



Antecedents of Student Character in Higher Education: The role of the Automated Short Essay Scoring (ASES) digital technology-based assessment model

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ABSTRACT

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Purpose: Students are the primary asset of institutions of higher education. It is essential to shape the pupils' personalities. Students with good character will behave honestly and respect academic integrity, which will benefit the nation and the educational institution. Consequently, the study's primary purpose was to investigate the relationship between the Automated Short Essay Scoring digital technology-based assessment model, trust, student character, and academic achievement in Indonesian higher education institutions. This study also explored the role of student personality as a mediator. **Research Method:** This research employed a survey-based and cross-sectional methodology. Using simple random selection, the questionnaire was delivered to 412 Indonesian higher education institutions employees for this purpose. The study's usable response rate was 61.29 percent. The information was collected via surveys.

Results: The study's findings support the premise that digital technology-based evaluation systems and trust substantially affect student character. Furthermore, student character is essential for enhancing academic performance. In conclusion, the moderating role of student character is also supported. **Implications for Research and Practice:** This study is useful for government authorities and academic decision-makers in developing student character-building methods. Additionally, this study contributes to developing a plan to enhance academic performance in the higher education sector.

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Introduction

Educationists and strategists are attempting to find characteristics that can influence students' character and improve their academic performance in this age of strong competition in higher education. Long have experts and academic decision-makers been examining the question of the student's character. Academic integrity is an important component of student character. The academic integrity of a university student is of utmost importance because it is the foundation of campus-based learning. The university's reputation is regarded as one of the most influential aspects in molding the students' personalities. In this regard, researchers emphasized the need for the institution to foster a learning culture that promotes students' character development. Responsibility, respect, trustworthiness, and sincerity are used to evaluate or determine a student's character. In the past few years, academic dishonesty has been a major concern for college students. Therefore, the decision-makers in higher education must develop the students' character to increase their academic honesty (Roberts & Hai-Jew, 2009).

Utilizing digital technologies has numerous advantages in enhancing the efficiency of learning assessment and diversifying learning opportunities. By utilizing automated feedback, companies and educational institutions can quickly receive and present students with input (Shute & Rahimi, 2017). Evaluating work in the higher education industry is one of the primary goals of adopting digital technologies. It can considerably aid in evaluating the pupils' performance, skills, and work. With the aid of digital technology, it is possible to evaluate the evaluation of many types of nature in a condensed time frame (Blundell, 2021).

AES is another term for computerized essay grading. AES is a computerized evaluation system. This system is used to grade pupils' progress automatically. AES began its study in 1966. In 1973, the initial AES project was known as project essay grader (PEG). Scholars utilize PEG to investigate the characteristics of writing. These features include traits, directions, and grammar, among others, to grade an essay. The PEG version of the updated AES standard was released in 2001. This version focused on the correlation system and human evaluator-based evaluation. In the previous few decades, a variety of additional AES has been presented, including natural language processing (NLP), Bayesian Essay Test Scoring System (BESTY), and many others. Most of these scoring systems evaluated the reader's essay using conventional methods. The AES has recently adopted the regression-based analytical method (Ramesh & Sanampudi, 2021).

The amount of trust between the institute, teacher, and student is one of the most significant variables influencing the student's character. Scholars have described trust as the readiness of one party to be exposed and vulnerable to the other party based on faith in the latter's honesty, competence, dependability, and altruism. In the context of higher education, the amount of trust has a substantial impact on the performance of students. Additionally, trust can assist shape the character of students. Researchers have therefore defined trust as the degree to which a person has faith in the willingness and ability of others to act predictably, ethically, and equitably. In the context of higher education, trust plays a crucial role in the outcome variable for students. Trust promotes the formation of relationships between stakeholders and pupils. Despite this, very few studies have attempted to study the impact of trust on students' learning and character development (Ennen et al., 2015).

Furthermore, the student's character has a crucial impact on improving their academic achievement. Students' academic performance must increase to attain a high level of professional accomplishment. Therefore, it is necessary to determine the characteristics that can improve students' academic performance by developing their character. This study examines the influence of trust, the Digital technology-based assessment methodology, and student character on academic success in the setting of Indonesian higher education. Furthermore, this study explored the mediating role of student personality.

Literature Review

Automated Short Essay Scoring (Digital technology-based assessment Model)

Literature defines automatic essay grading as a computer-based evaluation system. This system is utilized to analyze and score written content. AES is utilized primarily to reduce the cost and duration of the evaluation method. In addition, AES is very trustworthy and has a propensity toward generalizability when evaluating written assessments. Therefore, AES has garnered the interest of educators, academics, testing corporations, and higher education institutions (Sevcikova, 2018).

