Cakrawala Pendidikan
Jurnal Ilmiah Pendidikan
Vol. 41 No. 3, October 2022, pp.742-753
https://journal.uny.ac.id/index.php/cp/issue/view/2348
DOI: https://doi.org/10.21831/cp.v41i3.48911

Web-based instruments for national competences of physical education teachers

Suroto[1*], Bayu Budi Prakoso[1], Anung Priambodo[1], Fifukha Dwi Khory[1], and Vega Candra Dinata[1]
[1]Universitas Negeri Surabaya, Indonesia
*Corresponding Author: suroto@unesa.ac.id

ABSTRACT

Several studies believe that the use of national standards as a benchmark for teacher quality can align education services to achieve national goals. In addition, the number of years of teaching experience can determine teacher productivity during the course of their profession. This article explores the results of developing a teacher competency measurement instrument based on the Indonesian national standards and evaluating teacher competency based on gender, grade, and working period. To assess teacher competency, 277 Physical Education (PE) teachers completed an online survey at http://risetpjokindonesia.com/. The measurement results were analyzed using confirmatory factor analysis and Cronbach's alpha to test validity and reliability. A T-test and one-way ANOVA were used to evaluate teacher competency based on gender, grade, and working period. The findings show that the measurements are valid and reliable, allowing for their application in future research. Gender, grade, and working period were found to affect teacher competency. The development of teacher competency based on working period provides input in the form of accuracy in the teacher's professional development and the limitation of the teacher's productive period in carrying out his or her profession.

Keywords: web-based instrument, physical education, teacher, competency

Article history

Received:	*Revised:*	*Accepted:*	*Published:*
3 May 2021	*2 June 2021*	*24 June 2022*	*1 October 2022*

Citation (APA Style): Suroto, Prakoso, B. B., Priambodo, A., Khory, F. D., & Dinata, V.C. (2022). Web-based instruments for national competences of physical education teachers. *Cakrawala Pendidikan: Jurnal Ilmiah Pendidikan, 41*(3), 742-753. https://doi.org/10.21831/cp.v41i3.48911

INTRODUCTION

Quality education is one of the focuses of the Sustainable Development Goals (United Nations, n.d.). Given the challenges in its education system, Indonesia may be one of the contributors to the global problems in quality education. It should be noted that the government of the Republic of Indonesia has shown its support for education by allocating 20% of the national budget to education since 2003 (Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System, 2003). The budget for education is focused on improving access and quality of education services in Indonesia (Ministry of Finance of the Republic of Indonesia, 2017), but a large budget does not necessarily solve all problems in education. The toughest problem Indonesia faces is the development of teacher competency (pedagogic, personality, social, and professional), an initiative that began in 2005 (Law of the Republic of Indonesia Number 14 of 2005 concerning Teachers and Lecturers, 2005). The measurement of teacher competency has become the government's benchmark for providing incentives to teachers through the certification system. Initially, the teacher's portfolio system was chosen to measure teacher competency and was integrated with the certification system. However, an obstacle arose in the form of document manipulation (Maksum, 2010), which had an impact on the effectiveness of teacher certification programs. Also, there was an absence of evidence for the effectiveness of teacher certification on student learning outcomes and teacher performance (Kusumawardhani,

2017). The Teacher Competency Test took its place of the Teacher Portfolio System in 2012 because the Teacher Portfolio System's accuracy in determining teacher competency had been too low since 2007. The results of the test showed that the average teacher competency in Indonesia was below the national score targets (Team of Directorate General of Teachers and Education Staff, 2018). Under these conditions, the development of teacher competency in Indonesia is a cause for major concern.

Globally, the development of teacher competency is an important issue in education reform as it ensures the proper functioning of teachers in education services (Pantić & Wubbels, 2010). Competent teachers are the most important form of human capital for bringing Indonesia's national education system into line with those of developed countries(Yusof et al., 2019). Moreover, the impact of globalization at this time clearly presents extraordinary challenges in education, especially for developing countries (Akar, 2010). As a result, many countries do not adopt international standards as the benchmark for their education systems. Instead, normative quality measures limited to the relative variations in each country are used, which do not perfectly adhere to international standards (Wagner & Castillo, 2014). Additionally, there are several disparities between the circumstances in developed and developing countries, especially those related to the level of education(Madsen, 2020). Therefore, it is appropriate to use national standards as the benchmark for teachers' professional development so that educational services are in line with national education goals (Klentschy, 2005; Michael et al., 2016). This will affect the accuracy of teacher credentials in accordance with each nation's national standards(Liang et al., 2005; Nakai & Metzler, 2005; Yoo & Kim, 2005). In order to support the appropriateness of teachers' compliance with national standards, it is logical if the national standard is used as the checklist of competencies as a measure of the teacher's self-quality (Brookhart, 2011; Preston & Kennedy, 1995).

