Media Richness with Individual and Environmental Characteristics to Enhance Accounting Students' Cognitive Absorption

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***Abstract*—The Merdeka Belajar–Kampus Merdeka (MBKM) program has accelerated digital transformation in Indonesian education, shifting learning from teacher-centered to student-centered approaches supported by emerging technologies. This study investigates how individual characteristics (personal innovativeness and playfulness) and environmental characteristics (compatibility and familiarity), together with media richness, influence cognitive absorption in vocational high school students using e-learning systems. It also examines how cognitive absorption affects belief construction, reflected in perceived usefulness and ease of use of the system. Data from 222 students were analyzed using independent sample t-tests and Partial Least Squares (PLS). Results show that media richness and environmental characteristics enhance cognitive absorption, while familiarity has no significant effect in low-media environments. Higher cognitive absorption strengthens students' beliefs in the e-learning system. These findings suggest that integrating media-rich processes can improve learning engagement and support belief formation in e-learning adoption.**

***Keywords*—e-learning, cognitive absorption, media richness, personal innovativeness, playfulness, compatibility, familiarity, belief construction**

I. Introduction

Research on instructional innovation, especially in the use of learning media for teaching Accounting, is still rarely conducted [1–3]. Some studies have tested the use of learning media for Accounting, but have not specifically examined the influences of its classification, such as videos and text animation [4–6]. Thus, this study investigates a crucial issue in the field of Accounting Education: the usefulness of learning media. Specifically, this study examines students' intentions to use e-learning systems based on Media Richness Theory (MRT) [7], Cognitive Absorption (CA) [8], and the Technology Acceptance Model (TAM) [9]. MRT affirms that media properties, as depicted in the information presentation, support users' understanding [7]. Then, CA describes a state of deep involvement with technology [8]. Finally, TAM suggests that interrelationships among Perceived Usefulness (PU), Perceived Ease of Use (PEoU), and attitude could determine the users' intention to use technology [9].

E-learning systems offer some presentation types using various media such as texts, audio, and video. MRT provides the explanation of the media's capacity in presenting and classifying information based on the development of technology, leading to cognitive fit. Media, equipped with advanced and comprehensive technology, can deliver information at its best. This is then referred to as the types of presentation in learning media. The of presentation chosen affects students' concentration [10]. Moreover, concentration is part of the CA dimensions. Students with high CA have a positive perception towards the usefulness and ease of use in e-learning systems. Based on TAM, an individual is likely to make use of a specific information technology if they have a positive perception of its usefulness and ease of use. In short, the theories above explain the relationship of presentation types, CA, and students' intention to use e-learning systems. However, studies focusing on how different types of learning media influence students' cognitive absorption, particularly in vocational accounting education, remain limited. In practice, students often experience low engagement and shallow cognitive immersion when interacting with e-learning platforms, suggesting that media richness may play a decisive role in enhancing their learning involvement.

This study has novelty value for three main reasons. First, Agarwal and Karahanna [8] examined the effects of an individual's motivational state, which is CA in the construction of TAM. The model did not yet take into consideration individual characteristics, i.e. personal innovativeness and playfulness, and environmental characteristics, i.e. compatibility and familiarity [11]. Accordingly, it further introduces both individual and environmental characteristics. This study also adds the type of presentation as another essential antecedent besides CA, based on MRT. Secondly, before this research, Liu and Liao [10], investigated users' CA by using the flow theory as proposed by Agarwal and Karahanna [8]. This study combines both former models. Thirdly, the phenomena under study happen in Indonesia, an emerging country, which students tend to learn through tutorial systems. In other words, the learning system has not yet entirely oriented to student-centered learning. High school education usually implements learning systems in which the instructors teach the students in a one-way direction.

This study made some assumptions. Firstly, the only material course used was introductory Accounting, in order to avoid bias which may affect the experiment process. Secondly, the curriculum implemented was Curriculum Merdeka Belajar–Kampus Merdeka (MBKM), which is a national standard for all vocational high schools. Thirdly, the research examined the one-way relationship between

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environmental characteristics and users' CA. In other words, it did not discuss the relationship reciprocally. Based on the literature review, environmental characteristics consist of human-computer and human-social interactions with the computer. In brief, both kinds of interactions possibly happen altogether, reciprocally or even one-way. For instance, mandatory use of technology might affect one's perception or habit towards a certain specific system over a long period of time. Thus, this research is limited to the effects of an individual's environmental characteristics on his CA.

The MBKM policy has emerged as a major driver of digital transformation in Indonesian higher education, bridging the gap between academic competencies and industry demands through internship opportunities and off-campus learning programs [12, 13]. Despite this advancement, the implementation of e-learning systems has largely remained conventional and tutorial-based, lacking adaptive and innovative approaches. Recent technological developments, such as Artificial Intelligence (AI), Virtual and Augmented Reality (VR/AR), and gamification, provide significant opportunities for digital pedagogy, enabling more immersive, adaptive, and engaging learning processes [14, 15]. However, the optimal adoption of these innovations is hindered by unequal infrastructure readiness and limited lecturer training across institutions, especially in underdeveloped regions [15]. Therefore, educational transformation in the digital era cannot merely rely on curriculum reform, but must also be supported by comprehensive national strategies for policy execution, infrastructure development, and human resource capacity building [16].

Within the implementation of the *Merdeka Belajar-Kampus Merdeka* (MBKM) curriculum, digital transformation in Indonesian education has been encouraged. Nevertheless, vocational schools remain dominated by conventional, tutorial-based learning, where teachers play a central role in knowledge delivery. This learning pattern constrains students' opportunity to develop self-directed learning and deep cognitive involvement with digital media. Therefore, understanding the cognitive mechanisms that drive students' interaction with learning media under the MBKM context is essential for ensuring the effectiveness of technology-based learning. In short, the implementation of Curriculum MBKM has not been optimal yet. Tutorial-based learning still dominates the learning process. Meanwhile, students are exposed to vast knowledge with demands on them to be able to keep up with advanced technology. Besides, it is believed that the development of technology impacts the practice of Accounting education. It is also important andessential to find out the responses from studies in this field. The development of research in Accounting education shows the importance of effective, integrated technology in the learning processes. The effectiveness can be seen from the use of integrated technology to deliver appropriate information and knowledge, such as e-learning systems.

This study contributes to the literature in several ways. First, it extends the Technology Acceptance Model by integrating cognitive absorption and media richness as mediating mechanisms linking environmental and individual characteristics to students' behavioral intentions. Second, it addresses an empirical gap by examining vocational accounting students in Indonesia, a context where e-learning adoption remains uneven. Finally, it provides practical insights for educators and policymakers to design media-rich learning environments that foster students' cognitive absorption and enhance e-learning engagement.

Based on the explanation, the problem formulation is listed below:

1) Do learning media affect individuals' CA in e-learning systems?
2) Do individual characteristics affect individuals' CA in e-learning systems?
3) Do environmental characteristics affect individuals' CA in e-learning systems?
4) Does CA affect the construction of TAM in e-learning systems?

II. Literature Reviews

Cognitive Absorption (CA) refers to a state in which an individual is deeply and insightfully involved in a subject, particularly technology [8]. Theoretical foundations of CA include absorption theory [17], flow theory [18], and cognitive engagement [19]. CA consists of five dimensions: temporal dissociation, focused immersion, heightened enjoyment, curiosity, and control [8]. Previous studies have demonstrated that higher CA enhances engagement, motivation, and intention to use technology in learning environments [11–25].