Several studies have investigated the dependability and precision of various automated systems, including AES systems, in assessing the writing content. According to studies on AES, there is a considerable correlation between human rates and AES systems. With the AES system, there is no human intervention throughout the examination. Therefore, there is a possibility of pupils cheating. Despite several of these shortcomings, AES has drawn the interest of educators, academics, businesses, and higher education institutions (Klebanov & Madnani, 2022).

Different types of assessment methods are discussed in the academic literature. The AES contains very few modifications and enhancements. Initially, there was the project essay grader, also known as the AES (PEG). Allis Page created this system in 1996 at the request of the College Board. The primary objective of building this system was to successfully and efficiently grade a huge quantity of essays. This technique employs correlation to evaluate essay quality (Zhu, 2019).

IES, also known as intelligent essay assessor, is the second sort of AES mentioned in the literature. This system evaluates and evaluates the essays using semantic text analysis. The term for this is Latent semantic analysis. The other education system, an electronic essay, is utilized to analyze essays employing the linguistic aspects of the text. This AES utilizes the natural language processing (NLP) approach. Artificial intelligence is the most effective method for evaluating essays (AI). Researchers define this AI as the science of making machines intelligent. Several AI applications include computer vision, natural language processing, speech recognition, and game playing (Arafeh, 2015).

Today, there are many advancements in information technology and digital technology. This development has also affected the education of pupils in educational institutions. In this regard, digital learning systems are also a lot developments. These innovations include computer-based learning, interactive multimedia, game-based learning, and virtual classes, all of which play an essential role in the students' education. As a result of technological improvements, students' abilities and skills are greatly boosted (Alakrash & Abdul Razak, 2021).

Using technology-based exams, skill-based and cognitive performance is improved. Technology is utilized in the analysis, delivery, and design. The technology-based evaluation can be simulation-, game-, or performance-based to measure the students' performance readily. Through technology-based exams, it is feasible to obtain contextualized, targeted, and dynamic information on pupils quickly. The potential cost of such an examination is significantly less than paper-based exams. Information and digital technologies are crucial resources for enhancing students' learning of communication technologies (Mayrath et al., 2012).

Researchers define assessment generally as any activities conducted by students and instructors. The primary purpose of these activities is to evaluate the performance of the pupils to acquire important information about them. Summative assessment is sometimes referred to as the assessment of learning; it also presents a picture of the student's learning over a certain period. In contrast, formative assessment is also known as the learning process evaluation. This assessment process frequently occurs during the learning process. This approach is called formative learning because teachers use it to modify learning and teaching. The fundamental purpose of formative assessment is to encourage students to continually improve their performance (Ahmed et al., 2019).

On the other hand, evaluators utilize online exams for various purposes. One of the causes is the evaluation of tests with low stakes in providing feedback by teachers, providing feedback by teachers about students in a summative context for the promotion of students through grades, and facilitating students at the state level. Typically, such examinations consist of limited answers and multiple-choice questions (Jannah et al., 2020).

In terms of student evaluation in the higher education industry, technology has advanced significantly over time. Governments worldwide support digital technology because it is economically possible to solve various problems and complete various activities using digital technology. Various stages of digital technology have altered the assessment system in higher education. The first phase comprised transmitting lectures to students using technological methods such as laptops. In the second step, technology is integrated into evaluating higher education pupils. It also featured format innovation and the automation of the evaluation process. In the third phase, a simulation- and interaction-based performance measurement system is implemented (O'Leary et al., 2018). This study evaluated DTBM using AI to determine its impact on student character.

Academic Performance

Students are universities' greatest assets. Without students, educational institutions would be worthless. The country's social and economic development largely depends on the academic achievement of students and the overall effectiveness of educational institutions. Academic excellence in student performance plays a crucial part in producing the highest quality graduates. Therefore, academics have focused heavily on discovering the characteristics that can increase students' academic performance. Personal factors, environmental factors, psychological issues, and social factors influence the academic success of students. These factors have a significant impact on the academic success of students. However, there are country-specific and individual-specific variances in these variables. In this regard, research indicates that environmental, psychological, and socioeconomic factors play a vital role in enhancing academic achievement (Kaviyarasi & Balasubramanian, 2018).

