

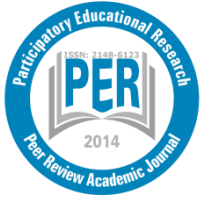
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## Determination of Teacher Qualifications from the Perspective of Stakeholders: Rubric Development Study

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The aim of this study is to develop a rubric to determine the qualifications of teachers, one of the most important elements of education. There are many measurement tools in the literature. One of the alternative and authentic assessment tools is rubrics, also known as rubrics. Rubrics have been defined in many studies in the literature. In the study, the rubric development stages suggested by Goodrich Andrade were taken into account. The rubric was created after the reliability studies of the rubric form were completed. In the research, an analytical rubric with 37 items was developed to be used in determining 'the qualified teacher.' The Cronbach alpha reliability coefficient of the developed measurement tool was found to be .96. Based on the results obtained from the research, it can be stated that the developed rubric is a valid and reliable measurement tool that can be used in the qualitative evaluation of teachers teaching all levels. The findings showed that the rubric had high agreement and reliability values among different stakeholder groups. Therefore, it can be said that this study provides a basis for Türkiye in determining teacher qualifications for science education, especially in the field of education. The developed rubric serves as a valid and reliable measurement tool, contributing to the objective assessment of teacher performance across all levels of the education process.

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## Introduction

Education consists of three components: teacher, student, and curriculum. Teachers, who are one of the most important elements of education, are the people who transfer the

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teaching objectives to students and guide them to reach predetermined goals. Teachers, who perform this task as a profession directly and indirectly, assume responsibilities in social, economic, cultural, political, and many other aspects. Teachers, who bring individuals into society by raising them in the context of both academic and life skills as part of their profession, also shape societies. Bozbayındır (2019) stated that teaching has many important social, economic, cultural, and political functions and responsibilities for societies. Therefore, the teaching profession is a profession that requires professionalism. For this purpose, the teaching profession is defined as follows in Article 3 of the Teaching Profession Law, which was adopted as Law No. 7354 on 03.02.2022:

"Teaching is a specialized profession that undertakes the duties of education and training and related administrative duties. Teachers are obliged to fulfill these duties in accordance with the aims and basic principles of Turkish National Education and the ethical principles of the teaching profession" (Teaching Profession Law, 2022).

As can be understood from this definition, teaching is a profession that requires a special specialization and is obliged to realize the education and training policies determined by the state. Güven (2010) stated that teaching has a different position from all other professions by emphasizing its impact on realizing individuals' potential and its mediating role in transferring cultural heritage. In this respect, teachers who will perform in this profession must have some qualifications.

Teachers are the basic building blocks of the education process. Education-training process; It is directly affected by teacher characteristics, teaching styles and skills. When the literature on this subject is examined, it is seen that efforts have been made to determine the characteristics of qualified teachers by taking opinions from different stakeholders. In these studies; teachers and students (Lang et al., 1993), teachers, students and parents (Liu & Meng, 2009; Yaman et al., 2022), teachers in different fields (Walls et al., 2002), science teachers (Murphy et al., 2004), male and female Opinions were received from female teacher candidates (Witcher et al., 2001; Minor et al., 2002), successful and unsuccessful students according to their grade point averages (Koutsoulis, 2003), and university and high school students (Check, 1986) to determine the characteristics of qualified teachers. When these studies were examined, it was seen that the inferences regarding teacher qualifications were classified in very different ways. Buaraphan (2012) classified the characteristics of teachers as "good, outstanding, master, expert, competent, ideal, effective and qualified". The concept of quality is defined in the dictionary of the Turkish Language Association (2021) as "a characteristic that indicates how something is distinguished from other things, qualification." Based on this definition, it is possible to define teacher quality as "the characteristics and qualities that explain how a teacher should be and distinguish the teaching profession from other professions. "When the literature is examined, many studies have been conducted on teacher qualities from past to present, and some theoretical views have been put forward on what these qualities are. Sünbül (1991) stated that the qualities of teachers are motivating, activity planning, informing, disciplining, counseling, providing learning, classroom management, family membership, being evaluative, giving confidence, professional mastery, and community leadership. Oktay (1991) defined a qualified teacher as someone with a high level of knowledge and competent in selecting and applying the most effective methods of transferring this knowledge to students. According to Oktay, qualified teachers are open to innovation, effective in classroom management, egalitarian, and tolerant towards students. These teachers are also role models. Çelikten et al. (2005) analyzed teacher qualities under two headings personal and professional characteristics. They argued that the personality traits that an effective teacher

