



## Why Instrument Needs to be Revised? An Experience in Developing Digital Creativity Instrument with The Expert Judgement

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### Abstract

Creativity plays a crucial role in 21st-century learning, particularly in its integration with technology. The fusion of digital technology and creativity forms the emerging domain known as digital creativity. This study aimed to assess the instrument development stages of digital creativity, describe the creative products produced by students, and identify the ranking indicators of digital creativity. The research design involved the development of a digital creativity assessment instrument for accounting students, employing quantitative descriptive research. The research subjects consisted of five experts and 177 accounting students. Data collection techniques included the Panel Expert Judgment and student performance assessments. Data analysis techniques involved Aiken's V and Consistency Reliability using the Inter-Rater Reliability, which employs the Interclass Correlation Coefficient (ICC). The results revealed that digital creativity instrument in this study was adopted and developed from Cropley & Cropley (2008), Guan et al. (2021), Haller et al. (2011) and Canina & Bruno (2021). The value of V and ICC values for the research instrument, focusing on instructions, language use, and content, were accepted with revisions. Similarly, the V and ICC values for the 29 indicators/items assessing digital creativity were accepted with revision. This indicate that the instrument is well-suited for measuring digital creativity, given its strong validity and reliability. Among the digital creativity indicators, the highest and lowest rankings were associated with ethical and sustainable learning and convincingness. The three most frequently used applications by students are Capcut, Canva, and Microsoft PowerPoint.

### How to Cite

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## INTRODUCTION

One of the critical components of 21st-century learning includes creative thinking skills, alongside collaboration, critical thinking, communication, problem-solving, self-direction, and technology fluency (Kotsiou et al., 2022). A crisis in creative thinking has become apparent, as indicated by a decline in creativity thinking scores (Kim, 2011), underscoring the need to nurture creativity in education process (Kaplan, 2019). Creativity has been recognized as a future skill by the Partnership for 21st-century Learning (2019) and is a fundamental aspect of the World Economic Forum's framework (2020). Creative thinking skills are an essential requirement for developing awareness and fostering innovation in the 21st-century, often intertwined with the creation of digital products to enhance creativity (Saprudin et al., 2019).

Creativity can be defined as the ability to identify new possibilities, generate novel idea, adapt flexibly to changing circumstances, and employ one's imagination to address complex challenges (Puccio, 2017). Amabile (1982) stated that individual creativity can be assessed by examining the novelty and utility of the products (ideas) produced. The stages of individual creativity encompass task presentation, preparation for gathering information and resources, generating ideas, validating ideas, and processing results (Amabile, 1982). Many researchers have highlighted the role of technology in fostering student creativity (Aguilar & Turmo, 2019; Grigorenko, 2019). Furthermore, Lee & Chen (2015) identified six categories of digital technology products, including information saving-sharing, digital gaming, digital designing digital writing, robot making, and learning environment which are used to enhance students' creativity. The intersection between digital technology and creativity has given rise to the emerging field of digital creativity, where digital devices are employed for various creative activities (Lee & Chen, 2015). Digital creativity represents the human capacity to produce innovative and

original digital outcomes while strategically harnessing digital technology opportunities (Bruno, 2022).

Digital creativity should be a focal point across all sectors, particularly in education, as it serves as a catalyst for advancing human development. Vocational High Schools specializing in accounting represent a valuable avenue for nurturing students' digital creativity skills, particularly within specific vocations. Generally, accounting has been perceived as a discipline that deals with historical data and information in a black-and-white manner, following to strict rules and often yielding right or wrong answers (Pathways Commission, 2015). The output of accounting has typically taken the form of financial reports traditionally presented in black and white. However, in the 21st century, digital technology has introduced new ways for data communications and the presentation of valuable information for decision-making, creating new opportunities to present and juxtapose additional data and information. Furthermore, accountant are expected to possess critical thinking skills, problems-solving abilities, and significantly, the capacity for creativity and innovation (Birkey & Hausserman, 2019; Powell et al., 2020).

