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Transformation of Character Assessment through ICT Technology: A Study of the Use of Web-Based Platforms

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ABSTRACT

Purpose of the study: The purpose of this study was to determine the perceptions of teachers, students, and parents towards the use of a web-based character assessment system supported by Information and Communication Technology (ICT), and to determine the results of student character using a web-based character assessment system.

Methodology: This study uses a quantitative research approach with a descriptive design. The tools used include a perception questionnaire and a web-based character assessment system. Data were collected using a questionnaire for perception data, and character data were collected using a web-based platform for character assessment. Analysis was performed using SPSS for descriptive statistical evaluation.

Main Findings: The study found that the majority of teachers (70%), students (68.67%), and parents (76%) rated the web-based character assessment system as very effective. The results showed that most students achieved good or excellent character outcomes, with an average score of 70.0. This demonstrates the system's ability to accurately assess and support students' character development.

Novelty/Originality of this study: This study introduces a comprehensive, ICT-enabled, web-based character assessment model that combines real-time data, transparency, and collaboration between schools and families. This study advances existing knowledge by demonstrating the potential of technology to enhance character education, providing a scalable framework for broader educational applications.

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1. INTRODUCTION

In the digital era, Information and Communication Technology (ICT) has become a major driver of transformation in various sectors, including education. The implementation of ICT in the world of education is not only limited to the delivery of teaching materials, but also includes the management and evaluation of learning [1], [2]. One aspect that receives attention is the assessment of student character, which is an important element in building a generation with integrity [3], [4]. By utilizing web-based platforms, educational institutions can integrate ICT technology to create a more effective and efficient assessment system [5], [6]. This transformation provides new opportunities for educators to evaluate student character holistically and based on data.

Character education is one of the main pillars in forming students' personalities who are competent in academics and have strong moral values [7]-[9]. However, the character assessment process is often considered subjective and less standardized [10]. This is a challenge for teachers in providing fair and accurate evaluations. The presence of ICT technology offers a solution to overcome this obstacle through a web-based assessment system that can be accessed widely and easily [11], [12]. With a technology-based approach, the character assessment process can become more transparent, measurable, and traceable.

Web-based systems provide various advantages in character assessment, such as ease of access, automatic data processing, and flexibility in information management [13]-[15]. Teachers can design assessments according to the desired character indicators [16], [17]. In addition, the platform allows the integration of data analysis tools to provide more in-depth feedback to students and parents. Thus, ICT is not only a tool, but also a catalyst to improve the quality of the character evaluation process. This is in line with the demands of 21st century education based on digital literacy and technology [18]-[20].

However, this transformation is not without challenges, such as limited technological infrastructure in some schools, especially in remote areas [21], [22]. In addition, the level of digital literacy of teachers and students is an important factor influencing the success of implementing a web-based system [23]-[25]. In this context, training and mentoring are crucial to ensure that all parties can make optimal use of technology [26], [27]. With the right strategy, ICT technology can be adapted by various educational institutions, both in urban and rural areas [28]. Therefore, collaborative efforts from government, schools, and technology developers are needed to ensure the sustainability of this transformation.

Studies on the use of web-based platforms for character assessment have shown promising results in various countries. These systems are able to increase student participation in self-evaluation, as well as make it easier for teachers to monitor their character development in real-time. In addition, this technology also allows a more personalized approach in providing feedback to students based on the data collected. By using a platform specifically designed for character assessment, teachers can identify each student's strengths and areas of development in more depth [29], [30]. This provides a foundation for more inclusive and learner-centered education. Although character assessment is an essential part of 21st century education, the conventional methods often used tend to be time-consuming, labor-intensive, and require less efficient manual documentation [31]. Previous research conducted by Granberg et al.,[32] only focuses on character evaluation through manual techniques or simple technology without utilizing the full potential of interactive and integrated web-based technology. This creates a gap in the development of a more effective and transparent character assessment model through ICT technology.

Transformation of education through technology is an urgent need, especially in integrating ICT to support effective assessment of student character [33]-[35]. Web-based platforms have the potential to increase efficiency, accuracy, and transparency in character assessment [36], [37]. The urgency of this research is based on the need to provide a tool that can involve all parties (teachers, students, and parents) in the evaluation process, while also answering the challenges of digital literacy in the modern education era. Web-based character assessment also has the potential to increase collaboration between schools, students, and parents. Data generated from this platform can be accessed by all related parties, thus encouraging transparency and accountability in the learning process [38]. Parents can more easily monitor their children's character development, while teachers can identify student behavior patterns more quickly. In the long term, this system can help create a more conducive educational environment and support the development of students' character as a whole. Thus, the application of ICT technology not only has an impact on technical aspects, but also on interpersonal relationships in the educational environment [39], [40].