Truthfulness/Trust

Trust, truthfulness, and honesty among pupils are very subjective concepts in education. During several classroom sessions, relationships between students and teachers foster the development of trust. The concept of trust is crucial in all contexts since it is intrinsically tied to an individual's behavior. Without trust, student and teacher efficiency and effectiveness are diminished. Trust implies that all kids may benefit from classroom chances and procedures. One cannot exaggerate the impact of trust on a student's performance. The relationship between the teacher and the pupils is the most important element in creating trust. If the teacher cannot fulfill the expected function, it will breed mistrust among the instructor, other stakeholders, and the students. If a student cannot trust the other pupils, he or she will not be able to comprehend the professors' lectures (Kurnianingsih et al., 2012).

Student Character

In the past, the word character was defined by the Greek word "Charassein," which signifies that it develops and follows a particular pattern. At the time of birth, a person's personality is not shaped. In contrast, the individual undergoes a lengthy process in terms of education to shape his or her character. In Arabic, the concept of character is named and defined in terms of a person's positive habits, attitudes, and morality. In this aspect, morality plays a crucial part in shaping a person's character. Therefore, a student's character is influenced by their education (Marini et al., 2020).

Previous studies have described character as temperance, courage, wisdom, and justice. Others have characterized character as tenacity, patience, justice, responsibility, respect, and honesty. It demonstrates that the term character is defined in numerous ways throughout literary works. Generally, it is also characterized as a person's personality, integrity, and character. It is the act, behavior, and thought of the individual. According to scholars, a person's character comprises socially positive or negative behavior patterns. The student's character is founded on standards, principles, and values such as respect for others, dependability, action, courage, and honesty. It is possible to determine a person's character by seeing how he or she reacts to various situations. Therefore, the character is defined by competencies, behavior, a positive attitude, and integrity (Suhardi et al., 2020).

In recent years, scholars have focused on the notion of character. Ethics is one of the fundamental components of character, and it calls attention to the morality of a person's life. Consequently, the term character derives from the Greek word for the mark. In this sense, it is also defined as a person's mental and moral traits. Defining the concept of character occasionally appears to be a relatively simple task.

In contrast, it is a highly technical term within the education framework. It is impossible to develop the students' character without adequate student development. Students' character development entails the formation of habits and the incorporation of behaviors that have an impact on their day-to-day existence. As a result, the student's character is affected. Literature defines character education and character development as having the same meaning because of which students become significant members of society (AchmadKurniady & Rosalin, 2021).

A student's academic integrity is also connected to his or her character. Academic integrity demonstrates a student's dedication to fundamental principles such as courage, accountability, respect, fairness, trust, and honesty. Students' academic character or behavior is characterized in terms of exchange, learning, and community service based on these ideals. Consequently, pupils gain from this trust in the form of educational achievements. For this goal, students must grasp academic integrity within the community. Furthermore, acting in accordance with these integral community rules is essential. Adopting this paradigm can enhance students' skills, abilities, and knowledge (Holden et al., 2021).

Various studies are undertaken regarding the education system and values and their effect on the students' personalities. The primary objective of character-based education is to foster the development of humanitarian values in the students' conduct. Other students cite a similar approach, stating that students' teaching, psychological functioning, and learning must be compatible with the educational system. Therefore, character education is viewed as a crucial instrument for acquiring and developing abilities necessary for students' academic success (Suprani & Hendracipta, 2019).

Later, scholars suggested that pupils are taught to shape their character through character education. With the aid of such an education, a learner may easily make sensible and moral decisions. Culture, traditions, and religion are among the traits of pupils that impress society. A student should acquire a deep connection to these principles, although his or her religious background, ethnicity, and culture may differ from those of other students. Therefore, the learner must be able to accept these characteristics in others. Researchers have identified three character indicators: moral action, moral emotion, and moral knowledge (Samani et al., 2018).

Researchers have noted in the literature that moral knowledge should be taught to pupils because it is a crucial attribute. It comprises six components: self-awareness, decision-making, moral reasoning, perspective-taking, understanding moral ideals, and awareness. In addition, teachers of moral feelings must foster the formation of moral feelings in their students. A person's moral feelings are contingent upon six principles: humility, self-control, loving the good, empathy, self-esteem, and awareness. In the end, moral action is the application of moral knowledge and feelings to actual actions. There are two morally significant primary characters. To comprehend a person's moral character, one must comprehend the three characteristics: habit, will, and competence. Researchers have mentioned several values to describe a person's personality. These include tolerance, peace, unity, modesty, kindness, justice, leadership, hard effort, creativity, confidence, cooperation and desire to serve, excellent behavior, wisdom and honesty, responsibility, and independence (Garrigan et al., 2018).