A study on digital creativity assessment literacy has revealed that, in the context of accounting education, assessment of digital creativity output among students remain underdeveloped (Tang et al., 2022). This finding aligns with the prevailing accounting education in Kudus Regency. Accounting teachers and students in Kudus have the potential to have good digital competence because, first, all teachers and students have used gadgets for communicating, searching for information, and learning media. Second, some facilities support digital creativity activities in the school environment. Third, many teachers and students can produce digital content on social media accounts. However, no schools pay attention to students' digital creativity. In practical accounting subjects such as basic accounting, accounting practicum for service, trade, and manufacturing companies, accoun-

ting practicum for government institutions/agencies, and financial accounting and tax administration, teachers continue to rely on traditional paper-based methods to produce accounting cycle output, neglecting the integration of technology. Consequently, there is a pressing need for innovative approaches from accounting teachers to instill digital creativity in students, ensuring that they acquire the competencies for 21st-century learning.

As per the World Economic Forum's 2020 report, it is anticipated that approximately 50% of the global workforce will require reskilling by 2025, driven by a dual disruption resulting from the economic fallout of the pandemic and the increasing global adoption of technology, which is reshaping the nature of work. Zahidi (2020) highlights the growing significance of creativity as one of the most sought-after skills. Consequently, individuals aspiring to enter in the field of accounting, particularly accounting students, must the development of digital creativity skills within accounting to remain competitive in the job market.

Students' digital creativity is manifested through content produced (Janse van Rensburg et al., 2022). According to Tang et al. (2022), one way to measure student creativity is by assessing the output or product created using digital technology. Accounting students can express their digital creativity by generating content in the form of videos, presentations, websites, smartphone applications and social media platforms (Janse van Rensburg et al., 2022). Additionally, digital creativity is analyzed through Unified Theory of Acceptance and Use Technology (Venkatesh et al., 2003), which indicated that digital storytelling (DST) is an effective approach to enhance student creativity (Suki & Suki, 2017). Thus, it can be inferred that content containing storytelling elements can stimulate students' digital creativity. Relevant studies have shown that implementing digital storytelling for accounting students can boost student engagement by integrating various metaphors into a cohesive narrative (Taylor et al., 2018). DST also aids in

developing students' public speaking and creative thinking (Yang et al., 2020), encourages discussion, enhances interaction among students, and cultivates high-level thinking skills and complex problem-solving abilities (Chen et al., 2023). Therefore, in this study, accounting students who create a content featuring storytelling will be referred to as "accounting student digital storytelling" (AS-DST).

AS-DST refers to a product created and designed by accounting students in the form of digital content (e.g., videos, presentations, websites, smartphone applications and social media platforms) aimed at narrating accounting cases and serving as platform for evaluating accounting students' digital creativity. Each individual will choose one of four accounting cases presented by the researcher, each guaranteed to involve higher order thinking skills (HOTS) to stimulate critical thinking skills among students. The instrument development process follows the stages established by Ediyanto et al. (2022), encompassing information gathering, planning, establishing the initial product (e.g., four accounting cases and digital creativity rubric), validating, and feedback or revision stage. After selecting a case, students will work on it by creating digital content, an innovative approach designed to enhance accounting students' digital creativity. The assessment of digital creativity in this research focuses on evaluating student performance, with experts who are experiences teachers (Haller et al., 2011) and researchers (Guan et al., 2021) assessing student creative products.

