Teacher effectiveness scale in higher education: Development and psychometric properties

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Abstract

This study focused with the development and psychometric properties of a scale that measures teacher effectiveness in higher education. Extant literature on effective teachers served as bases for the construction of a 107-item initial scale and 497 higher education students served as participants. Results of the study showed that there were four dimensions of teacher effectiveness in higher education. These dimensions identified in the scale posses the psychometric properties of internal consistency and validity. The internal consistency estimate of the sub-scales using Cronbach coefficient α ranged from 0.707 to 0.968 while the overall internal consistency estimate of the scale was 0.972. On the other hand, validity was evaluated using factor analysis with items having factor loadings of 0.500 and above retained. Thus, the resulting Teacher Effectiveness Scale in Higher Education (TESHE) is a psychometrically sound scale that measures the multidimensional aspects of teacher effectiveness in higher education.

Keywords: development; higher education; scale; teacher effectiveness; validation

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1. Introduction

Education is an important human activity because "investment in education is essential for both professional growth and economic development" (Anderson, 2004, p. 19). It is a known fact however, that education will never be complete and will never achieve its purpose without its facilitators, the teachers. This is because teachers occupy the most important part in the educational process (Rao & Kumar, 2004) and "accountable in the educational process" (David & Macayanan, 2010, p. 74). Specifically, teachers create impact in the whole educational process and in the lives of students. In fact, "literature consistently finds that teachers make a difference to student learning, with several studies reporting that up to 30 percent of the variance in student test scores in a given year may be attributed to teachers" (Hunt 2009, p. 24). This impact can be associated to the fact that "teaching is a specialized skill that involves not only expertise in the given academic field but also the ability to create for the learners an environment where they can get optimal learning gain" (Tan de-Ramos, 2011, p. 71).

With the important contributions teachers have in the educational process, it is but necessary to always encourage teachers to be at their best, that is, to be effective all the time. Encouraging teachers to be effective is not an impossible task. In essence, "all teachers from the most accomplished to those new to the profession are capable of improving, of becoming more effective" (TEMM, 2012, p. 1).

2. Literature Review

2.1 Teacher effectiveness

To give further enlightenment to the concern of this study, it is but necessary to define teacher effectiveness. "The term teacher effectiveness is used broadly, to mean the collection of characteristics, competencies, and behaviors of teachers at all educational levels that enable students to reach desired outcomes" (Hunt, 2009, p. 1). Awofala (2012) claimed that teacher effectiveness is synonymous to individual teachers' performance and "teacher effectiveness is encompassed in knowledge, attitudes, and performance" (Hunt, 2009, p. 30). Teacher effectiveness is important because the "effectiveness of every teacher is the life of every educational institution" (Rao & Kumar, 2004, p. 4). In particular, teacher characteristics are one of the factors that influence teachers' overall effectiveness (Anderson, 2004; Pagani & Seghieri, 2002). "Teacher characteristics are relatively stable traits that are related to and influence the way teachers practice their profession" (Anderson, 2004, p. 20).

Specifically, "effective teachers are those who achieve the goals they have set for themselves or which they have set for them by others" (Anderson, 2004, p. 22). They enable their students to attain "specific learning objectives as well as broader goals such as being able to solve problems, think critically, work collaboratively, and become effective citizens" (Hunt, 2009, p. 1). Additionally, "the work of effective teachers reverberates far outside of school walls. Their students develop a love of learning and a belief in themselves that they carry with them throughout their lives" (TEMM, 2012, p. 1). It must be recognized also that "the quality of a teacher can make the difference of a full year's growth in learning for a student in a single year" (Hunt, 2009, p. 24).

2.2 Evaluation of teacher effectiveness

Since effective teachers are a must, evaluating teachers to help them be effective is necessary. Evaluating the performance of teachers in educational institutions is tantamount to evaluating the learning of students (David &

Macayanan, 2010) therefore evaluation of teacher effectiveness in higher education is important (Hoyt & Pallet, 1999). Evaluations are considered important because through evaluations, performance and effectiveness can be determined (David & Macayanan, 2010). "Specific measures are necessary to identify particular strengths and behaviors upon which individual teachers can improve" (Pagani & Seghieri, 2002, p. 207).

It must be noted however that "measuring teacher effectiveness has remained elusive in part because of the ongoing debate about what an effective teacher is and does" (Goe, Bell, & Little, 2008, p. 2). One way at shedding light into this elusiveness is looking at teacher effectiveness from the standpoint of students. Goe, Bell, and Little (2008) recognized that "student ratings be included as part of the teachers evaluation process" (p. 41). Such recognition is "based on the premise that students are the direct consumers of the services provided by teachers and are therefore in a good position to assess and evaluate their teachers' performance" (Goe, Bell, & Little, 2008, p. 69).

Students have a great deal to share about their experiences in school and they can play an active role in the improvement of teaching quality and their learning as well. Therefore, the perspective of students is of great value. "Student ratings is a necessary source of evidence of teaching effectiveness for both formative and summative decisions" (Berk, 2005, p. 50) and evaluations given by students are an essential component of any evaluation system for teachers (Berk, 2005). Recognizing the important role of students in evaluating teacher effectiveness, the present study aimed the development and determination of psychometric properties of a scale that can measure teacher effectiveness in higher education from the perspective of students.

2.3 Conceptual Framework

Several concepts have been considered as framework for the development of the initial scale. These were literature on teacher effectiveness published between the years 2000 to 2009. Dimensions that emerged from the reviewed literature can be roughly divided into six: personality, subject matter expertise, relational competence with students, professional competence, teaching style, and classroom management style. These identified dimensions are presented in details in Figure 1.

