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Development and validation of a cooperating teacher mentoring scale for student teachers

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ABSTRACT

Teaching internship is a crucial component of teacher education to prepare student teachers for their future careers in education. This study developed and validated an instrument to measure and evaluate the performance of cooperating teachers in mentoring student teachers. Items capturing the concept of teacher mentoring were developed through literature review, interviews, and focus group discussions. The 110-item 5-point Likert scale was given to 265 randomly selected student teachers from higher education institutions in the Philippines. Validity and reliability of the cooperating teacher mentoring scale (CTMS) were tested using exploratory factor analysis (EFA) and reliability analyses. Moreover, EFA showed three-factor structure of the instrument regarding the CTMS. The study reported the average variance extracted (AVE), composite reliability, and Cronbach alpha coefficients. These findings confirmed that the extracted constructs possess convergent validity and meet the necessary requirements. The item remained in the factor loadings of less than 0.50 (instructional support and professional development: 20 items; supportive teaching and mentorship: 15 items; and effective mentoring and coaching: 15 items). This study has confirmed three-factor structure of the CTMS. Researchers, educators, administrators, and student teachers can use the CTMS to evaluate cooperating teachers' mentoring skills and provide feedback on areas that need improvement.

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1. INTRODUCTION

Teaching internship is a fundamental aspect of the teacher education curriculum designed to equip pre-service teachers for careers as educators across various grade levels in the classroom. Aspiring teachers undergo training in the core principles of learner-centered instruction during this phase, which includes hands-on experience in real classroom environment to better prepare them for their future teaching roles. It is considered as the crest of the teacher education preparation because it provides numerous opportunities for student interns to contextualize real context in the classroom setting, apply pedagogical skills and theoretical learning knowledge [1]. The field still lacks knowledge about the development of a professional identity for teaching mentors. These teachers take on multifaceted professional roles as teachers and teacher educators [2]. The cooperating teacher gives comments and immediate feedback if the students really understood the imparted lesson [3]. The teaching internship practices have served as a global guide for teacher education

institutions in training teaching interns. In the Philippines, student internships in teacher education programs for state universities and colleges begin in the fourth year after the completion of professional and major subjects based on Commission on Higher Education Memorandum Order (CMO) [4]. It serves as the final stage of practical training for education students before they enter the profession. This six-unit laboratory course requires 360 hours, lasting for one semester which takes place in the basic education schools. The student teachers follow a clinical approach and are supervised by a cooperating teacher who provides guidance on how to utilize observation, feedback, and appropriate mentorship and be prepared and supported for their role [5]. To support the mentor-mentee relationship of the cooperating teacher and their student teacher, certain authors indicated the need to implement best practices of mentoring [6]. Formalized mentoring should be structured during pre-service teacher experiences to support growth and development, as well as teacher self-efficacy [6]. The partnership between department of education and higher institutions is the key to the success of the provision of teacher education. However, several obstacles often arise in partnership programs, including a lack of awareness, information, and support, which leads to an overly negative perception of administrative burdens [7]. There are three principles of industrial involvement in academic programs, namely that the industry must develop the motivation and skills of workers to be involved in educational programs, must provide authentic materials and resources freely, and must invest for education programs [8]. An effective partnership between schools and industries can optimize industry engagement activities to provide the most beneficial learning experience for students [9]–[11].

In the study of Brucklacher [12] on cooperating teachers' evaluations of student teacher, it is observed that the rater was biased due to the relationship between cooperating teacher and student teacher, a common problem with the instrument. Rating showed that the teachers said that both their students and the program were more than adequate and often close to excellent with regard to the student teachers' knowledge and skill [13]. Cooperating teacher's function is the most important often disregarded connection to effective student teaching initiatives. According to Anderson [14], student teachers most frequently mentioned their cooperating teachers as the main influence on their development. Cooperating teachers were found to influence their student teachers through evaluations, rewards, sharing of knowledge, authority, and charisma. In a literature review on field experiences, Lu [15] proposed that the role of cooperating teachers progresses from being a cooperating teacher to a mentor teacher, and finally to a supervising teacher. As a cooperating teacher, a classroom teacher carries out a specific set of responsibilities outlined by the teacher education program. By conducting classroom observation, teaching and interacting with different teachers in mentoring teachers and students in field schools, pre-service teachers can enhance their teaching knowledge and reflective abilities and refine their professional identities [16]. Several scales are associated with student teachers evaluation by the cooperating teacher across various fields and areas. However, there is currently no instrument specifically designed to assess the performance of the cooperating teachers as mentor on their student teacher journey as pre-service teachers.

