LAMPIRAN A
(Submission & Registration)

REGISTRASI

Suroto Suroto <suroto@unesa.ac.id>

[CP] Journal Registration

1 pesan

Prof. Dr. Sulis Triyono <cakrawala@uny.ac.id> 6 April 2022 pukul 12.28
Kepada: Suroto Suroto <suroto@unesa.ac.id>

Dear Suroto Suroto,

You have now been registered as a user with Jurnal Cakrawala Pendidikan. We have included your username and password in this email, which are needed for all work with this journal through its website. At any point, you can ask to be removed from the journal's list of users by contacting me.

Username: suroto_unesa
Password: suro6303

Please make sure you have read our author guidelines or use the manuscript template provided.

Thank you,
Prof. Dr. Sulis Triyono

Cakrawala Pendidikan
http://journal.uny.ac.id/index.php/cp

--

----------Untuk mendukung "Gerakan UNY Hijau", disarankan tidak mencetak email ini dan lampirannya.
(To support the "Green UNY movement", it is recommended not to print the contents of this email and its attachments)
Universitas Negeri Yogyakarta

www.uny.ac.id <http://www.uny.ac.id>

SUBMISSION

Suroto Suroto <suroto@unesa.ac.id>

[CP] Submission Acknowledgement

1 pesan

Prof. Dr. Sulis Triyono <cakrawala@uny.ac.id> 6 April 2022 pukul 12.48
Kepada: Suroto Suroto <suroto@unesa.ac.id>

Dear Suroto Suroto,

Thank you for submitting the manuscript, "DEVELOPMENT OF WEB-BASED PE TEACHER COMPETENCY MEASUREMENT TOOLS BASED ON NATIONAL STANDARDS" to Jurnal Cakrawala Pendidikan. With the online journal management system that we are using, you will be able to track its progress through the editorial process by logging in to the journal web site:

Manuscript URL:
https://journal.uny.ac.id/index.php/cp/author/submission/48911
Username: suroto_unesa

If you have any questions, please contact me. Thank you for considering this journal as a venue for your work.

Sincerely,

Prof. Dr. Sulis Triyono
Jurnal Cakrawala Pendidikan

Cakrawala Pendidikan
http://journal.uny.ac.id/index.php/cp

--

----------Untuk mendukung "Gerakan UNY Hijau", disarankan tidak mencetak email ini dan lampirannya.
(To support the "Green UNY movement", it is recommended not to print the contents of this email and its attachments)
Universitas Negeri Yogyakarta

www.uny.ac.id <http://www.uny.ac.id>

LAMPIRAN B
(Feedback Revisi Penulisan Manuskrip)

Suroto Suroto <suroto@unesa.ac.id>

[CP] Editor Decision

1 pesan

Prof. Soni Nopembri, Ph.D. <soni_nopembri@uny.ac.id> 5 September 2022 pukul 06.01
Kepada: Suroto Suroto <suroto@unesa.ac.id>

Suroto Suroto:

We have reached a decision regarding your submission to Jurnal Cakrawala Pendidikan, "DEVELOPMENT OF WEB-BASED PE TEACHER COMPETENCY MEASUREMENT TOOLS BASED ON NATIONAL STANDARDS".

Our decision is: Revisions Required

Please revise your paper according to the reviewers comments below and also the comments in the soft-copy of your article (file attached), then highlight in yellow the revised part. Return the revised manuscript within 1 weeks (7 days) to be considered for the publication.

If you have any questions, please let us know

Thank you very much

Best regards

Prof. Soni Nopembri, Ph.D.
(Scopus ID: 57207831971), Universitas Negeri Yogyakarta
Phone 081315196479
soni_nopembri@uny.ac.id

Cakrawala Pendidikan
http://journal.uny.ac.id/index.php/cp

--

----------Untuk mendukung "Gerakan UNY Hijau", disarankan tidak mencetak email ini dan lampirannya.
(To support the "Green UNY movement", it is recommended not to print the contents of this email and its attachments)
Universitas Negeri Yogyakarta

www.uny.ac.id <http://www.uny.ac.id>

REVIEWER A

DEVELOPMENT OF WEB-BASED PE TEACHER COMPETENCY MEASUREMENT TOOLS BASED ON NATIONAL STANDARDS

PENGEMBANGAN ALAT UKUR KOMPETENSI GURU PJOK BERBASIS WEB BERDASARKAN STANDAR NASIONAL

Commented [ESK1]: The title should be adjusted to the purpose. This title is not quite right because the goal is not yet on the development aspect

Suroto[1*], Bayu Budi Prakoso[1], Anung Priambodo[1], Fifukha Dwi Khory[1], and Vega Candra Dinata[1]

[1]Universitas Negeri Surabaya, Indonesia

[*]e-mail: 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 two issues: 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. A total of 277 physical education teachers participated in an online survey via the web http://risetpjokindonesia.com/ to measure teacher competency. The measurement results were analyzed using confirmatory factor analysis and Cronbach's alpha to test validity and reliability. 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 made are valid and reliable, so they can be used for similar measurements in the future. 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 of the teacher professional development carried out and the limitation of the productive period of the teacher in carrying out his or her profession.

Keywords: web-based measurement, PE teacher competency, national standards

Abstrak: Beberapa penelitian meyakini bahwa penggunaan standar nasional sebagai tolok ukur kualitas guru dapat menyelaraskan layanan pendidikan untuk mencapai tujuan nasional. Selain itu, lamanya pengalaman mengajar dapat menentukan produktivitas guru selama menjalankan profesinya. Artikel ini membahas dua hal: hasil pengembangan instrumen pengukuran kompetensi guru berdasarkan standar nasional Indonesia, dan evaluasi kompetensi guru berdasarkan jenis kelamin, tingkat sekolah, dan masa kerja. Sebanyak 277 guru PJOK mengikuti survei *online* melalui web http://risetpjokindonesia.com/ untuk mengukur kompetensi guru. Hasil pengukuran dianalisis menggunakan *confirmatory factor analysis* dan *Cronbach's alpha* untuk menguji validitas dan reliabilitas. Uji-t dan ANOVA digunakan untuk mengevaluasi kompetensi guru berdasarkan jenis kelamin, kelas, dan masa kerja. Temuan menunjukkan bahwa pengukuran yang dilakukan valid dan reliabel, sehingga dapat digunakan untuk pengukuran serupa di masa mendatang. Jenis kelamin, tingkat sekolah, dan masa kerja dinyatakan memengaruhi kompetensi guru. Pengembangan kompetensi guru berdasarkan masa kerja memberikan masukan berupa ketepatan pengembangan keprofesian guru yang dilakukan dan batasan masa produktif guru dalam menjalankan profesinya.

Kata-kata kunci: pengukuran berbasis web, kompetensi guru PJOK, standar nasional

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 (Goverment of the Republic of Indonesia 2003). The budget for education is focused on improving access and quality of education services in Indonesia (Ministry of Finance of Republic of Indonesia 2017).

However, 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 which began in 2005 (Indonesian Government 2005). The measurement of teacher competency has become the government's benchmark in 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). Since 2007, the accuracy of measuring teacher competency using the teacher's portfolio system was too low, so it was replaced by the Teacher Competency Test in 2012. 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 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 and Wubbels 2010). Competent teachers are the most important form of human capital to improve the national education system in Indonesia in alignment with developed countries (Yusof, Yaakob, and Ibrahim 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 are not exactly in line with international standards (Wagner and Castillo 2014). In addition, the conditions of developed and developing countries differ in many aspects, including differences in the quality of education (Madsen 2020). There-fore, the decision to

Commented [ESK2]: Don't use it at the beginning of the sentence, please adjust the sentence

use national standards as the benchmark for the professional development of teachers is appropriate, so that education services become aligned with national education goals (Klentschy 2005; Michael et al. 2016). This will have an impact on the accuracy of teacher qualifications according to the national standards of each country (Nakai and Metzler 2005; Yoo and Kim 2005; Liang, Walls, and Lu 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 (Preston and Kennedy 1995; Brookhart 2011).