Based on the explanation above, it is proposed that the first objective of this article is to explore the results of developing a teacher competency measurement instrument based on the Indonesian national standards, specifically for physical education teachers, by utilizing the Indonesian national standards for teacher competency. The measurement model developed was a web-based checklist of competencies (http://risetpjokindonesia.com/). The initial idea of developing teacher competency measurement, both independently and online, is to track the advancement of teacher competency, which has received little attention from the government (Saito & Van Cappelle, 2009). Although teachers use technology extensively (Huda et al., 2018), it has not yet been completely utilized for educational objectives in Indonesia (Wuryaningsih et al., 2019) because teachers still frequently adhere to their conventional approaches to competency development (Sari, 2012). This gap really highlights the need for such measurements to be made so that teachers are accustomed to using information and communication technology for professional development. The second objective of this research is to examine the qualifications of physical education teachers in relation to their gender, educational attainment, and years of teaching experience. The productive periods of teachers follow their working periods, according to previous research, and teacher productivity assessments can be examined by considering six value-added models that comprise the most widely used criteria for determining teacher productivity (Harris & Sass, 2011; Sass et al., 2014). Due to the fact that both studies were carried out in Florida, USA, the findings may not apply to developing countries.

METHOD

This quantitative research was conducted using an online survey technique using the website http://risetpjokindonesia.com/, developed by the Riset PJOK Indonesia team (Team for Physical Education Research in Indonesia). The survey was distributed to teacher communities, academic institutions, and instructors who voluntarily responded on their own.

Participants

Participating universities and teachers' communities signed a Memorandum of Understanding (MoU) and committed to providing the venue and inviting teachers, including alumni from six universities (Universitas Negeri Surabaya, Universitas Nahdlatul Ulama Sunan Giri Bojonegoro, STKIP PGRI Jombang, Universitas PGRI Banyuwangi, Universitas Pendidikan Ganesha, Universitas Cenderawasih) – four universities (Universitas Negeri Surabaya, Universitas Nahdlatul Ulama Sunan Giri Bojonegoro, STKIP PGRI Jombang, Universitas PGRI Banyuwangi) from the province of East Java representing Western Indonesia, one university (Universitas Pendidikan Ganesha) from the province of Bali representing Central Indonesia, and one university (Universitas Cenderawasih) from the province of Papua representing Eastern Indonesia)—or members of the teacher community to be participants. The research team provided support in the form of socialization, workshops, and mentoring activities. The number of participating PE teachers was 277 (see Table 1). The age of participants ranged from 19 to 55 years (M = 34.5, SD = 10.5). The working period of participants ranged from Level 5: 0-5 years to Level 10: >25 years, with the most experienced participant having 36 years (M = 10, SD = 9.1).

Table 1. Basic information of the participants

Parameter	Content	Number
Total participants[1]		277
Gender	Male	223
	Female	54
Grade	Elementary school	77
	Junior high school	104
	Senior high school	96
Working period[2]	Level 5 = 0-5 years	124
	Level 6 = 6-10 years	51
	Level 7 = 11-15 years	35
	Level 8 = 16-20 years	26
	Level 9 = 21-25 years	12
	Level 10 = >25 years	29

[1] Retrieval of data in 2016, 2017, 2018 and 2019*
[2] Level 1-4 is the level used for prospective PE teachers*

Measure

The instrument used is a questionnaire developed by the Riset PJOK Indonesia team that has been validated to measure the competency of PE teachers in Indonesia (Suroto, 2016; Suroto et al., 2017). The instrument consists of 24 questions that are used to measure 24 core competencies for PE teachers. Questions 1-10 measure pedagogic competence, questions 11-15 measure personality competence, questions 16-19 measure social competence, and questions 20-24 measure professional competence (Law of the Republic of Indonesia Number 14 of 2005 concerning Teachers and Lecturers, 2005; Regulation of the Minister of National Education of the Republic of Indonesia Number 18 of 2007 concerning Certification for Teachers in Position, 2007). Each question has 4 to 6 answers, ranging from "never" to "always", and there is a column for the PE teacher to provide descriptions of empirical evidence to support the answers.

The instrument on http://risetpjokindonesia.com is based on self-evaluation. First, the subject (PE teacher) has to register for an account. Upon admittance by the website administrator, the subject receives a user ID and password to access the website. Next, the subject has to provide some data based on their residence ID card (full name, Indonesia residential ID number, place of birth, and date of birth). Then, the subject answers the questionnaire by choosing his or her answers and providing a description of empirical evidence to support the answers. After completing the questionnaire, the score appears on the result cell. The subjects may directly print the results or request a soft copy of the validation results.