This study introduces a web-based character assessment model that utilizes ICT technology comprehensively to integrate teacher, student, and parent assessments in one interactive platform. This innovation lies in the application of automation features in report preparation, real-time analysis, and an interface designed to increase the involvement of all stakeholders. This system is a new solution that is more transparent, efficient, and valid compared to conventional methods [41]. The transformation of character assessment through ICT technology is not just a trend, but an urgent need in the world of modern education. Education that integrates technology not only aims to improve students' cognitive aspects, but also to shape their characters [42], [43]. With web-based technology, character evaluation can be done in a more standardized and objective manner, so that the results are more reliable. In the midst of the ever-advancing development of technology, educational institutions need to adapt and utilize ICT as an integral part of the learning and evaluation process [44], [45]. The purpose of this study is to determine the perceptions of teachers, students, and parents towards the use of a web-based character assessment system supported by Information and Communication Technology (ICT), and to determine the results of student character using a web-based character assessment system. Through this study, it is expected to identify opportunities and challenges in the implementation of a web-based character assessment system, as well as provide recommendations for its future development.

2. RESEARCH METHOD

2.1 Types of research

This study uses a quantitative approach with a descriptive research design. This design was chosen to describe the application of Information and Communication Technology (ICT) in a web-based character assessment system in depth and systematically [46]. Descriptive research allows researchers to explore perceptions and outcomes of character assessments with a web-based character assessment platform [47]. The data collected focused on teacher, student, and parent perceptions of the use of the system, as well as the results of student character evaluations.

2.2 Population and Research Sample

The population in this study included all teachers and students at junior high school level in Jambi who have used or plan to adopt a web-based character assessment system. In addition, parents of students are also part of the population, considering their role in monitoring the development of children's character. The research sample was selected using a purposive sampling technique, with the criteria being schools that already have adequate ICT infrastructure access and have used a web-based platform for character assessment for at least one semester [48]-[50]. The sample consisted of 10 teachers, 150 students, and 50 parents from schools in Jambi, which were considered representative to provide a comprehensive picture.

2.3 Research Instruments

The research instruments used include a perception questionnaire and a web-based character assessment. The perception questionnaire is used to measure the perception and level of satisfaction of teachers, students, and parents towards the web-based character assessment system. The questionnaire consists of 20 statement items with a Likert scale of 1-5, covering aspects of ease of use, efficiency, and accuracy of assessment results. The perception questionnaire outline can be seen in Table 1. The web-based character assessment consists of 5 character indicators and 17 statement items with a Likert scale of 1-5. The character instrument outline can be seen in Table 2.

Table 1. Perception questionnaire grid

Aspect	Indicator	Number of statement items
Ease of Use	The system interface is easy to understand and use	3
	Ease of accessing assessment features	2
	Speed of system response when used	1
Efficiency	Time-saving system compared to conventional methods	2
	Simplifies the creation of assessment reports	2
	Reduces the administrative burden on teachers	1
Accuracy of Results	The data generated is in accordance with the character of the student	3
	The system generates reports that are in accordance with the assessment indicators	2
	The system's ability to provide accurate information on student development	2
User Satisfaction	Teachers feel helped by the system	1
	Parents are satisfied with access to information on child development	1
Total statement		20

Table 2. Character instrument grid

Indicator	Number of statement items
Independent	4
Religious	4
Hard work	3
Creative	3
Discipline	3
Total statements	17

Based on the grid above, the categories of teacher, student and parent perceptions can be seen in table 3, while the categories of student character can be seen in table 4.

Table 3. Perception Categories

Interval	Category
20-36	Very bad
37-52	Not good
53-68	Fair
69-84	Good
85-100	Very good

Table 4. Character categories

Interval	Category
17.0-30.6	Very bad
30.7-44.2	Not good
44.3-57.8	Fair
57.9-71.4	Good
71.5-85.0	Very good

The following is a view of the main page of the web-based character assessment system used in this study:

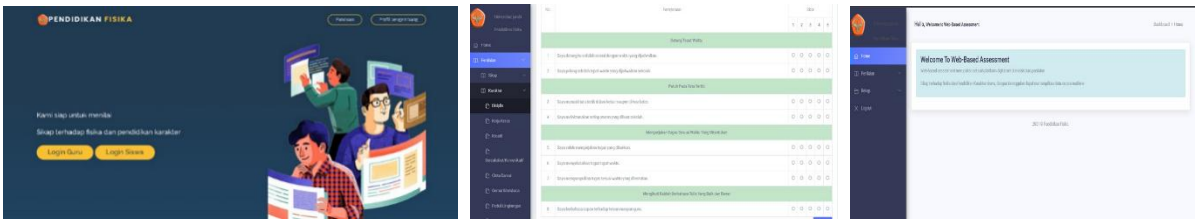

Figure 1. Main page view of the web-based character assessment system.