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 preparing teacher competency measurement, both independently and online, is to keep a record of the development of teacher competency, which has received minimal attention from the government (Saito and Van Cappelle 2009). The potential for achieving this idea is huge because of the massive use of technological gadgets among teachers (Huda et al. 2018), although it has not been fully used for educational purposes in Indonesia (Wuryaningsih et al. 2019) because teachers still tend to maintain their traditional ways in competency development (Sari 2012). The existence of this gap actually raises the importance for the presence of such measurements, so that teachers are accustomed to using information and communication technology for their professional development.

The second purpose of this article is to analyze the competency of physical education teachers based on gender, educational level, and years of working period as PE teachers. Previously, other researchers have found that the productive periods of teachers follow their working period, and that teacher productivity evaluations can be analyzed by considering six value-added models that include the most common specifications in measuring teacher productivity (Sass, Semykina, and Harris 2014; Harris and Sass 2011). Both studies are conducted in Florida, USA, which may be different from the results in developing countries.

METHOD

This quantitative research was conducted using an online survey technique using the web http://risetpjokindonesia.com/ developed by the Riset PJOK Indonesia team (Team for

Physical Education Research in Indonesia). The survey was conducted on teacher communities, universities, and teachers voluntarily filling independently.

Participants

Participating universities and teachers' communities signed a Memorandum of Understanding (MoU) and committed to provide the venue and invite teachers (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 participants (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 Indone-sia (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 (Indonesian Government 2005; Ministry of National Education of Republic of Indonesia 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 in 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, 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 for a soft copy of the validation results.

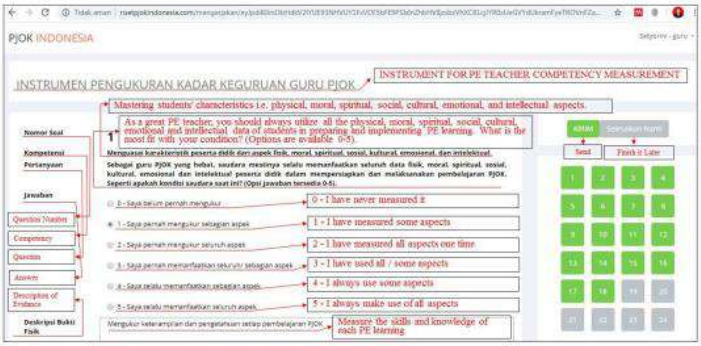


Figure 1. Example of Instrument Display

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 1985; 1980; 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 (Ho 2006; Hair et al. 2014). Cronbach alpha was

used to assess reliability with the provisions of alpha values> 0.5 (Streiner 2003). 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, Gamst, and Guarino 2013). T-test was used to assess the effect of gender on teacher competency, whereas one-way ANOVA was used to assess the effect of working period on teacher competency.

FINDINGS AND DISCUSSION

Finding

Content validity based on subject matter experts

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 as valid for all the items tested. Therefore, the count of each item was 1, and it could be con-cluded that the instrument was valid (Aiken 1985).

Construct validity (confirmatory factor analysis) and reliability (cronbach alpha)

277 teachers were asked 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 carried out met the adequacy value of the model (Ho 2006). Eigenvalue scores that were formed in each anal-ysis in each factor was 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 (per-sonality), 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				

Items/ Component	Components				Total
	1	2	3	4	
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 teacher competency

The correlation value between competency components was found to be signifi-cant ($p < 0.001$). As shown in Table 3, the scores indicate that the four types of teach-er competency comprises the total competency value.

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.

Descriptive statistics on teacher competency scores

Descriptive statistics of the measurement results show that the form of data distribution is symmetric (kurtosis and skewness ≤1). Thus, the data distribution is normal (Meyers, Gamst, and Guarino 2013). Then, percentiles in the descriptive statistics are used as a basis for determining the score categories. In Table 4, the mean total teacher competency of 63.7 is between the 40-50 percentiles, meaning that it is still in the moderate competency category. The pedagogical mean of 25.1 is between the 50-60 percentiles, meaning that it is still in the

good competency category. The personality mean of 13.9 is between the 40-50 percentiles, meaning that it is still in the moderate competency category. The social mean of 11.7 is between the 40-50 percentiles, meaning that it is still in the moderate competency category. The professional mean of 13.0 is on 50 percentiles, meaning that it is still in the moderate competency category.

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 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), where 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 level 6 (p = 0.045) and 9 (p = 0.002). 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).

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

Discussion

The first purpose of this article is to describe the results of the development of instruments for measuring teacher competency, specifically physical education teachers, by utilizing Indonesian national standards for teacher competency. This goal is achieved in two stages, namely (1) the results of developing a teacher competency measurement instrument based on the Indonesian national standards, (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 0.842-0.896. These values are greater than 0.4, so it can be concluded that the instrument has a 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 kurtoses), meaning that the teacher's competency scores still tend to be below the average scores across Indonesia (Meyers, Gamst, and Guarino 2013). The average value of 63.7 is between the 40-50 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, Yaakob, and Ibrahim 2019). This finding does not

Commented [ESK3]: adapt to research objectives

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 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 lesser compared to the number of male PE teachers. This is due to the assumption that physical activity and sports is related to masculinity (Lentillon, Cogérino, and Kaestner 2006). A possible explanation for higher competency scores in female teachers is that, being the minority, they have to raise their quality to 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 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 (Song 2008). Based on the results of other studies by Youngs and King, show that differences in school policies and leadership style of principals are believed to be important variables in the process of implementing professional development programs for teachers (Youngs and 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 and 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 leadership style of the principal.

Teacher competency based on working period shows that teacher 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 at 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 by Sass, Semykina, and Harris, which explain that teacher quality is influenced by working period especially during the first 5 years of work (Sass, Semykina, and Harris 2014), which then continues for the next 10 years (Harris and Sass 2011). The results of this study indicate that there are limits on the productive age of teachers in carrying out their

Commented [ESK4]: where is the year and page

profession, which is 0-25 years. Based on the static competency conditions in the 10-20 year work period, the provision of treatment for the development of teacher competency is crucial at this period.

The findings of this article provides 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 uses 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) (Indonesian Government 2005; Ministry of National Education of Republic of Indonesia 2007).

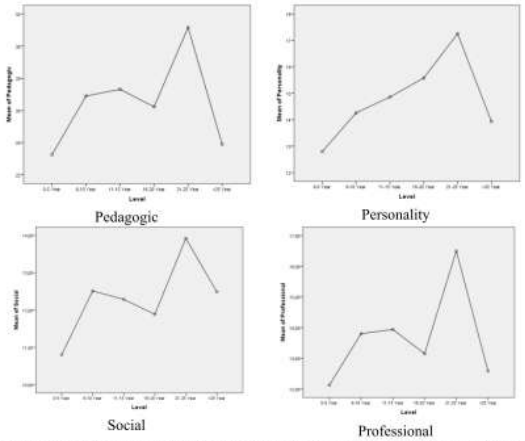


Figure 2. Changes in Mean Teacher Competency Component Based on Working Period

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

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 are 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 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 and Doan 2015). Furthermore, the use of the web as a media aims to increase teacher activity in the use of information and communication technology. This is relevant to the results of other studies by Andyani et al, where the use of information and communication technology proven to have a positive impact on the pedagogical role of teachers (Hanna Andyani et al. 2020).

Conclusion

The focus of quality education 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, so 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, 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 is based on working period, namely for PE teachers in the 10-20 year working period who experience static growth in their competency. This has implications for the Indonesian government and future research.

Commented [ESK5]: is this part of the goal

AKNOWLEDGEMENTS

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

REFERENCES

Aiken, Lewis R. 1980. "Content Validity and Reliability of Single Items or Questionnaires." *Educational and Psychological Measurement* 40 (4): 955–59. https://doi.org/10.1177/001316448004000419.

Aiken, Lewis R.. 1985. "Three Coefficients for Analyzing the Reliability and Validity of Ratings." *Educational and Psychological Measurement* 45 (1): 131–42. https://doi.org/10.1177/0013164485451012.

Akar, Hanife. 2010. "Globalization and Its Challenges for Developing Countries: The Case of Turkish Higher Education." *Asia Pacific Education Review* 11 (3): 447–57. https://doi.org/10.1007/s12564-010-9086-0.

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

Chepko, Stevie, and Robert Doan. 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, Fiona. 2006. "Physical Education Teacher Educators' Professional Identities, Continuing Professional Development and the Issue of Gender Equality." *Physical Education & Sport Pedagogy* 11 (3): 247–63. https://doi.org/10.1080/17408980600986306.