Dimensions	Recognized by (authors):	Manifestations
1. Personality	Akintayo and Iwoye (2008), Bustos-Orosa (2008), Magno and Sembrano (2007), Malikow (2006), Restubog (2009), Raymond (2008), Sanchez (2007)	being caring, kind, compassionate, bold, aggressive, an extrovert, active, energetic, strong, relaxed, practical, predictable, reasonable, gracious, wise, decisive, stable, rational, challenging, enthusiastic, creative, respectful, friendly, reflective, charismatic, having sense of humor, concern of students' successes, good prior academic performance
2. Subject Matter Expertise	Lacang (2007), Magno and Sembrano (2007), Minor et al. (2002), Reyes (2000)	being knowledgeable of subject matter, delivering well-prepared lessons, being an expert, having content mastery, ability to teach many subjects.
3. Relational Competence with students	Bustos-Orosa (2008), Magno and Sembrano (2007), Reyes (2000), Sanchez (2007)	having the ability to establish rapport, maintain harmonious relationships, being sensitive, open-minded, accepting, interacting affectionately with students, initiating teacher-student relationships, helping students, believing in students, recognizing the potentials of students
4. Professional Competence	Lacang (2007), Reyes (2000), Magno and Sembrano (2007), Minor et al. (2002)	being dedicated to work, ethical, passionate about work, fair, positive role model, having a sense of integrity
5. Teaching Style	Malikow (2006), Minor et al. (2002), Restubog (2009), Reyes (2000), Sanchez (2007)	explaining complicated material well, flexible instructional style, being student-centered, having instructional clarity, using varied instructional strategies, effective in using of instructional equipment, integrating values in lessons, giving homework, showing love for subject taught , encouraging the asking of questions, encouraging discussions, teaching in an organized manner, developing sense of responsibility among the students, being a good communicator, and making classes interesting
6. Classroom Management Style	Minor et al. (2002), Sanchez (2007)	maintaining students' on task behavior, not yelling at students, modeling positive behaviors, always maintaining discipline, rewarding good behaviors, creating safe environment

Figure 1. Six dimensions of teacher effectiveness based on extant literature

2.4 Statement of the Problem

This study aimed to prepare a scale that will measure teacher effectiveness in higher education. Specifically, it sought to answer the following questions:

A.   How can a scale which will measure teacher effectiveness in higher education be developed?

B.   How can the scale be validated?

2.5 Hypothesis

The Teacher Effectiveness Scale in Higher Education (TESHE) is a psychometrically sound scale that measures the multidimensional aspects of teacher effectiveness in higher education.

3.   Research Methodology

3.1 Search for content domain

Review of literature published between the years 2000 to 2009 was carried out. Such undertaking provided the framework that served as guide in writing the items in the initial scale on teacher effectiveness. Reviewed literature were not only limited to teacher effectiveness in higher education but in all levels.

3.2 Item writing

The review of literature led to the writing of items in the initial scale which were based on the identified six dimensions of teacher effectiveness, namely: personality, subject matter expertise, relational competence with students, professional competence, teaching style, and classroom management style. A total of 107 items were written with the following breakdown: personality 25 items, subject matter expertise 10 items, relational competence with students 18 items, professional competence- 10 items, teaching style 32 items, and classroom management style 12 items.

3.3 Administration of the initial scale

The administration of the initial scale was done to evaluate the psychometric properties of the scale. A total of 619 higher education students chosen via systematic random sampling were originally included in this study. These higher education students were second year students and above. Only second year students and above were chosen because of the assumption that these students were already very much aware of how learning is best facilitated especially by teachers in higher education. However, out of the 619 higher education students originally included in the study, only 497 completely responded to the scale and therefore served as participants. Among the participants, there were 304 females and 193 males. Their mean age was 18.629 with a standard deviation of 2.054. The distribution of the participants per programs is presented in Table 1.

3.4 Descriptive statistics

With the responses of the participants in the administration of the initial scale as bases, the means and standard deviations of the items included in the initial scale were computed. This was done because the means and standard deviations could serve as guide in deciding what items to include in the final scale.

3.5 Evaluation of reliability

The reliability of the scale was evaluated using Cronbach's Coefficient Alpha formula. This method examined the internal consistency of the items in the scale.

3.6 Evaluation of validity

Factor analysis was primarily used to evaluate the scale's validity. Specifically, Exploratory Factor Analysis (EFA) was used with Principal Components Analysis (PCA) and Varimax Rotation (with Kaiser Normalization).

3.7 Development of final scale

The development of the final scale was based on validity and reliability evaluations. For recognition, the scale was labeled "Teacher Effectiveness Scale in Higher Education (TESHE)."

Table 1

Distribution of the participants per program

Program	Sample Size	Participants	Rate of Return (%)
Doctor in Veterinary Medicine (Second Year)	31	22	70.96
Doctor in Veterinary Medicine (Third Year)	16	13	81.25
Doctor in Veterinary Medicine (Fourth Year)	11	10	90.91
Bachelor of Arts in English (Fourth Year)	22	22	100.00
Bachelor of Science in Mathematics (Fourth Year)	14	14	100.00
Bachelor of Science in Biology (Fourth Year)	23	22	95.65
Bachelor of Science in Development Communication (Fourth Year)	20	14	70.00
Bachelor of Science in Home Technology (Second Year)	99	71	71.72
Bachelor of Science in Hotel and Restaurant Management (Second Year)	99	73	73.74
Bachelor of Science in Agriculture (Third Year)	76	55	72.37
Bachelor of Science in Agricultural Engineering (Fourth Year)	7	6	85.71
Bachelor of Science in Information Technology (Third Year)	123	106	86.18
Bachelor in Elementary Education (Second Year)	78	69	88.46
Total	**619**	**497**	**80.29**

4. Results and discussion

The purpose of this study was to develop and validate a scale that measures teacher effectiveness in higher education from the perspective of students. Following this aim, the study started with a review of literature on teacher effectiveness. The ideas from the reviewed literature served as bases in writing the 107 items included in the initial scale and which were distributed as follows: personality - 25 items, subject matter expertise - 10 items, relational competence with students - 18 items, professional competence - 10 items, teaching style - 32 items, and classroom management style - 12 items.