should have are as follows: Open-mindedness, objectivity, being a role model, solution-orientation, and being a good observer, while professional characteristics are competence in using time effectively, cooperation with colleagues and administrators, recognizing the developmental characteristics of students and acting accordingly, field knowledge, professional knowledge, and general culture. Gültekin (2020) stated that the change processes that continue worldwide affect education and teachers, and therefore, teacher qualifications should be continuously improved. Bozbayındır (2019) stated that teacher qualifications should be handled in terms of cognitive, affective, and personality aspects and classified these qualities as communication skills, expressing oneself properly, love of the profession, sensitivity towards social and universal values, openness to innovation and development, having intellectual characteristics, research, planning, and sensitivity. Okpala and Ellis (2005), in their study examining teacher qualities from students' perspective, stated that the most important qualities a teacher should have are; teaching skills, commitment to teaching, professional field knowledge, and verbal skills. Koçyiğit, Erdem, and Eğmir (2020) emphasized that raising qualified people can only be achieved through qualified teachers and defined these teachers as teachers who have the "General Qualifications for the Teaching Profession" published by the Ministry of National Education in 2006, which consists of 31 sub-qualifications and 233 performance indicators.

When the relevant literature is examined, it is seen that there are many studies on which characteristics a qualified teacher should have. Most of these studies were prepared in the form of reviews and surveys, and some were conducted by taking the opinions of teachers and students. Likert-type measurement tools were developed by Kolesnik (1970, cited in Oktay, 1991) and Koçyiğit et al. (2020) to determine teacher qualifications. The scale developed by Koçyiğit et al. reveals which competencies an effective teacher should have rather than the general characteristics an effective teacher should have. This situation shows that there is a need for comprehensive and up-to-date measurement tools in determining teacher qualifications. In addition, since the data obtained in survey studies conducted with Likert scales contain superficial information, it would be possible to use alternative assessment tools and obtain detailed information about teacher qualifications. In this study, the measurement methods and techniques that can be used in determining teacher qualifications were examined, and the preparation of a rubric suitable for the research objectives would be appropriate for these purposes. It is accepted that the validity levels of the rubrics in the observer group, which are divided into two types of scales, respondent and observer, are higher than the graded scales in the respondent group (Torgerson, 1958). Another meaning of this is that rubrics have a lower margin of error than Likert-type scales. This can be explained by the fact that observing teachers' performances in the education process and determining their qualifications accordingly yields less erroneous results than the graded scales used to measure tendencies in a subject. This means the validity level of the measurement processes with rubrics is higher.

There are many measurement tools in the literature (Bal İncebacak & Ersoy, 2022). One of the alternative and authentic assessment tools is rubrics, also known as rubrics. Rubrics have been defined in many studies in the literature. Rubrics are measurement tools that are effective in terms of validity and reliability in determining the performance or qualities of individuals in certain situations (Alicı & Aktaş, 2018). It is a scoring key that lists the criteria for performance and shows what needs to be done in the study (Popham, 1997). It is a learning tool used before, during, and after the performance process and facilitates follow-up by clarifying the teacher's goals and objectives (Googrich, 2000). In short, rubrics are not only scoring, measurement, and evaluation tools but also determine qualifications. Because of this purpose, it is thought that using rubrics to collect detailed information about the teacher's