Considering the significant importance of the teaching internship phase in adequately preparing individuals for a career as professional educators, it is imperative to devise a valid and reliable assessment tool capable of accurately evaluating the performance and feedback of cooperating teachers by the student teachers. Such an instrument can complement the existing monitoring scale for teachers' weaknesses and provide valuable data for both cooperating teachers and student teacher supervisors who oversee student teaching, enabling them to identify any challenges encountered. This research focuses on designing and validating a cooperating teacher mentoring scale (CTMS), which aims to answer the following questions:

i) What factors are associated with the propose CTMS?
ii) What is the reliability coefficient of the factors in the CTMS?
iii) Is CTMS a reliable tool for evaluating cooperating teachers mentoring?

The novelty of this research is unique in its innovative approach to curriculum design in teaching internship program. By addressing the identified gap, this research has the potential to contribute to the development of a learner-centered among student interns. The findings of this study are valuable for assessing the performance of cooperating teachers in mentoring student interns. It can provide feedback to teachers and help improve both the teaching and mentoring processes throughout the entire teaching internship journey.

2. METHOD

The items of the scale were generated based on the literature review and focus group discussions of student teachers during their teaching internship experiences and do not congruently align with the seven domains in Philippine professional standards for teachers (PPST) since the main objective of this study is to develop a valid and reliable instrument that would evaluate cooperating teachers mentoring skills towards student interns. This study developed and validated the instrument by applying exploratory factor

analysis (EFA) and reliability analysis. This instrument measures the level of mentoring skills of the cooperating teachers during the teaching internship of the student teachers. It follows the method used by Sebial and Facultad [17], development and validation of the mathematics attitude scale (MAS), development and validation of the physics anxiety rating scale (PARS) [18], and mixed methods for the development of effective scale and validation analysis [19]. The instrument's reliability value determines its suitability for use in actual studies. A high reliability value indicates that the instrument yield more accurate data that aligns with the study's objectives [20]. It develops and validates an instrument on cooperating teachers mentoring towards student teacher. Exploratory sequential involves combining qualitative and quantitative data collection and analysis in a series of phases [21]. Existing literature related to mentoring skills, instructional and evaluation skills, classroom management skills, teaching content pedagogy skills, and mastery of the subject matter skills.

The qualitative aspect of the study included generating statements for the questionnaire by conducting interviews and focus group discussions with key informants who underwent practice teaching. The researcher conducted a semi-structured interview process to gather more accurate additional information from those in charge of small schools and the respondents was studied. This information was then used to build questionnaire items. For the quantitative component, education graduates who underwent teaching internship will going to give their responses about the cooperating teacher's evaluation of teaching based on a five-point response scale. The respondents were education students who are currently enrolled in the teaching internship during the second semester of A.Y. 2023-2024 through random sampling of the three universities. The sample size was determined based on closeness between the reproduced correlation matrix in each sample compared with the reference reproduced correlation matrix. Questionnaire for pilot testing was given to 265 student teachers from various State Universities and Colleges in Northern Mindanao, Philippines. The instrument development process introduced by Miller and Lovler [22] was used. According to pre-service teachers, they lack the vision, mission, and genuine meaning of life, which makes them less adept at overcoming obstacles in life [23], [24]. The selection of this model is due to the effectiveness of its application in previous research, where all the instruments developed using the steps proposed in this model obtained high validity and reliability [25].

Prior to data gathering, approved letter from the research ethics committee (REC) was done and informed consent forms was distributed to the target respondents and thoroughly explain the study's purpose, guidelines, risks, benefits, and their rights as respondents. To ensure the confidentiality of the data, the names of people, institutions, events, and other forms of data shared by the respondents were coded. The respondent's identity kept confidential and treated fairly. They will be given also tokens of appreciation after the conduct of this study. The minimum number of respondents required for this EFA is 60, as suggested by Hair *et al.* [23]. However, their study recommends using a sample size of 100 participants for EFA. The instrument is composed of 110 items. Each item was screened to ensure that it is simple, clear, relevant, and unambiguous. It is in the form of a Likert scale where participants had to choose frequency of mentoring scale of their cooperating teachers based on the following: 5=always, 4=often, 3=sometimes, 2=rarely, and 1=never. The data analysis was performed using R-statistics. For the reliability analysis, item-total correlations were taken into account for each item. In order to assess construct validity, EFA was conducted, and reliability coefficients, such as Cronbach's alpha, were calculated for both the scale and subscales.