4.1 Descriptive statistics

The 107item initial scale was administered to 619 higher education students chosen via systematic random sampling but only 497 completely responded and therefore considered as participants. With the responses of the participants in the administration of the initial scale as bases, the means and standard deviations of the items included in the initial scale were computed. Descriptive statistics come first whenever data is examined and the most common of these are the means and standard deviations.

The means and standard deviations of items can provide clues about which items will be useful and which ones will not be. If the variance of an item is low, this mean that there is little variability on the item and it may not be useful. While it is not common to examine item level descriptive statistics in most research applications, in creating and validating tests it is a crucial first step (Kline, 2005).

The descriptive statistics of the items in the initial scale is presented in Table 2.1 while items with the highest and lowest means in the initial scale together with their standard deviations are presented in Tables 2.2 and 2.3 respectively.

Table 2.1

Descriptive statistics of items in the initial scale

Dimensions	Code	Statement	*N*	Min	Max	*M*	*SD*
P	P_1	Accomplishes tasks creatively.	497	1	4	3.195	0.589
	P_2	Shows interest in a variety of things.	497	1	4	3.211	0.590
	P_3	Knows what one really wants.	497	1	4	3.064	0.644
	P_4	Blends with others easily.	497	1	4	3.203	0.655
	P_5	Displays kindness for others.	497	1	4	3.340	0.662
	P_6	Respects others.	497	1	4	3.523	0.666
	P_7	Accepts others.	497	1	4	3.429	0.641
	P_8	Manifests charisma.	497	1	4	2.960	0.674
	P_9	Exhibits grace under pressure.	497	1	4	3.014	0.633
	P_10	Manifests an outgoing personality.	497	1	4	3.012	0.647
	P_11	Uses reason more than emotions.	497	1	4	3.018	0.744
	P_12	Shows firmness in making decisions.	497	1	4	3.141	0.619
	P_13	Thinks thoroughly before decisions are made.	497	1	4	3.318	0.692
	P_14	Shows concern for others.	497	1	4	3.457	0.628
	P_15	Displays friendly attitude towards others.	497	1	4	3.374	0.657
	P_16	Good academic standing when still studying.	497	1	4	3.346	0.620
	P_17	Possesses good sense of humor.	497	1	4	3.300	0.616
	P_18	Assumes responsibilities for mistakes committed.	497	1	4	3.147	0.632
	P_19	Admits mistakes.	497	1	4	3.265	0.762
	P_20	Shows compassion for others.	497	1	4	3.237	0.622
	P_21	Cares for the welfare of others.	497	1	4	3.270	0.638
	P_22	Always active.	497	1	4	3.241	0.685
	P_23	Displays a lot of energy.	497	1	4	3.205	0.665
	P_24	Shows predictability of actions.	497	1	4	3.032	0.662
	P_25	Spends time reflecting.	497	1	4	3.057	0.670
SME	SME_26	Always prepared when holding classes.	497	1	4	3.308	0.675
	SME_27	Shows mastery of lessons taught.	497	1	4	3.304	0.671
	SME_28	Knows a lot of information about lessons taught.	497	1	4	3.322	0.682
	SME_29	Manifests expertise in lessons taught.	497	1	4	3.231	0.667
	SME_30	Shares a lot of interesting ideas related to lessons taught.	497	1	4	3.330	0.684
	SME_31	Displays authority when teaching.	497	1	4	3.185	0.691
	SME_32	Knows how to answer questions raised about lessons taught.	497	1	4	3.300	0.663
	SME_33	Shows thorough understanding of lessons taught.	497	1	4	3.322	0.645
	SME_34	Shares information that are only relevant to lessons taught.	497	1	4	3.229	0.654
	SME_35	Exhibits ability to teach a lot of academic subjects.	497	1	4	3.241	0.652
TRC	TRC_36	Responses to feedback given by students.	497	1	4	3.197	0.673
	TRC_37	Makes students feel they belong.	497	1	4	3.332	0.684
	TRC_38	Exhibits non-threatening behaviors when interacting with students.	497	1	4	3.159	0.670
	TRC_39	Displays sensitivity to the needs of students.	497	1	4	3.113	0.650
	TRC_40	Shows approachability with students.	497	1	4	3.296	0.668
	TRC_41	Exhibits fair treatment of students.	497	1	4	3.231	0.710
	TRC_42	Solicits students' feedback.	497	1	4	2.998	0.750
	TRC_43	Welcomes comments from students.	497	1	4	3.300	0.666
	TRC_44	Has a positive regard of students.	497	1	4	3.278	0.698
	TRC_45	Exhibits open-mindedness in issues concerning students.	497	1	4	3.318	0.650