Individual characteristics influence CA by affecting how users engage with technology. In this study, the focus is on personal innovativeness and playfulness. Personal innovativeness is the individual's propensity to experiment with new technology without fear of mistakes [20]. Empirical evidence shows that students with higher personal innovativeness demonstrate greater engagement and willingness to adopt new e-learning tools [20]. Playfulness refers to the intrinsic enjoyment and cognitive engagement experienced while using technology [21], which has been linked to deeper CA and positive perceptions of learning media [21].

Environmental characteristics describe the external factors influencing CA, encompassing compatibility and familiarity. Compatibility is the degree to which personal goals align with the features of the technology [11]. Familiarity refers to the knowledge, experience, and time spent interacting with technology [22]. Prior studies indicate that both compatibility and familiarity can facilitate CA by reducing cognitive barriers and promoting seamless interaction with learning systems [22].

Presentation type, operationalized as media richness, represents the classification of learning materials (e.g., text, audio, video) and their capacity to deliver information effectively [10]. Richer media have been shown to enhance concentration, a key dimension of CA, by providing multiple cues that support understanding and engagement [10]. In vocational accounting education, presentation type is critical because it can modulate students' CA, thereby influencing their subsequent perceptions of e-learning systems.

Cognitive Absorption (CA) serves as a key antecedent to the belief constructs of the Technology Acceptance Model (TAM). Specifically, higher levels of CA positively influence

Perceived Usefulness (PU) and Perceived Ease of Use (PEoU), which are the primary variables of TAM, and these in turn affect students' behavioral intention to use e-learning systems [8, 23, 24]. In other words, the TAM variables in this study are conceptualized as consequences of CA, highlighting that students' deep involvement with e-learning technology shapes their beliefs about its usefulness and ease of use. Empirical studies confirm that students who experience high CA perceive the technology as more valuable and easier to use, resulting in stronger intentions to adopt e-learning systems [11, 25].

III. Research Hypotheses

A. Presentation Types and Cognitive Absorption

In addition to individual and environmental characteristics, this study uses presentation type, which is derived from MRT, as an antecedent of CA. This study highlights the functional importance of media richness in Accounting education. Previous studies have found that media richness has a positive effect on group interaction, discussion process, listening ability, the use of learning applications, and mobile learning [26–30]. Effective communication media accompanied by technological developments are helpful for students to improve their intelligence [10]. Presentation type is a form of communication media that could be used to educate students. Previous studies have found that presentation types have a positive effect on students' learning concentration with various media such as text, audio, and video [10, 31–33].

This study argues that the presentation types affect the students in both concentration and engagement because they have various properties that lead to cognitive fit. High media, a combination of multiple media (text-audio-video) presents more understandable information [34], while low media (text only) is monotonic and static. High media can satisfy the individuals' curiosity, so they tend to recognise the information contents profoundly with information technology. Likewise, they spend more time when they use it. Therefore, this study develops the first hypothesis as follows.

H1: Students who are exposed to high media presentations exhibit higher levels of cognitive absorption compared to those who are exposed to low media or no media at all.Individual Characteristics and Cognitive Absorption.

Two of the individual characteristics that are most associated with an individual's CA are personal innovativeness and playfulness. This study uses personal innovativeness to explain the individuals' innate courage to practice new technology without fear of guilt [8]. Jia and Hartke [35] found that personal innovativeness positively affects CA. This research argues that students with high personal innovativeness have the desire to practice new things including e-learning systems. Individuals with high hopes are not concerned about the risk of using the information system because of their curiosity. Then, the students are extremely courageous to involve themselves in using the e-learning system. Therefore, this study develops the hypothesis as follows.

H2: Personal innovativeness has a positive impact on students' cognitive absorption.

On the other hand, playfulness is the next antecedent of users' CA. The individuals' character of playfulness encourages them to act spontaneously on new things [21]. Zhu and Morosan [36] and Chandra [11] found that playfulness had a positive effect on CA. This research argues that students with high playfulness have a pleasant feeling when interacting with information technology. Such feelings increase their spontaneity with the use of various features on the e-learning systems. High inspiration leads the students to be more interactive with the e-learning systems. The high interaction with the e-learning systems increases their involvement. Therefore, this study presents the third hypothesis as follows.

H3: Playfulness has a positive impact on students' cognitive absorption.

B. Environmental Characteristics and Cognitive Absorption

Based on Chandra, Theng [11], two of the environmental characteristics that will be investigated in this study are compatibility and familiarity. Compatibility affects individual involvement in the use of information technology [37]. The higher the individual's compatibility (ideas, beliefs, and user needs) with technology is, the lower the individual's cognitive dissonance of the technology will be. Then, individuals get profoundly involved when they use information technology [11]. Moreover, compatibility has an essential role for users to use information systems technology continually [20]. This research argues that students with high compatibility with e-learning systems always convince themselves that the information systems can support their learning process. Their individual belief further encourages them to have feelings and emotions that the system could be used to acquire knowledge. Thus, individuals tend to be deeply involved when they use information technology. Therefore, this study develops the fourth hypothesis as follows.

H4: Compatibility has a positive impact on students' cognitive absorption.

Familiarity affects users' CA, especially their experience and anxiety when they use information technology [11]. Familiarity enhances users' experience and motivation to use information technology [11]. Such experiences may reduce the emerging threats to use information technology [38]. Users' anxiety is lower when they have high experience. This research argues that students with high familiarity have high experience with the use of e-learning systems. Such experiences encourage an individual's positive attitude and then escalate his intrinsic motivation to use e-learning systems. Therefore, this study develops the fifth hypothesis as follows.

H5: Familiarity has a positive impact on students' cognitive absorption.

C. Cognitive Absorption and Technology Acceptance Model (TAM)

TAM is no longer sufficient to explain users' intentions to use e-learning systems due to the complexity of user roles [10, 39]. Based on these allegations, Liu [10] examined presentation and concentration as external variables of TAM. Liu [10] found that presentation and concentration methods affect the PU, and supported the overall hypothesis significantly in TAM. Furthermore, Agarwal and Karahanna [8] introduced CA as an antecedent factor of

TAM. They found that CA had a positive effect on belief and intention to use technology. These findings indicate that various external constructs still affect TAM. TAM is constructed by the interrelationships between users' CA, PU, and PEoU.

Previous studies have shown that users' CA associates positively with the PU [8, 11, 39, 40]. Theory of self-perception [41] Implies a connection between users' CA and PU. Bem [41] explains that individuals tend to seek additional reasons or justify their actions to rationalise their attitudes and reduce cognitive dissonance. Individuals with high CA spend more time enjoying their engagement process in specific information technologies. Specific information technology could enhance users' usefulness when they are highly engaged [42]. This research argues that students with high CA tend to have positive experiences with e-learning systems. Their experience arises because they have consciously spent more time to use the information systems. Therefore, this study argues for the sixth hypothesis as follows.

H6: Students' perception of usefulness is positively impacted by their cognitive absorption.