performance in the classroom instead of classical measurement tools in measuring teacher quality is more appropriate. Kan (2007) stated that rubrics can be used as a scoring key to reach a judgment about the performance or product through criteria. These tools are tables with horizontal and vertical axes, and there are performance values corresponding to certain performances on these tables. Rubrics can be used in many performance-oriented situations. The difference between this tool and the classical evaluation tools is that it is possible to observe the performance process of the teacher while using that knowledge and skill rather than determining whether the teacher has the knowledge or skill. Rubrics can be developed in two different ways: analytical and holistic rubrics. While analytical rubrics enable independent scoring of a product, process, or situation in parts, holistic rubrics evaluate the product, process, or situation holistically without considering the parts and components (Kan, 2007). Rubrics are defined as scoring tools that list criteria for what is measured in identifying certain situations and monitoring the process (Goodrich, 1996; 2001). According to Anderson (2003), progress in individuals can be measured by multiple-choice tests. Multiple-choice tests provide a standardized response and ensure objectivity where everyone reaches the same conclusion, but progress is not as simple a process as can be confined to the response given to a test question. At this point, Moskal and Leydens (2000) emphasize that rubrics allow evaluation across a wide range, depending on the purpose of assessment (purpose) and clearly defining what individuals are expected to learn and how they will demonstrate these competencies (goals). Rubrics should be designed appropriately for the purpose for which they will be used. In cases where it is not possible to separate assessment independently into criteria and there is no difference between the criteria on which performance will be determined, holistic rubrics should be preferred (Brookhart, 2018). In cases where performance can be separated into criteria and detailed scoring can be done, analytical rubrics should be used (Haladyna, 1997). Scoring can be done holistically or analytically, depending on the purpose of the assessment. When performance-based assessment is conducted in students' written compositions to distinguish acceptable and unacceptable responses from each other, evaluation criteria such as organization, content, and word choice are used. However, when determining score ranges, the student with the highest score should have made no errors in the relevant criteria context (Popham, 1997, p. 75). Analytical rubrics separate the components of the text, and each element has its own indicators and descriptive statements (Spence, 2010). Considering that teacher qualifications may have more than one dimension and diversity, it was decided that developing an analytical rubric for this study was more appropriate. The stages of analytical rubric development for determining teacher qualifications are explained in detail in the method section.

## **Method**

### ***Research group***

This research was carried out with multiple case study design, which is one of the qualitative research methods. According to Creswell (2013), a case study is a qualitative research approach in which the researcher examines one or more limited cases over time with data collection tools such as observations, interviews, audio-visuals, documents, reports that includes multiple sources, and defines situations and themes related to the situation. According to Gerring (2007), case study is the in-depth study of a single case in order to explain more cases, and case study involving more than one case is called multiple case study. In such studies, it is difficult to study these cases in depth due to the large number of cases, and therefore, the sample of cases instead of a single case becomes the focus of the study. In this context, during the rubric development process, opinions were received from a total of



440 stakeholders, including lecturers (N: 20), teachers (N: 113), students (N: 230), prospective teachers (N: 25), parents (N: 30) and educational administrators (N: 22) in the 2020-2021 academic year. The opinions received from all stakeholders were analyzed, and an item pool was created. After this stage, for the items in the item pool in the spring semester of the 2020-2021 academic year, the opinions of 3 instructors, teachers (N: 3), students (N: 3), teacher candidates (N: 3), parents (N: 3), and educational administrators (N: 3), who did not express their opinions in the first stage were taken. Changes were made in the item pool and statements in line with the opinions and suggestions of these 18 stakeholders.

### **Rubric Development Stages**

Rubrics are essential tools in education for assessing student performance. They provide clear expectations to students, making the assessment process more meaningful and transparent for both teachers and students. In this context, following specific stages in the rubric development process is crucial for creating effective and reliable rubrics. The rubric development stages suggested by Goodrich Andrade (2000) and presented in Figure 1 were followed:

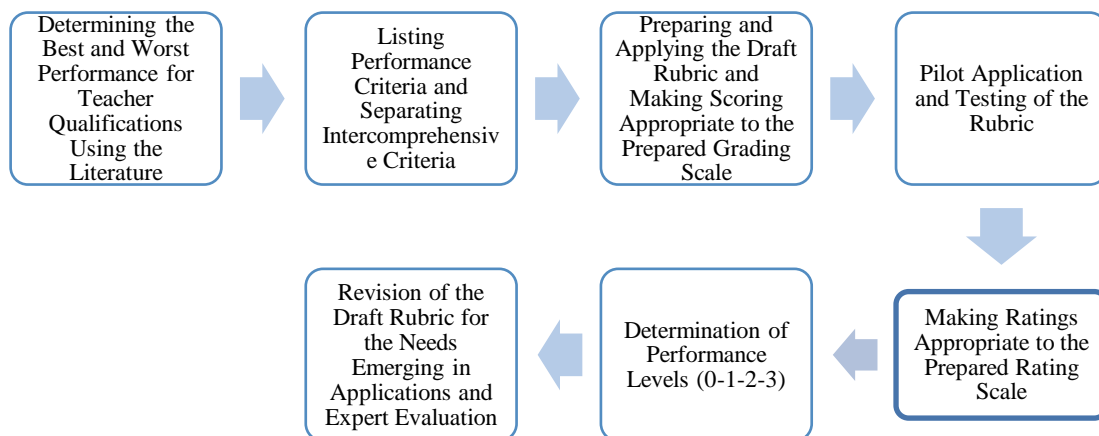


Figure 1. Rubric Development Stages

The rubric development process is divided into seven main stages: determining the best and worst performances, listing performance criteria, preparing and applying the draft rubric, pilot application and testing of the rubric, determination of performance levels, making ratings appropriate to the prepared rating scale, and revising the draft rubric based on expert evaluation and emerging needs. These stages systematically address the structuring of rubrics, ensuring their validity and reliability.

**Determining the Best and Worst Performance for Teacher Qualifications Using the Literature:** Identifying the best and worst performance examples for teacher qualifications using the literature forms the foundation of the rubric. This stage clearly establishes the performance standards to be evaluated.

**Listing Performance Criteria and Separating Intercomprehensive Criteria:** Determining and listing performance criteria and separating comprehensive criteria ensure the rubric's objectivity. This is crucial for maintaining consistency in the evaluation process.

**Preparing and Applying the Draft Rubric and Making Scoring Appropriate to the Prepared Grading Scale:** Preparing the draft rubric and making scoring appropriate to the prepared



grading scale are necessary to test the functionality of the rubric.

**Pilot Application and Testing of the Rubric:** The pilot application of the rubric evaluates how the rubric performs under real usage conditions. This process enhances the rubric's validity and reliability.

**Determination of Performance Levels (0-1-2-3):** Determining performance levels (0-1-2-3) ensures that the rubric is detailed and structured. This clearly shows students the level of performance they are demonstrating.

**Making Ratings Appropriate to the Prepared Rating Scale:** Making ratings appropriate to the prepared rating scale ensures that the assessment process is clear and understandable.

**Revision of the Draft Rubric for the Needs Emerging in Applications and Expert Evaluation:** Revising the draft rubric based on feedback from applications and expert evaluations makes the rubric more suitable for needs.

The reasons for choosing this rubric development process for assessing teacher qualifications are as follows:

**Systematic Approach:** This method addresses the rubric development process systematically, providing a holistic approach to structuring rubrics. This makes rubrics more understandable and useful for both teachers and students.

**Validity and Reliability:** The validity and reliability of rubrics are critical for fair and objective assessments in education. These stages help ensure these two important characteristics.

**Providing Feedback:** Structuring rubrics with clear criteria and performance levels allows for specific feedback to students. This supports students in making more effective progress in their learning processes.

**Adaptability:** This method can be adapted to different educational levels and course contents. This makes rubrics usable across a wide range of contexts.

The stages of the rubric development process for assessing teacher qualifications provide a significant guide for the effective and efficient use of rubrics in education. The systematic structure, potential for ensuring validity and reliability, ability to provide effective feedback to students, and adaptability are the main reasons for choosing this method. Properly structured rubrics make the assessment process more meaningful and transparent for both teachers and students, enhancing the overall educational experience.