Table 2.1 continued …

Descriptive statistics of items in the initial scale

Dimensions	Code	Statement	*N*	Min	Max	*M*	*SD*
TRC	TRC_46	Respects students.	497	1	4	3.503	0.629
	TRC_47	Accepts students.	497	1	4	3.459	0.628
	TRC_48	Extends help to students.	497	1	4	3.348	0.664
	TRC_49	Believes in the potential of students.	497	1	4	3.352	0.665
	TRC_50	Interacts with students outside of class hours.	497	1	4	3.217	0.673
	TRC_51	Shows interest to know more about students.	497	1	4	3.258	0.637
	TRC_52	Communicates often with students.	497	1	4	3.221	0.672
	TRC_53	Have high expectations of students.	497	1	4	3.123	0.721
PC	PC_54	Observes proper dress code.	497	1	4	3.205	0.739
	PC_55	Reports to work on time.	497	1	4	3.292	0.658
	PC_56	Shows passion for teaching.	497	1	4	3.366	0.650
	PC_57	Does not violate school policies.	497	1	4	3.304	0.703
	PC_58	Observes norms of conduct in the teaching profession.	497	1	4	3.296	0.628
	PC_59	Gives appropriate assessment of students.	497	1	4	3.298	0.651
	PC_60	Observes ethical conduct in the teaching profession.	497	1	4	3.270	0.650
	PC_61	Shows dedication to the teaching profession.	497	1	4	3.374	0.648
	PC_62	Serves as positive role model to students.	497	1	4	3.406	0.644
	PC_63	Commands respect from students.	497	1	4	3.364	0.668
TS	TS_64	Shows enthusiasm in the teaching of lessons.	497	1	4	3.304	0.656
	TS_65	Elicits enthusiasm among students when teaching.	497	1	4	3.244	0.595
	TS_66	Incorporates creativity in delivering of lessons.	497	1	4	3.272	0.639
	TS_67	Communicates ideas effectively.	497	1	4	3.356	0.644
	TS_68	Provides students with activities relevant to lessons.	497	1	4	3.354	0.644
	TS_69	Gives a lot of activities aimed at facilitating students' intellectual development.	497	1	4	3.236	0.647
	TS_70	Makes learners the center of learning.	497	1	4	3.366	0.640
	TS_71	Explains complicated lessons well.	497	1	4	3.362	0.661
	TS_72	Shows love for teaching while discussing.	497	1	4	3.366	0.662
	TS_73	Gives instructions clearly.	497	1	4	3.429	0.644
	TS_74	Encourages students to analyze lessons.	497	1	4	3.429	0.635
	TS_75	Answers students' questions.	497	1	4	3.433	0.606
	TS_76	Links lessons to real life situations.	497	1	4	3.366	0.601
	TS_77	Makes learning enjoyable for students.	497	1	4	3.382	0.653
	TS_78	Interacts with students during class discussions.	497	1	4	3.304	0.671
	TS_79	Manages time in the classroom well.	497	1	4	3.348	0.679
	TS_80	Welcomes students' participation in classroom discussions.	497	1	4	3.384	0.628
	TS_81	Encourages students to be hard working.	497	1	4	3.409	0.654
	TS_82	Uses a variety of instructional strategies.	497	1	4	3.338	0.659
	TS_83	Observes flexibility of instructional style to be able to fit to the different needs of students.	497	1	4	3.274	0.639
	TS_84	Gives plenty of examples relevant to lessons.	497	1	4	3.314	0.630
	TS_85	Takes into consideration students' moral development in lessons taught.	497	1	4	3.336	0.624
	TS_86	Provides activities aimed at developing critical thinking among students.	497	1	4	3.300	0.589
	TS_87	Gives a lot of activities that encourage students to assume responsibility.	497	1	4	3.300	0.642
	TS_88	Explains immediately parts of lessons that are unclear to the students.	497	1	4	3.336	0.624
	TS_89	Sets realistic goals for students to accomplish.	497	1	4	3.354	0.625

Table 2.1 continued …

Descriptive statistics of items in the initial scale

Dimensions	Code	Statement	N	Min	Max	M	SD
	TS_90	Announces requirements ahead of time.	497	1	4	3.413	0.606
	TS_91	Uses instructional equipment/materials effectively.	497	1	4	3.332	0.639
	TS_92	Exhibits the ability to attend to a lot of concerns while teaching.	497	1	4	3.316	0.637
	TS_93	Encourages students to raise questions	497	1	4	3.344	0.645
	TS_94	Chooses relevant strategies to maximize students' learning gains.	497	1	4	3.328	0.647
	TS_95	Gives many examples to make difficult topics easy to learn.	497	1	4	3.378	0.646
CMS	CMS_96	Sets classroom rules for students to follow.	497	1	4	3.366	0.668
	CMS_97	Maintains the absence of classroom disruptions.	497	1	4	3.248	0.670
	CMS_98	Shows firmness in the implementation of classroom discipline.	497	1	4	3.368	0.647
	CMS_99	Rewards positive behaviors.	497	1	4	3.268	0.662
	CMS_100	Acknowledges positive behaviors.	497	1	4	3.338	0.631
	CMS_101	Shows keenness to inappropriate behaviors.	497	1	4	3.272	0.593
	CMS_102	Corrects inappropriate behavior.	497	1	4	3.326	0.643
	CMS_103	Responds at once to issues involving discipline.	497	1	4	3.280	0.632
	CMS_104	Sees to it that students are always on task.	497	1	4	3.292	0.639
	CMS_105	Gives importance to discipline in the classroom	497	1	4	3.390	0.623
	CMS_106	Does not yell at students.	497	1	4	3.223	0.681
	CMS_107	Tries to know the concerns of students who misbehave.	497	1	4	3.312	0.661

Note. Numbering of items was done continuously. P: Personality, SME: Subject Matter Expertise, TRC: Teacher's Relational Competence (with students), PC: Professional Competence, TS: Teaching Style, CMS: Classroom Management Style.