Previous studies have shown that users' CA associates positively with their PEoU [8, 11, 40]. This research argues that students with high CA tend to have high experience because they frequently use information technology [40]. It means that individuals' experience could decrease their cognitive burden. The low cognitive burden then decreases their efforts because users do not need more time to use e-learning systems. The low efforts, therefore, indicate that information technology is easy to use [40]. On the other hand, individuals with high experiences tend to have their confidence increased since the information system is easy to use. Users' experience eliminates their doubts about using the e-learning systems, so that they feel free to use it. This discussion leads to the next hypothesis as follows.

H7: Students' cognitive absorption has a positive impact on their perceived ease of use.

D. Technology Acceptance Model (TAM)

TAM describes individuals' behaviour toward their intentions and actual usage of the information systems technology [9, 43]. TAM has two primary belief keys: PU and PEoU [43]. PU describes the magnitude of users' benefits that they could realise [43]. Meanwhile, PEoU describes the users' effort in comprehension [43]. The critical reasoning in TAM is based on the users' cost and benefit paradigm. PEoU represents users' cost, while PU represents users' benefit [40]. Visinescu [40] Also noted that rational users would maximize their profits and minimize their costs when they work and continue to use the information system technology.

Liu [10] found that PEoU affects users' attitude to use e-learning systems. PEoU also positively affects PU through users' attitudes and intentions to use information systems technology [10, 40, 43]. In other words, users' attitude mediates the relationship between their belief and intentions to use the information technology [43, 44]. Liu [10] also found that users' attitude positively affects their intentions to use e-learning systems. To summarise the hypotheses development, this study posits the same logic and critical reasoning with TAM and all previous reviews. Specifically the constructs of individual belief and attitude influence the student's intention to use e-learning systems. Thus, this study formulates TAM hypotheses as follows.

H8: The perceived ease of use has a positive impact on the perceived usefulness of e-learning systems.

H9: The perceived ease of use has a positive influence on students' attitude towards e-learning systems.

H10: The perceived usefulness has a positive effect on students' attitude towards e-learning systems.

H11: The perceived usefulness has a positive impact on students' intention to use e-learning systems.

H12: Students' attitude has a positive influence on their intention to use e-learning systems.

E. Research Model

This study's model illustrates users' intentions to use e-learning systems [10, 11, 40]. This study examines presentation types, individual characteristics, and environmental characteristics as the antecedents of users' CA [8]. Furthermore, this study posits the entire construct and TAM to investigate the model's interrelationship.

This model is a combination of Liu's and Agarwal's models. The relationship between presentation types and CA follows Liu's model that suggests a relationship between learning media and individual states. Besides, this research tests the effect of personal traits on individual CA by following Agarwal's model. In addition, the impact of environmental characteristics on individual CA is tested based on the model of Chandra [11]. The consequences of CA are following the original model of Agarwal. CA is the other external variable of TAM, especially on PU and PEoU. Fig. 1 shows conceptual model.

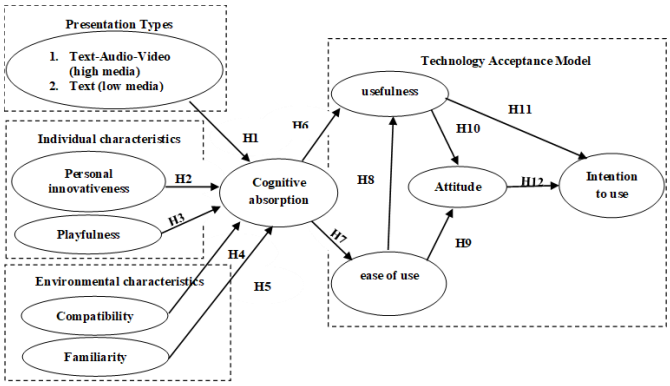


Fig. 1. Research model.

IV. Methodology

A. Participants

This study had employed several participants as required to ensure the data validity along with its conclusion [45]. The participants of this study were vocational high school students majoring in Accounting in Yogyakarta, Indonesia. There are 36 vocational high schools in Yogyakarta. In average, each school has two Accounting classes accommodating 19 to 23 students. The sample of schools in this study were chosen randomly and 4 vocational high schools were finally selected as the samples. 222 participants were chosen randomly by using a lottery system. High school students were eligible to become the research's participants

because they were the daily users of computer-based learning media. Meanwhile, high schools were selected for whether they had computer learning facilities accompanied by an internet network. This study was carried out in an experimental duration that was sufficient for both the instructors and the students to get involved in a teaching and learning process.

B. The Experimental Design

This study employed a controlled experimental design using a post-test-only control group approach. The experiment compared three groups of vocational accounting students with different learning treatments: high media, low media, and control. The control group was used only in the first stage to examine the effects of media on students' Cognitive Absorption (CA) and clarify the baseline compared to groups exposed to electronic media. It is important to note that this study is not a classroom action research; all data were collected via post-test questionnaires rather than direct observation. This research compared three groups with high and low media treatments and also a control group. The control group was only employed in the first stage. It was used to examine the effects of media on students' CA more clearly compared to the other groups which did not use any electronic media. In other words, the control group was intended to clarify effects of media on students' CA. In this experimental study, learning materials used were one of an introductory Accounting subject that had never been taught in class. The materials were different types from e-learning system presentations: texts-audio-video for the high media group and texts only for the low media group. The control group only used textbooks without any electronic media. The equipment used in this study was provided in the computer and internet laboratories. To make the three groups equivalent, they were assigned randomly by using a lottery ticket in which number 1 is for the high media, number 2 is for the low media, and number 3 is for the control group.

Next, the high media group was compared to the low media group to test H2–H12. The purpose of this experiment was to compare the CA response of the two groups after getting treatment, and its relation to the intention of using the e-learning system. The control group was not employed in the test of H2-12 since the hypotheses would like to examine the effects of electronic media. Thus, the control group was considered relevant only to the first hypothesis test. However, after all experiments had been done, all participants would get the explanation of the materials and the media used.

This research used introduction to Accounting as the e-learning system material. This study argued that the use of this material could eliminate difficulty bias [46]. The difference between the various types of presentations can be seen in Figs. 2–4. media. Interactive media represented high media. Low media were represented by only power point presentation media, which were conventional in this learning context. On the other hand, the control group only relied on a textbook for its learning activities, or in other words, there were no electronic media for the students to learn. This experiment was conducted during the schedules of Accounting class. The experiment was also done in the class and computer laboratories as provided by the schools. The rooms were facilitated with proper lighting, fans, and Air Conditioner (AC). The experiment was done in the morning to avoid potential problems such as fatigue, information leakage, and a decrease in the number of participants.

Ethical procedures in this study were carried out by the Ethics Committee standards, and a debriefing method was conducted on all the subjects shortly after the experiment was conducted. This was feasible since the subjects got different treatments so that they had the potential to experience psychological pressure or other losses. Debriefing contains an elaboration of the research objectives and procedures which had been experienced by the subjects. Ethically, the purpose of debriefing was to help the subjects to restore their normal conditions [47]. The subjects were also given the privilege to decide whether they would join the experiment or not.

Fig. 2. High media presentation type.

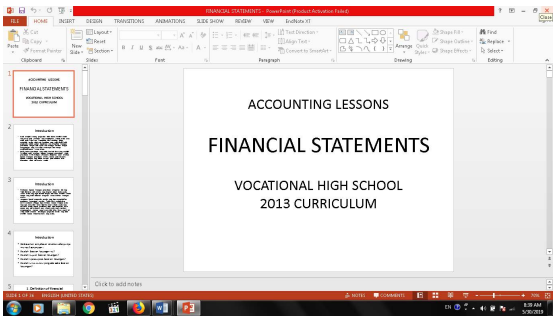


Fig. 3. Low media presentation type.