While several studies have explored methods for measuring digital creativity, none have specifically assessed digital creativity in accounting students through creative products in the form of digital storytelling. Research on digital creativity is typically conducted within realm of arts education such as music and multimedia (Al Hashimi et al., 2019), cinema (Sánchez-Holgado & Arcila-Calderón, 2017), and corporate context (Shao et al., 2022). Therefore, in the context of accounting education (Janse van Rensburg et al., 2022), this study

addresses the development of a digital creativity assessment model using authentic assessment. As a result, this study aims to: (1) provide a literature review and gather information regarding digital creativity while elucidating the necessary product; (2) establish the initial product (instrument for AS-DST); (3) examine the validity and reliability of instrument for AS-DST, containing five criteria and 29 indicators; (4) describe the feedback and revision stage of instrument development; (5) elaborate the creative products produced by students; and (6) identify the ranking of digital creativity indicators based on AS-DST assessments by experts and researchers.

## METHODS

### Research Design

This study adopted a development research to create an instrument for accounting students' digital creativity using quantitative descriptive research methods. This instrument development process consisted of five stages, following the framework proposed by Ediyanto et al. (2022): information gathering, planning, establishment of the initial product (including the creation of four accounting cases and a digital creativity rubric), validating, and feedback or revision stage. This study also involved two analytics tools: Content Validity Index Aiken's V and Consistency Reliability using the Inter-Rater Reliability technique from the Interclass Correlation Coefficient (ICC). Aiken's V was chosen for its ability to measure validity using a polytomous scale, accommodating more than two possible scores (Aiken, 1985). Then ICC, on the other hand, serves as a reliability test for the same variable on a continuous scale, measured by two or more different evaluators or, in other words, two or more experts. Since five experts were selected in this study, the Cohen's Kappa coefficient agreement was not employed; instead, the Inter-Rater Reliability derived from the Interclass Correlation Coefficient was used. This study sought to determine the validity and reliability of the digital creativity assess-

ment instrument, evaluate the digital creativity output generated by accounting students, and rank the digital creativity indicators based on AS-DST assessments conducted by experts and researchers.

### Research Subject

The research subject in this study encompassed five experts who are experts with specialized knowledge in accounting education and educational technology. These experts played dual roles in this study: firstly, in validating the digital creativity assessment instruments for accounting students, which included instructions for creating AS-DST content and accounting cases; and secondly, in validating the 29 indicators/items used for assessing digital. The digital creativity indicators employed in this study were adapted and refined from various sources, including by Cropley & Cropley (2008), Guan et al. (2021), Haller et al. (2011) and Canina & Bruno (2021). Table 1 provides an overview of the criteria used to select experts, ensuring that they possess expertise in academics and practical aspect of accounting education, educational technology, and assessment. Furthermore, accounting teachers with practical experience in the field were also included as practitioners in this group of experts. Additionally, the research subjects involved in generating digital creativity outputs consisted of vocational high school accounting students from three schools, comprising both state and private institutions, totaling 177 students.

Table 2 displays the sample size of accounting students in Kudus. In Kudus, there are only five vocational high schools that offer accounting as a major field of study. Out of these five schools, three were selected based on the following criteria: (1) students in the eleventh grade or twelfth grade (tenth grade was excluded as, at the time the research, students had not yet received any accounting material); (2) students who had received instruction in the fundamental of accounting or financial accounting; and (3) students who

were not presently engaged in on-the-job training. Following these criteria, a total of 177 students were identified and included as research samples.

**Table 2.** Distribution of Accounting Student Sample in Kudus Regency

Type of School	Amount of Student
Public School A	90 students
Private School A	39 students
Private School B	48 students
Σ students	177 students

Source: Processed primary data (2023)

**Data Collection Technique**

This study employed the Panel Expert Judgment process as its primary data col-

lection technique. The procedur for expert judgement, adapted from Sotille (2016) and adjusted to this research, comprised the following steps: (1) selection and confirmation of the activity to be analyzed (the instrument for AS-DST); (2) compilations of a list of digital creativity indicators and accouting HOTS cases; (3) expert selection; (4) eliciting expert ratings; (5) compilation of a report distributed to all experts; (6) expert review and revision; and (7) generation of a second report. The involvement of experts is crucial in assessing the validity and reliability of the developed assessment items for accounting students' digital creativity (Roebianto et al., 2023). Additionally, this study incorporated student performance assessments to gather information regarding the types of applications used by students to create AS-DST and to rank the assessment