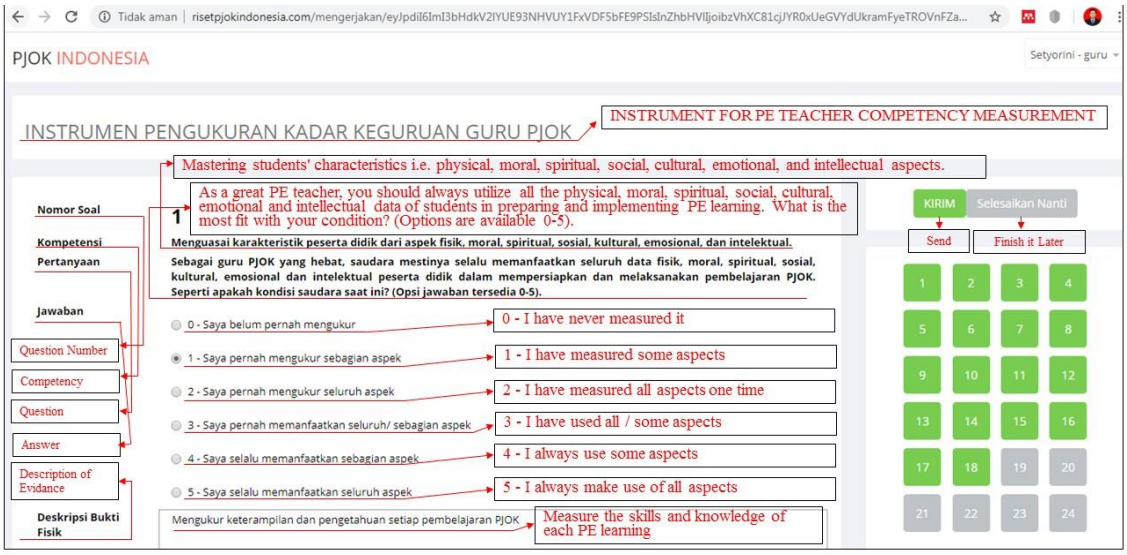

Figure 1. Example of Instrument Display

Data analysis

Subject matter experts (SMEs) were used to assess content validity using Aiken's V as a formula to determine the degree of instrument validity (Aiken, 1980, 1985; Sireci, 1998). Confirmatory factor analysis (CFA) was used to assess the validity of the measurement results. The level of acceptance measures of the analysis results used are the fit model: KMO (> 0.5) and Chi-Square (p <0.05); loading factor> 0.5 (Hair et al., 2014; Ho, 2006). Cronbach's alpha was used to assess reliability with the provisions of alpha values> 0.5 (Streiner, 2003). A descriptive statistical analysis was used to calculate the mean, standard deviation, skewness, kurtosis, and 10-90 percentiles. The level of acceptance skewness and kurtosis to determine the normal shape of the curve used was ≤ 1 (Meyers et al., 2013). A T-test was used to assess the effect of gender on teacher competency, whereas a one-way ANOVA was used to assess the effect of work period on teacher competency.

FINDING AND DISCUSSION

Finding

Initial validation of the teacher competency instrument

The instrument used in this study was tested for content validity by professors who were subject matter experts (SMEs) in teacher competency. Analysis of test results was done using Aiken's V (Aiken, 1980; Sireci, 1998). Each panelist declared the instrument valid for all the items tested. Therefore, the count of each item was 1, and it could be concluded that the instrument was valid (Aiken, 1985).

Totaling 277 teachers were requested to fill in the instrument (see Table 2). The results of KMO (> 0.5) and Chi-Square (p <0.05) showed that the factor analysis met the model's adequacy value(Ho, 2006). The Eigenvalue scores that were formed in each analysis for each factor were greater than 1. The loading values for each factor were as follows: 0.606-0.733 (pedagogic), 0.756-0.824 (personality), 0.556-0.826 (social), 0.662-0.821 (professional), and 0.842-0.89 (total competency). The results of Cronbach's alpha of each component were as follows: 0857 (pedagogic), 0.845 (personality), 0.624 (social), 0.804 (professional), 0.85 (total competency). These results indicate that the instrument has sufficient reliability as an appropriate instrument (Streiner, 2003).

Table 2. Results of CFA for validity and Cronbach's Alpha for reliability

Items/ Component	Components				Total
	1	2	3	4	
1. Pedagogic					0.875
Pedagogic-1	0.661				
Pedagogic-2	0.671				
Pedagogic-3	0.733				
Pedagogic-4	0.716				
Pedagogic-5	0.606				
Pedagogic-6	0.609				
Pedagogic-7	0.616				
Pedagogic-8	0.687				
Pedagogic-9	0.695				
Pedagogic-10	0.706				
2. Personality					0.896
Personality-1		0.763			
Personality-2		0.801			
Personality-3		0.821			
Personality-4		0.824			
Personality-5		0.756			
3. Social					0.842
Social-1			0.756		
Social-2			0.826		
Social-3			0.556		
Social-4			0.649		
4. Professional					0.890
Professional -1				0.682	
Professional -2				0.801	
Professional -3				0.821	
Professional -4				0.767	
Professional -5				0.662	
Total Variance Explained					
Eigenvalue	4.5	3.1	1.9	2.8	3.1
Variance (%)	45.1	62.9	49.7	56.2	76.7
Variance accumulated (%)	45.1	62.9	49.7	56.2	76.7
KMO and Bartlett's Test					
KMO	0.891	0.860	0.675	0.822	0.844
Chi Square	924	545	165	406	666
df	45	10	6	10	6
p-value	0.000	0.000	0.000	0.000	0.000
Cronbach's α	0.857	0.845	0.624	0.804	0.850

Correlation matrix between components of PE teacher competency

The correlation value between competency components was found to be significant ($p < 0.001$). The scores demonstrate that the four categories of teacher competency make up the entire competency value, as shown in Table 3.