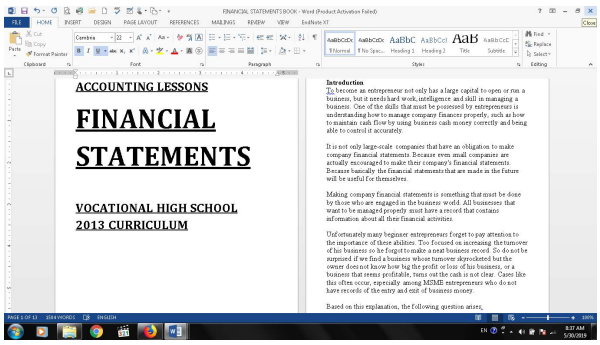


Fig. 4. Control group presentation type.

All of the instrumental media were comparable because they represented the duplicate content and were also used by the teachers in many schools. However, this study argued that in the learning environment in Indonesia, most teachers used a textbook only and sometimes a PowerPoint presentation. Only a few teachers used interactive media for teaching. Therefore, this research discusses the importance of interactive media for learning in Indonesia.

The duration of the learning session for each group was 20–25 min, ensuring sufficient time for participants to engage with the assigned media. The treatments for each group were clearly specified in the experimental procedure: the high

media group used an interactive e-learning system with texts, audio, and video; the low media group used a conventional PowerPoint presentation containing texts only; and the control group relied solely on textbooks without any electronic media. These procedures were detailed step by step in the experimental design to ensure clarity and reproducibility of the treatment effects on students' cognitive absorption.

C. Procedures

In this study, the first procedure involved inviting all participants to attend a seminar held at the same exact location and at the same time. This step ensured that all participants were gathered in one place, allowing the researchers to control attendance and confirm that the required number of participants was achieved without any cancellations. After this initial session, the participants were randomly divided into three groups. Group 1 used an e-learning system with a flash media player presentation (high media), Group 2 used a PowerPoint presentation (low media), and Group 3 was exposed to conventional learning without using any e-learning systems. Subsequently, the participants engaged with the assigned learning systems during the instructional process. Following the learning phase, participants were asked to complete questionnaires measuring individual characteristics, environmental characteristics, Computer Anxiety (CA), and all Technology Acceptance Model (TAM) variables, along with their intentions to use e-learning systems.

Specifically, randomization was conducted using a computer program that randomly assigned participants based on a list of names. Randomization was performed at the individual level, ensuring that each participant had an equal chance of being allocated to either the experimental or control group. The intervention was delivered in a single session for each group, with each session lasting approximately 20–25 min. To maintain instructor consistency, all facilitators and instructors involved in the experiment possessed similar educational backgrounds and comparable experience in guiding participants through the experimental procedures, thereby controlling for potential instructor-related variability. To prevent contamination between groups, the control group was strictly separated from the experimental treatment. Additionally, the study controlled for time and location, ensuring that both experimental and control groups used the same facilities under similar conditions. These measures collectively enhanced the internal validity of the experiment and ensured that observed differences could be attributed to the treatment rather than extraneous factors.

Ethical considerations were strictly followed in this study, as participants included minors. Parental consent was obtained in writing from the parents or legal guardians of all participants prior to their involvement in the research. The study protocol was reviewed and approved by the Institutional Review Board (IRB) / Ethics Committee of Universitas Negeri Yogyakarta, Indonesia, ensuring that all procedures complied with ethical standards for research involving minors. To further uphold ethical standards, all participants underwent a debriefing session immediately after the experimental procedure. During debriefing, the purpose of the study, the nature of the treatment, and any questions or concerns from participants were explained and addressed. These measures ensured that the rights, safety, and well-being of all participants were adequately protected throughout the study.

D. Instrument Development

This study developed variable measurements by positing the TAM based on the model of Davis [48] and Liu [10]. Meanwhile, the variable measurement for CA dimensions, personal innovativeness, and playfulness was measured based on Agarwal and Karahanna [8] Model. The last, variable measurement of compatibility was based on the model of Moore and Benbasat [49], and familiarity was measured based on Gefen [50]. All of the variable instruments used a 7-point Likert scale ranging from strongly disagree (1) to agree (7) strongly. Each statement item in this questionnaire had been reviewed by some experts in order to ensure the face and content validity. Moreover, this study also conducted a pilot test.

This study posited all question items from the previously established studies. CA consists of five dimensions, namely, temporal dissociation, focused immersion, heightened enjoyment, curiosity, and control [8]. Temporal dissociation has such dimensions as the feeling that time flies so fast, the need for more time, and lateness. Focused immersion also sets question items regarding feelings of immorality and focus. Then, heightened enjoyment contains comfort, pleasure, and a lack of boredom. The term control is a situation where someone can easily master any technology. Curiosity consists of curiosity and imagination. Personal innovativeness also explains a user's strong desires and pleasure to try [8]. Then, playfulness has such dimensions as voluntary activity, imagination, flexibility, creativity, and fun [8]. Compatibility describes conformity to the task, lifestyle, and purpose of using information technology [49]. Familiarity comprises familiarity with technology and interaction among members [50].

This study posited against all TAM. PEoU conceptualises that users do not spend much effort to understand the information technology systems. PU consists of items of usefulness, productivity, and effectiveness of achievement. Attitude deals with someone's interest towards technology. Finally, intention describes the seriousness and sustainability of technology use.

It is important to note that the data in this study were primarily derived from experimental observations and the evaluation of differences between experimental and control groups using validated measurement instruments. By relying on direct observation and structured assessment rather than solely on self-report questionnaires, the study minimized the risk of Common standard Method Bias (CMB). This approach ensured that the observed effects reflect genuine differences in variables, rather than artefacts of a single data source. Consequently, the internal validity of the experimental findings is strengthened, and the results provide a more accurate representation of the relationships specified in the proposed model.

E. Hypotheses Testing

This study tested the first hypothesis using Multivariate Analysis of Variance (MANOVA) and an

independent-sample t-test, which compared users' CA within various types of presentation. The test only showed the relationship between learning media and the individual's CA. It explained the positive relationship between high press and the individual's CA. Furthermore, this study examined the causal relationship of high press and low media models using Partial Least Square (PLS). The researcher chose PLS because it can be used to and analyse small samples, support reflective and formative constructs, and predict the goodness of fit model by assuming normal distributions of residual errors [11, 51].

V. Results and Discussion

A. Participants' Characteristics

The research participants were 222 Grade X vocational high school students majoring in Accounting from four vocational high schools (SMK), namely SMK N 7 Yogyakarta, SMK N 7 Sleman, SMK 17 Sleman, and SMK Muhammadiyah 1 Kulon Progo. Table 1 shows that the participants consisted of 210 female students (94.6%) and 12 male students (5.4%). The majority of them were 15 years old (106 students or 47.7%). The high media, low media, and control groups comprised 75, 75, and 72 participants, respectively. It should be noted that the sample in this study exhibited a high gender imbalance, with 94.6% of participants being female. This imbalance primarily reflects the distribution of students in the relevant field of study in Indonesia, which tends to attract more female students. Nonetheless, the primary focus of this research was on testing the proposed model, rather than achieving population-level generalizability. While generalization of results is important, essential for broader empirical research, such as surveys, this study prioritized internal validity, ensuring that the experimental findings robustly represent the relationships within the proposed model. The gender composition is acknowledged as a limitation and will be considered in future studies, particularly when testing the model on a more gender-balanced population. The data that support the findings of this study are available from the corresponding author upon reasonable request. Table 1 shows the participants' characteristics.