**Table 1.** List of Expert Characteristics for Validating of Digital Creativity Assessment Instruments for Accounting Students

Expert	Gender	Occupation/ Affiliation	Courses	Main Goal
Expert 1	Female	Professor/ Department of Economics Education at Universitas Sebelas Maret	Financial management, cost accounting, budgeting, and creativepreneur	Validating the accounting content
Expert 2	Male	Lector/ Department in Educational Technology at Universitas Sebelas Maret	Foundations of educational technology, development of online-based independent learning, design of education and training program systems, performance technology	Validating the instruments of digital creativity
Expert 3	Female	Teacher and Heads of the accounting program at SMK PGRI 2 Kudus	MYOB and Spreadsheet	Validating the instruments of digital creativity
Expert 4	Female	Teacher, Assessor of LSP P3, and accounting teacher at SMK N 1 Kudus	Practical accounting for public sector and Financial accounting	Validating the instruments of digital creativity
Expert 5	Male	Teacher, Heads of the accounting program at SMK PGRI 1 Mejobo Kudus	MYOB and spreadsheet	Validating the instruments of digital creativity

Source: Processed primary data (2023)

indicators of students' digital creativity. The evaluation of student-produced products was conducted by subject matter experts, as a product is deemed creative when experts in the field concur that it possesses creative attributes (Amabile, 1982). Amabile (1982) further elucidated that individual creativity centers on the product (idea) generated by an individual, rendering the use of questionnaires, interviews, or observational techniques unsuitable for assessing students' digital creativity.

**Data Analysis**

*Content Validity Index Aiken's V*

Content validity within this research employed to validate the assessment instrument, which comprises elements related to instructions, language use, and content, as well as the validation of the 29 AS-DST indicators/assessment items used to evaluate the content produced by students as part of AS-DST. After the experts reviewed the instrument, they provided suggestions for enhancements to measure digital creativity. Subsequently, content validity as assessed using Aiken's V index.

Aiken's V index was utilized to evaluate the content validity of the rubric that had been developed for the assessment questions in accounting. This aimed to determine the appropriateness of each item within the rubric. The V coefficient, which ranges from 0 to 1 signifies high content validity for an item or group of items when assessing a single rater (Aiken, 1985). Items with a V coefficient below 0.50 were considered for removal (Aiken, 1985). In this study, which involved five experts and five assessment categories, each item needed to achieve a minimum value of 0.80 (Aiken, 1985). Items failing to meet this minimum requirement were either eliminated or revised (Roebianto et al., 2023). The following is the Aiken's V formula (Aiken, 1985):

$$V = \frac{\sum s}{n(c-1)}$$

$$s = r - lo$$

Description:

V = item validity

s = the lowest score reduces the score set by the expert

lo = lowest validity assessment number (1)

c = highest validity assessment number (5)

r = numbers given by an expert

n = number of experts

*Analysis Interclass Correlation Coefficient (ICC)*

To assess the reliability of the rubric embedded in the digital creativity assessment instrument for accounting students, the Consistency Reliability using the Inter-Rater Reliability technique via the ICC was employed. In this context, the statistical analysis was the analysis of variance (Morrow et al., 2015). ICC serves reliability test of the same variable measured on a continuous scale, involving two or more experts. Given that five experts were selected for this study, the Cohen's Kappa coefficient (commonly used with 2 experts) was not applied. Instead, the Inter-Rater Reliability from the Interclass Correlation Coefficient was utilized. The calculation of ICC values in this study was performed using the SPSS Version 25 application. In the Intraclass Correlation Coefficient table, an Intraclass Correlation column is presented. The Single Measures value is employed when individual ratings constitute the level of observation in the outcome, whereas the Average Measures value is utilized when the level of observation in the outcome represents the average of multiple ratings. Table 3 outlines the statistical criteria for ICC, which consists of four categories. If the ICC values less than 0,40, the reliability is considered poor. In contrast, If the ICC values between 0,75 and 1,00 indicate excellent reliability.