Competency Profile for Physical Education TeachersAccording to descriptive statistics of the measurement findings, the data distribution is symmetric (kurtosis and skewness ≤1). The data distribution is hence normal (Meyers et al., 2013). The score categories are then established using percentiles from the descriptive statistics. In Table 4, the mean total teacher competency of 63.7 is between the 40th and 50th percentiles, meaning that it is still in the moderate competency category. The pedagogical mean of 25.1 is between the 50th and 60th percentiles, which further establishes its place in the category of good competency. The personality mean of 13.9 is between the 40th and 50th percentiles, meaning that it is still in the moderate competency category. The social mean of 11.7 is between the 40th and 50th percentiles, meaning that it is still in the moderate competency category. The professional mean of 13.0, which is in the 50th percentiles, is further classified in the moderate competency category.

Table 3. Correlation matrix between components

Component	Pedagogic	Personality	Social	Professional	Total
Pedagogic	-				
Personality	0.727**	-			
Social	0.623**	0.673**	-		
Professional	0.712**	0.732**	0.667**	-	
Total	0.925**	0.883**	0.801**	0.869**	-

**. Correlation is significant at the 0.01 level.

Table 4. Descriptive statistics on the competency scores of PE teachers

Statistics	Pedagogic	Personality	Social	Professional	Total
N	277	277	277	277	277
Mean	25.1	13.9	11.7	13.0	63.7
Std. Dev.	8.065	4.504	3.380	4.047	17.658
Skewness	0.086	-0.502	-0.659	-0.160	-0.197
Kurtosis	-0.794	-0.655	-0.106	-0.711	-0.786
Percentiles					
10	15	6	7	7.8	39
20	18	10	9	9	49
30	20	12	10	11	53
40	23	13	11	12	58
50	25	15	12	13	64
60	27	16	13	14	70
70	30	17	14	16	75.6
80	33	18	15	17	81
90	37	20	16	18	87
Score scale	0-43	0-20	0-16	0-21	0-100

Effects of gender, working period, and grade on PE teacher competency

Table 5 shows the effect of gender on teacher competency. Gender differences were proven to have an influence on teacher competency in the pedagogical component (t (275) = 2,142, p = 0.033), with female teachers scored higher for pedagogic competence compared to male teachers.

Table 5. Effect of gender on teacher competency scores

Independent Variable	Dependent Variable	Mean Difference	t	*p*	Conclusion[a]
	Pedagogic	2.603	2.142	0.033	F>M
Gender:	Personality	0.314	0.459	0.646	F=M
Female (F)	Social	0.354	0.694	0.490	F=M
Male (M)	Professional	0.805	1.313	0.190	F=M
	Total	4.077	1.526	0.128	F=M

[a]post hoc test based on Bonferroni

Table 6 shows the effect of working period and grade on teacher competency. One-way ANOVA shows that working period level has an effect on total competence (F (5, 271) = 5,023, p = 0,000). The post hoc Bonferroni tests showed that total competency at level 5 was lower than at level 6 (p = 0.045) and 9 (p = 0.002). The working period also affects the individual components. For example, pedagogic components (F (5, 271) = 4,155, p = 0.001) level 5, is lower than level 9 (p = 0.014), personality (F (5, 271) = 4.159), p = 0.001) level 5 is lower than level 9 (p = 0.013), social (F (5, 271) = 4,142, p = 0.001) level 5 is lower than level 6 (p = 0.029) and level 9 (p = 0.028), and professional (F (5, 271) = 4.001, p = 0.002) level 5 is lower than level 9 (p = 0.004). Meanwhile, grade of school affects professional competence (F= 5.205, p= 0.006) and total competence (F= 3.523, p= 0.031) as elementary school teachers' professional competence is lower than those in junior high school.

Table 6. Effect of working period and grade on teacher competency

Independent Variable	Dependent Variable	Mean Square	F	*p*	Conclusion[a]
Working period[1]	Pedagogic	256	4.155	0.001	lvl 5<9
	Personality	80	4.159	0.001	lvl 5<9
	Social	45	4.142	0.001	lvl 5<6; 5<9
	Professional	62	4.001	0.002	lvl 5<9
	Total	1460	5.023	0.000	lvl 5<6; 5<9
Grade[2]	Pedagogic	204	3.189	0.043	
	Personality	56	2.789	0.063	
	Social	5	0.477	0.621	
	Professional	83	5.205	0.006	1<2
	Total	1079	3.523	0.031	1<2

[1]0-5 year= level 5; 6-10 year= level 6; 11-15 year= level 7; 16-20 year= level 8; 21-25 year= level 9; >25 year= level 10