3. RESULTS AND DISCUSSION

The study involved an extensive literature review on various topics, such as mentoring, instructional leadership, evaluation, classroom management, teaching content pedagogy, and mastery of subject matter skills. To gather qualitative data, interviews and focus group discussions were conducted with key informants who had undergone practice teaching for a response based on their experiences. The researcher also conducted semi-structured interviews with the cooperating teachers from various cooperating schools for their insights and with the with the individuals responsible for small schools to gather more accurate information. The development of the CTMS heavily relied on the works mentioned in this section and in the rationale of the paper.

An EFA with varimax rotation was conducted to examine the factor structure of the questionnaire. The EFA required us to check for both univariate and multivariate normality in the data, as it is a prerequisite for factor analysis. This study utilized the varimax rotation, specifically the orthogonal rotation technique. The purpose of the varimax rotation was to reduce the number of variables with high loadings on each factor and decrease the impact of small loadings even further. This study employed the varimax rotation, which is an orthogonal rotation method. The varimax rotation aims to minimize the number of variables with high loadings on each factor and also reduces the magnitude of small loadings.

In accordance with Hair *et al.* [23], items with factor loadings below 0.5 were eliminated. Consequently, out of the initial 110 items, 60 were removed, resulting in 50 remaining items. The Bartlett's

test of sphericity yielded a highly significant result (p=0), suggesting that the factor model is appropriate for the data. For this study, a variety of tests were performed to assess the appropriateness of respondent data for factor analysis prior to identifying factors. A total of 265 student teachers completed the questionnaire, which makes it suitable for use in an EFA. Moreover, an association between the items was demonstrated in questionnaire, which allows for factor analysis. High communalities show that the extracted components are good representations of the variable. If the communality was greater than 0.5 that respective items were used for further analysis and the other whose communalities were less than 0.5 removed into consideration while using principal component analysis [21]. The data underwent principal component analysis with varimax rotation. After removing factor cross loadings and factors with loadings below 0.50, a total of 60 items were excluded from the analyses. Three factors were formed based on the eigenvalues of the factors. These factors consisted of a total of 50 items, as determined by the scree plot test. The alpha values for each factor were calculated both with and without including troubling items. The scree plot was examined in each case, and the items were reread to check for any misinterpretation when including an item into a specific factor. The researcher determined that the 3-factor model provided the most optimal factor structure for the questionnaire.

The distribution of items in each factor and factor loadings at the end of the factor analysis are given in Table 1. As seen from the table, the factor loadings of the items constituting the questionnaire range from 0.50 to 0.74. There are three factors with 50 items. Factor 1 represents the Instructional support and professional development, with 20 items. Factor 2 represents supportive teaching and mentorship, with 15 items. Factor 3 represents effective mentoring and coaching practices, with 15 items. The naming factors is more of an art, as there are no hard and fast rules. The key is to choose names that accurately reflect the variables within each factor. Factor analysis was first conducted on the instrument to ensure the validity and reliability of the instrument to be used [26]. Any assistance and guidance provided by mentors to new educators is called support [27]. The first factor (instructional support and professional development) item number 1 “share appropriate instructional devices during my practice teaching journey”, item number 4 “assist in constructing and administering test and other forms of measurements”, and item number 11 “assist in using instructional communication technology in classroom instruction” encapsulate the comprehensive assistance and guidance provided by mentors focusing on instructional strategies, assessment practices, classroom management, technology integration, and ongoing professional growth. This factor name emphasizes the importance of mentorship in facilitating effective teaching practices and enhancing teacher confidence and competence.

The factor two, referred to as supportive teaching and mentorship, item number 23 “support me in teaching and made me feel more confident as a teacher”, item number 27 “discuss evaluation and provide feedback of my teaching after my class for improvement” and item 35 “guide how to organize and employs pedagogies that suit the needs of students” pertains to essential aspects of guiding and nurturing educators, focusing on providing practical assistance, constructive feedback, and emotional support to enhance teaching effectiveness and student engagement. Lastly, factor three is labeled as “effective mentoring and coaching practices”, item 36 “demonstrate an authentic and genuine interest in their mentee’s development”, item number 41 “give freedom and space I need to grow into their role as student teacher”, and item number 44 “provide constructive and meaningful feedback on progress and performance, helping them to identify their next steps” aptly summarizes the skills and behaviors demonstrated by mentors and coaches in guiding and supporting others’ professional and personal growth within an educational or mentoring setting. According to Gay *et al*. [28], reliability refers to the concept of consistency and stability of an instrument. Consistency means that the same item has been tested repeatedly at different times and on the same subject, but the result score or answer given is still the same, while stability is freedom from error and able to produce consistent results [29].