**Table 3.** ICC Statistical Criteria

ICC	Criteria
ICC < 0.40	Poor
0.40 – 0.59	Fair
0.60 – 0.74	Good
0.75 – 1.00	Excellent

Sumber: Cicchetti et al. (2006)

## RESULT AND DISCUSSION

### Information Gathering about Digital Creativity and Planning the Development of The Product

The objective of information gathering is to identify problems, including the identification of gaps and conducting assessments to determine the necessary actions for problem resolution (Ediyanto et al., 2022). In assessing an individual’s digital creativity, Hoffmann et al. (2016) suggested the uses of the Creative Behavior Questionnaire: Digital (CBQD). CBQD consists three scales: the achievement of digital creativity, everyday school-based creativity and digital creativity self-expression. Al Hashimi et al. (2019) applied a combination of measurements from the Torrance Test of Creative Thinking (Torrance, 1979) to measure the digital creativity of multimedia-based art and design education students. This evaluation considered indicators such as originality, flexibility, fluency, elaboration, lateral thinking, and efficiency. Canina & Bruno (2021) proposed four indicators in The Digital Creativity for Developing Digital Maturity (DC4DM) has four indicators: cognitive, digital, cross-functional team, and strategic vision. Moreover, commonly used indicators for assessing creativity through the products created include relevance and effectiveness, generation of novelty, elegance, and genesis

(Cropley & Cropley, 2008; Guan et al., 2021; Haller et al., 2011).

Table 4 presents the criteria employed to assess digital creativity in this study, encompassing relevance and effectiveness, generation of novelty, elegance, genesis, and digital aspects. Relevance and effectiveness pertain to the extent to which the information aligns with established facts and principles. Generation of novelty involves the process of posing problems, integrating new elements into existing knowledge, and generating fresh insights. Elegance considers the aesthetic impacts on five individuals besides oneself. Genesis relates to concepts that extend beyond the immediate context of four.

Drawing previous literature on digital creativity measurement, this study aimed to create instruments for AS-DST. As such, the indicators in Table 4 were chosen due to their suitability for evaluating creative output in the form of AS-DST content generated by accounting students. These indicators were adapted from Cropley & Cropley (2008). Additionally, the digital indicator introduced by Canina & Bruno (2021) was included to address a previously unmeasured component – digital capabilities reflected in a creative product. Table 5 outlines the assessment items, graded on a scale from 1 to 5, with an explanation of each indicator provided in Table 5.

**Table 4.** Digital Creativity Measurement

Criteria	Indicators
Relevance and effectiveness	Correctness, performance, and appropriateness
Generation of novelty	Diagnosis, prescription, prognosis, replication, redefinition, combination, incrementation, reconstruction, redirection, reinitiation, and generation
Elegance	Recognition, convincingness, pleasingness, completedness, and harmoniousness
Genesis	Foundationally, transferability, germinality, seminality
Digital	Data literacy, information literacy, envisioning technology opportunities, ethical and sustainable thinking, digital collaboration, healthy use of technology

Source: Cropley & Cropley (2008) and Canina & Bruno (2021)

**Table 5.** AS-DST Rating Scale

Score	Interpretation
1	The AS-DST produced by students does not match the indicators
2	The AS-DST produced by students is less consistent with the indicators
3	The AS-DST produced by students is entirely consistent with the indicators
4	The AS-DST produced by students is consistent with the indicators
5	The AS-DST produced by students is very consistent with the indicators

Source: Processed primary data (2023)

**Initial product (Instrument for AS-DST)**

The AS-DST assessment instrument comprises two primary components:

1. The assessment instrument: this part includes instructions for addressing accounting questions and cases
2. The AS-DST assessment rubric: this section encompasses five 5 criteria and 29 digital creativity indicators.