2.4 Data Analysis Techniques

Data analysis in this study used descriptive statistical analysis using SPSS software [51]-[53]. Descriptive statistics are used to describe the perceptions of teachers, students, and parents towards the web-based character assessment system and to describe the results of student character assessment through the web-based character assessment system. The results of this analysis are presented in the form of average scores and percentages.

2.5 Research Procedures

This research was conducted through several systematic stages. The first stage is preparation, where the researcher prepares a research design, including determining the objectives, methods, and instruments to be used [54]. Preparing a questionnaire used to collect data on teacher, student, and parent perceptions of the use of a web-based character assessment system. The second stage is data collection, namely quantitative data collected by distributing perception questionnaires to respondents (teachers, students, and parents) and filling in the web-based character assessment system by students [55]. The third stage is data analysis, namely analysis using statistical software to produce descriptive information related to student character perceptions and results from a web-based character assessment system. The fourth stage is conclusion, the researcher concludes based on the results of the analysis obtained.

3. RESULTS AND DISCUSSION

3.1. Teacher, Student, and Parent Perceptions of Web-Based Character Assessment Systems

Table 5. Distribution of teacher, student, and parent perceptions of the Web-Based Character Assessment System

Respondents	Interval	Category	F	%	Mean	Med	Min	Max
Teacher	20-36	Very bad	0	0	88.5	87.0	69.0	100.0
	37-52	Not good	0	0				
	53-68	Fair	1	10				
	69-84	Good	2	20				
	85-100	Very good	7	70				
	Total sample		10	100				
Student	20-36	Very bad	0	0.00	86.0	86.0	53.0	100.0
	37-52	Not good	10	6.67				
	53-68	Fair	13	8.67				
	69-84	Good	35	23.33				

	85-100	Very good	103	68.67				
	Total sample		150	100.00				
	20-36	Very bad	0	0				
	37-52	Not good	0	0				
Parent	53-68	Fair	4	8	87.5	88.0	53.0	100.0
	69-84	Good	8	16				
	85-100	Very good	38	76				
	Total sample		50	100				

Table 5 shows the distribution of teachers', students', and parents' perceptions of the web-based character assessment system based on the score interval category. In the teacher group, most respondents (70%) gave perceptions in the very good category with a score interval of 85-100. As many as 20% of teachers were in the good category (69-84), and only 10% gave perceptions in the sufficient category (53-68). There were no teacher respondents who gave assessments in the bad or very bad categories. The average score of teachers' perceptions of this system was 85.5, with a median of 87, a minimum score of 69, and a maximum score of 100.

For the student group, the majority of respondents (68.67%) gave their perceptions in the very good category (85-100), followed by 23.33% in the good category (69-84). A small number of students gave their perceptions in the sufficient (8.67%) and poor (6.67%) categories, while none were in the very poor category. The average value of students' perceptions was 82.0, with a median of 83, a minimum value of 53, and a maximum value of 100.

In the parent group, most (76%) gave perceptions in the very good category (85-100). As many as 16% were in the good category (69-84), and only 8% were in the sufficient category (53-68). No parent respondents gave an assessment in the bad or very bad category. The average value of parent perception was 83.5, with a median of 84, a minimum value of 53, and a maximum value of 100.

Overall, these results indicate that the web-based character assessment system received very positive responses from all three main user groups, namely teachers, students, and parents. This system was considered superior in terms of ease of use, efficiency, and accuracy of assessment results.

The results of the study showed that perceptions of the web-based character assessment system were very positive, especially among teachers, students, and parents. Most respondents in all three groups gave ratings in the very good category, indicating high acceptance of the system. This is consistent with research by Mahardika et al. [56], which states that the implementation of web-based technology can increase transparency and efficiency in the education process, including character assessment.

In the teacher group, the dominant perception in the very good category indicates that the system has succeeded in reducing the administrative burden. Teachers feel helped by the automation features, such as the creation of assessment reports. This is in line with research by Nugroho et al. [57], which found that web-based technology can reduce the complexity of manual assessments, so that teachers can focus more on pedagogical aspects.

The student group also showed high acceptance, with the majority giving ratings in the very good and good categories. This high positive perception reflects the ease of accessibility and interactivity of the system, which allows students to better understand their self-assessment. Research by Wahyudi et al. [58] supports this finding, showing that web-based systems can increase student engagement and make them more aware of the character building process.