Table 2 presents the eigenvalues, percent of variance, and total percent of variance associated with the three factors. The three factors explained 50.3% of the total variance. The items were examined for their meanings and their factor loadings were considered. Based on this analysis, each item was assigned to a specific factor. Certain items were revised to accurately reflect their respective factors. Based on the eigenvalue, all the components recorded values of 2.03 or higher, which exceeds 1.0. The eigenvalue serves as an indication of the formation of the necessary number of components in the actual research instrument [30]. The results of the analysis of the CTMS construct show that the items with the variance contribution weighting value of each factor are shown in Table 2. The amount of explained variance used to measure the construct of cooperating teacher mentoring is 50.3%, which is considered adequate and acceptable since it exceeds the minimum threshold of 50% [31]. However, the variance value is 39.66%, which is below 50%, indicating that there is no common method bias in the data [32]. The results reveal four main factors that are extracted in the construct of culturally responsive leadership, aligning with the findings in Table 2.

Table 1. Items and final three-factor structure of the CTMS

	Factors	Factor 1	Factor 2	Factor 3
Factor 1: instructional support and professional development				
My cooperating teacher…				
1	Share appropriate instructional devices during my practice teaching journey	0.50		
2	Help choose what strategy is effective to use in particular topic	0.63		
3	Discuss how to monitor the instructional materials on my lesson	0.67		
4	Assist in constructing and administering test and other forms of measurements	0.58		
5	Guide in interpreting test results and other activities properly	0.58		
6	Assist in constructing valid and reliable formative and summative test	0.62		
7	Assist is using non-traditional assessment methods and techniques	0.56		
8	Check my work in giving grades of students following the rating system	0.52		
9	Suggest provisions for remedial instruction to ensure mastery in learning	0.55		
10	Help in using variety of techniques to attain the objective of the lesson	0.60		
11	Assist in using instructional communication technology in classroom instruction	0.52		
12	Assist in the use of new and innovative instructional materials	0.59		
13	Introduce new instructional strategies using information and communication technology	0.51		
14	Conduct post conference for feedback after the class on teaching-learning process	0.63		
15	Guide how to structure the classroom for effective learning	0.52		
16	Assist in the skills and competence in handling routine activities in the class	0.53		
17	Assist in planning varied assessment choices to match the needs and learning styles of the students	0.57		
18	Guide in the enhance programs to improve performance of the learners	0.56		
19	Assist in the achievement of lesson objectives through pre-conference	0.52		
20	Provide scaffold support to enable to make good progress and outcomes	0.51		
Factor 2: supportive teaching and mentorship				
21	Help formulates daily lesson plan with complete parts		0.51	
22	Encourage to give assignment as reinforcement of enrichment of the lesson		0.50	
23	Support me in teaching and made me feel more confident as a teacher		0.50	
24	Assist me with classroom management strategies for teaching		0.71	
25	Give me clear guidance for planning to teach		0.74	
26	Discuss with me the content knowledge I needed for teaching		0.74	
27	Discuss evaluation and provide feedback of my teaching after my class for improvement		0.63	
28	Provide written suggestions on how to improve my teaching		0.65	
29	Clearly articulated what I needed to improve in my teaching		0.65	
30	Teach me how to deal with absenteeism		0.54	
31	Is understanding when it comes to my concerns in the subject and lesson plan		0.53	
32	Highly effective in helping them develop teaching strategies		0.71	
33	Demonstrate how to develop good rapport with students while teaching		0.61	
34	Show a great deal of patience towards the students		0.50	
35	Guide how to organize and employs pedagogies that suit the needs of students		0.64	
Factor 3: effective mentoring and coaching practices				
36	Demonstrate an authentic and genuine interest in their mentee's development			0.55
37	Demonstrate flexibility and adaptability in order to meet their mentee's needs			0.60
38	Facilitate access to wider expertise within their setting by observing the student teacher			0.58
39	Use a range of coaching and mentoring models tools and techniques to support the mentoring process			0.51
40	Demonstrate self-awareness by identifying their own strengths and weaknesses as a mentor			0.55
41	Give freedom and space I need to grow into their role as student teacher			0.60
42	Support and encourage to be critically reflective, identifying and exploring areas for improvement			0.54
43	Help in setting solution-focused, realistic and achievable goals			0.60
44	Provide constructive and meaningful feedback on progress and performance, helping them to identify their next steps			0.54
45	Demonstrate model lessons applying appropriate approaches/strategies to meet students' diverse learning needs			0.53
46	Encourage to assess student learning and ensure specific, timely feedback to students			0.62
47	Teach to establish leadership, stress tolerance, fairness, justice, proper attire and good grooming			0.50
48	Provide opportunities for students to practice and apply learning in real-life situations			0.50
49	Utilize evaluation and performance results as basis for improving instruction			0.51
50	Relate subject matter to previous topics and areas of interest			0.50