Based on Table 2.1, the means of the items included in the initial scale ranged from 2.960 to 3.523 while the standard deviations of the items were from 0.589 to 0.762. Kline (2005) claimed that the higher the variability or the standard deviation of the item and the more the mean of the item is at the center point of the distribution, the better the item will perform.

Table 2.2

Items in the scale with the highest means

Dimensions	Code	Statement	N	Min	Max	M	SD
P	P_6	Respects others.	497	1	4	3.523	0.666
TRC	TRC_46	Respects students.	497	1	4	3.503	0.629
TRC	TRC_47	Accepts students.	497	1	4	3.459	0.628
P	P_14	Shows concern for others.	497	1	4	3.457	0.628
TS	TS_75	Answers students' questions.	497	1	4	3.433	0.606
P	P_7	Accepts others.	497	1	4	3.429	0.641
TS	TS_73	Gives instructions clearly.	497	1	4	3.429	0.644
TS	TS_74	Encourages students to analyze lessons.	497	1	4	3.429	0.635
TS	TS_90	Announces requirements ahead of time.	497	1	4	3.413	0.606
TS	TS_81	Encourages students to be hard working.	497	1	4	3.409	0.654
PC	PC_62	Serves as positive role model to students.	497	1	4	3.406	0.644

Based on Table 2.2, the first five items with the highest means in the initial scale pertains to respecting others, respecting students, accepting students, showing concern for students, and answering students' questions.

On the contrary, as reflected in Table 2.3, the five items in the initial scale with the lowest means pertain to manifesting charisma, soliciting students' feedback, manifesting outgoing personality, exhibiting grace under pressure, and using reason more than emotions.

Table 2.3

Items in the scale with the lowest means

Dimensions	Code	Statement	N	Min	Max	M	SD
P	P_8	Manifests charisma.	497	1	4	2.960	0.674
TRC	TRC_42	Solicits students' feedback.	497	1	4	2.998	0.750
P	P_10	Manifests an outgoing personality.	497	1	4	3.012	0.647
P	P_9	Exhibits grace under pressure.	497	1	4	3.014	0.633
P	P_11	Uses reason more than emotions.	497	1	4	3.018	0.744
P	P_24	Shows predictability of actions.	497	1	4	3.032	0.662
P	P_25	Spends time reflecting.	497	1	4	3.057	0.670
P	P_3	Knows what one really wants.	497	1	4	3.064	0.644

4.2 Evaluation of reliability

Aside from the descriptive properties of the 107 items included in the initial scale, an internal consistency was performed to evaluate how each item could contribute to the variance of the scale. The item-total correlation using Cronbach's Alpha was used. This process determined the individual item reliability index and is presented in Table 3.1.

Table 3.1

Item-total correlations of items in the initial scale

Dimensions	Code	Statement	Item-Total Correlation	Conbach's Alpha if Item is Deleted
P	P_1	Accomplishes tasks creatively.	0.449	0.980
	P_2	Shows interest in a variety of things.	0.446	0.980
	P_3	Knows what one really wants.	0.375	0.980
	P_4	Blends with others easily.	0.425	0.980
	P_5	Displays kindness for others.	0.523	0.980
	P_6	Respects others.	0.467	0.980
	P_7	Accepts others.	0.476	0.980
	P_8	Manifests charisma.	0.418	0.980
	P_9	Exhibits grace under pressure.	0.409	0.980
	P_10	Manifests an outgoing personality.	0.364	0.980
	P_11	Uses reason more than emotions.	0.371	0.980
	P_12	Shows firmness in making decisions.	0.526	0.980
	P_13	Thinks thoroughly before decisions are made.	0.482	0.980
	P_14	Shows concern for others.	0.460	0.980
	P_15	Displays friendly attitude towards others.	0.520	0.980
	P_16	Good academic standing when still studying.	0.500	0.980
	P_17	Possesses good sense of humor.	0.498	0.980
	P_18	Assumes responsibilities for mistakes committed.	0.491	0.980
	P_19	Admits mistakes.	0.479	0.980
	P_20	Shows compassion for others.	0.512	0.980
	P_21	Cares for the welfare of others.	0.474	0.980
	P_22	Always active.	0.523	0.980
	P_23	Displays a lot of energy.	0.543	0.980
	P_24	Shows predictability of actions.	0.452	0.980
	P_25	Spends time reflecting.	0.463	0.980
SME	SME_26	Always prepared when holding classes.	0.512	0.980
	SME_27	Shows mastery of lessons taught.	0.590	0.980
	SME_28	Knows a lot of information about lessons taught.	0.577	0.980
	SME_29	Manifests expertise in lessons taught.	0.598	0.980
	SME_30	Shares a lot of interesting ideas related to lessons taught.	0.587	0.980