Table 1. Participants' characteristics

No.	Characteristics	Participants	Total	
1	Sex	Male	12	5.40 %
		Female	210	94.60 %
	Total		222	100.00 %
2	Age	14 years old	5	2.30 %
		15 years old	106	47.70 %
		16 years old	96	43.20 %
		17 years old	15	6.80 %
	Total		222	100.00 %

B. Validity and Reliability Analysis

This study confirmed the data validity by using Cronbach's alpha and composite reliability [52]. This study used cut-off values with the loading factor for each item of more than 0.70. Table 2 shows that all question items have values above 0.7, thus all items had high validity. Besides, this study employed composite reliability with cut-off values above 0.70, and the composite reliability values for all constructs met the criteria.

Table 2. Statistical results of reliability and validity tests

Constructs	High Media			Low Media		
	Item	Validity	Reliability	Item	Validity	Reliability
Personal Innovativeness	PI 1	0.896	0.866	PI 1	0.902	0.942
				PI 2	0.871	
				PI 3	0.918	
	PI 4	0.850		PI 4	0.895	
Playfulness	Ply 2	0.948	0.976	Ply 2	0.779	0.841
	Ply 4	0.976		Ply 4	0.738	
	Ply 6	0.969		Ply 5	0.877	
Compatibility	Com 2	0.787	0.818	Com1	0.856	0.881
	Com 3	0.875		Com2	0.798	
				Com3	0.875	
Familiarity	Fam2	0.874	0.878	Fam 1	0.795	0.891
	Fam3	0.869		Fam 2	0.792	
				Fam 3	0.854	
	Fam5	0.774		Fam 4	0.751	
				Fam 5	0.744	
Cognitive Absorption	CO	0.739	0.814	CO	0.734	0.850
	CU	0.794		CU	0.755	
	HE	0.776		FI	0.755	
				HE	0.818	
Perceived ease of use	PeU2	0.831	0.852	PeU 1	0.859	0.882
	PeU3	0.829		PeU 2	0.869	
	PeU4	0.770		PeU 3	0.740	
				PeU 4	0.753	
Perceived usefulness	PU 2	0.829	0.894	PU 2	0.871	0.875
	PU 3	0.905		PU 3	0.908	
	PU 4	0.841		PU 4	0.724	
Attitude	Att 1	0.914	0.903	Att 2	0.940	0.940
	Att 2	0.914		Att 3	0.944	
	Att 3	0.776				
Intention to use	Int 2	0.905	0.892	Int 1	0.910	0.913
	Int 3	0.890		Int 3	0.923	

Note: TD: Temporal dissociation, FI: Focused immersion, HE: Heightened enjoyment, CU: Curiosity, CO: Control. The high media and low media comprised 75 and 75 participants respectively.

C. Hypothesis Testing

This study examined the relationship between presentation types (high media, low media, and control group) and students' CA (temporal dissociation, focused immersion, heightened enjoyment, curiosity, and control) experimentally. H1 states that students with high media presentation types possessed higher CA than those using low media types and those of the control group. Table 3 shows the test results of H1. When compared, the Temporal Dissociation (TD) of students from all groups showed statistically significant differences. The mean scores of high media, low media, and control group on TD dimensions were 5.542, 5.189 and 4.434 respectively. The mean comparison of high media and low media was significant with a t-value of 5.152 at a significance level of 0.01. Similarly, the contrast between the low media and control group was significantly different with a t-value of 5.999 at a significance level of 0.01. In the Focused Immersion (FI) dimension, the mean scores of the high media, low media, and control groups were 5.166, 4.784, and 3.724, respectively. The comparison of these mean scores resulted in t-values of 2.462, 12.601 and 9.989 for the high media, low media, and control groups, respectively. They were all statistically significant at a significance level of 0.01. The mean scores for the the Heightened Enjoyment (HE) dimension in the high media, low media, and control groups were 5.871, 5.605 and 4.421, respectively. The comparison results among the high media, low media, and control groups in HE showed similar significance to that of TD and FI. The mean score of Curiosity (CU) was 5.833 in high media, 5.575 in low media, and 4.572 in the control group. The high media group differed significantly from the low media group with a significance level of 0.05. Meanwhile, the low media group also showed a significant difference from the control group with a significance level of 0.01. The mean scores of high media, low media, and control groups on the Control (CO) dimension were 5.132, 4.969, and 4.341 respectively. The mean comparisons among the high media, low media, and control group resulted in t-value (significant level) of 1.412 (0.10), 6.541 (0.01), and 4.736 (0.01) respectively. All of the statistical results supported H1.

Table 3. Statistical means of presentation types

CA	HM	LM	C	HM Vs. LM		HM Vs. C		LM Vs. C	
				Mean Diff.	t-value	Mean Diff.	t-value	Mean Diff.	t-value
TD	5.542	5.189	4.434	0.353	5.152***	1.108	9.129***	0.755	5.999***
FI	5.166	4.784	3.724	0.382	2.462***	1.442	12.601***	1.060	9.989***
HE	5.871	5.605	4.421	0.266	4.011***	1.450	14.545***	1.184	11.034***
CU	5.833	5.575	4.572	0.258	2.217**	1.261	9.758***	1.003	7.505***
CO	5.132	4.969	4.341	0.162	1.412*	0.791	6.541***	0.629	4.736***

Note: CA: Cognitive Absorption, HM: High Media, LM: low Media, C: Control, TD: Temporal dissociation, FI: Focused immersion, HE: Heightened enjoyment, CU: Curiosity, CO: Control; *, **, *** One-tailed significance at 0.10, 0.05, 0.01 levels, respectively, for predicted effects. The high media, low media, and control groups comprised 75, 75, and 72 participants, respectively.

This study investigated users' intentions to use e-learning systems in two presentation types (high and low media groups). This study excluded the control group from these two models. This study used the control group to investigate H1 only. It employed the Smart PLS-3 to examine high and low media modelsHypotheses test results and structural models show the statistical results for high and low model media models. This study supported all of the H2–H12 that were statistically significant in the low media model, except for H5 high media model, and were so in the low media model, except for H5, which was statistically insignificant.

Table 4. AVE and composite reliability high media

Construct	AVE	Composite Reliability
Personal Innovativeness	0.763	0.866
Playfulness	0.930	0.976
Compatibility	0.692	0.818
Familiarity	0.706	0.878
Cognitive Absorption	0.593	0.814
Perceived Usefulness	0.737	0.894
Perceived Ease of Use	0.657	0.852
Attitude	0.758	0.903
Intention	0.805	0.892

Based on Tables 4 and 5, the results of the Average Variance Extracted (AVE) and Composite Reliability (CR) tests indicate that both the high-media and low-media models meet the requirements for convergent validity and construct reliability. In the high-media group, all AVE values exceed the 0.50 threshold, and CR values are above 0.70, confirming that the indicators consistently represent their respective constructs and demonstrate strong internal consistency. Similarly, in the low-media group, all constructs show satisfactory AVE and CR values, indicating stable and reliable measurement across conditions. Overall, these findings confirm that the measurement model for both groups is valid and reliable, ensuring that the constructs accurately capture students' perceptions and cognitive absorption in different media presentation contexts.