The first part of the instrument will undergo validation and reliability testing by experts, evaluating three main assessment aspects: clarity of the instructions (items A1 – A3), the use of appropriate language (items B1 – B5), and the correctness of accounting material (items C1 – C7).

**Table 6.** Validity Test Results of The Instruments of Accounting Students’ Digital Creativity Assessment based on Instructions. Language Use and Content Aspects

No	Aspect	Items	V	Step 1	Step 2	
				Interpretation	V	Interpretation
1	Instruction	A.1	0.85	Remaining	0.95	Remaining
2		A.2	0.80	Remaining	0.95	Remaining
3		A.3	0.80	Remaining	0.80	Remaining
4	Language Use	B.1	0.75	Revised	0.90	Remaining
5		B.2	0.80	Remaining	0.80	Remaining
6		B.3	0.75	Revised	0.80	Remaining
7		B.4	0.80	Remaining	0.90	Remaining
8		B.5	0.85	Remaining	0.85	Remaining
9	The correctness of accounting material (Content)	C.1	0.80	Remaining	0.90	Remaining
10		C.2	0.70	Revised	0.80	Remaining
11		C.3	0.80	Remaining	0.95	Remaining
12		C.4	0.80	Remaining	0.85	Remaining
13		C.5	0.75	Revised	0.80	Remaining
14		C.6	0.75	Revised	0.90	Remaining
15		C.7	0.70	Revised	0.80	Remaining

Source: Processed primary data (2023)



For the second part of instrument, which is the assessment rubric of digital creativity, the initial questionnaire was originally in English and was subsequently translated into Bahasa, the Indonesian language. Throughout the translation process, items were adapted from prior research (Beaton et al., 2000; Setyandari et al., 2019). This translation process was executed by academics proficient in both English and Bahasa to ensure precision and cultural suitability. Then, in the back translation process, the Bahasa version of the questionnaire was re-translated into English. This step was employed to guarantee accuracy and identify any discrepancies or errors that might have occurred during the initial translation process.

**Validating the Instrument for AS-DST**

*Results of Content Validity Test for Accounting Students’ Digital Creativity Assessment Instrument*

Table 6 presents the outcomes of the content validity test conducted on the accounting digital creativity assessment instrument. The assessment is categorized into three aspects: instructions, use of language, and content.

This study employed Aiken’s V content validity index to assess three aspects of the assessment instrument: instructions, language use, and content, following the same methodology as Ulfah et al. (2020). In the Table 6, the results of the content validity index, Aiken’s V, during the initial evaluation of digital creativity assessment instrument, indicated six assessment items were below 0.80 threshold, necessitating revisions. Specifically, in the language usage aspect, item B.1 and item B.3 scored

0.750. In the content aspect, items C.2 (0.70), C5 (0.75), C6 (0.70), and C7 (0.70) yielded values below 0.80. Subsequently, a revision process was initiated for the sections identified by the experts as requiring improvement. The revised content was then resubmitted to the experts for re-evaluation of its sustainability. The results of the second content validation test stage demonstrated that all items within the digital creativity assessment instrument met the validity requirements, surpassing the minimum threshold of 0.80.

In the Table 7, the comprehensive of the digital creativity assessment instrument yields a validity score of 0.86, indicating a high degree of validity. This signifies that the instrument is highly suitable for research purposes.

*Content Validity Test Results of Accounting Students’ Digital Creativity Assessment Indicators/ Items*

Table 8 displays the results of the validity test employing Aiken’s V content validity index for the 29 items/indicators of digital creativity. In initial evaluation, it was observed that seven out of 29 indicators had values falling below the minimum threshold of 0.80. Specifically, the indicators for diagnosis (0.70), prescription (0.70), prognosis (0.75), combination (0.75), reconstruction (0.75), reinitiation (0.75), and generation (0.75) required revisions. Subsequently, the indicators/items with low scores were addressed in line with the recommendations of the experts. After the revisions, the indicators/items were reevaluated for validity, resulting in all 29 digital creativity indicators achieving scores exceeding 0.80.