Goverment of the Republic of Indonesia. 2003. *Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*. http://peraturan.go.id/search/download/11e58ce2b70ac2c094ce313132313436.html.

Groißböck, Peter. 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, Joseph F., William C. Black, Barry J. Babin, and Rolph E. Anderson. 2014. *Multivariate Data Analysis*. 7th ed. Pearson Education Limited.

Hanna Andyani, Punaji Setyosari, Bambang Budi Wiyono, and Ery Tri Djatmika. 2020. "Does Technological Pedagogical Content Knowledge Impact on the Use of ICT In Pedagogy?" *International Journal of Emerging Technologies in Learning (IJET)* 15 (3): 126–39. https://doi.org/https://doi.org/10.3991/ijet.v15i03.11690.

Harris, Douglas N., and Tim R. Sass. 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, Robert. 2006. *Handbook of Univariate and Multivariate Data Analysis and Interpretation with SPSS*. Chapman & Hall/CRC, Taylor & Francis Group.

Huda, Miftachul, Andino Maseleno, Pardimin Atmotiyoso, Maragustam Siregar, Roslee Ahmad, Kamarul Azmi Jasmi, Nasrul Hisyam Nor Muhamad, Mohd Ismail Mustari, and Bushrah Basiron. 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.

Indonesian Government. 2005. *Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 Tentang Guru Dan Dosen*. http://ditjenpp.kemenkumham.go.id/database-

peraturan/peraturan-menteri.html.

Kim, Taeyeon, and Youngjun Lee. 2019. "Principal Instructional Leadership for Teacher Participation in Professional Development: Evidence from Japan, Singapore, and South Korea." *Asia Pacific Education Review*, September, 1–18. https://doi.org/10.1007/s12564-019-09616-x.

Klentschy, Michael 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, Prita Nurmalia. 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, Vanessa, Geneviève Cogérino, and Mattias Kaestner. 2006. "Injustice in Physical Education: Gender and the Perception of Deprivation in Grades and Teacher Support." *Social Psychology of Education* 9 (3): 321–39. https://doi.org/10.1007/s11218-005-5122-z.

Liang, Gouli, Richard T. Walls, and Chunlei Lu. 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, Siri Sollied. 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*, January, 1–17. https://doi.org/10.1007/s10671-020-09260-y.

Maksum, Ali. 2010. "Kualitas Guru Pendidikan Jasmani Di Sekolah : Antara Harapan Dan Kenyataan," no. 3: 1–32.

Meyers, Lawrence S., Glenn C. Gamst, and A. J. Guarino. 2013. *Performing Data Analysis Using IBM SPSS*. John Wiley & Sons, Inc.

Michael, Robert Daniel, Collin Webster, Debra Patterson, Patricia Laguna, and Clay Sherman. 2016. "Standards-Based Assessment, Grading, and Professional Development of California Middle School Physical Education Teachers." *Journal of Teaching in Physical Education* 35 (3): 277–83. 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. 2017. https://www.kemenkeu.go.id/apbn2017.

Ministry of National Education of Republic of Indonesia. 2007. *Peraturan Menteri Pendidikan Nasional Republik Indonesia Nomor 16 Tahun 2007 Tentang Standar Kualifikasi Akademik Dan Kompetensi Guru*. http://vervalsp.data.kemdikbud.go.id/prosespembelajaran/file/Permendiknas No 16 Tahun 2007.pdf.

Moynihan, Sharon, Leena Paakkari, Raili Välimaa, Didier Jourdan, and Patricia Mannix-McNamara. 2015. "Teacher Competencies in Health Education: Results of a Delphi Study." *PLoS ONE* 10 (12). https://doi.org/10.1371/journal.pone.0143703.

Nakai, Takashi, and Michael W. Metzler. 2005. "Standards and Practice for K-12 Physical

Education in Japan." *Journal of Physical Education, Recreation & Dance* 76 (7): 17–22.

Pantić, Nataša, and Theo Wubbels. 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, Barbara, and Kerry J Kennedy. 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, Mioko, and Frank Van Cappelle. 2009. "Approaches to Monitoring the Quality of Education in Developing Countries-Searching for Better Research-Policy Linkages." *In The International Symposium on Quality Education for All – Approaches to Monitoring and Improving the Quality of Education*. Berlin. 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, Eunice Ratna. 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, Tim R., Anastasia Semykina, and Douglas N. Harris. 2014. "Value-Added Models and the Measurement of Teacher Productivity." *Economics of Education Review* 38 (February): 9–23. https://doi.org/10.1016/j.econedurev.2013.10.003.

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

Song, Kyoung-oh. 2008. "The Impacts of District Policy and School Context on Teacher Professional Development." *Asia Pacific Education Review* 9 (4): 436–47. https://doi.org/10.1007/bf03025661.

Streiner, David 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." In *Seminar Nasional Hasil Penelitian Dan Pengabdian Kepada Masyarakat - Subtema: Inovasi Pendidikan*, 193–202. Surabaya: Universitas Negeri Surabaya. http://lppm.unesa.ac.id/semnasppm/prosiding2016/1_Inovasi_Pendidikan.pdf.

Suroto, F D Khory, V C Dinata, and A Priambodo. 2017. "Core Competency Measurement Model for Prospective Physical Education Teacher." *IOP Conference Series: Materials Science and Engineering* 180 (March): 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.* Jakarta: Directorate General of Teachers and Education Staff.

United Nations. n.d. "Education - United Nations Sustainable Development." Accessed June 15, 2019. https://www.un.org/sustainabledevelopment/education/.

Wagner, Daniel A., and Nathan M. Castillo. 2014. "Learning at the Bottom of the Pyramid: Constraints, Comparability and Policy in Developing Countries." *Prospects* 44 (4): 627–38. https://doi.org/10.1007/s11125-014-9328-8.

Wuryaningsih, Dewi Haryani Susilastuti, Muhadjir Darwin, and Adi Cilik Pierewan. 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): 123–47. https://doi.org/https://doi.org/10.3991/ijet.v14i21.10736.

Yoo, Sang Suk, and Ha Young Kim. 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, Peter, and M. Bruce King. 2002. "Principal Leadership for Professional Development to Build School Capacity." *Educational Administration Quarterly* 38 (5): 643–70. https://doi.org/10.1177/0013161X02239642.

Yusof, Mat Rahimi, Mohd Faiz Mohd Yaakob, and Mohd Yusri Ibrahim. 2019. "Measurement Model of Teaching Competency of Secondary School Teachers in Malaysia." *International Journal of Emerging Technologies in Learning* 14 (20): 157–64. https://doi.org/10.3991/ijet.v14i20.11465.

REVIEWER B

~~DEVELOPMENT OF~~ WEB-BASED PHYSICAL EDUCATION~~PE~~ TEACHER COMPETENCY ~~MEASUREMENT TOOLS~~ INSTRUMENT BASED ON NATIONAL STANDARDS

Suroto[1*], Bayu Budi Prakoso[1], Anung Priambodo[1], Fifukha Dwi Khory[1], and Vega Candra Dinata[1]

[1]Universitas Negeri Surabaya, Indonesia

[*]e-mail: 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 ~~two issues:~~ 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. A total of 277 physical education teachers participated in an online survey via the web http://risetpjokindonesia.com/ to measure teacher competency. The measurement results were ~~analyzed~~analysed using confirmatory factor analysis and Cronbach's alpha to test validity and reliability. 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 made are valid and reliable, so they can be used for similar measurements in the future. 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 of the teacher professional development carried out and the limitation of the productive period of the teacher in carrying out his or her profession.

Keywords: web-based measurement, PE teacher competency, national standards

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 (Goverment of the Republic of Indonesia 2003). The budget for education is focused on improving access and quality of education services in Indonesia (Ministry of Finance of Republic of Indonesia 2017).