[2]Elementary school= 1; Junior high school= 2; Senior high school= 3

[a]Post hoc test based on bonferroni

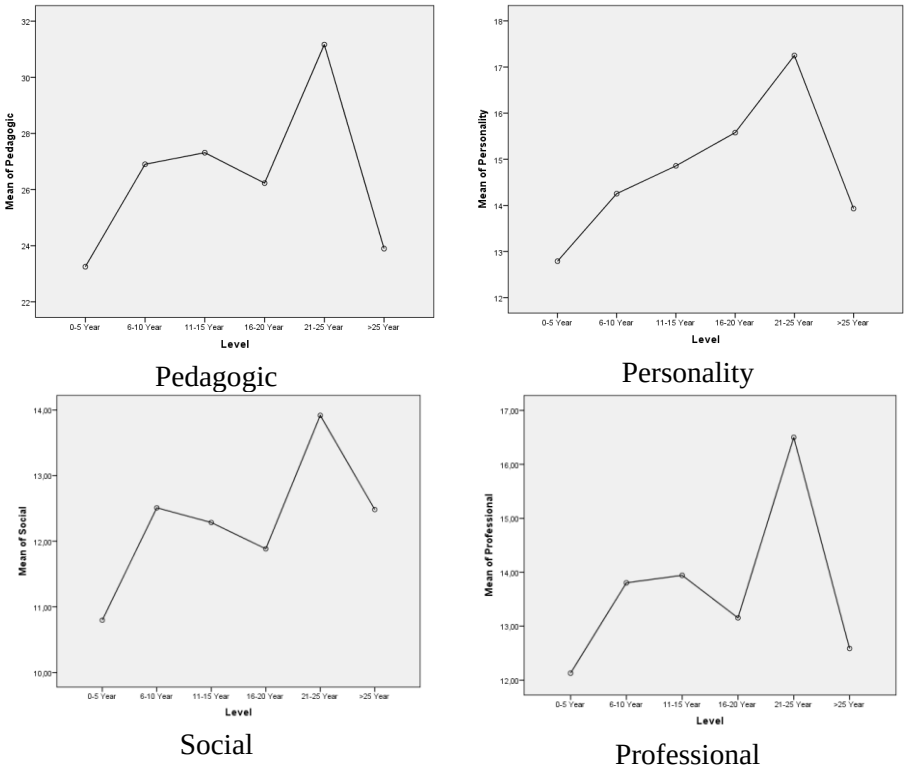

Figure 2. Changes in Mean Teacher Competency Component Based on Working Period

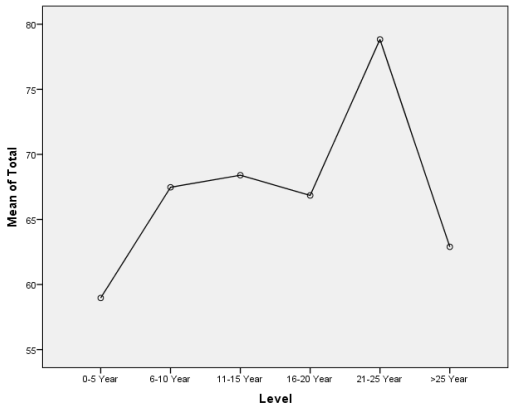

Figure 3. Changes in Mean Teacher Competency Based on Working Period

Figures 2 and 3 show the four phases of changing teacher competency conditions. First, there was an increasing trend in the initial period of becoming a teacher (0-5 years); second, there was no development of teacher competence (6-20 years); third, there was a sharp increase (21-25 years); and fourth, there was a significant decrease when retirement approached (> 25 years).

Discussion

Based on the findings, the research objectives can be explained in two stages, namely (1) the results of developing a teacher competency measurement instrument based on the Indonesian national standards and (2) evaluating teacher competency based on gender, grade, and working period. Based on the results of data analysis, it can be shown that the instrument has sufficient content validity. The results of the CFA analysis show that the factor loading value of each item is in the range of values 0.556-0.824, and the loading factor in the measurement component is in the range of 0.842-0.896. These values are greater than 0.4, so it can be concluded that the instrument has valid construct validity (Hair et al., 2014). In addition, the correlation matrix (Table 3) shows that the competency component composed of each measurement item has a positive and significant correlation in compiling the teacher's final score. The Cronbach's alpha values for components are in the range of 0.624-0.857, while the total value of 0.85 indicates that this instrument is reliable (Streiner, 2003). Descriptive statistics show that the distribution curve tends to tilt to the left (negative skewness and kurtosis), meaning that the teacher's competency scores still tend to be below the average scores across Indonesia (Meyers et al., 2013). The average value of 63.7 is between the 40th and50th percentiles, meaning that it is still in the moderate category. This shows that teachers in Indonesia are still lacking in competency, which is a common characteristic for teachers in developing countries (Yusof et al., 2019). This finding does not justify the current conditions but provides a basis for further development of teacher competency.

The second purpose of this article is to analyze the competency of physical education teachers based on gender, grade, and years of working experience as PE teachers. Based on gender, female teacher competency is proven to be higher than male teacher competency. This is different from the results of other previous studies by Dowling, which concluded that gender is not an important consideration in determining quality, and that both male and female teachers are considered equally competent (Dowling, 2006). Unfortunately, the findings of this article show that the number of female PE teachers is relatively lower compared to the number of male PE teachers. This is due to the assumption that physical activity and sports are related to masculinity (Lentillon et al., 2006). A possible explanation for higher competency scores in female teachers is that, being the minority, they have to raise their quality so they can continue to exist and be recognized alongside the majority of male teachers.