The academic integrity of a student is also affected by their character. Academic integrity demonstrates the student's dedication to courage, accountability, respect, fairness, honesty, and trust. From this perspective, the student's academic behavior or academic character is described as the establishment of a community devoted to learning and sharing particular ideas. For higher education, scholars believe that students and instructors must act in a manner that does not tarnish the institution's reputation. As a result, this reputation influences the pupils' character and improves academic achievement. Overall, it is crucial to comprehend the fundamental ideals of character and academic integrity within the community and society. If pupils adhere to these beliefs, they can enhance their abilities and professional performance (Holden et al., 2021).

Hypothesis Development

Digital technology-based assessment and Student Character

The pupils' character is founded on sincerity, integrity, values, norms, and justice. In addition, academic integrity demonstrates the fundamental qualities of bravery, accountability, respect, fairness, trust, and honesty. The integrity and character of kids can be easily altered with the use of technology. Integrity and honesty play a crucial role in the kids' long-term success. The students' character influences students' career-altering decisions. Lack of intent or knowledge cannot be used as an explanation for character or academic integrity violations. Several studies study the impact of various technologies, tools, methodologies, and tactics on online education and the formation of students' character through academic integrity. According to scholars, decision-makers must focus on the online courses and evaluation system to ensure academic integrity and mold the students' character (Rogerson, 2022).

Regarding the evaluation of assignments and the students' academic integrity, the student's submissions must be unique and their work. In addition, this content is original and must be properly referenced to prevent students from gaining an unfair advantage. Students can compromise academic integrity in various ways, including unlawful use of online courses and computers, misbehavior, falsification, conspiracy, a duplicate submission, collusion, cheating, plagiarism, misrepresentation, and bribery. Using various social networks has made it much simpler for students to exchange answers to their academic duties, assignments, and examinations. Moreover, they are quite capable of cheating. With a computerized assessment system, it is now quite simple for professionals to end such conduct. Consequently, the students' character is favorably affected (Sabrina et al., 2022).

Truthfulness/ Trust and Student Character

Various criteria, including honesty, altruism, and competence, were cited by scholars to define trust. Integrity is the factor that indicates to the trustor that the trustee is adhering to all appropriate principles. On the other hand, integrity demonstrates the student's support for societal ideals, and the student's behavior regularly demonstrates this support. Regarding trust in the instructor, it is assumed that pupils would adhere to classroom regulations. As a result, the instructor will acquire the kids' trust, which will assist in molding their character. It is essential to build confidence inside the academic community so external stakeholders can have faith in scholarly degrees, teaching, and research. Trust in these communities creates an atmosphere in which everyone is treated with respect and fairness. Past research has demonstrated that faith in the educational system plays a crucial part in molding the student's character (Olujuwon et al., 2020).

Previous research has defined integrity as "adherence to moral and ethical values; solid moral character; honesty." Academic communities rely heavily on establishing mutual trust between all parties involved. If there is confidence among the academic environment's stakeholders, the scholars and students will openly share their thoughts. The faculty develops and disseminates rules for evaluating assignments to foster trust between instructors and students. With the aid of trust, faculty members can openly communicate their thoughts with students, which aids in molding the students' character (Muhammad et al., 2020).

Student Character and Academic performance

In the university setting, the student's character plays a crucial part in his or her learning, as it depends on the student's core values, integrity, and honesty. Students' online integrity and character can be safeguarded in multiple ways through the use of technology in online examinations. Consequently, there is a close relationship between students' integrity and character. Some studies compared the academic performance of pupils observed during online tests to those not seen during traditional exams. They noticed that students' academic performance is dramatically impacted when their character is formed via online assessment (Daffin Jr & Jones, 2018). If the student is anxious about upcoming tests, his or her performance may suffer. In addition, if the student uses the Internet to prepare for tests, this will positively impact the student's performance (Ayoub & Aladwan, 2021). H1: DTBM affects SC.

H2: AP affects SC positively.

H3: TR affects SC positively.

H4: SC mediates the relationship between DTBM and AP significantly.

H5L SC mediates the relationship between TR and AP.