Table 5. AVE and composite reliability low media

Construct	AVE	Composite Reliability
Personal Innovativeness	0.804	0.942
Playfulness	0.640	0.841
Compatibility	0.712	0.881
Familiarity	0.621	0.891
Cognitive Absorption	0.587	0.850
Perceived Usefulness	0.702	0.875
Perceived Ease of Use	0.652	0.882
Attitude	0.887	0.940
Intention	0.840	0.913

Based on Table 6, the comparison of R-squared values for the Intention construct between the high media (0.716) and low media (0.717) conditions indicates that the model demonstrates a strong and consistent explanatory power across both settings. R^2 values above 0.70 generally reflect a high level of goodness of fit in Partial Least Squares-Structural Equation Modeling (PLS-SEM) models, meaning that the predictor variables (such as attitude, perceived usefulness, and perceived ease of use) explain a substantial portion of the variance in the intention to use e-learning systems. The close similarity between the two R^2 values also suggests that the structural model maintains stability and strong predictive validity, despite differences in media richness. Therefore, both the high and low media

presentation models achieve a good model fit, indicating that the relationships among constructs are robust and reliable in explaining users' behavioral intentions toward e-learning adoption.

Table 6. R-square results

Construct	R square high media	R square low media
Cognitive Absorption	0.476	0.296
Perceived Usefulness	0.676	0.515
Perceived Ease of Use	0.437	0.299
Attitude	0.731	0.699
Intention	0.716	0.717

In this study, one-tailed tests were employed due to the predictive nature of the proposed model. The hypotheses were grounded in a strong theoretical foundation and logical reasoning, which clearly indicated the expected direction of the relationships among variables. Therefore, one-tailed tests were deemed appropriate to increase statistical power while testing theoretically justified directional predictions. Regarding potential confounders, such as participants' age and prior experience with technology, previous research has suggested that these factors can influence outcomes in technology acceptance studies. However, in the context of the current study, it was assumed that all student participants had similar exposure to and familiarity with technology from an early age, thereby minimizing variability due to these confounders. Nevertheless, the influence of such factors remains a consideration for future studies, particularly when extending the model to more diverse populations. Table 7 and Figs. 5–6 summarize the structural model and hypothesis testing outcomes. All relationships from H2 to H12 were statistically significant in the low media model, whereas in the high media model only H5 was not supported.

Table 7. Hypotheses test results

Hypothesis		Path linkages	High Media		Low Media	
			β Coeffs.	t-statistics	*β* Coeffs.	t-statistics
H2	(+)	PI→CA	0.266	2.785***	0.428	4.854***
H3	(+)	PLY→CA	0.215	2.633***	0.150	1.336*
H4	(+)	COM→CA	0.350	3.216***	0.300	2.484***
H5	(+)	FAM→CA	0.197	2.262**	−0.089	0.561
H6	(+)	CA→PU	0.293	3.985***	0.327	4.197***
H7	(+)	CA→PEU	0.661	9.557***	0.547	7.198***
H8	(+)	PEU→PU	0.599	8.281***	0.484	7.626***
H9	(+)	PEU→A	0.225	2.343**	0.158	1.905**
H10	(+)	PU→A	0.666	7.851***	0.723	9.546***
H11	(+)	PU→I	0.395	3.084***	0.481	4.309***
H12	(+)	A→I	0.486	3.799***	0.404	3.378***

Note: PI: Personal Innovativeness, PLY: Playfulness, COM: Compatibility, FAM: Familiarity, CA: Cognitive Absorption, PEU: Perceived Ease of Use, PU: Perceived Usefulness, A: Attitude, I: Intention to Use; *, **, *** One-tailed significance at 0.10, 0.05, 0.01 levels, respectively, for predicted effects. The high media and low media comprised 75 and 75 participants respectively.

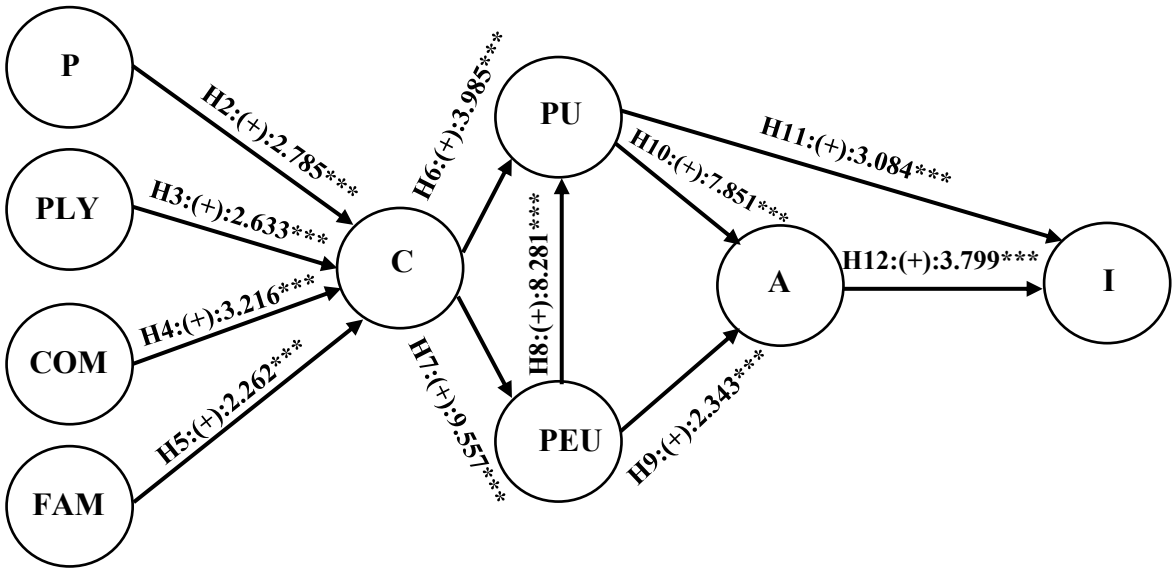
H2 and H3 examined the relationship between individual characteristics and students' Cognitive Absorption (CA). H2 hypothesized that personal innovativeness would positively influence CA. The results confirmed this hypothesis, with a standardized coefficient of $\beta = 0.266$, $t = 2.785$, $p = 0.006$ in the high media model and a standardized $\beta = 0.428$, $t = 4.854$, $p < 0.001$ in the low media model, providing strong support for H2. H3 proposed that playfulness would positively affect CA. In the high media model, the effect was significant (standardized $\beta = 0.215$, $t = 2.633$, $p = 0.009$), whereas in the low media model, the effect was smaller and only marginally significant (standardized $\beta = 0.150$, $t = 1.336$, $p = 0.091$). Consequently, H3 was supported in both media conditions, although the effect was stronger and more substantial in the high media context. Overall, these findings suggest that individual characteristics, particularly personal innovativeness, play a crucial role in enhancing students' CA, consistent with previous studies in this area [8, 11, 36].