Teacher competency based on grade shows that teachers at higher levels are considered to be more competent than teachers at lower levels. However, this condition does not occur linearly. Middle school teachers are considered to be better than elementary school teachers. This

condition can be further discussed based on the leadership styles of school principals and school policies at each different grade level (Song, 2008). Based on the results of other studies by Youngs and King, it is seen that differences in school policies and the leadership styles of principals are believed to be important variables in the process of implementing professional development programs for teachers (Youngs & King, 2002). These differences can affect teacher participation in professional development programs and create further implications for the results of teacher participation in professional development programs (Kim & Lee, 2019). Thus, differences in teacher quality occur not just because of the grade of the school but also due to differences in school policy and the leadership style of the principal.

Teacher competency based on working period shows that a teacher's working period influences teacher competency. In Figure 3, the surge in teacher competency occurs in the early years of work (0-10). However, static conditions occur during the 10–20-year work period, as if the teacher's competency does not further develop. The next surge occurred in the 20–25-year work period, and after 25 years of work, teacher competency declined. The results of this study are similar to other studies, which explain that teacher quality is influenced by working period especially during the first 5 years of work (Sass et al., 2014), which then continues for the next 10 years (Harris & Sass, 2011). The results of this study indicate that there are limits on the productive age of teachers in carrying out their profession, which is 0-25 years. The provision of treatment for the development of teacher competency throughout this time is essential in light of the static competency conditions in the 10–20-year employment period. The findings of this article provide complementary support to the development of teacher competency programs based on national standards, especially in the context of measuring PE teacher competencies. The measurement of teacher competency based on national standards in Indonesia is very precise. Teacher competency benchmarks based on national standards use four aspects (figure 2), namely pedagogic (teacher's skills in teaching), personality and social (teacher's attitude), and professional (teacher's knowledge in carrying out their role as educators) (Law of the Republic of Indonesia Number 14 of 2005 concerning Teachers and Lecturers, 2005; Regulation of the Minister of National Education of the Republic of Indonesia Number 18 of 2007 concerning Certification for Teachers in Position, 2007).

The use of these four aspects is relevant to the results of other previous studies by Moynihan et al; that the formulation of teacher competency measurement can make use of three aspects, namely knowledge, skills, and attitude aspects (Moynihan et al., 2015). Besides being relevant based on the aspects measured, the web-based model used is also relevant. The measurement model chosen was self-evaluation, namely checking the teacher's self-quality based on the national standards check-list. This supports the teacher's professional development program on an ongoing basis independently. Self-evaluation is considered a powerful method for reflecting on the progress of the teacher's self-quality development (Groißböck, 2012). In addition, the developed instrument can help teachers conduct formative competency measurements every semester. Formative assessment every semester is expected to be used as a basis for corrective actions to develop self-skills (Chepko & Doan, 2015). Furthermore, the use of the web as a medium aims to increase teacher activity in the use of information and communication technology. This is relevant to the results of other studies, where the use of information and communication technology was proven to have a positive impact on the pedagogical role of teachers (Andyani et al., 2020).

CONCLUSION

The instrument for measuring teacher competence supports efforts to achieve quality education and has become a global issue that is directly related to teacher quality. Teacher professional development (TPD) is one solution to improve teacher quality. Improving teacher quality by meeting the demands of national standards is an appropriate strategy for developing countries to ensure that national goals are achieved. This article contributes to efforts to improve teacher quality in the form of an instrument for measuring teacher PE competencies based on valid and reliable national standards. In addition, research findings indicate that gender, the school

principal's leadership policy and style, and working period are believed to be variables that influence teacher competency. It is recommended that the implementation of TPD be based on working period, specifically for PE teachers in the working period of 10-20 year who experience static growth in their competency. This has implications for the Indonesian government and future research.

ACKNOWLEDGMENT

The study was funded by the Minister of Education and Culture of the Republic of Indonesia, under the supervision of Lembaga Penelitian dan Pengabdian kepada Masyarakat Universitas Negeri Surabaya.

REFERENCES

Aiken, L. R. (1980). Content Validity and Reliability of Single Items or Questionnaires. *Educational and Psychological Measurement*, *40*(4), 955–959. https://doi.org/10.1177/001316448004000419

Aiken, L. R. (1985). Three Coefficients for Analyzing the Reliability and Validity of Ratings. *Educational and Psychological Measurement*, *45*(1), 131–142. https://doi.org/10.1177/0013164485451012

Akar, H. (2010). Globalization and its challenges for developing countries: The case of Turkish higher education. *Asia Pacific Education Review*, *11*(3), 447–457. https://doi.org/10.1007/s12564-010-9086-0

Andyani, H., Setyosari, P., Wiyono, B. B., & Djatmika, E. T. (2020). Does Technological Pedagogical Content Knowledge Impact on the Use of ICT In Pedagogy? *International Journal of Emerging Technologies in Learning (IJET)*, *15*(3), 126–139. https://doi.org/https://doi.org/10.3991/ijet.v15i03.11690

Brookhart, S. M. (2011). Educational Assessment Knowledge and Skills for Teachers. *EducationalMeasurement: Issues and Practice*, *30*(1), 3–12.