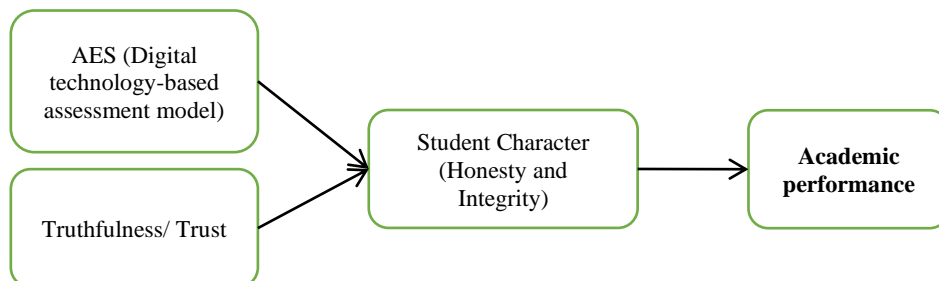


Figure 1: Theoretical Framework

Methodology

The technique used in this study is cross-sectional. By adopting this technique, researchers could collect the data and meet the study's objectives. On the other hand, scholars of this study could collect high-quality, less biased, and accurate data from the respondents (Creswell, 2003).

Sampling and Data Collection

The staff of Indonesian educational institutions was surveyed to acquire the study's data. The information was collected via surveys. Before disseminating the questionnaire to the respondents, the researchers conducted a pilot study to assess the data's readability and dependability (Hess & Singer, 1995). Later, questionnaires were provided to the study's participants. The study's questionnaires were disseminated to respondents using a straightforward random selection technique. According to Researchers, the study must include a minimum of more than 200 participants. With these parameters in mind, we distributed questionnaires to 472 responders (Faculty members). The percentage of usable surveys returned was 61.29 percent. The remaining questions were eliminated due to respondents' insufficient responses to the key portions of part 2 of the questionnaires.

Measurements

The study's questionnaire consisted of two sections. The first section contained general information on respondents and a demographics questionnaire. In contrast, the second section of the questionnaire contained questions about the study's variables.

The study's questionnaires were adapted from previous investigations. The performance items were adapted from [Ayoub and Aladwan \(2021\)](#), the trustworthiness items were adapted from [Jarvenpaa et al. \(1998\)](#), and the academic integrity questions were adapted from [Arslan and Polat \(2016\)](#). The second section of the study's questionnaire utilized a Likert 7 scale. This study utilized the Likert 7 scale to reflect the respondents' real opinions more accurately. On the Likert 7-point scale, 1 indicated "strongly disagree," while 7 indicated that respondents strongly agreed.

Data Analysis

The returned survey was further analyzed using SEM and clever PLS-3.3.9. Consequently, PLS-SEM is used to test the proposed model of the investigation. According to [Hair Jr et al. \(2017\)](#), this method is ideal for exploratory research. In addition, this PLS-SEM affords the chance and facilitates the examination of complex models ([Joseph F Hair et al., 2019](#)). Moreover, [Vinzi et al. \(2010\)](#) stated that no assumptions are necessary regarding the distribution of the PLS-SEM data. It is also a viable alternative to CB-SEM because it addresses the issue of prediction accuracy, models with limited theoretical support, and studies with small sample sizes. It also aids in the study analysis that cannot guarantee the right model definition.

Additionally, scholars have noted several PLS flaws. SEMs reported that if the sample size is small, high-valued structural path coefficients are required, data may be prone to multicollinearity if not handled properly, and it tends to generate mean square errors. Despite these limitations, PLS is beneficial for data processing when there are few participants ([Wong, 2011](#)). Earlier studies have also utilized PLS-SEM ([Henseler et al., 2009](#)). Therefore, PLS-SEM was utilized to predict the link between the proposed model in this investigation.

Before proceeding with the study's analysis, we analyzed the respondents' demographic. The majority of the study's respondents were male (64 percent), between the ages of 21 and 30 (53 percent), and were also married in the majority (67 percent) (47 percent).

Data Analysis

The PLS analysis is based on a two-step procedure. The first phase is referred to as the outer model, while the second is known as the structural model. The data through the outer model (also known as the measurement model) are evaluated by determining the proposed model's reliability and validity. To establish the validity of the data, convergent validity must also be conducted. Scholars have advocated evaluating Cronbach alpha and CR to determine the data's credibility. To verify the data's dependability, it is essential to confirm these two requirements.

