Innovative Work Behaviour, Quality Work Life, Digital Transformation and Leader member exchange on Universities Performance. Linguistica Antverpiensia.2021(2).2908-2932

Purwanto, A., Asbari, M., & Santoso, T. I. (2021). Analisis Data Penelitian Marketing: Perbandingan Hasil antara Amos, SmartPLS, WarpPLS, dan SPSS Untuk Jumlah Sampel Besar. Journal of Industrial Engineering & Management Research, 2(4), 216 - 227. https://doi.org/10.7777/jiemar.v2i4.178

Nam, S. T., Kim, D. G., & Jin, C. Y. (2018). A Comparison Analysis among Structural Equation Modeling (AMOS, LISREL and PLS) Using the Same Data. Journal of the Korea Institute of Information and Communication Engineering, 22(7), 978-984.

Budi Santoso, P., Asbari, M., Siswanto, E., & Fahmi, K. (2021). The Role of Job Satisfaction and Organizational Citizenship Behavior on Performance: Evidence from Indonesian Teachers.

International Journal of Social and Management Studies, 1(1), 22–31. https://doi.org/10.5555/ijosmas.v1i1.2

Putra, F., Asbari, M., Purwanto, A., Novitasari, D., & Santoso, P. B. (2021). Linking Social Support and Performance in Higher Education. International Journal of Social and Management Studies, 2(1), 64–73. https://doi.org/10.5555/ijosmas.v2i1.8

Johan, M. (2021). The Effect of Knowledge Sharing and Interpersonal Trust on Innovation: An Empirical Study in Indonesia Higher Education . International Journal of Social and Management Studies, 2(3), 106–122. https://doi.org/10.5555/ijosmas.v2i3.38

Purwanto, A., Santoso, P. B., Siswanto, E., Hartuti, H., Setiana, Y. N., Sudargini, Y., & Fahmi, K. (2021). Effect of Hard Skills, Soft Skills, Organizational Learning and Innovation Capability on Islamic University Lecturers' Performance. International Journal of Social and Management Studies, 2(1), 14–40. https://doi.org/10.5555/ijosmas.v2i1.5

Novitasari, D., Asbari, M., Purwanto, A., Fahmalatif, F., Sudargini, Y., Hidayati, L. H., & Wiratama, J. (2021). The Influence of Social Support Factors on Performance: A Case Study of Elementary School Teachers. International Journal of Social and Management Studies, 2(1), 41–52.

https://doi.org/10.5555/ijosmas.v2i1.6

Anas Ahmadi, E., Herwidyaningtyas, F. B., & Fatimah, S. (2020). The Influence of Organizational Culture, Work Motivation, and Job Satisfaction on Management Lecturer Performance (Empirical Study at Higher Education in the Residency of Bojonegoro). Journal of Industrial Engineering & Management Research, 1(3), 76-83. https://doi.org/10.7777/jiemar.v1i3.68

Jayus, J. A. (2021). The Effect of Distributive Justice, Procedural Justice and Interactional Justice on Teacher Engangement and Teachers Performance. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(7), 131-139.

Ahmed, U., Umrani, W. A., Qureshi, M. A., & Samad, A. (2018). Examining the links between teachers support, academic efficacy, academic resilience, and student engagement in Bahrain. International Journal of Advanced and Applied Sciences, 5(9), 39-46.

Ahmed, U., Umrani, W. A., Qureshi, M. A., & Samad, A. (2018). Examining the links between teachers support, academic efficacy, academic resilience, and student engagement in Bahrain. International Journal of Advanced and Applied Sciences, 5(9), 39-46.

Purwanto, A., J. T. Purba, I. Bernarto, and R. Sijabat. 2021. Effect of Management Innovation, Transformational leadership and knowledge sharing on Market Performance of Indonesian

Consumer Goods Company. Jurnal Aplikasi Manajemen, 19(2), 424–434. Malang: Universitas Brawijaya. http://dx.doi.org/10.21776/ub.jam.2021.019.02.18.

Purwanto, A., John Tampil Purba, Innocentius Bernarto, Rosdiana Sijabat. (2021). EFFECT OF TRANSFORMATIONAL LEADERSHIP,JOB SATISFACTION, AND ORGANIZATIONAL COMMITMENTS ON ORGANIZATIONAL CITIZENSHIP BEHAVIOR. Inovbiz: Jurnal Inovasi Bisnis 9 (2021) 61-69

Purwanto, John Tampil Purba, Innocentius Bernarto, Rosdiana Sijabat (2021).Peran Organizational Citizenship Behavior (OCB), Transformational and Digital Leadership Terhadap Kinerja Melalui Mediasi Komitmen Organisasi Pada Family Business. Jenius. 4(3). 256-262.http://dx.doi.org/10.32493/JJSDM.v4i3.10454

Mustafa, M. B., Nordin, M. B., & Razzaq, A. B. A. (2020). Structural Equation Modelling Using AMOS: Confirmatory Factor Analysis for Taskload of Special Education Integration Program Teachers. Univers. J. Educ. Res, 8(1), 127-133.