Parents gave very positive responses to the system, with the majority of respondents in the very good category. This reflects that the information transparency feature, such as real-time access to child development, is highly valued. These results are in line with research by Surya et al. [59], which states that parental involvement in the child's educational process increases with the presence of technology that allows easy and accurate monitoring.

Overall, these results indicate that the web-based character assessment system is effective in meeting the needs of various education stakeholders. The system's advantages in ease of use, efficiency, and accuracy of assessment also reflect the relevance of implementing web-based technology in the context of modern education. These findings underscore the importance of developing web-based systems to support a more transparent, efficient, and inclusive education process.

3.2. Student character results using a web-based character assessment system

Table 6. Student character results using a web-based character assessment system

Respondents	Interval	Category	F	%	Mean	Med	Min	Max
	17.0-30.6	Very bad	0	0				
Student	30.7-44.2	Not good	7	4.67	70.0	71.0	32.0	85.0
	44.3-57.8	Fair	10	6.67				

57.9-71.4	Good	71	47.33
71.5-85.0	Very good	62	41.33
Total sample		150	100

Table 6 presents the results of student character measured using a web-based character assessment system based on score intervals, assessment categories, number of respondents (F), and percentage (%). Most students (47.33%) obtained results in the good category with a score interval of 57.9-71.4. Followed by 41.33% of students who were in the very good category with a score interval of 71.5-85.0. A total of 6.67% of students were in the sufficient category (44.3-57.8), while 4.67% of students were in the poor category (30.7-44.2). There were no students in the very poor category (17.0-30.6).The average value of the students' character results was 70.0 with a median of 71.0, indicating that most students have characters that are assessed in the good category. The minimum value obtained by students was 32.0, while the maximum value reached 85.0.

These results indicate that the use of a web-based character assessment system generally provides positive results. The majority of students showed good or very good character, reflecting the effectiveness of the system in assessing and mapping student character according to the established indicators.

The results showed that the majority of students (88.66%) were in the good and very good categories in character assessment using a web-based system. This shows the effectiveness of the system in providing accurate and systematic character evaluations according to established indicators. This finding is in line with research by Rahman et al. [60], which shows that web-based technology can improve the quality of character evaluation because it allows for more objective, consistent, and transparent assessments.

As many as 6.67% of students were in the sufficient category, and only 4.67% were in the poor category. The absence of students in the very poor category indicates that the web-based system is able to motivate students to improve their character through clear and real-time feedback. Research by Fitri et al. [61] supports this, showing that technology that provides instant access to assessment results can encourage students to be more proactive in developing their character.

The average character score of students reaching 70.0 and the maximum score of 85.0 indicates that most students have achieved a good level of character. The median of 71.0 also confirms the fact that the distribution of results is in the high category. These results are in line with research by Handayani et al. [62], which found that the use of web-based systems in education can create an assessment environment that supports the formation of student character as a whole.

Web-based systems provide the benefits of efficiency and validity in the assessment process. The accuracy of the assessment results is reflected in the absence of students who were assessed in the very poor category. This finding is consistent with research by Nugroho and Setyawan [63], which shows that technology-based systems increase the consistency of assessment results compared to manual methods, making them more reliable for all parties involved. Overall, these results emphasize the role of web-based technology as a solution to the challenges of character assessment in the world of education. The implementation of this system not only improves the quality of assessment, but also encourages active student involvement in developing their character.

This study provides important implications for the world of education, especially in the context of student character assessment. The results of the study indicate that the use of a web-based character assessment system can improve efficiency, transparency, and involvement of all parties (teachers, students, and parents) in the assessment process. The advantages of this system in providing fast and accurate feedback allow students to be more proactive in developing their character, and make it easier for teachers and parents to monitor the development of their children's character. Another implication is that this web-based system can be used as a model for character assessment at a wider level of education, given its ease of access and efficiency. This system also opens up opportunities for the integration of technology in more comprehensive and holistic character development.

This study has several limitations, namely that it does not cover external factors that can influence perceptions and assessments of the system, such as socio-economic conditions or the level of parental involvement outside the formal education system. Future research can explore external factors, such as parental involvement or socio-economic background, that may influence the effectiveness of a web-based character assessment system.

4. CONCLUSION

Based on the objectives of this study, it can be concluded that the perceptions of teachers, students, and parents towards the use of a web-based character assessment system are generally very positive. This system is considered effective in providing transparent, accurate, and easily accessible assessments for all parties. The majority of respondents felt that this system made it easier to monitor student character development and increase the involvement of parents and teachers in the education process. In addition, the results of student character obtained through this system showed that most students were in the good and very good categories, reflecting the success of the system in assessing and developing student character. Thus, the use of a web-based character

assessment system has been proven to provide a positive contribution to student character assessment and can be used as a model for further implementation in educational environments.

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