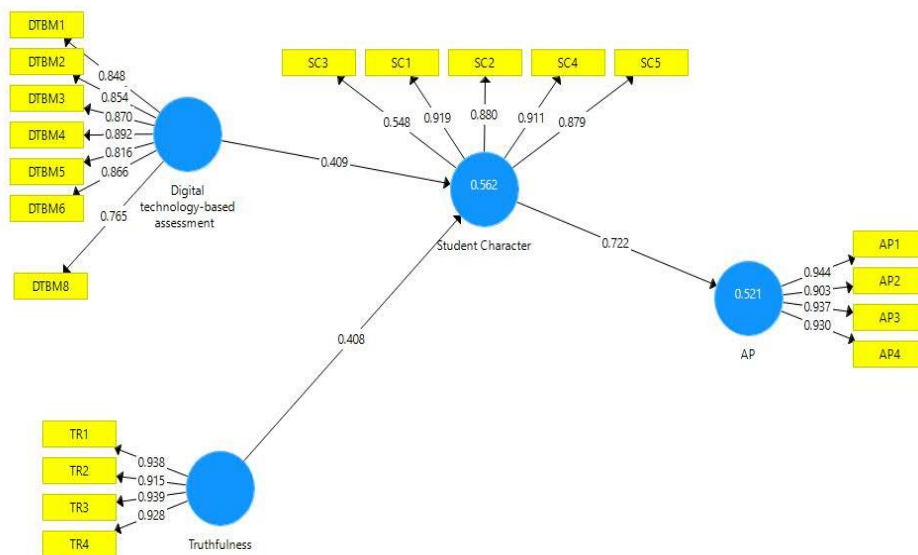


Figure 3: Measurement Model

Note: AP= academic performance, SC= student character, DTBM= AES Digital technology-based assessment model; TR= truthfulness

Before determining the data's dependability, it is essential to assess its multicollinearity. Multicollinearity is a problem that arises when there is considerable intercorrelation among the variables of the research and the data. Multicollinearity is problematic because it influences the interaction between variables. Therefore, VIF was undertaken in this study to ensure no multicollinearity issue with this data (Joe F Hair et al., 2011). According to academics, the VIF score must be less than 5 to demonstrate that there is no multicollinearity issue. According to table 1, all VIF values are less than 5, indicating that the data are suitable for further examination.

Table 1

VIF		
	AP	SC
DTBM		1.885
SC	1.000	
TR		1.887

Note: AP= academic performance, SC= student character, DTBM= AES Digital technology-based assessment model; TR= truthfulness

Moving towards the measurement model of the study, evaluation of factor loading is important. According to Hair Jr et al. (2017), factor loading values must be at least between 0.4 to 0.70. According to values in table 2, all values of factor loading of retained items are more than 0.50. It is evident that all factor loading values of AP are more than 0.90, the factor loading values of DTBM is more than 0.765, SC is more than 0.548, and TR is more than 0.915. Thus, all the items of these variables have acceptable factor loading.

Table 2

Factor loading

	AP	DTBM	SC	TR
AP1	0.944			
AP2	0.903			
AP3	0.937			
AP4	0.930			
DTBM1		0.848		
DTBM2		0.854		
DTBM3		0.870		
DTBM4		0.892		
DTBM5		0.816		
DTBM6		0.866		
DTBM8		0.765		
SC1			0.919	
SC2			0.880	
SC3			0.548	
SC4			0.911	
SC5			0.879	
TR1				0.938
TR2				0.915
TR3				0.939
TR4				0.928

Note: AP= academic performance, SC= student character, DTBM= AES Digital technology-based assessment model; TR= truthfulness

The reliability assessment model is the subsequent phase of the measurement model. As noted, two conditions must be met for this purpose: CR and Cronbach Alpha. According to [Joseph F Hair et al. \(2010\)](#), the minimum acceptable CR and Cronbach Alpha values should be more than 0.70. [Table 3](#) demonstrates that the CR and Cronbach Alpha values are greater than 0.70, proving the data's dependability and validating the questionnaire for analysis.

Table 3

Reliability and Validity

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
AP	0.947	0.961	0.862
DTBM	0.933	0.946	0.714
SC	0.885	0.920	0.704
TR	0.948	0.962	0.865

Note: AP= academic performance, SC= student character, DTBM= AES Digital technology-based assessment model; TR= truthfulness

Evaluation of the extracted average variance is the next step in confirming convergent validity. According to experts, the AVE threshold value exceeds 0.50. In other words, the allowable AVE value exceeds 0.50. [Table 2](#) demonstrates that AVE values exceed 0.70, demonstrating the convergent validity of the data.