However, 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 which began in 2005 (Indonesian Government 2005). The measurement of teacher competency has become the government's benchmark in providing incentives to teachers through the certification system. Initially, the

Commented [SN1]: Please use Mendeley tools for all citations

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). Since 2007, the accuracy of measuring teacher competency using the teacher's portfolio system was too low, so it was replaced by the Teacher Competency Test in 2012. 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 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 and Wubbels 2010). Competent teachers are the most important form of human capital to improve the national education system in Indonesia in alignment with developed countries (Yusof, Yaakob, and Ibrahim 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 are not exactly in line with international standards (Wagner and Castillo 2014). In addition, the conditions of developed and developing countries differ in many aspects, including differences in the quality of education (Madsen 2020). There-fore, the decision to use national standards as the benchmark for the professional development of teachers is appropriate, so that education services become aligned with national education goals (Klentschy 2005; Michael et al. 2016). This will have an impact on the accuracy of teacher qualifications according to the national standards of each country (Nakai and Metzler 2005; Yoo and Kim 2005; Liang, Walls, and Lu 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 (Preston and Kennedy 1995; Brookhart 2011).

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

preparing teacher competency measurement, both independently and online, is to keep a record of the development of teacher competency, which has received minimal attention from the government (Saito and Van Cappelle 2009). The potential for achieving this idea is huge because of the massive use of technological gadgets among teachers (Huda et al. 2018), although it has not been fully used for educational purposes in Indonesia (Wuryaningsih et al. 2019) because teachers still tend to maintain their traditional ways in competency development (Sari 2012). The existence of this gap actually raises the importance for the presence of such measurements, so that teachers are accustomed to using information and communication technology for their professional development.

The second purpose of this article is to analyze the competency of physical education teachers based on gender, educational level, and years of working period as PE teachers. Previously, other researchers have found that the productive periods of teachers follow their working period, and that teacher productivity evaluations can be analyzed by considering six value-added models that include the most common specifications in measuring teacher productivity (Sass, Semykina, and Harris 2014; Harris and Sass 2011). Both studies are conducted in Florida, USA, which may be different from the results in developing countries.

METHOD

This quantitative research was conducted using an online survey technique using the web http://risetpjokindonesia.com/ developed by the Riset PJOK Indonesia team (Team for Physical Education Research in Indonesia). The survey was conducted on teacher communities, universities, and teachers voluntarily filling independently.

Participants

Participating universities and teachers' communities signed a Memorandum of Understanding (MoU) and committed to provide the venue and invite teachers (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 participants (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 Indone-sia (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 (Indonesian Government 2005; Ministry of National Education of Republic of Indonesia 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 in 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, 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 for a soft copy of the validation results.

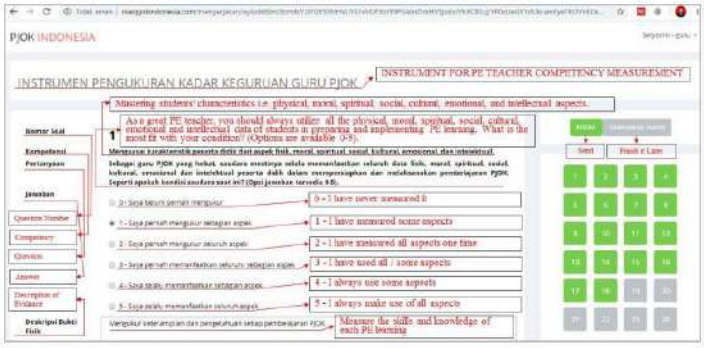


Figure 1. Example of Instrument Display

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 1985; 1980; 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 (Ho 2006; Hair et al. 2014). Cronbach alpha was used to assess reliability with the provisions of alpha values> 0.5 (Streiner 2003). 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, Gamst, and Guarino 2013). T-test was used to assess the effect of gender on teacher competency, whereas one-way ANOVA was used to assess the effect of working period on teacher competency.

FINDINGS AND DISCUSSION

Finding

Content validity based on subject matter experts

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 as valid for all the items

tested. Therefore, the count of each item was 1, and it could be con-cluded that the instrument was valid (Aiken 1985).

Construct validity (confirmatory factor analysis) and reliability (cronbach alpha)

277 teachers were asked 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 carried out met the adequacy value of the model (Ho 2006). Eigenvalue scores that were formed in each anal-ysis in each factor was 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 (per-sonality), 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

Items/ Component	Components				Total
	1	2	3	4	
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 teacher competency

The correlation value between competency components was found to be signifi-cant (p <0.001). As shown in Table 3, the scores indicate that the four types of teach-er competency comprises the total competency value.

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.

Descriptive statistics on teacher competency scores

Descriptive statistics of the measurement results show that the form of data distribution is symmetric (kurtosis and skewness ≤1). Thus, the data distribution is normal (Meyers, Gamst, and Guarino 2013). Then, percentiles in the descriptive statistics are used as a basis for determining the score categories. In Table 4, the mean total teacher competency of 63.7 is between the 40-50 percentiles, meaning that it is still in the moderate competency category. The pedagogical mean of 25.1 is between the 50-60 percentiles, meaning that it is still in the good competency category. The personality mean of 13.9 is between the 40-50 percentiles, meaning that it is still in the moderate competency category. The social mean of 11.7 is between the 40-50 percentiles, meaning that it is still in the moderate competency category. The professional mean of 13.0 is on 50 percentiles, meaning that it is still in the moderate competency category.

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

Statistics	Pedagogic	Personality	Social	Professional	Total
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 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), where 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]
Gender: Female (F) Male (M)	Pedagogic	2.603	2.142	0.033	F>M
	Personality	0.314	0.459	0.646	F=M
	Social	0.354	0.694	0.490	F=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 level 6 (p = 0.045) and 9 (p = 0.002). 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).

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

Discussion

The first purpose of this article is to describe the results of the development of instruments for measuring teacher competency, specifically physical education teachers, by utilizing Indonesian national standards for teacher competency. This goal is achieved in two stages, namely (1) the results of developing a teacher competency measurement instrument based on the Indonesian national standards, (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 0.842-0.896. These values are greater than 0.4, so it can be concluded that the instrument has a 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 kurtoses), meaning that the teacher's competency scores still tend to be below the average scores across Indonesia (Meyers, Gamst, and Guarino 2013). The average value of 63.7 is between the 40-50 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, Yaakob, and Ibrahim 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 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 lesser compared to the number of male PE teachers. This is due to the assumption that physical activity and sports is related to masculinity (Lentillon, Cogérino, and Kaestner 2006). A possible explanation for higher competency scores

in female teachers is that, being the minority, they have to raise their quality to 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 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 (Song 2008). Based on the results of other studies by Youngs and King, show that differences in school policies and leadership style of principals are believed to be important variables in the process of implementing professional development programs for teachers (Youngs and 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 and 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 leadership style of the principal.

Teacher competency based on working period shows that teacher 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 at 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 by Sass, Semykina, and Harris, which explain that teacher quality is influenced by working period especially during the first 5 years of work (Sass, Semykina, and Harris 2014), which then continues for the next 10 years (Harris and 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. Based on the static competency conditions in the 10-20 year work period, the provision of treatment for the development of teacher competency is crucial at this period.

The findings of this article provides 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 uses 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) (Indonesian Government 2005; Ministry of National Education of Republic of Indonesia 2007).

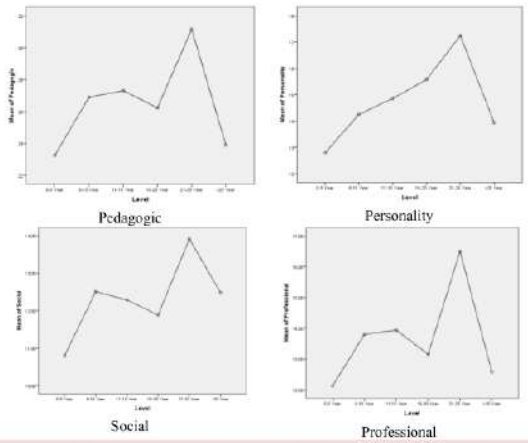


Figure 2. Changes in Mean Teacher Competency Component Based on Working Period

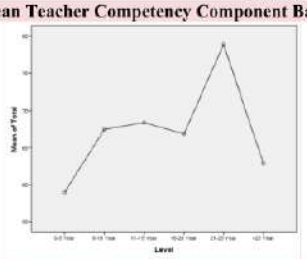


Figure 3. Changes in Mean Teacher Competency Based on Working Period

Commented [SN2]: Please, the figure relocation to results sections

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 are 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 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 and Doan 2015). Furthermore, the

use of the web as a media aims to increase teacher activity in the use of information and communication technology. This is relevant to the results of other studies by Andyani et al, where the use of information and communication technology proven to have a positive impact on the pedagogical role of teachers (Hanna Andyani et al. 2020).