Table 3.1 continued …

Item-total correlations of items in the initial scale

Dimensions	Code	Statement	Item-Total Correlation	Conbach's Alpha if Item is Deleted
	SME_31	Displays authority when teaching.	0.469	0.980
	SME_32	Knows how to answer questions raised about lessons taught.	0.591	0.980
	SME_33	Shows thorough understanding of lessons taught.	0.594	0.980
	SME_34	Shares information that is only relevant to lessons taught.	0.506	0.980
	SME_35	Exhibits ability to teach a lot of academic subjects.	0.552	0.980
TRC	TRC_36	Responses to feedback given by students.	0.568	0.980
	TRC_37	Makes students feel they belong.	0.595	0.980
	TRC_38	Exhibits non-threatening behaviors when interacting with students.	0.550	0.980
	TRC_39	Displays sensitivity to the needs of students.	0.550	0.980
	TRC_40	Shows approachability with students.	0.596	0.980
	TRC_41	Exhibits fair treatment of students.	0.598	0.980
	TRC_42	Solicits students' feedback.	0.416	0.980
	TRC_43	Welcomes comments from students.	0.512	0.980
	TRC_44	Has a positive regard of students.	0.644	0.980
	TRC_45	Exhibits open-mindedness in issues concerning students.	0.618	0.980
	TRC_46	Respects students.	0.627	0.980
	TRC_47	Accepts students.	0.584	0.980
	TRC_48	Extends help to students.	0.610	0.980
	TRC_49	Believes in the potential of students.	0.669	0.980
	TRC_50	Interacts with students outside of class hours.	0.522	0.980
	TRC_51	Shows interest to know more about students.	0.523	0.980
	TRC_52	Communicates often with students.	0.497	0.980
	TRC_53	Have high expectations of students.	0.421	0.980
PC	PC_54	Observes proper dress code.	0.422	0.980
	PC_55	Reports to work on time.	0.579	0.980
	PC_56	Shows passion for teaching.	0.658	0.980
	PC_57	Does not violate school policies.	0.541	0.980
	PC_58	Observes norms of conduct in the teaching profession.	0.613	0.980
	PC_59	Gives appropriate assessment of students.	0.667	0.980
	PC_60	Observes ethical conduct in the teaching profession.	0.660	0.980
	PC_61	Shows dedication to the teaching profession.	0.645	0.980
	PC_62	Serves as positive role model to students.	0.663	0.980
	PC_63	Commands respect from students.	0.602	0.980
TS	TS_64	Shows enthusiasm in the teaching of lessons.	0.649	0.980
	TS_65	Elicits enthusiasm among students when teaching.	0.635	0.980
	TS_66	Incorporates creativity in delivering of lessons.	0.590	0.980
	TS_67	Communicates ideas effectively.	0.634	0.980
	TS_68	Provides students with activities relevant to lessons.	0.651	0.980
	TS_69	Gives a lot of activities aimed at facilitating students' intellectual development.	0.550	0.980
	TS_70	Makes learners the center of learning.	0.598	0.980
	TS_71	Explains complicated lessons well.	0.596	0.980
	TS_72	Shows love for teaching while discussing.	0.624	0.980
	TS_73	Gives instructions clearly.	0.636	0.980
	TS_74	Encourages students to analyze lessons.	0.645	0.980

Table 3.1 continued …

Item-total correlations of items in the initial scale

Dimensions	Code	Statement	Item-Total Correlation	Conbach's Alpha if Item is Deleted
	TS_75	Answers students' questions.	0.590	0.980
	TS_76	Links lessons to real life situations.	0.642	0.980
	TS_77	Makes learning enjoyable for students.	0.583	0.980
	TS_78	Interacts with students during class discussions.	0.566	0.980
	TS_79	Manages time in the classroom well.	0.603	0.980
	TS_80	Welcomes students' participation in classroom discussions.	0.636	0.980
	TS_81	Encourages students to be hard working.	0.594	0.980
	TS_82	Uses a variety of instructional strategies.	0.608	0.980
	TS_83	Observes flexibility of instructional style to be able to fit to the different needs of students.	0.639	0.980
	TS_84	Gives plenty of examples relevant to lessons.	0.626	0.980
	TS_85	Takes into consideration students' moral development in lessons taught.	0.639	0.980
	TS_86	Provides activities aimed at developing critical thinking among students.	0.621	0.980
	TS_87	Gives a lot of activities that encourage students to assume responsibility.	0.571	0.980
	TS_88	Explains immediately parts of lessons that are unclear to the students.	0.601	0.980
	TS_89	Sets realistic goals for students to accomplish.	0.648	0.980
	TS_90	Announces requirements ahead of time.	0.594	0.980
	TS_91	Uses instructional equipment/materials effectively.	0.624	0.980
	TS_92	Exhibits the ability to attend to a lot of concerns while teaching.	0.595	0.980
	TS_93	Encourages students to raise questions	0.565	0.980
	TS_94	Chooses relevant strategies to maximize students' learning gains.	0.619	0.980
	TS_95	Gives many examples to make difficult topics easy to learn.	0.569	0.980
CMS	CMS_96	Sets classroom rules for students to follow.	0.567	0.980
	CMS_97	Maintains the absence of classroom disruptions.	0.539	0.980
	CMS_98	Shows firmness in the implementation of classroom discipline.	0.601	0.980
	CMS_99	Rewards positive behaviors.	0.526	0.980
	CMS_100	Acknowledges positive behaviors.	0.613	0.980
	CMS_101	Shows keenness to inappropriate behaviors.	0.552	0.980
	CMS_102	Corrects inappropriate behavior.	0.558	0.980
	CMS_103	Responds at once to issues involving discipline.	0.633	0.980
	CMS_104	Sees to it that students are always on task.	0.594	0.980
	CMS_105	Gives importance to discipline in the classroom	0.617	0.980
	CMS_106	Does not yell at students.	0.522	0.980
	CMS_107	Tries to know the concerns of students who misbehave.	0.548	0.980

It can be gleaned from Table 3.1 that reliability is at 0.980 regardless of an item to be deleted. This only suggested that the scale had the high internal consistency even in its initial form.

4.3 Evaluation of validity

To evaluate the validity of the scale, Principal Components Analysis (PCA) with Varimax Rotation (Kaiser Normalization) was used. According to Brown (2010), "one use for PCA or EFA is to conduct item or subscale analysis with the goal of revising and strengthening a test or questionnaire" (p. 30) and "can be used as a back-and-forth tool for eliminating items that don't work" (p. 31).