## **Findings**

As a result of the data analysis obtained during the rubric development process, the following procedures were performed, and findings were obtained. The findings presented in this section stem from a thorough analysis conducted throughout the rubric development process, encompassing various procedures and resulting in significant insights into teacher qualifications. The data collection phase involved comprehensive methods to gather information from diverse stakeholders in the educational domain. This included surveys, interviews, and focus group discussions with lecturers, teachers, teacher candidates,



educational administrators, parents, and other relevant individuals involved in the educational process. Following data collection, rigorous analysis techniques were employed to extract meaningful patterns and themes. Qualitative data, such as open-ended responses from surveys and transcripts from interviews and focus groups, were analyzed using thematic analysis to identify recurring themes and insights. Through the analysis process, a range of teacher qualifications and characteristics emerged from the data. These qualifications were identified based on input from stakeholders and aligned with existing literature on effective teaching practices and educator competencies. The identified teacher qualifications were then translated into rubric items, forming the basis of the analytical rubric for assessing teacher qualifications. Each rubric item was carefully crafted to reflect a specific aspect of teacher performance or competency, ensuring comprehensive coverage of the desired qualifications. The draft rubric items underwent a validation process involving consultation with stakeholders from various backgrounds. Feedback from lecturers, teachers, students, parents, and administrators was solicited to ensure the relevance, clarity, and comprehensiveness of the rubric items. Based on stakeholder feedback and expert input, iterative refinements were made to the rubric items to enhance their clarity and effectiveness. The final version of the rubric was then established, comprising a set of well-defined criteria for evaluating teacher qualifications. To ensure the reliability of the rubric, statistical analyses, such as Cronbach's alpha coefficient, were conducted to assess internal consistency. The high reliability coefficient obtained validated the consistency of the rubric in measuring teacher qualifications. The completed rubric consists of 37 items, each aligned with specific teacher qualifications identified through the data analysis process. A 4-point scoring system was adopted to facilitate objective evaluation, with detailed scoring criteria provided for each rubric item.

### ***Determining the Best and Worst Performance for Teacher Qualifications Based on Literature***

At this stage, the subject area and content of the measurement tool to be developed were decided, and the studies determining the characteristics of qualified teachers were examined. A total of 440 stakeholders were interviewed with an interview form consisting of open-ended questions covering these characteristics. The data obtained from the stakeholders were classified according to the three competency areas (Professional Knowledge, Professional Skills, Attitude, and Values) accepted as the general competencies of the teaching profession by MoNE (2017). The items in the item pool were created according to these competency areas.

### ***Listing of Performance Measures and Elimination of Overlapping Measures***

In the second stage, qualified teacher characteristics were ranked through content analysis of the related opinions, and a checklist consisting of 83 items was prepared. This checklist included the most recurring features in the content analysis, and "Favorable/Unfavorable" options were given in front of each feature. This checklist was sent to 120 stakeholders determined by the convenience sampling method, including instructors (N: 14), teachers (N: 53), students (N: 23), prospective teachers (N: 19), parents (N: 4) and educational administrators (N: 6). Stakeholders were asked to express their opinions on whether the relevant items were appropriate in determining the characteristics of qualified teachers. The Weighted Kappa Coefficient for Inter-rater Agreement was used to determine whether the stakeholders' responses were consistent. The Kappa Coefficient is used to determine the agreement between the scores given by more than one rater (Cohen et al., 1996). While the Kappa ( $\kappa$ ) statistic determines the degree of agreement between two raters,



the statistical procedures developed by Fleiss (1971) are preferred when there are more than two raters. Since there were more than two raters in this study, the fit index generalized by Fleiss (1971), which takes a value between -1.00 and +1.00, was used. The formula is as follows:

$$\kappa = \frac{\bar{P} - \bar{P}_e}{1 - \bar{P}_e}$$

$\bar{P}$  = Observed compliance rate,  $\bar{P}_e$  = Coincidental compatibility rate.

Landis and Koch (1977) presented as shown in Table 1 for interpreting  $\kappa$  values:

Table 1. Levels of Agreement Used to Interpret  $\kappa$  Values

$\kappa$	Compliance Power
< 0,00	No numbness at all
0,00 - 0,20	Insignificant numbness
0,21 - 0,40	Moderate numbness
0,41 - 0,60	Mostly numbness
0,61 - 0,80	Significant numbness
0,81 - 1,00	Almost perfect match

After collecting these data, the items with at least 80% agreement within and between each group were listed to be used in the analytic rubric (See Appendix Table 2). According to these agreement index values, the Kappa coefficient was determined as .80 as a result of the analysis of the items examined. This value indicates that there is a significant degree of agreement between raters. The number of items with which the stakeholders agreed was determined as 37. Accordingly, the number of items on the checklist, which was 83, was updated to 37.