We utilized the HTMT & Fornell and Larcker techniques to evaluate discriminant validity as the final phase of the measurement model. It is essential to evaluate discriminant validity to determine the constructs' uniqueness. For discriminant validity, the initial method was the Fornell and Larcker method. According to the method proposed by [Fornell and Larcker \(1981\)](#), the square root of the AVE of each variable on the diagonal must be greater than the remaining constructs. It is obvious from the data in [table 4](#) that discriminant validity has been established, as all diagonal values are greater than the other values.

Table 4

Fornell and Larcker

	AP	DTBM	SC	TR
AP	0.928			
DTBM	0.605	0.845		
SC	0.722	0.688	0.839	
TR	0.676	0.686	0.698	0.930

Note: AP= academic performance, SC= student character, DTBM= AES Digital technology-based assessment model; TR= truthfulness

The second method utilized in the present study to evaluate discriminant validity is the HTMT, for which the matrix values must be smaller than 0.85. [Table 5](#)'s values reveal that all the matrix's values are less than 0.85, confirming discriminant validity through HTMT.

Table 5

HTMT

	AP	DTBM	SC	TR
AP				
DTBM	0.642			
SC	0.792	0.758		
TR	0.710	0.727	0.755	

Note: AP= academic performance, SC= student character, DTBM= Digital technology-based assessment model; TR= truthfulness

Following the measurement construction the model comes the evaluation of the structural model. The measurement of the R square is a crucial step in statistically examining the suggested hypothesis. In this study, the bootstrapping method was used for this aim. The data presented in [Table 6](#) represent the statistical outcomes of direct linkages.

Table 6

Direct results

HYP	Path	Beta	SD	T value	P Values	Decision
H1	DTBM -> SC	0.409	0.087	4.698	0.000	Supported
H2	SC -> AP	0.722	0.045	15.954	0.000	Supported
H3	TR -> SC	0.408	0.081	5.008	0.000	Supported

Note: AP= academic performance, SC= student character, DTBM= AES Digital technology-based assessment model; TR= truthfulness

According to the values in the table, it can be observed that SC is directly affected by DTBM. Thus H1 of the study is supported (Beta=0.409, t=4.698). Moreover, H2 of the study is also supported (Beta=0.722, t=15.954), confirming the claim that SC has a significant relationship with AP. At the end of direct relationships, there is a direct and significant relationship between TR and SC (Beta=0.408, t=5.008). Thus H3 of the study is also supported as well.

Table 7

Indirect Results

HYP	Path	Beta	SD	T value	P Values	Decision
H4	DTBM -> SC -> AP	0.295	0.067	4.399	0.000	Supported
H5	TR -> SC -> AP	0.294	0.065	4.502	0.000	Supported

Note: AP= academic performance, SC= student character, DTBM= Digital technology-based assessment model; TR= truthfulness

Next, we examined the statistical findings of indirect relationships of the study proposed earlier. It is evident from table 7 that SC mediates significantly among DTBM and AP (Beta=0.295, t=4.399). Thus H4 of the study is supported as well. In the end, the H5 of the study is also supported as SC mediates the relationship between TR and AP (Beta=0.294, t=4.502).

After confirming the direct and indirect results of the study, the final stage of the structural model is the assessment of the R square. This test is important to examine the effect of predicting variables on the outcome variables. As per the values mentioned in table 7, AP is affected by 52.1%, and SC is affected by 56.2% by the proposed IV's of the study.

Table 7

R square

	Original Sample (O)
AP	0.521
SC	0.562

Note: AP= academic performance, SC= student character

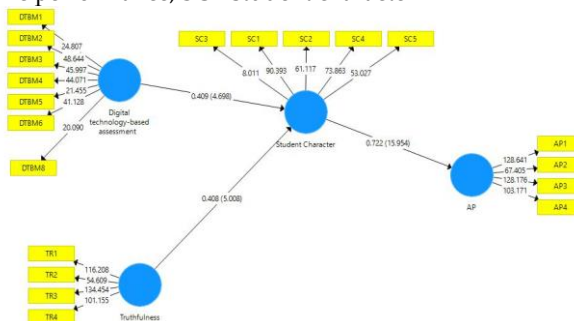


Figure 3: Structural Model

Note: AP= academic performance, SC= student character, DTBM= AES Digital technology-based assessment model; TR= truthfulness

At the end of the analysis, we conducted the study's predictive relevance (Q square). The predictive relevance of the study is established if the value of Q square is non-zero. It can be observed from table 8 that both values of Q square are non-zero. Thus predictive relevancy is established in the present research.