Conclusion

The focus of quality education 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, so 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, 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 is based on working period, namely for PE teachers in the 10-20 year working period who experience static growth in their competency. This has implications for the Indonesian government and future research.

AKNOWLEDGEMENTS

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

REFERENCES

Commented [SN3]: Please use Mendeley tools for writing references

Aiken, Lewis R. 1980. "Content Validity and Reliability of Single Items or Questionnaires." *Educational and Psychological Measurement* 40 (4): 955–59. https://doi.org/10.1177/001316448004000419.

Aiken, Lewis R.. 1985. "Three Coefficients for Analyzing the Reliability and Validity of Ratings." *Educational and Psychological Measurement* 45 (1): 131–42. https://doi.org/10.1177/0013164485451012.

Akar, Hanife. 2010. "Globalization and Its Challenges for Developing Countries: The Case of Turkish Higher Education." *Asia Pacific Education Review* 11 (3): 447–57. https://doi.org/10.1007/s12564-010-9086-0.

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

Chepko, Stevie, and Robert Doan. 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, Fiona. 2006. "Physical Education Teacher Educators' Professional Identities, Continuing Professional Development and the Issue of Gender Equality." *Physical Education & Sport Pedagogy* 11 (3): 247–63. https://doi.org/10.1080/17408980600986306.

Goverment of the Republic of Indonesia. 2003. *Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*. http://peraturan.go.id/search/download/11e58ce2b70ac2c094ce313132313436.html.

Groißböck, Peter. 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, Joseph F., William C. Black, Barry J. Babin, and Rolph E. Anderson. 2014. *Multivariate Data Analysis*. 7th ed. Pearson Education Limited.

Hanna Andyani, Punaji Setyosari, Bambang Budi Wiyono, and Ery Tri Djatmika. 2020. "Does Technological Pedagogical Content Knowledge Impact on the Use of ICT In Pedagogy?" *International Journal of Emerging Technologies in Learning (IJET)* 15 (3): 126–39. https://doi.org/https://doi.org/10.3991/ijet.v15i03.11690.

Harris, Douglas N., and Tim R. Sass. 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, Robert. 2006. *Handbook of Univariate and Multivariate Data Analysis and Interpretation with SPSS*. Chapman & Hall/CRC, Taylor & Francis Group.

Huda, Miftachul, Andino Maseleno, Pardimin Atmotiyoso, Maragustam Siregar, Roslee Ahmad, Kamarul Azmi Jasmi, Nasrul Hisyam Nor Muhamad, Mohd Ismail Mustari, and Bushrah Basiron. 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.

Indonesian Government. 2005. *Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 Tentang Guru Dan Dosen*. http://ditjenpp.kemenkumham.go.id/database-peraturan/peraturan-menteri.html.

Kim, Taeyeon, and Youngjun Lee. 2019. "Principal Instructional Leadership for Teacher Participation in Professional Development: Evidence from Japan, Singapore, and South Korea." *Asia Pacific Education Review*, September, 1–18. https://doi.org/10.1007/s12564-019-09616-x.

Klentschy, Michael 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, Prita Nurmalia. 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, Vanessa, Geneviève Cogérino, and Mattias Kaestner. 2006. "Injustice in Physical Education: Gender and the Perception of Deprivation in Grades and Teacher Support." *Social Psychology of Education* 9 (3): 321–39. https://doi.org/10.1007/s11218-005-5122-z.

Liang, Gouli, Richard T. Walls, and Chunlei Lu. 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, Siri Sollied. 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*, January, 1–17. https://doi.org/10.1007/s10671-020-09260-y.

Maksum, Ali. 2010. "Kualitas Guru Pendidikan Jasmani Di Sekolah : Antara Harapan Dan Kenyataan," no. 3: 1–32.

Meyers, Lawrence S., Glenn C. Gamst, and A. J. Guarino. 2013. *Performing Data Analysis Using IBM SPSS*. John Wiley & Sons, Inc.

Michael, Robert Daniel, Collin Webster, Debra Patterson, Patricia Laguna, and Clay Sherman. 2016. "Standards-Based Assessment, Grading, and Professional Development of California Middle School Physical Education Teachers." *Journal of Teaching in Physical Education* 35 (3): 277–83. 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. 2017. https://www.kemenkeu.go.id/apbn2017.

Ministry of National Education of Republic of Indonesia. 2007. *Peraturan Menteri Pendidikan Nasional Republik Indonesia Nomor 16 Tahun 2007 Tentang Standar Kualifikasi Akademik Dan Kompetensi Guru*. http://vervalsp.data.kemdikbud.go.id/prosespembelajaran/file/Permendiknas No 16 Tahun 2007.pdf.

Moynihan, Sharon, Leena Paakkari, Raili Välimaa, Didier Jourdan, and Patricia Mannix-McNamara. 2015. "Teacher Competencies in Health Education: Results of a Delphi Study." *PLoS ONE* 10 (12). https://doi.org/10.1371/journal.pone.0143703.

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

Pantić, Nataša, and Theo Wubbels. 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, Barbara, and Kerry J Kennedy. 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, Mioko, and Frank Van Cappelle. 2009. "Approaches to Monitoring the Quality of Education in Developing Countries-Searching for Better Research-Policy Linkages." *In The International Symposium on Quality Education for All – Approaches to Monitoring and Improving the Quality of Education*. Berlin. 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, Eunice Ratna. 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, Tim R., Anastasia Semykina, and Douglas N. Harris. 2014. "Value-Added Models and the Measurement of Teacher Productivity." *Economics of Education Review* 38 (February): 9–23. https://doi.org/10.1016/j.econedurev.2013.10.003.

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

Song, Kyoung-oh. 2008. "The Impacts of District Policy and School Context on Teacher Professional Development." *Asia Pacific Education Review* 9 (4): 436–47. https://doi.org/10.1007/bf03025661.

Streiner, David 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." In *Seminar Nasional Hasil Penelitian Dan Pengabdian Kepada Masyarakat - Subtema: Inovasi Pendidikan*, 193–202. Surabaya: Universitas Negeri Surabaya. http://lppm.unesa.ac.id/semnasppm/prosiding2016/1_Inovasi_Pendidikan.pdf.

Suroto, F D Khory, V C Dinata, and A Priambodo. 2017. "Core Competency Measurement Model for Prospective Physical Education Teacher." *IOP Conference Series: Materials Science and Engineering* 180 (March): 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*. Jakarta: Directorate General of Teachers and Education Staff.

United Nations. n.d. "Education - United Nations Sustainable Development." Accessed June 15, 2019. https://www.un.org/sustainabledevelopment/education/.

Wagner, Daniel A., and Nathan M. Castillo. 2014. "Learning at the Bottom of the Pyramid: Constraints, Comparability and Policy in Developing Countries." *Prospects* 44 (4): 627–38. https://doi.org/10.1007/s11125-014-9328-8.

Wuryaningsih, Dewi Haryani Susilastuti, Muhadjir Darwin, and Adi Cilik Pierewan. 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): 123–47. https://doi.org/https://doi.org/10.3991/ijet.v14i21.10736.

Yoo, Sang Suk, and Ha Young Kim. 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, Peter, and M. Bruce King. 2002. "Principal Leadership for Professional Development to Build School Capacity." *Educational Administration Quarterly* 38 (5): 643–70. https://doi.org/10.1177/0013161X02239642.

Yusof, Mat Rahimi, Mohd Faiz Mohd Yaakob, and Mohd Yusri Ibrahim. 2019. "Measurement Model of Teaching Competency of Secondary School Teachers in Malaysia." *International Journal of Emerging Technologies in Learning* 14 (20): 157–64.

https://doi.org/10.3991/ijet.v14i20.11465.