### ***Preparing and Applying the Draft Rubric and Making Scoring Appropriate to the Prepared Rating Scale***

In the third stage, to determine the extent to which these items worked, 12 teachers experienced in science education were observed in two different classes for at least one class hour. The results of these observations were analyzed independently by three researchers to test the extent to which the observation form items worked. For the three items on which the three researchers did not reach a common opinion, discussions were held, and the statements were edited.

### ***Pilot Implementation and Testing of the Rubric***

In the fourth stage, the presentations of 5 different teachers who taught courses through the Education Information Network (EBA) in the distance education process were examined to see whether they had the characteristics of the measurement tool. In addition, semi-structured interviews were conducted with three of the teachers who have a large number of followers on social media and are well-known in their field, and information was collected about how they teach their courses and what they do while presenting the content. Whether these teachers had the qualifications in the 37-item item pool was tested by checking their answers to the interviews. At the end of these processes, it was determined that both the teachers who presented on EBA and the popular teachers had the characteristics in the measurement tool to a significant extent.

### ***Making Scoring Appropriate to the Prepared Rating Scale, Determining Performance Levels (0-1-2-3), and Revising the Draft Rubric in Light of the Needs Arising in Practices and Expert Evaluation***

In the fifth stage, after the above process, the analytical rubric options were determined to classify teachers according to their qualification levels. In the literature review (Simon & Giroux, 2001), it was decided to use the grades *"Does not exhibit the statement related to the dimension / does not have the characteristic (0 points); partially exhibits the statement related to the dimension / partially possesses the characteristic (1 point); sufficiently exhibits the statement related to the dimension / sufficiently possesses the characteristic (2 points); fully exhibits the statement related to the dimension / fully possesses the characteristic (3 points)"* which are frequently used in rubrics for human behaviors. The items were sorted according to categories, and attribute indicators were written for each attribute as 0-1-2-3. Each attribute is scored between 0-3. The highest possible score is 111, and the lowest score is 0. After this process, the rubric was finalized. "Qualified teacher identification rubric form" is presented in Appendix 1.

### ***Validity Study of Rubric Form***

The coefficient of agreement between the evaluations made for each criterion was calculated for 120 stakeholders, including instructors (N: 14), teachers (N: 53), students (N: 23), prospective teachers (N: 19), parents (N: 4) and educational administrators (N: 6). Szymanski and Linkowski (1995) state that the coefficient of agreement between raters in such studies should be at least .80. In this respect, it can be said that the rubric is an adequate and reliable measurement tool since it selects items with high coefficient of agreement between raters. The 46 items with low agreement were removed from the form, and the items with high agreement indices were included in the rubric in accordance with content validity.

### ***Reliability Study of Rubric Form***

As a result of the internal consistency coefficient (Cronbach's Alpha) analysis performed on the stakeholders' responses participating in the study, the reliability value of the rubric was calculated as .96. It can be said that the developed rubric is a sufficiently reliable measurement tool.

## **Results and Discussion**

Rubrics (Jonsson & Svingby, 2007) are one of the measurement tools proposed to be developed to evaluate any performance by considering all its features and details. When the literature is examined, it is stated that rubrics are a frequently preferred evaluation method because they clearly express all the indicators related to the performance intended to be measured and provide a consistent evaluation opportunity (Melanlıoğlu, 2016). In this context, the use of rubrics at the evaluation stage of the educational process provides important contributions in terms of making qualified measurements. In this study, "Rubric for Determining Teacher Qualifications" was developed because it was thought that developing an analytical rubric to be used in determining the characteristics expected to be possessed by qualified teachers would contribute to the literature. Rubrics can be developed in two different types: analytical and holistic rubrics. Since Wiggins (1998) stated that analytical rubrics present performance criteria in more detail than holistic rubrics, it was decided to develop analytical rubrics in this study. Rubric options are categorized with quantitative and qualitative statements to determine qualities (Simon & Giroux, 2001). In the literature review, it is seen that classifications are made in 3 or 5 categories (Aktaş & Alıcı, 2018; Bağçeci et

al., 2020; Kan, 2007). In this study, in the scoring of rubric performance criteria, the grades of "does not have, partially has, has enough, and fully has", frequently used in rubrics for human behaviors, were used.