Fathema, N., Shannon, D., & Ross, M. (2015). Expanding the Technology Acceptance Model (TAM) to examine faculty use of Learning Management Systems (LMSs) in higher education

institutions. Journal of Online Learning & Teaching, 11(2).

Standage, M., & Treasure, D. C. (2002). Relationship among achievement goal orientations and multidimensional situational motivation in physical education. british Journal of educational psychology, 72(1), 87-103.

Kulinna, P. H., & Cothran, D. J. (2003). Physical education teachers' self-reported use and perceptions of various teaching styles. Learning and Instruction, 13(6), 597-609.

Skaalvik, E. M., & Skaalvik, S. (2010). Teacher self-efficacy and teacher burnout: A study of relations. Teaching and teacher education, 26(4), 1059-1069.

Iordanoglou, D. (2007). The teacher as leader: The relationship between emotional intelligence and leadership effectiveness, commitment, and satisfaction. Journal of Leadership Studies, 1(3), 57-66.

Kokkinos, C. M., Charalambous, K., & Davazoglou, A. (2009). Interpersonal teacher behaviour in primary school classrooms: A cross-cultural validation of a Greek translation of the Questionnaire on Teacher Interaction. Learning environments research, 12(2), 101-114.

Mustafa, M. Z. B., Nordin, M. B., Razzaq, A. R. B. A., & bin Ibrahim, B. (2020). Organizational Commitment of Vocational College Teachers in Malaysia. PalArch's Journal of Archaeology of Egypt/Egyptology, 17(9), 5023-5029.

Woolley, M. E., Strutchens, M., Gilbert, M. C., & Martin, W. G. (2010).

Mathematics success of Black middle school students: Direct and indirect effects of teacher expectations and reform practices. Negro Educational Review, 61(1-4), 41.

Šebjan, U., & Tominc, P. (2015). Impact of support of teacher and compatibility with needs of study on usefulness of SPSS by students. Computers in Human Behavior, 53, 354-365.

Murtiningsih, M., Kristiawan, M., & Lian, B. (2019). The Correlation Between Supervision of Headmaster and Interpersonal Communication With Work Ethos of the Teacher. European Journal of Education Studies.

Espelage, D. L., Polanin, J. R., & Low, S. K. (2014). Teacher and staff perceptions of school environment as predictors of student aggression, victimization, and willingness to intervene in bullying situations. School psychology quarterly, 29(3), 287.

Gokdere, M. (2012). A Comparative Study of the Attitude, Concern, and Interaction Levels of Elementary School Teachers and Teacher Candidates towards Inclusive Education. Educational Sciences: Theory and Practice, 12(4), 2800-2806.

Chong, W. H., Klassen, R. M., Huan, V. S., Wong, I., & Kates, A. D. (2010). The relationships among school types, teacher efficacy beliefs, and academic climate: Perspective from Asian middle schools. The Journal of Educational Research, 103(3), 183-190.

Thoma, C. A., Baker, S. R., & Saddler, S. J. (2002). Self-determination in teacher education: A model to facilitate transition planning for students with disabilities. Remedial and special education, 23(2), 82-89.

Erdogan, A., & Sahin, I. (2010). Relationship between math teacher candidates' technological pedagogical and content knowledge (TPACK) and achievement levels. Procedia-Social and Behavioral Sciences, 2(2), 2707-2711.

Hughes, G. D. (2012). Teacher retention: Teacher characteristics, school characteristics, organizational characteristics, and teacher efficacy. The Journal of Educational Research, 105(4), 245-255.

Taylor, M., Yates, A., Meyer, L. H., & Kinsella, P. (2011). Teacher professional leadership in support of teacher professional development. Teaching and teacher education, 27(1), 85-94.

Kock, N. (2010). Using WarpPLS in e-collaboration studies: An overview of five main analysis steps. International Journal of e-Collaboration (IJeC), 6(4), 1-11.

Kock, N. (2011). Using WarpPLS in e-collaboration studies: Descriptive statistics, settings, and key analysis results. International Journal of e-Collaboration (IJeC), 7(2), 1-18.

Mahipalan, M., & Sheena, S. (2019). Workplace spirituality, psychological well-being and mediating role of subjective stress: A case of secondary school teachers in India. International Journal of Ethics and Systems.

Ifinedo, E., Rikala, J., & Hämäläinen, T. (2020). Factors affecting Nigerian

teacher educators' technology integration: Considering characteristics, knowledge constructs, ICT practices and beliefs. Computers & education, 146, 103760.

Lim, S. C., & Thien, L. M. (2020). Chinese academic leadership from the perspective of Confucian virtues and its effects on teacher commitment. International Online Journal of Educational Leadership, 4(1), 37-51.

Thien, L. M., & Adams, D. (2021). Distributed leadership and teachers' affective commitment to change in Malaysian primary schools: the contextual influence of gender and teaching experience. Educational Studies, 47(2), 179-199.