LAMPIRAN B-2
NASKAH ARTIKEL VERSI REVISI

WEB-BASED PHYSICAL EDUCATION TEACHER COMPETENCY INSTRUMENT BASED ON NATIONAL STANDARDS

Suroto[1*], Bayu Budi Prakoso[1], Anung Priambodo[1], Fifukha Dwi Khory[1], and Vega Candra Dinata[1]

[1]Universitas Negeri Surabaya, Indonesia

[*]e-mail: 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. A total of 277 physical education teachers participated in an online survey via the web http://risetpjokindonesia.com/ to measure teacher competency. The measurement results were analysed using confirmatory factor analysis and Cronbach's alpha to test validity and reliability. 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 made are valid and reliable, so they can be used for similar measurements in the future. 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 of the teacher professional development carried out and the limitation of the productive period of the teacher in carrying out his or her profession.

Keywords: web-based measurement, PE teacher competency, national standards

INTRODUCTION

Quality education is one of the focuses of the Sustainable Development Goals (United Nations, n.d.)~~(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 (Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional, 2003)~~ (Goverment of the Republic of Indonesia 2003)~~. The budget for education is focused on improving access and quality of education services in Indo-nesia (Ministry of Finance of Republic of Indonesia, 2017)~~ (Ministry of Finance of Republic of Indonesia 2017)~~, but.

~~However, 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 which began in 2005 (Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 Tentang Guru Dan Dosen, 2005)~~ (Indonesian~~

Formatted: English (United States)

Commented [A1]: Please use Mendeley tools for all citations

Government 2005). The measurement of teacher competency has become the government's benchmark in 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)(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)(Kusumawardhani 2017). Since 2007, the accuracy of measuring teacher competency using the teacher's portfolio system was too low, so it was replaced by the Teacher Competency Test in 2012. 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)(Team of Directorate General of Teachers and Education Staff 2018). Under these conditions, the development of teacher competency in Indonesia is 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)(Pantić and Wubbels 2010). Competent teachers are the most important form of human capital to improve the national education system in Indonesia in alignment with developed countries (Yusof et al., 2019)(Yusof, Yaakob, and Ibrahim 2019). Moreover, the impact of globalization at this time clearly presents extraordinary challenges in education, especially for developing countries (Akar, 2010)(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 are not exactly in line with international standards (Wagner & Castillo, 2014)(Wagner and Castillo 2014). In addition, the conditions of developed and developing countries differ in many aspects, including differences in the quality of education (Madsen, 2020)(Madsen 2020). There-fore, the decision to use national standards as the benchmark for the professional development of teachers is appropriate, so that education services become aligned with national education goals (Klentschy, 2005; Michael et al., 2016)(Klentschy 2005; Michael et al. 2016). This will have an impact on the accuracy of teacher qualifications according to the national standards of each country (Liang et al., 2005; Nakai & Metzler, 2005; Yoo & Kim, 2005)(Nakai and Metzler 2005; Yoo and Kim 2005; Liang, Walls, and Lu 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)(Preston and Kennedy 1995; Brookhart 2011).

Formatted: English (United States)

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 preparing teacher competency measurement, both independently and online, is to keep a record of the development of teacher competency, which has received minimal attention from the government (Saito & Van Cappelle, 2009)(Saito and Van Cappelle 2009). The potential for achieving this idea is huge because of the massive use of technological gadgets among teachers (Huda et al., 2018)(Huda et al. 2018), although it has not been fully used for educational purposes in Indonesia (Wuryaningsih et al., 2019)(Wuryaningsih et al. 2019) because teachers still tend to maintain their traditional ways in competency development (Sari, 2012)(Sari 2012). The existence of this gap actually raises the importance for the presence of such measurements, so that teachers are accustomed to using information and communication technology for their professional development.

The second purpose of this article is to analyze the competency of physical education teachers based on gender, educational level, and years of working period as PE teachers. Previously, other researchers have found that the productive periods of teachers follow their working period, and that teacher productivity evaluations can be analyzed by considering six value-added models that include the most common specifications in measuring teacher productivity (Harris & Sass, 2011; Sass et al., 2014)(Sass, Semykina, and Harris 2014; Harris and Sass 2011). Both studies are conducted in Florida, USA, which may be different from the results in developing countries.

METHOD

This quantitative research was conducted using an online survey technique using the web http://risetpjokindonesia.com/ developed by the Riset PJOK Indonesia team (Team for Physical Education Research in Indonesia). The survey was conducted on teacher communities, universities, and teachers voluntarily filling independently.

Participants

Participating universities and teachers' communities signed a Memorandum of Understanding (MoU) and committed to provide the venue and invite teachers (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 participants (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 Indone-sia (Suroto, 2016; Suroto et al., 2017)~~(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 (Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 Tentang Guru Dan Dosen, 2005; Peraturan

Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)

Menteri Pendidikan Nasional Republik Indonesia Nomor 18 Tahun 2007 Tentang Sertifikasi Bagi Guru Dalam Jabatan, 2007)~~(Indonesian Government 2005; Ministry of National Education of Republic of Indonesia 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 in 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, 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 for a soft copy of the validation results.

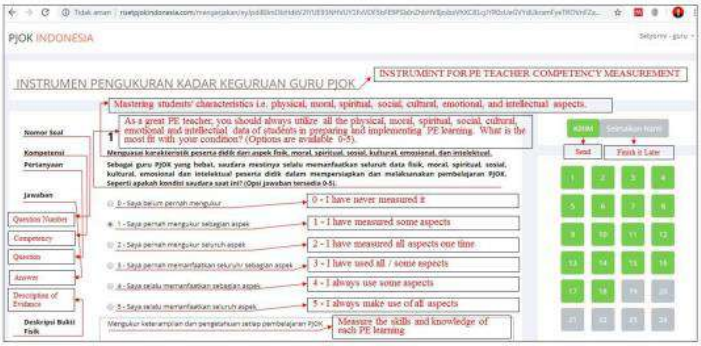


Figure 1. Example of Instrument Display

Formatted: English (United States)

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)~~(Aiken 1985; 1980; 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)~~(Ho 2006; Hair et al. 2014)~~. Cronbach alpha was used to assess reliability with the provisions of alpha values> 0.5 (Streiner, 2003)~~(Streiner 2003)~~. 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)(Meyers, Gamst, and Guarino 2013). T-test was used to assess the effect of gender on teacher competency, whereas one-way ANOVA was used to assess the effect of working period on teacher competency.

FINDINGS AND DISCUSSION

Finding

Content validity based on subject matter experts

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)(Aiken 1980; Sireci 1998). Each panelist declared the instrument as 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)(Aiken 1985).

Construct validity (confirmatory factor analysis) and reliability (cronbach alpha)

277 teachers were asked 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 carried out met the adequacy value of the model (Ho, 2006)(Ho 2006). Eigenvalue scores that were formed in each anal-ysis in each factor was 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 (per-sonality), 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)(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			

Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)

Items/ Component	Components				Total
	1	2	3	4	
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 teacher competency

The correlation value between competency components was found to be signifi-cant ($p < 0.001$). As shown in Table 3, the scores indicate that the four types of teach-er competency comprises the total competency value.

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.

Descriptive statistics on teacher competency scores

Descriptive statistics of the measurement results show that the form of data distribution is symmetric (kurtosis and skewness ≤1). Thus, the data distribution is normal (Meyers et al., 2013)~~(Meyers, Gamst, and Guarino 2013)~~. Then, percentiles in the descriptive statistics are used as a basis for determining the score categories. In Table 4, the mean total teacher competency of 63.7 is between the 40-50 percentiles, meaning that it is still in the moderate competency category. The pedagogical mean of 25.1 is between the 50-60 percentiles, meaning that it is still in the good competency category. The personality mean of 13.9 is between the

Formatted: English (United States)

40-50 percentiles, meaning that it is still in the moderate competency category. The social mean of 11.7 is between the 40-50 percentiles, meaning that it is still in the moderate competency category. The professional mean of 13.0 is on 50 percentiles, meaning that it is still in the moderate competency category.

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 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), where 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 level 6 (p = 0.045) and 9 (p = 0.002). 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

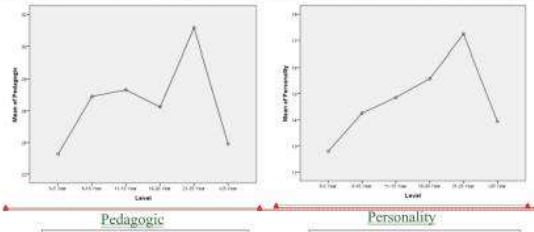
than level 9 (p = 0.004). Meanwhile, grade of school affects professional competence (F= 5.205, p= 0.006) and total competence (F= 3.523, p= 0.031), Elementary school teachers are lower than junior high school teachers.