In the literature, there are many studies on teacher qualities (Atar, 2014; Booth & Coles, 2017; Buaraphan, 2012; Çalışkan et al., 2013; Kim et al., 2019; Maden et al., 2010; Morgil & Yılmaz, 1999; Okçabol, 2004; Özkan & Arslantaş, 2013). In the related studies, teacher qualities were examined by taking opinions from teachers, students, or prospective teachers and were categorized in different categories. In this study, unlike the other studies mentioned above, academicians, teachers, students, teacher candidates, parents, and administrators, who are the stakeholders of the educational process, were included in the research process, and it was aimed to determine teacher qualifications from the perspective of all stakeholders. While teacher quality has a great impact on student achievement (Stronge et al., 2008), it also affects all segments of society. From this point of view, determining the qualifications of teachers will contribute to the training of qualified teachers.

As a first step in the rubric development study, a national and international literature review was conducted on the basic characteristics of qualified teachers. Data were collected from 440 stakeholders (lecturers, teachers, teacher candidates, educational administrators, parents, and alike.) in all segments of education through open and closed-ended questions created within the scope of the literature. The data collected from these stakeholders were analyzed by three different researchers, and a pool of 83 items was created to define qualified teachers. These items were converted into a checklist template, and options such as "Appropriate" or "Not appropriate" were added to each item. These items were presented to the opinions of faculty members, teachers, prospective teachers, educational administrators, students, and parents. A total of 120 stakeholders were consulted. These stakeholders were asked to evaluate whether the items were appropriate to be used to distinguish qualified teachers. After the collection of these data, the items with at least 80% agreement within and between each group were listed to be used in the analytical rubric, and the rubric was finalized (Table 2). The fact that Cronbach's alpha coefficient calculated to determine the internal consistency of the rubric was found to be .96 was accepted as evidence that the reliability was sufficient (Vierra & Garret, 2005).

The final version of the "Rubric for Determining Teacher Qualifications", whose validity and reliability studies were completed, consists of 37 items, and a 4-point scoring system is used in its evaluation. The highest score that can be obtained from the rubric is 111, and the lowest score is 0. The 37 performance criteria in the rubric consist of teacher quality statements determined in light of the data collected from stakeholders and the literature review. With this measurement tool, users can accurately and objectively score teachers' qualifications.

Taylor and Tyler (2012), in their study on the importance of evaluating teacher performance, state that rubrics are frequently used in performance evaluation and that the most preferred evaluation tool in this regard is the rubric developed by Charlotte Danielson. This rubric scores teachers with four basic criteria in terms of their skills and practices: 4 - outstanding, 3 - competent, 2 - basic, and 1 - inadequate. However, this rubric does not evaluate teachers in terms of all their qualifications but only in terms of their professional skills and performance. When the studies in the literature are examined, it is thought that the developed analytical rubric will contribute to the researchers in meeting this need, considering the need for a comprehensive measurement tool that will provide an evaluation in terms of all qualifications.

In this study, an analytical rubric was developed to be used in determining qualified teachers. Considering similar criteria, measurement tools such as holistic rubrics, checklists, and rating scales can be developed to evaluate teacher qualifications, and the results obtained can be compared. The sample used in the development of the rubric mainly consists of teachers working in science education. In order to apply the rubric to different education levels, conducting validity and reliability studies in other education levels will enable the rubric to reach a wider audience and become functional.

In conclusion, this study successfully concluded the process of developing a comprehensive analytical rubric that can be used to identify and evaluate teacher qualifications. The findings showed that the rubric had high agreement and reliability values among different stakeholder groups. Therefore, it can be said that this study provides a basis for Turkey in determining teacher qualifications for science education, especially in the field of education.