Table 2. Principle components and the corresponding Eigen value and variance of the questionnaire

Factors	Eigen value	Percent variance	Total variance
Factor 1 (instructional support and professional development)	6.7	39.6	39.6
Factor 2 (supportive teaching and mentorship)	1.0	6.0	45.6
Factor 3 (effective mentoring and coaching practices)	0.8	4.7	50.4

Table 3 displays the Cronbach alpha reliability values were used to determine the internal consistency reliability estimates for the three factors of the questionnaire, as well as for the overall instrument. Quantitative data measures and analysis initial psychometric evaluation of the quantitative data

was part of descriptive statistics using Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy to ensure sampling adequacy for factor analysis and Bartlett's test of sphericity. Factorability of a scale was evaluated by the KMO sampling adequacy coefficient. (KMO>0.70), was found to be 0.92, indicating a favorable level of adequacy as suggested threshold of 0.6 [20]. Table 3 presents the factors' names, item quantities, Cronbach alpha reliability coefficients, and a representative item for each factor. The first factor "instructional support and professional development" consists of 20 statements with a reliability coefficient of 0.95. The second factor "supportive teaching and mentorship" consists of 15 items and has a reliability coefficient of 0.95. The third factor "Effective mentoring and coaching practices" includes 15 items and has a coefficient value of 0.94. Overall, the questionnaire demonstrated a high level of reliability with a Cronbach alpha coefficient of 0.98. This indicates that it is a consistent and dependable tool with respect to multi-item scales, measurement internal reliability was considered and measured in terms of its consistency [29]. Internal reliability: assesses whether the items have internal consistency. It also assesses whether items that make up the scale are measuring one concept. In this study to examine the reliabilities of a measurement, Cronbach's coefficient alpha. The most popular indicator of internal consistency was utilized. According to Hair *et al.* [23], an alpha value ranging from 0.7 to 0.8 is deemed acceptable. A lower alpha value indicates a decrease in the reliability of the instrument. An alpha coefficient value of approximately 0.90 is considered "excellent," around 0.80 is considered "very good," and a value between 0.50 and 0.79 is considered adequate. However, values below 0.50 are considered unacceptable [29]. The higher the correlation the greater the reliability of the instrument. The reliability was determined through the value of Cronbach alpha. High reliability and validity values show the high quality of the study instrument. Value on the score reliability explains that the instrument used is consistent and stable. Consistency on the instrument is when the researcher receives almost the same score after conducting the test repeatedly and at different times [30]. Due to time constraints, a confirmatory factor analysis (CFA) was not done as it is the limitation and recommendation of the study to confirm the factors and items generated by the study using EFA and increase the number of respondents in CFA. It can be concluded that all items within this dimension possess a high degree, and it is recommended that all study components be sustained.

Table 3. Factor names, number of items, reliability coefficients, and sample item factor in the questionnaire

Factors	#of items	Cronbach alpha	Sample item
Factor 1: instructional support and professional development	20	0.95	Discuss how to monitor the instructional materials on my lesson
Factor 2: supportive teaching and mentorship	15	0.95	Discuss with me the content knowledge I needed for teaching
Factor 3: effective mentoring and coaching practices	15	0.94	Encourage to assess student learning and ensure specific, timely feedback to students
Whole instrument	50	0.98	Reliable

4. CONCLUSION

This study has resulted in the development of a valid and reliable evaluation instrument called the CTMS. EFA was conducted to assess the validity of the construct. The analysis revealed that the scale consisted of three subscales, which collectively accounted for 50.3% of the total variances. The Cronbach alpha coefficient for the instrument is 0.98, indicating high reliability. Additionally, the subscales demonstrate high reliability, with reliability coefficients ranging from 0.94 to 0.95, indicating their overall reliability of 0.98. CTMS can be utilized to evaluate cooperating teachers' mentoring skill and feedback by the student interns after their teaching internship journey. This assessment helps identify areas where cooperating teachers may lack mentoring skills. It also allows student teachers to identify challenges and implement necessary interventions. Based on the instrument's high reliability and validity, it is strongly recommended as the top choice for measuring mentoring feedback from cooperating teachers in cooperating schools. Additionally, this instrument can serve as a valuable reference and guide for the creation of future assessment tools related to leadership.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare that they have no conflicts of interest.

DATA AVAILABILITY

Data availability is not applicable to this paper as no new data were created or analyzed in this study.

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