Table 8

Q²(Q square)

	Q²
AP	0.445
SC	0.385

Note: AP= academic performance, SC= student character

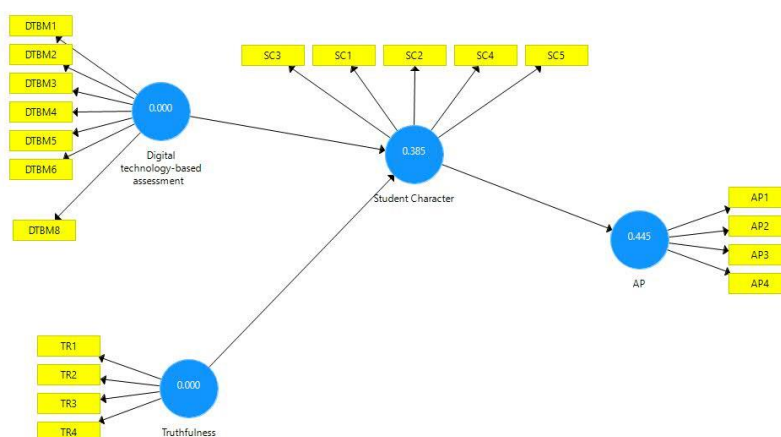


Figure 3: Blindfolding

Note: AP= academic performance, SC= student character, DTBM= AES Digital technology-based assessment model; TR= truthfulness

Discussion

Several historical studies have investigated the variable that can shape character and enhance academic achievement. However, student character remains the primary concern for Indonesian higher education institutions. Therefore, we investigated the impact of trust, AES DTBM, on academic achievement as mediated by student character. The study found that AES DTBM has a considerable and favorable impact on student character. Because the student has access to digital resources that can assist with exam preparation, AES DTBM can effectively and efficiently evaluate students' character. These results are consistent with Rogerson (2022)'s findings. Therefore supporting H1 Furthermore, the study's findings support the argument that student trust in teachers and the institution plays an essential role in molding student character, hence confirming the study's hypothesis (H2). These study findings are comparable to those of (Olujuwon et al., 2020). Possible explanations for such findings include the influence of professors on pupils' values and ethics. If these pupils believe in their teachers, they will mirror their teachers' behavior. These students will behave morally if their instructors do so as well. In addition, trust promotes the development of integrity in terms of student character. These study results also support Hypothesis 2.

Furthermore, the pupils' character significantly impacts their academic achievement. If students are honest and act under societal values, their academic performance will also increase. These findings corroborate Hypothesis 3 and are comparable to Ayoub and Aladwan (2021)'s findings. Additionally, trust has a crucial role in shaping student character, which influences academic success. Thus, statistical evidence demonstrates that the relationship between trust and academic success is mediated by student character, supporting Hypothesis 4. In conclusion, the findings support the claim that student personality mediates the link between DTBM and AP in support of Hypothesis 5.

Conclusion, Limitations, and Recommendations

This study's primary objective was to investigate the relationship between trust and AES DTBM in student character development and academic achievement. In addition, we explored the mediating role of student personality in the context of Indonesian higher education institutions. The outcomes of the study indicate that Indonesian higher education institutions must change the assessment method to shape student character. Artificial intelligence is one of the most important AES kinds. This strategy allows colleges and universities to efficiently evaluate and grade essays using interactive games and similar elements. This type of evaluation system will encourage students' honesty. In addition, educational institutions should cultivate a culture that fosters trust between professors and students. It will also contribute to the development of the student's character. If the student's character is positively molded and nurtured, this will benefit their performance.

The limitations of this study are comparable to those of other empirical investigations. This study examined the role of student character as a mediator. Future research may also investigate the moderating role of culture within the suggested framework. This is because the student's culture influences his or her values and beliefs. In addition, this research is cross-sectional. Future studies can adopt a longitudinal study design. In conclusion, this study is quantitative. Future research should take a mixed-method approach to obtain more precise results.

The present study contributes to both theory and practice. This study addresses the dearth of research examining the impact of DTBM on student character development and academic performance improvement. This study also closes the gap between research examining the moderating role of student personality. In terms of its application to practice, this study provides academic decision-makers with guidance for cultivating student character and enhancing academic success. This report also serves as a reference for the government to establish a strategy to improve the use of technology in student evaluation.

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