As a result of this study, it was determined that the rubric developed to assess teacher qualifications is a valid and reliable measurement tool. By following the rubric development stages suggested by Goodrich Andrade, a comprehensive process led to the creation of a 37-item analytical rubric. The Cronbach alpha reliability coefficient of the developed measurement tool was found to be .96, indicating a high level of reliability. The research findings showed that the rubric had high agreement and reliability values among different stakeholder groups. Therefore, it can be said that this study provides a solid foundation for determining teacher qualifications in Turkey, especially in the field of science education. The developed rubric, as a valid and reliable measurement tool, will contribute to the objective evaluation of teachers' performance at all levels of the education process. This study successfully completed the development process of a comprehensive analytical rubric that can be used to identify and evaluate qualified teachers. The findings indicate that the rubric demonstrates high agreement and reliability values among different stakeholder groups. Therefore, it can be argued that this study provides a solid foundation for determining teacher qualifications in Turkey, particularly in the field of education. The developed rubric serves as a valid and reliable measurement tool, contributing to the objective assessment of teacher performance across all levels of the education process.

### ***Limitations and Recommendations***

The rubric should be continuously reviewed and refined based on feedback from its application in real-world scenarios. Regular updates and revisions informed by empirical data and user feedback will help maintain the rubric's relevance and effectiveness. By addressing these limitations and following the recommended steps, the developed analytic rubric can become a more powerful tool for objectively assessing teacher qualifications and enhancing the overall educational process.

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### Conflicts of interest

There are no conflicts of interest.

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## Appendix 1:

Table 2: Rubric items

	0	1	2	3
1. Qualified teachers should have digital competencies.				
2. A qualified teacher should have a good command of his/her field.				
3. A qualified teacher should be open to learning.				
4. Qualified teachers should love their profession.				
6. A qualified teacher should have professional awareness.				
7. A qualified teacher must be a good decision-maker.				
8. A qualified teacher should have good communication skills.				
9. A qualified teacher should be a problem solver.				
13. A qualified teacher should constantly follow innovations.				
14. Qualified teachers should learn the innovations they follow.				



20. A qualified teacher should constantly monitor student motivation				
21. The qualified teacher should work separately for the student with low motivation.				
22. A qualified teacher should follow the student's progress.				
25. A qualified teacher should care about the student.				
26. A qualified teacher is one who values the student.				
27. A qualified teacher should strive to understand the student.				
29. A qualified teacher should have effective communication.				
31. Qualified teachers should show interest in their students.				
33. Qualified teachers should be honest among their qualities.				
35. Being respectful should be among the qualities of a qualified teacher.				
37. A qualified teacher needs to be fair.				
40. The qualified teacher has to develop the ability to empathize.				
42. A qualified teacher should be understanding.				
44. A qualified teacher should be self-confident.				
49. Qualified teachers should contribute to the organizational culture.				
58. A qualified teacher should not discriminate.				
59. A qualified teacher should have high expressive skills.				
60. A qualified teacher should be hardworking.				
61. A qualified teacher should continuously improve himself/herself.				
63. A qualified teacher should be a role model.				
64. A qualified teacher has to be constructive.				
67. A qualified teacher should be a guide.				
69. A qualified teacher should have high pedagogical knowledge.				
71. A qualified teacher should value the student's ideas.				
72. A qualified teacher should have research and inquiry skills.				
74. A qualified teacher should give importance to universal values.				
77. A qualified teacher should make the other person feel valued.				

The meanings of the grades of the rubric are as follows.

*0 points: Does not exhibit the statement related to the dimension/ does not have the characteristic.*

*1 point: Partially exhibits the statement related to the dimension/ partially possesses the characteristic.*

*2 points: Sufficiently demonstrates the statement related to the dimension/ has the feature sufficiently.*

*3 points: Fully demonstrates the statement related to the dimension / has the characteristic completely.*

The items were sorted according to categories and attribute indicators were written for each attribute as 0-1-2-3.

Each attribute is scored between 0-3. The highest possible score is 111 and the lowest score is 0.