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

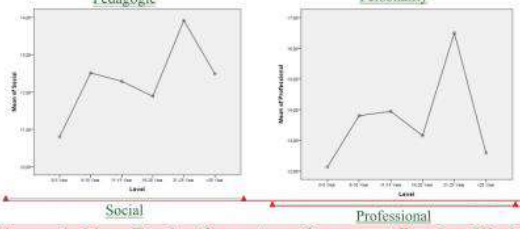
Independent Variable	Dependent Variable	Mean Square	F	*p*	Conclusion[a]
Working period[1]	Pedagogic	256	4.155	0.001	lvl 5<9
	Personality	80	4.159	0.001	lvl 5<9
	Social	45	4.142	0.001	lvl 5<6; 5<9
	Professional	62	4.001	0.002	lvl 5<9
	Total	1460	5.023	0.000	lvl 5<6; 5<9
Grade[2]	Pedagogic	204	3.189	0.043	
	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 and 3 shows the changes in mean teacher competency on working period.



Pedagogic Personality



Social Professional

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

Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)

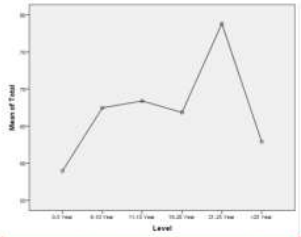


Figure 3. Changes in Mean Teacher Competency Based on Working Period

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), the third increased sharply (21-25 years), and the fourth decreased sharply when approaching retirement (> 25 years).

Discussion

Based on the findings, the research objectives can be explained in two stages~~The first purpose of this article is to describe the results of the development of instruments for measuring teacher competency, specifically physical education teachers, by utilizing Indonesian national standards for teacher competency. This goal is achieved in two stages~~, namely (1) the results of developing a teacher competency measurement instrument based on the Indonesian national standards, (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 0.842-0.896. These values are greater than 0.4, so it can be concluded that the instrument has a valid construct validity (Hair et al., 2014)~~(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)~~(Streiner 2003)~~. Descriptive statistics show that the distribution curve tends to tilt to the left (negative skewness and kurtoseis), meaning that the teacher's competency scores still tend to be below the average scores across Indonesia (Meyers et al., 2013)~~(Meyers, Gamst, and Guarino 2013)~~. The average value of 63.7 is between the 40-50 percentiles, meaning that it is still in the moderate category. This shows

Formatted: English (United States)
Formatted: English (United States)
Commented [A2]: Please, the figure relocation to results sections
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: ^ SubsequentParagraphsTextStyle, Indent: First line: 0,75 cm, Line spacing: 1,5 lines
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)

that teachers in Indonesia are still lacking in competency, which is a common characteristic for teachers in developing countries (Yusof et al., 2019)~~(Yusof, Yaakob, and Ibrahim 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 male and female teachers are considered equally competent (Dowling, 2006)~~(Dowling 2006)~~. Unfortunately, the findings of this article show that the number of female PE teachers is relatively lesser compared to the number of male PE teachers. This is due to the assumption that physical activity and sports is related to masculinity (Lentillon et al., 2006)~~(Lentillon, Cogérino, and Kaestner 2006)~~. A possible explanation for higher competency scores in female teachers is that, being the minority, they have to raise their quality to 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 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 (Song, 2008)~~(Song 2008)~~. Based on the results of other studies by Youngs and King, show that differences in school policies and leadership style of principals are believed to be important variables in the process of implementing professional development programs for teachers (Youngs & King, 2002)~~(Youngs and 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)~~(Kim and 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 leadership style of the principal.

Formatted: English (United States)

Formatted: English (United States)

Formatted: English (United States)

Teacher competency based on working period shows that teacher 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 at 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 ~~by Sass, Semykina, and Harris~~, which explain that teacher quality is influenced by working period especially during the first 5 years of work (Sass et al., 2014)~~(Sass, Semykina, and Harris 2014)~~, which then continues for the next 10 years (Harris & Sass, 2011)~~(Harris and 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. Based on the static competency conditions in the 10-20 year work period, the provision of treatment for the development of teacher competency is crucial at this period.

The findings of this article provides 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 uses 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)_ (Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 Tentang Guru Dan Dosen, 2005; Peraturan Menteri Pendidikan Nasional Republik Indonesia Nomor 18 Tahun 2007 Tentang Sertifikasi Bagi Guru Dalam Jabatan, 2007)~~(Indonesian Government 2005; Ministry of National Education of Republic of Indonesia 2007)~~.

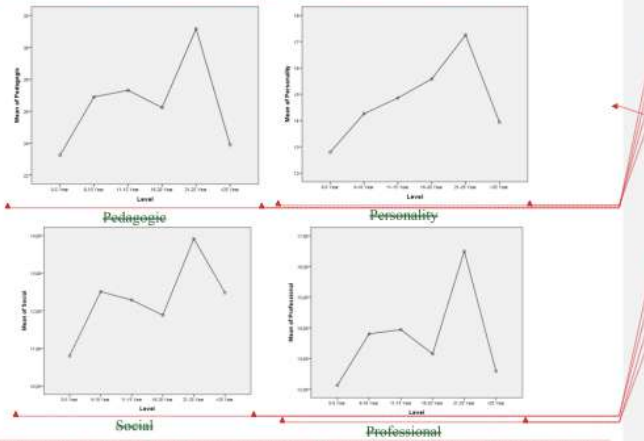


Figure 2. Changes in Mean Teacher Competency Component Based on Working Period

Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted Table
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)

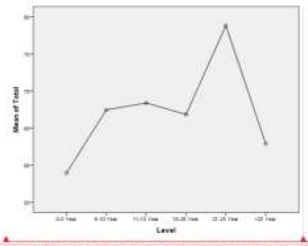


Figure 3. Changes in Mean Teacher Competency Based on Working Period

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)(Moynihan et al. 2015). Besides being relevant based on the aspects measured, the web-based model used are 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 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)(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)(Chepko and Doan 2015). Furthermore, the use of the web as a media aims to increase teacher activity in the use of information and communication technology. This is relevant to the results of other studies by Andyani et al, where the use of information and communication technology proven to have a positive impact on the pedagogical role of teachers (Andyani et al., 2020)(Hanna 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 The focus of quality education 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, so 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

Formatted: English (United States)
Formatted: English (United States)
Commented [A3]: Please, the figure relocation to results sections
Formatted: English (United States)
Formatted: English (United States)
Formatted: English (United States)

valid and reliable national standards. In addition, research findings indicate that gender, 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 is based on working period, namely for PE teachers in the 10-20 year working period who experience static growth in their competency. This has implications for the Indonesian government and future research.

AKNOWLEDGEMENTS

The study was funded by Minister of Education and Culture of the Republic of Indonesia, by 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

Formatted: English (United States)

Commented [A4]: Please use Mendeley tools for writing references

Formatted: English (United States)

Formatted: English (United States)

Formatted: Justified

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

Aiken, Lewis R. 1980. "Content Validity and Reliability of Single Items or Questionnaires." *Educational and Psychological Measurement* 40 (4): 955–59. https://doi.org/10.1177/001316448004000419.

Aiken, Lewis R.. 1985. "Three Coefficients for Analyzing the Reliability and Validity of Ratings." *Educational and Psychological Measurement* 45 (1): 131–42. https://doi.org/10.1177/0013164485451012.

Akar, Hanife. 2010. "Globalization and Its Challenges for Developing Countries: The Case of Turkish Higher Education." *Asia Pacific Education Review* 11 (3): 447–57. https://doi.org/10.1007/s12564-010-9086-0.

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

Chepko, Stevie, and Robert Doan. 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, Fiona. 2006. "Physical Education Teacher Educators' Professional Identities, Continuing Professional Development and the Issue of Gender Equality." *Physical Education & Sport Pedagogy* 11 (3): 247–63. https://doi.org/10.1080/17408980600986306.

Goverment of the Republic of Indonesia. 2003. *Undang-Undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional*. http://peraturan.go.id/search/download/11e58ee2b70ac2e094ee313132313436.html.