Manalo, R. A., de Castro, B., & Uy, C. (2020). The mediating role of job satisfaction on the effect of motivation to organizational commitment and work engagement of private secondary high school teachers in Metro-Manila. Review of Integrative Business and Economics Research, 9, 133-159.

Ali, G. (2017). The Moderating Effect of Organizational Identification on the Relationships between Teachers Perceived Organizational Justice and Burnout Behaviours at College Level. NICE Research Journal, 140-162.

Matriadi, F., Salim, S. R. A., Dalimunthe, R. F., & Gultom, P. (2019). The influences of compensation and supply chain managemnet towards educatioan system: The mediating role of job motivation. International Journal of Supply Chain Management, 8(3), 183-191.

Yatim, N. A. M., Kelana, B. W. Y., & Mohd, Z. H. (2020). The Effect of Dark Tetrad Personalities Traits in Cyber Aggression Behavior among Johor Bahru Teachers.

Moore-Russo, D., & Viglietti, J. M. (2012). Using the K5 connected cognition diagram to analyze teachers' communication and understanding of regions in three-dimensional space. The Journal of Mathematical Behavior, 31(2), 235-251.

Chambers, F. C., & Armour, K. M. (2011). Do as we do and not as we say: teacher educators supporting student teachers to learn on teaching practice. Sport, Education and Society, 16(4), 527-544.

Xulu, P. S. (2018). To investigate the effectiveness of Japanese lesson study as a collaborative professional development activity for teachers at school level (Doctoral dissertation).

Inayati, D., & Emaliana, I. (2017). The Relationship among Pre-Service EFL Teachers' Beliefs about Language Learning, Pedagogical Beliefs, and Beliefs about ICT Integration. Dinamika ilmu, 17(1), 83-99.

Jones, E., & Bergin, C. (2019). Evaluating teacher effectiveness using classroom observations: A Rasch analysis of the rater effects of principals. Educational Assessment, 24(2), 91-118.

Zhonghua, L. (2012). Using contemporary education strategies to improve teaching and learning in a Botany course at Beijing Forestry University. International Journal of Innovation in

Science and Mathematics Education, 13(1).

Kenny, R. F., & McDaniel, R. (2011). The role teachers' expectations and value assessments of video games play in their adopting and integrating them into their classrooms. British Journal of Educational Technology, 42(2), 197-213.

Sarnacchiaro, P., Scippacercola, S., & Malafronte, P. (2019). A statistical model for the self-evaluation of teacher satisfaction in school management: a study in the Italian Secondary School. Electronic Journal of Applied Statistical Analysis, 12(3), 637-656.

Dorman, J. P. (2003). Relationship between school and classroom environment and teacher burnout: A LISREL analysis. Social Psychology of Education, 6(2), 107-127.

Yuen, A. H., & Ma, W. W. (2008). Exploring teacher acceptance of e-learning technology. Asia-Pacific Journal of Teacher Education, 36(3), 229-243.

Demir, K. (2008). Transformational Leadership and Collective Efficacy: The Moderating Roles of Collaborative Culture and Teachers' Self-Efficacy. Eurasian Journal of Educational Research (EJER), (33).

Mahdizadeh, H., Biemans, H., & Mulder, M. (2008). Determining factors of the use of e-learning environments by university teachers. Computers & education, 51(1), 142-154.

Geijsel, F., Sleegers, P., Leithwood, K., & Jantzi, D. (2003). Transformational leadership effects on teachers' commitment and effort toward school reform. Journal of educational administration.

Lee, M. H., & Tsai, C. C. (2010). Exploring teachers' perceived self efficacy and technological pedagogical content knowledge with respect to educational use of the World Wide Web. Instructional Science, 38(1), 1-21.

Karabenick, S. A., & Sharma, R. (1994). Perceived teacher support of student questioning in the college classroom: Its relation to student characteristics and role in the classroom questioning process. Journal of educational psychology, 86(1), 90.

Kheruniah, A. E. (2013). A teacher personality competence contribution to a student study motivation and discipline to fiqh lesson. International Journal of Scientific & Technology Research, 2(2), 108-112.

Ellis, K. (2000). Perceived teacher confirmation. The development and validation of an instrument and two studies of the relationship to cognitive and affective learning. Human Communication Research, 26(2), 264-291.

Al-Ruz, J. A., & Khasawneh, S. (2011). Jordanian pre-service teachers' and technology integration: A human resource development approach. Journal of Educational Technology & Society, 14(4), 77-87.

Zeinabadi, H. (2010). Job satisfaction and organizational commitment as antecedents of organizational citizenship behavior (OCB) of

teachers. Procedia-Social and Behavioral Sciences, 5, 998-1003.

Bolkan, S., Goodboy, A. K., & Griffin, D. J. (2011). Teacher leadership and intellectual stimulation: Improving students' approaches to studying through intrinsic motivation. Communication Research Reports, 28(4), 337-346