H4 and H5 examined the relationship between environmental characteristics and students' Cognitive Absorption (CA). H4 hypothesized that compatibility would positively influence CA in both high and low media models. The results confirmed this hypothesis, with a standardized coefficient of $\beta = 0.350$, $t = 3.216$, $p = 0.001$ in the high media model and a standardized $\beta = 0.300$, $t = 2.484$, $p = 0.007$ in the low media model, both statistically significant at the 0.01 level. H5 proposed that familiarity would positively affect CA. In the high media model, the effect was significantly substantial (standardized $\beta = 0.197$, $t = 2.262$, $p = 0.024$), whereas in the low media model, the effect was not significant (standardized $\beta = -0.089$, $t = 0.561$, $p = 0.287$). These findings suggest that compatibility consistently enhances students' CA, while familiarity does not have a significant effect, possibly because participants were novices with limited engagement in the e-learning system [11].

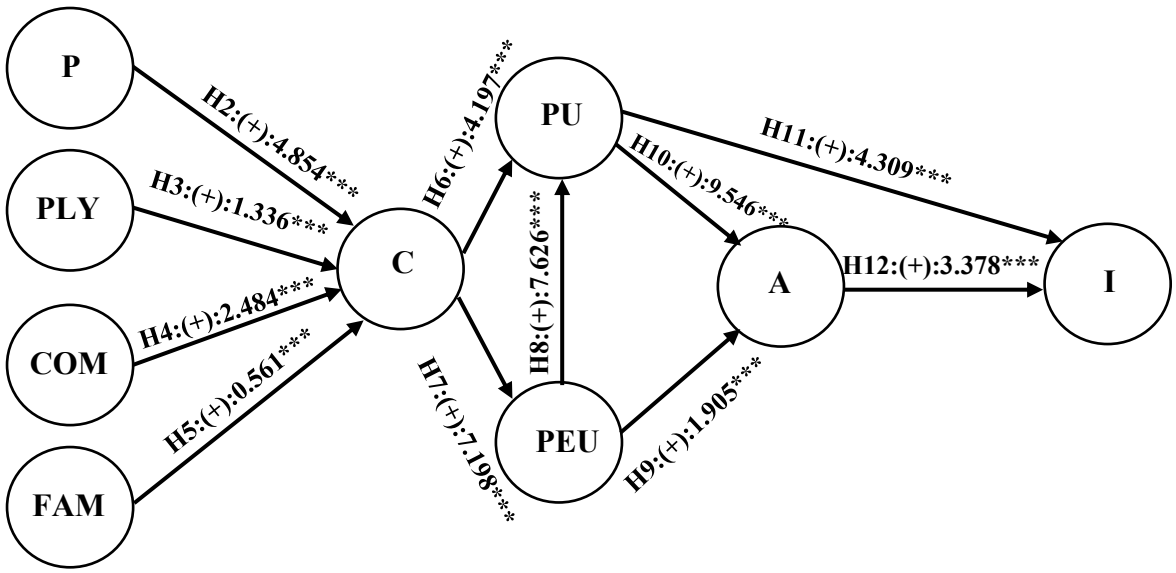
H6 and H7 hypothesized that users' Cognitive Absorption (CA) would positively influence Perceived Usefulness (PU) and Perceived Ease of Use (PEU), respectively. The results confirmed these hypotheses. For H6, the standardized coefficient was $\beta = 0.293$, $t = 3.985$, $p < 0.001$ in the high media model and standardized $\beta = 0.327$, $t = 4.197$, $p < 0.001$ in the low media model, both statistically significant at the 0.01 level. For H7, the high media model showed standardized $\beta = 0.661$, $t = 9.557$, $p < 0.001$, and the low media model showed standardized $\beta = 0.547$, $t = 7.198$, $p < 0.001$, also statistically significant. These findings support H6 and H7, indicating that users' CA positively affects their beliefs about the usefulness and ease of use of the e-learning system, consistent with prior studies [8, 25, 40, 53].

his study further examined two presentation types using the Technology Acceptance Model (TAM). Figs. 5 and 6 show that all TAM-related hypotheses were statistically supported. H8 and H9 hypothesised that Perceived Ease of Use (PEU) would positively influence Perceived Usefulness (PU) and attitude, respectively. In the high media model, the standardised coefficient for PEU affecting PU was $\beta = 0.599$, $t = 8.281$, $p < 0.001$, and for PEU affecting attitude was $\beta = 0.225$, $t = 2.343$, $p = 0.020$. In the low media model, the standardised coefficients were $\beta = 0.484$, $t = 7.626$, $p < 0.001$ for PEU affecting PU, and $\beta = 0.158$, $t = 1.905$, $p = 0.029$ for

PEU affecting attitude. All effects were statistically significant at the 0.01 and 0.05 levels, confirming H8 and H9. H10 and H11 hypothesised that Perceived Usefulness (PU) would positively affect users' attitude and their intention to use e-learning systems. In the high media model, the standardised coefficient for PU affecting attitude was β = 0.666, t = 7.851, p < 0.001, and for PU affecting intention to use was β = 0.395, t = 3.084, p = 0.002. In the low media model, the standardised coefficients were β = 0.723, t = 9.546, p < 0.001 for PU affecting attitude, and β = 0.481, t = 4.309, p < 0.001 for PU affecting intention to use, all statistically significant at the 0.01 level. H12 proposed that users' attitude would positively affect their intention to use e-learning systems. The standardised coefficient between attitude and intention was β = 0.486, t = 3.799, p < 0.001 in the high media model and β = 0.404, t = 3.378, p < 0.001 in the low media model, both significant at the 0.01 level. Overall, these results indicate that both presentation models support users' intention to use e-learning systems.



Note: PI: Personal Innovativeness, PLY: Playfulness, COMP: Compatibility, FAM: Familiarity, CA: Cognitive Absorption, PEU: Perceived Ease of Use, PU: Perceived Usefulness, A: Attitude, I: Intention to Use; *, **, *** One-tailed significance at 0.10, 0.05, 0.01 levels, respectively, for predicted effects.
Fig. 5. The results of the structural model-high media presentation type.



Note: PI: Personal Innovativeness, PLY: Playfulness, COMP: Compatibility, FAM: Familiarity, CA: Cognitive Absorption, PEU: Perceived Ease of Use, PU: Perceived Usefulness, A: Attitude, I: Intention to Use; *, **, *** One-tailed significance at 0.10, 0.05, 0.01 levels, respectively, for predicted effects.
Fig. 6. The results of the structural model-low media presentation type.

D. Research Findings

In general, this study shows that learning media affects one's CA in using e-learning systems in Accounting. The effects are supported by the significant results of the test employing high press, low media and a control group. Additionally, both individual and environmental characteristics also influence users' CA, though environmental characteristics are only influential in the high media group. Furthermore, one's CA has an effect on belief constructs in TAM. Eventually, all hypotheses proposed in TAM are significantly supported. Specifically, this study succeeded in demonstrating that the high media presentations could improve the students' CA in comparison with the lower

media group. Therefore, the learning process in high schools needs to incorporate high media technology techniques.

Although this study employed an experimental design, students' cognitive absorption was measured using post-test questionnaires rather than direct observations. This approach was chosen because CA is a subjective internal state, involving personal engagement and immersion with the learning material, which is challenging to capture through direct observation alone. Questionnaires allowed participants to self-report their levels of focus, enjoyment, curiosity, and control, providing reliable data to assess the cognitive and emotional aspects of CA. Previous studies in e-learning research have similarly used questionnaires to assess CA, demonstrating that self-reported measures effectively capture students' engagement and immersion [8, 11, 36].