Four dimensions of teacher effectiveness were identified after the conduct of PCA with Varimax Rotation (Kaiser Normalization). The cut-off was item loadings of 0.500 correlation coefficients and above. The dimensions were labeled based on the common themes of items under them. The identified dimensions together with items and their factor loadings under them are presented in Table 4.1 to 4.4.

Table 4.1

Dimension 1: Teaching-related behavior

Original Code	Statement	Factor Loadings	Eigenvalues	Explained Variance	Alpha
TRC_49	Believes in the potential of students.	0.518	20.34	19.01	0.968
PC_56	Shows passion for teaching.	0.537			
PC_57	Does not violate school policies.	0.547			
PC_58	Observes norms of conduct in the teaching profession.	0.530			
PC_59	Gives appropriate assessment of students.	0.578			
PC_60	Observes ethical conduct in the teaching profession.	0.534			
PC_61	Shows dedication to the teaching profession.	0.569			
PC_62	Serves as positive role model to students.	0.634			
PC_63	Commands respect from students.	0.569			
TS_65	Elicits enthusiasm among students when teaching.	0.519			
TS_67	Incorporates creativity in delivering of lessons.	0.545			
TS_68	Communicates ideas effectively.	0.536			
TS_70	Provides students with activities relevant to lessons.	0.559			
TS_72	Shows love for teaching while discussing.	0.583			
TS_73	Gives instructions clearly.	0.521			
TS_74	Encourages students to analyze lessons.	0.545			
TS_75	Answers students' questions.	0.545			
TS_76	Links lessons to real life situations.	0.581			
TS_77	Makes learning enjoyable for students.	0.543			
TS_78	Interacts with students during class discussions.	0.533			
TS_79	Manages time in the classroom well.	0.613			
TS_80	Welcomes students' participation in classroom discussions.	0.560			
TS_81	Encourages students to be hard working.	0.552			
TS_82	Uses a variety of instructional strategies.	0.544			
TS_83	Observes flexibility of instructional style to be able to fit to the different needs of students.	0.603			
TS_84	Gives plenty of examples relevant to lessons.	0.542			
TS_85	Takes into consideration students' moral development in lessons taught.	0.574			
TS_86	Provides activities aimed at developing critical thinking among students.	0.594			

Table 4.1 continued …

Dimension 1: Teaching-related behavior

Original Code	Statement	Factor Loadings	Eigenvalues	Explained Variance	Alpha
TS_87	Gives a lot of activities that encourage students to assume responsibility.	0.507			
TS_89	Sets realistic goals for students to accomplish.	0.539			
TS_90	Announces requirements ahead of time.	0.535			
TS_91	Uses instructional equipment/materials effectively.	0.557			
TS_92	Exhibits the ability to attend to a lot of concerns while teaching.	0.559			
TS_94	Chooses relevant strategies to maximize students' learning gains.	0.600			
CMS_96	Sets classroom rules for students to follow.	0.576			
CMS_98	Shows firmness in the implementation of classroom discipline.	0.549			
CMS_99	Rewards positive behaviors.	0.542			
CMS_100	Acknowledges positive behaviors.	0.583			
CMS_101	Shows keenness to inappropriate behaviors.	0.586			
CMS_102	Corrects inappropriate behavior.	0.552			
CMS_103	Responds at once to issues involving discipline.	0.579			
CMS_104	Sees to it that students are always on task.	0.546			
CMS_105	Gives importance to discipline in the classroom.	0.585			
CMS_106	Does not yell at students.	0.515			
CMS_107	Tries to know the concerns of students who misbehave.	0.531			

It can be observed from Table 4.1 that Dimension 1: Teaching Related Behavior had the largest cluster of items. Teaching-Related Behavior is reflected on the forty-five items (49, 56-63, 65, 67, 68, 70, 72-87, 89-92, 94, 96, 98-107) of the initial scale. These items reflect believing in the potential of students, showing passion for teaching, not violating school policies, observing norms of conduct in the teaching profession, giving appropriate assessment of students, observing ethical conduct in the teaching profession, showing dedication to the teaching profession, serving as positive role model to students, commanding respect from students, eliciting enthusiasm among students when teaching, incorporating creativity in delivering of lessons, communicating ideas effectively, providing students with activities relevant to lessons, showing love for teaching while discussing, giving of instructions clearly, encouraging students to analyze lessons, answering students' questions, linking lessons to real life situations, making learning enjoyable for students, interacting with students during class discussions, managing of time, welcoming students' participation in classroom discussions, encouraging students to be hardworking, using a variety of instructional strategies, observing flexibility of instructional style to be able to fit to the different needs of students, giving plenty of examples relevant to lessons, taking into consideration students' moral development in lessons taught, providing of activities aimed at developing critical thinking among students, giving a lot of activities that encourage students to assume responsibility, setting realistic goals for students to accomplish, announcing of requirements ahead of time, using of instructional equipment/ materials effectively, exhibiting the ability to attend to a lot of concerns while teaching, choosing relevant strategies to maximize students' learning gains, setting classroom rules for students to follow, showing firmness in the implementation of classroom discipline, rewarding positive behaviors, acknowledging positive behaviors, showing keenness to inappropriate behaviors, correcting inappropriate behaviors, responding at once to issues

involving discipline, seeing to it that students are always on task, giving importance to discipline in the classroom, not yelling at students, and trying to know the concerns of students who misbehave.