Groißböck, Peter. 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, Joseph F., William C. Black, Barry J. Babin, and Rolph E. Anderson. 2014. *Multivariate*

Data Analysis. 7th ed. Pearson Education Limited.

Hanna Andyani, Punaji Setyosari, Bambang Budi Wiyono, and Ery Tri Djatmika. 2020. "Does Technological Pedagogical Content Knowledge Impact on the Use of ICT In Pedagogy?" *International Journal of Emerging Technologies in Learning (IJET)* 15 (3): 126–39. https://doi.org/https://doi.org/10.3991/ijet.v15i03.11690.

Harris, Douglas N., and Tim R. Sass. 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, Robert. 2006. *Handbook of Univariate and Multivariate Data Analysis and Interpretation with SPSS*. Chapman & Hall/CRC, Taylor & Francis Group.

Huda, Miftachul, Andino Maseleno, Pardimin Atmotiyoso, Maragustam Siregar, Roslee Ahmad, Kamarul Azmi Jasmi, Nasrul Hisyam Nor Muhamad, Mohd Ismail Mustari, and Bushrah Basiron. 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.

Indonesian Government. 2005. *Undang-Undang Republik Indonesia Nomor 14 Tahun 2005 Tentang Guru Dan Dosen*. http://ditjenpp.kemenkumham.go.id/database-peraturan/peraturan-menteri.html.

Kim, Taeyeon, and Youngjun Lee. 2019. "Principal Instructional Leadership for Teacher Participation in Professional Development: Evidence from Japan, Singapore, and South Korea." *Asia Pacific Education Review*, September, 1–18. https://doi.org/10.1007/s12564-019-09616-x.

Klentschy, Michael 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, Prita Nurmalia. 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, Vanessa, Geneviève Cogérino, and Mattias Kaestner. 2006. "Injustice in Physical Education: Gender and the Perception of Deprivation in Grades and Teacher Support." *Social Psychology of Education* 9 (3): 321–39. https://doi.org/10.1007/s11218-005-5122-z.

Liang, Gouli, Richard T. Walls, and Chunlei Lu. 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, Siri Sollied. 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*, January, 1–17. https://doi.org/10.1007/s10671-020-09260-y.

Maksum, Ali. 2010. "Kualitas Guru Pendidikan Jasmani Di Sekolah : Antara Harapan Dan Kenyataan," no. 3: 1–32.

Meyers, Lawrence S., Glenn C. Gamst, and A. J. Guarino. 2013. *Performing Data Analysis Using IBM SPSS*. John Wiley & Sons, Inc.

Michael, Robert Daniel, Collin Webster, Debra Patterson, Patricia Laguna, and Clay Sherman. 2016. "Standards-Based Assessment, Grading, and Professional Development of California Middle School Physical Education Teachers." *Journal of Teaching in Physical Education* 35 (3): 277–83. 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. 2017. https://www.kemenkeu.go.id/apbn2017.

Ministry of National Education of Republic of Indonesia. 2007. *Peraturan Menteri Pendidikan Nasional Republik Indonesia Nomor 16 Tahun 2007 Tentang Standar Kualifikasi Akademik Dan Kompetensi Guru*. http://vervalsp.data.kemdikbud.go.id/prosespembelajaran/file/Permendiknas No 16 Tahun 2007.pdf.

Moynihan, Sharon, Leena Paakkari, Raili Välimaa, Didier Jourdan, and Patricia Mannix-McNamara. 2015. "Teacher Competencies in Health Education: Results of a Delphi Study." *PLoS ONE* 10 (12). https://doi.org/10.1371/journal.pone.0143703.

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

Pantić, Nataša, and Theo Wubbels. 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, Barbara, and Kerry J Kennedy. 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, Mioko, and Frank Van Cappelle. 2009. "Approaches to Monitoring the Quality of Education in Developing Countries-Searching for Better Research-Policy Linkages." *In The International Symposium on Quality Education for All – Approaches to Monitoring and Improving the Quality of Education*. Berlin. 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, Eunice Ratna. 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, Tim R., Anastasia Semykina, and Douglas N. Harris. 2014. "Value-Added Models and the Measurement of Teacher Productivity." *Economics of Education Review* 38 (February): 9–23. https://doi.org/10.1016/j.econedurev.2013.10.003.

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

Song, Kyoung-oh. 2008. "The Impacts of District Policy and School Context on Teacher Professional Development." *Asia Pacific Education Review* 9 (4): 436–47. https://doi.org/10.1007/bf03025661.

Streiner, David 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." In *Seminar Nasional Hasil Penelitian Dan Pengabdian Kepada Masyarakat - Subtema: Inovasi Pendidikan*, 193–202. Surabaya: Universitas Negeri Surabaya. http://lppm.unesa.ac.id/semnasppm/prosiding2016/1_Inovasi_Pendidikan.pdf.

Suroto, F D Khory, V C Dinata, and A Priambodo. 2017. "Core Competency Measurement Model for Prospective Physical Education Teacher." *IOP Conference Series: Materials Science and Engineering* 180 (March): 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*. Jakarta: Directorate General of Teachers and Education Staff.

United Nations. n.d. "Education - United Nations Sustainable Development." Accessed June 15, 2019. https://www.un.org/sustainabledevelopment/education/.

Wagner, Daniel A., and Nathan M. Castillo. 2014. "Learning at the Bottom of the Pyramid: Constraints, Comparability and Policy in Developing Countries." *Prospects* 44 (4): 627–38. https://doi.org/10.1007/s11125-014-9328-8.

Wuryaningsih, Dewi Haryani Susilastuti, Muhadjir Darwin, and Adi Cilik Pierewan. 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): 123–47. https://doi.org/https://doi.org/10.3991/ijet.v14i21.10736.

Yoo, Sang Suk, and Ha Young Kim. 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, Peter, and M. Bruce King. 2002. "Principal Leadership for Professional Development to Build School Capacity." *Educational Administration Quarterly* 38 (5): 643–70. https://doi.org/10.1177/0013161X02239642.

Yusof, Mat Rahimi, Mohd Faiz Mohd Yaakob, and Mohd Yusri Ibrahim. 2019. "Measurement Model of Teaching Competency of Secondary School Teachers in Malaysia." *International Journal of Emerging Technologies in Learning* 14 (20): 157–64. https://doi.org/10.3991/ijet.v14i20.11465.

LAMPIRAN C
Letter of Acceptance dari Editor Journal Cakrawala Pendidikan

Suroto Suroto <suroto@unesa.ac.id>

[CP] Editor Decision: Accept

1 pesan

Prof. Soni Nopembri, Ph.D. <soni_nopembri@uny.ac.id> 28 September 2022 pukul 09.36
Kepada: Suroto Suroto <suroto@unesa.ac.id>

Dear Suroto Suroto:

Congratulation,

After a thorough review process, The Editorial Team of Jurnal Cakrawala Pendidikan has reached a decision regarding your submission.

The Editorial Team is pleased to inform you that your manuscript has been ACCEPTED.

We kindly ask you to pay the article publication fee. The article publication fee is Rp2.500.000,00 You may pay by bank transfer to:

Bank Transfer
Bank Name: Bank Tabungan Negara (BTN)
Branch: Yogyakarta
Account No.: 00005-01-30-000144-3
Beneficiary: RPL 030 UNY UTK OPRS BLU

Please send the receipt/payslip (either a scan, a photo, a .pdf file, or a .jpg file) to cakrawala@uny.ac.id, CC: sulis@uny.ac.id, email subject: CAKRAWALA PENDIDIKAN PUBLICATION FEE. Please write the author's name and the article title in your email.

Thank you very much for submitting your article to Jurnal Cakrawala Pendidikan. We welcome your contributions in the future.

Best regards.

Prof. Soni Nopembri, Ph.D.
(Scopus ID: 57207831971), Universitas Negeri Yogyakarta
Phone 081315196479
soni_nopembri@uny.ac.id

Cakrawala Pendidikan
http://journal.uny.ac.id/index.php/cp

--

----------Untuk mendukung "Gerakan UNY Hijau", disarankan tidak mencetak email ini dan lampirannya.
(To support the "Green UNY movement", it is recommended not to print the contents of this email and its attachments)
Universitas Negeri Yogyakarta

www.uny.ac.id <http://www.uny.ac.id>

48911-136289-3-RV_suroto.docx
396K