However, the results should be interpreted with caution because CA in this study was measured using self-report questionnaires rather than direct or authentic assessments of learning performance. CA is a subjective, internal cognitive-emotional state, encompassing temporal dissociation, focused immersion, enjoyment, curiosity, and sense of control. While questionnaires provide insight into participants' perceptions of engagement, they may not fully reflect actual cognitive behaviors or the depth of learning. Self-perception biases, social desirability, or differing interpretations of questionnaire items could influence students' responses. Therefore, the observed effects of high- and low-media presentations on CA, as well as their impact on Technology Acceptance Model constructs, may capture perceived rather than actual engagement. Moreover, relying solely on self-reported data limits the generalizability of the findings to real learning performance or behavior.

Future research should use performance-based assessments, real-time observations, or physiological measures (e.g., eye tracking, interaction logs) to provide more accurate and objective evaluations of Cognitive Absorption (CA) in e-learning. Subsequent studies could explore diverse and complex learning materials, additional individual traits such as self-regulation and self-efficacy, environmental characteristics in low-media settings, and advanced learning media innovations like Augmented Reality (AR) and Virtual Reality (VR) to enhance generalizability and practical relevance.

Recent phenomena show that the development of technology in learning media has impacted the practice of Accounting education. Students are now exposed to various knowledge through advanced learning media, such as interactive learning media and online learning. Globally, students have more alternatives in the learning process. This also happens in Indonesia, although the use of advanced technology as learning media has not been optimised in its practice.

This attribution process suits the characteristics of Generation Z. Generation Z has automatically been familiar with internet technology. This familiarity undoubtedly affects students' personality and their learning processes. Oh and Reeves [54] Suggest that the learning process should be suitable for the newest generation. This study then implies that the management of high school education and its instructors or teachers should facilitate the learning process with sophisticated media technology. Simultaneously, the management should provide students with the flexibility to access unlimited learning media. Moreover, the management of high school education in Indonesia also needs to upgrade the learning media continuously.

This study supports the findings of Liu and Koufaris [10]. Both studies suggest that high media makes users concentrate on capturing knowledge profoundly. Likewise, high richness media gives users more enjoyment with various learning media. These findings that high media can lead users to perform stronger cognitive engagement [19]. This study confirms and then signifies that flow theory has reasonably explained the role of high media presentation in enhancing users' learning performance [55].

This study found that environmental characteristics were an antecedent factor affecting students' CA. However, this study showed a different result in the relationship between familiarity and students' CA. Familiarity positively affected the students' CA only in the high media, but it did not in the low press. Firstly, this study posited Piaget's theory of cognitive development to explain the difference [56]. The theory suggests that users' experience influences the development of knowledge acquisition [56]. The majority of the students are Generation Z, who grew up with highly developed technology. That technology has been an integral part of their life. This study found that students' familiarity with high richness media presentations was very high. It implies that students' familiarity with high media positively influences their CA, but it does not apply to the case of students with low media exposure. Moreover, high media encourages students' optimism level in relation to educational systems.

Secondly, this study posited the knowledge transformation process, i.e., Socialisation, Externalisation, Combination, and Internalisation (SECI) [57]. SECI's knowledge transformation process was used to explain the differences. This study suggested that students could easily and comprehensively understand when high media was used through SECI. High media could accelerate students' CA in comparison with low media. It means that the high-technology media encourages students to convey knowledge easily. Therefore, this study recommends that the management of high school education facilitate the learning process by providing high-tech media. In other words, the management should extensively encourage Indonesian teachers to advance their knowledge concerning learning media systems.

This study also found that high-technology media played a vital role in the learning process to improve their Accounting knowledge. High media were useful not only to encourage students to master their technological expertise but also to improve their learning convenience. Therefore, the use of high press is the key to success in and enhancing students' intention, and acquiring wider knowledge. Moreover, the Indonesian government should regulate that high school education should use high technology options as learning media.

This study had several limitations. First, the material used in this study was introductory Accounting for vocational high schools. This study argued that more varied and complex materials will affect the choice and the use of learning media. For instance, complex calculations might be effectively

explained through Microsoft Excel, Basic and other accounting software. Secondly, the curriculum of vocational high schools is only applied in Indonesia. Future research may consider the curriculum as an essential factor since it might be implemented differently in other countries. Thirdly, the correlation between environmental characteristics and CA could be re-examined in either one-way or reciprocal directions. Furthermore, the influence of environmental characteristics and factors, especially familiarity on CA, can also be tested in a low media group. Such a test can also be applied to other sample groups who possess a low understanding of technology. Fourthly, this study focused only on individual innovativeness and playfulness as the traits affecting students' CA. Further studies can hypothesise other personality traits: self-regulation and self-efficacy [58]. Next, this study used a single application of e-learning systems in its experimental method. Furthermore, this study suggests that future studies use some applications of e-learning systems. New experimental research methods could use some multi-e-learning systems simultaneously to investigate students' multitasking capabilities associated with their CA [59]. Lastly, further research is warranted to investigate other forms of learning media, including augmented reality and virtual reality, as potential innovations in accounting pedagogy [60]. In addition, this study was conducted within a specific context involving vocational students in Indonesia. This context reflects a unique learning culture in which accounting education tends to attract more female students. Such gender dominance may influence perceptions, attitudes, and behavioural intentions toward e-learning adoption. Nevertheless, this particularity provides valuable direction for future research to explore the influence of vocational learning culture by considering gender dynamics and other contextual variables. Further investigations are encouraged to enhance the generalizability and applicability of the current findings across diverse educational and cultural settings.

VI. Conclusions

This study investigated the impact of instructional media types on the use of e-learning systems. The findings indicate that high-media presentations enhance students' Cognitive Absorption (CA), while individual characteristics (personal innovativeness and playfulness) and environmental characteristics (compatibility and familiarity) support CA. Cognitive absorption, in turn, positively influences students' beliefs and intentions to use e-learning systems. Familiarity alone is insufficient to accelerate CA, though it contributes in high-media contexts. The study extends the understanding of cognitive absorption by highlighting the combined roles of media richness, individual, and environmental characteristics in e-learning adoption.

This study highlights the crucial role of e-learning systems in high school Accounting education. The acceptance of e-learning aligns with individual and environmental characteristics, supporting students' CA. High-tech media are particularly effective in enhancing Accounting learning for Generation Z. Educational providers should prioritize technological learning media, as their integration is essential to improving the quality of Accounting education in Indonesia.

Data Availability

The data supporting the findings of this study are available upon request from the authors.

Ethical Statement

The Ethics Committee of Universitas Negeri Yogyakarta approved this study. Informed consent was obtained from all participants, and their anonymity and confidentiality were strictly maintained throughout the research process.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Muhammad Roy Aziz Haryana: Conceptualization, Formal analysis, Methodology, Project administration, Resources, Supervision, Writing—original draft. Hendri Hermawan: Formal analysis, Software, Validation, Visualization, Writing—review & editing. Rudi Prasetya Timur: Data curation, Formal analysis, Methodology, Software, Validation, Visualization, Writing—review & editing. Rochmat Susanto: Investigation, Visualization, Writing—review & editing. All authors had approved the final version.

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