Table 4.2

Dimension 2: Subject matter expertise

Original Code	Statement	Factor Loadings	Eigenvalues	Explained Variance	Alpha
SME_26	Always prepared when holding classes.	0.592	8.78	8.21	0.892
SME_27	Shows mastery of lessons taught.	0.671			
SME_28	Knows a lot of information about lessons taught.	0.664			
SME_29	Manifests expertise in lessons taught.	0.584			
SME_30	Shares a lot of interesting ideas related to lessons taught.	0.613			
SME_31	Displays authority when teaching.	0.513			
SME_32	Knows how to answer questions raised about lessons taught.	0.617			
SME_33	Shows thorough understanding of lessons taught.	0.596			
SME_34	Shares information that is only relevant to lessons taught.	0.521			
SME_35	Exhibits ability to teach a lot of academic subjects.	0.521			

As observed in Table 4.2, Dimension 2: Subject Matter Expertise had the second largest cluster of items. Subject Matter Expertise is reflected on the ten items (26-35) of the initial scale. These items reflect being prepared always when holding classes, showing mastery of lessons taught, knowing a lot of information about lessons taught, manifesting expertise in lessons taught, sharing a lot of interesting ideas related to lessons taught, displaying authority when teaching, knowing how to answer questions raised about lessons taught, showing thorough understanding of lessons taught, sharing information that is relevant only to lessons taught, and exhibiting the ability to a teach a lot of academic subjects.

Table 4.3

Dimension 3: Relational expertise

Original Code	Statement	Factor Loadings	Eigenvalues	Explained Variance	Alpha
P_5	Displays kindness for others.	0.532	8.37	7.82	0.835
P_6	Respects others.	0.623			
P_7	Accepts others.	0.625			
P_13	Thinks thoroughly before decisions are made.	0.549			
P_14	Shows concern for others.	0.632			
P_15	Displays friendly attitude towards others.	0.553			
TRC_47	Accepts students.	0.553			

As observed in Table 4.3, Dimension 3: Relational Expertise had the third largest cluster of items. Relational Expertise is reflected on the seven items (5-7, 13-15, 47) of the initial scale. These items reflect displaying kindness for others, respecting others, accepting others, thinking thoroughly of decisions before being made, showing concern for others, displaying friendly attitude toward others, and accepting students.

As observed in Table 4.4, Dimension 4: Personality had the least cluster of items. Personality is reflected on the five items (8-10, 24, 25) of the initial scale. This cover items that reflect manifesting charisma, exhibiting

grace under pressure, manifesting an outgoing personality, showing predictability of actions, and spending time reflecting.

Table 4.4

Dimension 4: Personality

Original Code	Statement	Factor Loadings	Eigenvalues	Explained Variance	Alpha
P_8	Manifests charisma.	0.538	6.76	6.32	0.707
P_9	Exhibits grace under pressure.	0.534			
P_10	Manifests an outgoing personality.	0.521			
P_24	Shows predictability of actions.	0.576			
P_25	Spends time reflecting.	0.573			

4.4 Development of final scale

After analyzing the descriptive statistics (means and standard deviations of items), reliability (Cornbach's Alpha Formula), and validity (PCA with Varimax Rotation), items to be included were finally determined. Out of the 107 items in the initial scale, 67 were retained. The 67 items retained were the items that loaded on the four identified dimensions (teaching-related behavior, subject matter expertise, relational expertise, and personality) through PCA. Table 5.1 presents the psychometric properties of final scale and its subscales while Table 5.2 presents the correlation analysis of the subscales.

Table 5.1

Psychometric properties of the final scale and its subscales

Factors	Number of Items	Range of Factor Loadings	Alpha
Whole Scale	67	0.507 to 0.748	0.972
Teaching-Related Behavior (TRB)	45	0.507 to 0.634	0.968
Subject Matter Expertise (SME)	10	0.513 to 0.671	0.892
Relational Expertise (RE)	7	0.532 to 0.632	0.835
Personality (P)	5	0.521 to 0.576	0.707

As seen in Table 5.1, the Alpha of the final scale was 0.972 which signifies high internal consistency while the Alpha of its subscales ranged from 0.707 to 0.968. Thus, the final scale has been proven reliable (Alpha value of 0.972 indicating high internal consistency) and valid (from 0.507 to 0.748 factor loadings based on the 0.500 cut-off for screening of items).

Table 5.2

Correlation analysis of the subscales

Subscales	TRB	SME	RE	P
TRB	1			
SME	0.696(**)	1		
RE	0.627(**)	0.512(**)	1	
T	0.505(**)	0.521(**)	0.447(**)	1

Note. **Correlation is significant at the 0.01 level (2-tailed). Subscale scores were used in the correlation analysis.

Table 5.2 shows the results of the correlation analysis among the four subscales of the final scale. Results indicate that the four subscales are significantly correlated with each other. These mean that as the value in one of the subscales increases, the value in the other three subscales also increases. Thus, the subscales can be used as indicators of teacher effectiveness in higher education. The final scale may be used by administrators, students or even faculty members in higher education as an objective scale in evaluating teacher effectiveness. For

recognition, the scale is named "Teacher Effectiveness Scale in Higher Education (TESHE)

4.5 Limitations of the Study

This study was only limited to one state college in Pampanga in the Philippines with 497 higher education students as participants. Therefore it is not guaranteed that the results of this study also hold true to other colleges and universities either in the Philippines or abroad.

5. Conclusion

The TESHE is a psychometrically sound scale that measures the multidimensional aspects of teacher effectiveness in higher education. This is reflected in the results of its reliability evaluation (Cronbach's Alpha value of 0.972 showing high internal consistency) and validity evaluation (from 0.507 to 0.748 factor loadings based on the 0.500 cut-off for screening of items).

5.1 Recommendations

The TESHE has gone stages of testing its reliability (Cronbach's Coefficient Alpha formula) and validity (PCA with Varimax Rotation) in the process of establishing its psychometric properties. However, to have a more detailed property of TESHE, further study is still recommended. It must be reviewed again to determine redundant items to further establish its reliability and validity.

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