Chepko, S., & Doan, R. (2015). Implementing the New National Standards and Grade-Level Outcomes: Teaching for Skill Mastery. *The Journal of Physical Education, Recreation & Dance*, *86*(7), 9–13. https://doi.org/10.1080/07303084.2015.1064683

Dowling, F. (2006). Physical education teacher educators' professional identities, continuing professional development and the issue of gender equality. *Physical Education & Sport Pedagogy*, *11*(3), 247–263. https://doi.org/10.1080/17408980600986306

Undang-Undang Republik Indonesia Nomor 20 tahun 2003 tentang Sistem Pendidikan Nasional, (2003). http://peraturan.go.id/search/download/11e58ce2b70ac2c094ce313132313436.html

Groißböck, P. (2012). Teaching ePortfolios in Teacher Education. *International Journal of Emerging Technologies in Learning (IJET)*, *7*(Special issue 2), 42–49. https://doi.org/http://dx.doi.org/10.3991/ijet.v7iS2.2324

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate Data Analysis* (7th ed.). Pearson Education Limited.

Harris, D. N., & Sass, T. R. (2011). Teacher training, teacher quality and student achievement. *Journal of Public Economics*, *95*(7–8), 798–812. https://doi.org/10.1016/j.jpubeco.2010.11.009

Ho, R. (2006). *Handbook of Univariate and Multivariate Data Analysis and Interpretation with SPSS*. Chapman & Hall/CRC, Taylor & Francis Group.

Huda, M., Maseleno, A., Atmotiyoso, P., Siregar, M., Ahmad, R., Jasmi, K. A., Muhamad, N. H. N., Mustari, M. I., & Basiron, B. (2018). Big Data Emerging Technology: Insights into Innovative Environment for Online Learning Resources. *International Journal of Emerging Technologies in Learning (IJET)*, *13*(1), 23–36. https://doi.org/https://doi.org/10.3991/ijet.v13i01.6990

Undang-Undang Republik Indonesia Nomor 14 tahun 2005 tentang Guru dan Dosen, (2005). http://ditjenpp.kemenkumham.go.id/database-peraturan/peraturan-menteri.html

Kim, T., & Lee, Y. (2019). Principal instructional leadership for teacher participation in professional development: evidence from Japan, Singapore, and South Korea. *Asia Pacific Education Review*, 1–18. https://doi.org/10.1007/s12564-019-09616-x

Klentschy, M. P. (2005). Designing Professional Development Opportunities for Teachers that Foster Collaboration, Capacity Building and Reflective Practice. *Science Educator*, *14*(1), 1–8. https://search.proquest.com/docview/228722616/C8DF11B3DB17456DPQ/1?accountid=38628

Kusumawardhani, P. N. (2017). Does teacher certification program lead to better quality teachers? Evidence from Indonesia. *Education Economics*, *25*(6), 590–618. https://doi.org/10.1080/09645292.2017.1329405

Lentillon, V., Cogérino, G., & Kaestner, M. (2006). Injustice in physical education: Gender and the perception of deprivation in grades and teacher support. *Social Psychology of Education*, *9*(3), 321–339. https://doi.org/10.1007/s11218-005-5122-z

Liang, G., Walls, R. T., & Lu, C. (2005). Standards and Practice in Asian Physical Education: Standards and Practice for Physical Education in China. *Journal of Physical Education, Recreation & Dance*, *76*(6), 15–19.

Madsen, S. S. (2020). Understandings and attitudes regarding skill-based and competency-based cultures for learning: a comparative study of Norwegian and New Zealand teacher educators. *Educational Research for Policy and Practice*, 1–17. https://doi.org/10.1007/s10671-020-09260-y

Maksum, A. (2010). *Kualitas Guru Pendidikan Jasmani di Sekolah : Antara Harapan dan Kenyataan*. *3*, 1–32.

Meyers, L. S., Gamst, G. C., & Guarino, A. J. (2013). *Performing Data Analysis Using IBM SPSS*. John Wiley & Sons, Inc.

Michael, R. D., Webster, C., Patterson, D., Laguna, P., & Sherman, C. (2016). Standards-Based Assessment, Grading, and Professional Development of California Middle School Physical Education Teachers. *Journal of Teaching in Physical Education*, *35*(3), 277–283. https://doi.org/10.1123/jtpe.2015-0162

Ministry of Finance of Republic of Indonesia. (2017). *Perekonomian Indonesia dan APBN 2017*. Ministry of Finance of Republic of Indonesia. https://www.kemenkeu.go.id/apbn2017

Peraturan Menteri Pendidikan Nasional Republik Indonesia Nomor 18 tahun 2007 tentang Sertifikasi bagi Guru dalam Jabatan, (2007). http://kelembagaan.ristekdikti.go.id/wp-content/uploads/2016/12/Permen18-2007SertifikasiGuru.pdf

Moynihan, S., Paakkari, L., Välimaa, R., Jourdan, D., & Mannix-McNamara, P. (2015). Teacher Competencies in Health Education: Results of a Delphi Study. *PLoS ONE*, *10*(12). https://doi.org/10.1371/journal.pone.0143703

Nakai, T., & Metzler, M. W. (2005). Standards and Practice for K-12 Physical Education in Japan. *Journal of Physical Education, Recreation & Dance*, *76*(7), 17–22.

Pantić, N., & Wubbels, T. (2010). Teacher competencies as a basis for teacher education - Views of Serbian teachers and teacher educators. *Teaching and Teacher Education*, *26*(3), 694–703. https://doi.org/10.1016/j.tate.2009.10.005

Preston, B., & Kennedy, K. J. (1995). The national competency framework for beginning teaching: A radical approach to initial teacher education? *The Australian Educational Researcher*, *22*(2), 27–62. https://doi.org/10.1007/BF03219592

Saito, M., & Van Cappelle, F. (2009, May 11). Approaches to Monitoring the Quality of Education in Developing Countries-Searching for Better Research-Policy Linkages. *The International Symposium on Quality Education for All – Approaches to Monitoring and Improving the Quality of Education* . http://119.82.251.165:8080/xmlui/bitstream/handle/123456789/467/Approaches-to-Monitoring-the-Quality-of-Education-in-Developing-Countries.pdf?sequence=1

Sari, E. R. (2012). Online learning community: A case study of teacher professional development in Indonesia. *Intercultural Education*, *23*(1), 63–72. https://doi.org/10.1080/14675986.2012.664755

Sass, T. R., Semykina, A., & Harris, D. N. (2014). Value-added models and the measurement of teacher productivity. *Economics of Education Review*, *38*, 9–23. https://doi.org/10.1016/j.econedurev.2013.10.003

Sireci, S. G. (1998). The Construct of Content Validity. *Social Indicators Research*, *45*(1–3), 83–117. https://doi.org/10.1023/A:1006985528729

Song, K. (2008). The impacts of district policy and school context on teacher professional development. *Asia Pacific Education Review*, *9*(4), 436–447. https://doi.org/10.1007/bf03025661

Streiner, D. L. (2003). Starting at the Beginning: An Introduction to Coefficient Alpha and Internal Consistency. *Journal of Personality Assessment*, *80*(1), 99–103.

Suroto. (2016). Pengembangan Instrumen Pengukuran Kadar Keguruan (Tingkat Kompetensi) Mahasiswa Calon Guru dan Guru PJOK Indonesia. *Seminar Nasional Hasil Penelitian Dan Pengabdian Kepada Masyarakat - Subtema: Inovasi Pendidikan*, 193–202. http://lppm.unesa.ac.id/semnasppm/prosiding2016/1_Inovasi_Pendidikan.pdf

Suroto, Khory, F. D., Dinata, V. C., & Priambodo, A. (2017). Core Competency Measurement Model for Prospective Physical Education Teacher. *IOP Conference Series: Materials Science and Engineering*, *180*, 012181. https://doi.org/10.1088/1757-899X/180/1/012181

Team of Directorate General of Teachers and Education Staff. (2018). *Pedoman Umum Program Pengembangan Keprofesian Berkelanjutan*. Directorate General of Teachers and Education Staff.

United Nations. (n.d.). *Education - United Nations Sustainable Development*. Retrieved June 15, 2019, from https://www.un.org/sustainabledevelopment/education/

Wagner, D. A., & Castillo, N. M. (2014). Learning at the bottom of the pyramid: Constraints, comparability and policy in developing countries. *Prospects*, *44*(4), 627–638. https://doi.org/10.1007/s11125-014-9328-8

Wuryaningsih, Susilastuti, D. H., Darwin, M., & Pierewan, A. C. (2019). Effects of Web-Based Learning and F2F Learning on Teachers Achievement in Teacher Training Program in Indonesia. *International Journal of Emerging Technologies in Learning (IJET)*, *14*(21), 123–147. https://doi.org/https://doi.org/10.3991/ijet.v14i21.10736

Yoo, S. S., & Kim, H. Y. (2005). Standards and Practice in Asian Physical Education : Standards and Practice in Korean Physical Education. *Journal of Physical Education, Recreation & Dance*, *76*(6), 20–24.

Youngs, P., & King, M. B. (2002). Principal Leadership for Professional Development to Build School Capacity. *Educational Administration Quarterly*, *38*(5), 643–670. https://doi.org/10.1177/0013161X02239642

Yusof, M. R., Yaakob, M. F. M., & Ibrahim, M. Y. (2019). Measurement model of teaching competency of secondary school teachers in Malaysia. *International Journal of Emerging Technologies in Learning*, *14*(20), 157–164. https://doi.org/10.3991/ijet.v14i20.11465