**Table 7.** Validity Test Results of The Instruments of Accounting Students’ Digital Creativity Assessment based on Instructional Aspects. Use of Language and Content – Overall

Items	Expert					s1	s2	s3	s4	s5	Σs	V	Interpretation
	1	2	3	4	5								
1-19	63	69	68	74	60	48	54	53	59	45	259	0.86	Appropriate

Source: Processed primary data (2023)

**Table 8.** Validity Test Results of Accounting Students' Digital Creativity Indicators/Items

No	Criteria	Indicator/Items	Step 1 (before revision)		Step 2 (after revision)	
			V <sub>1</sub>	Interpretation	V <sub>2</sub>	Interpretation
1	Relevance and effectiveness	Correctness	0.80	Remaining	0.80	Remaining
2		Performance	0.80	Remaining	0.80	Remaining
3		Appropriateness	0.80	Remaining	0.80	Remaining
4	Generation	Diagnosis	0.70	Revised	0.80	Remaining
5		Prescription	0.70	Revised	0.90	Remaining
6		Prognosis	0.75	Revised	0.80	Remaining
7		Replication	0.80	Remaining	0.80	Remaining
8		Redefinition	0.80	Remaining	0.80	Remaining
9		Combination	0.75	Revised	0.80	Remaining
10		Incrementation	0.85	Remaining	0.85	Remaining
11		Reconstruction	0.75	Revised	0.80	Remaining
12		Redirection	0.80	Remaining	0.80	Remaining
13		Reinitation	0.75	Revised	0.80	Remaining
14		Generation	0.75	Revised	0.80	Remaining
15		Elegance	Recognition	0.85	Remaining	0.85
16	Convincingness		0.80	Remaining	0.80	Remaining
17	Pleasingness		0.90	Remaining	0.90	Remaining
18	Completedness		0.90	Remaining	0.90	Remaining
19	Harmoniousness		0.80	Remaining	0.80	Remaining
20	Genesis	Foundationally	0.85	Remaining	0.85	Remaining
21		Transferability	0.90	Remaining	0.90	Remaining
22		Germinality	0.80	Remaining	0.80	Remaining
23		Seminality	0.90	Remaining	0.90	Remaining
24	Digital	Data Literacy	0.95	Remaining	0.95	Remaining
25		Information literacy	0.95	Remaining	0.95	Remaining
26		Envisioning technology opportunities	1.00	Remaining	1.00	Remaining
27		Ethical and sustainable thinking	1.00	Remaining	1.00	Remaining
28		Digital collaboration	1.00	Remaining	1.00	Remaining
29		Healthy use of technology	1.00	Remaining	1.00	Remaining

Source: Processed primary data (2023)

**Table 9.** Results of the Validity Test of Digital Creativity Indicators/Items for Accounting Students – Overall

Items	Expert					s1	s2	s3	s4	s5	Σs	V	Interpretation
	1	2	3	4	5								
1-29	120	126	134	142	122	91	97	105	113	93	499	0.86	Appropriate

Source: Processed primary data (2023)

Table 9 elucidates the comprehensive evaluation of the indicators/items within the digital creativity assessment instrument, all of which demonstrate a validity value exceeding 0,80. This indicates that the indicators/items used to measure accounting students’ digital creativity possess a high degree of validity.

*Results of the Reliability Test of the Digital Creativity Assessment Instruments for Accounting Students: Instructions, Language Use and Content Aspects*

The reliability test of the instruments, which involved the Inter-Rater Reliability correlation coefficient derived from the Interclass Correlation Coefficient, was conducted using the SPSS version 25 application. The assessments were carried out across three aspects: guidance, language usage, and content. The results of this instrument reliability test are provided in Table 10 and Table 11.

**Table 10.** Alpha Coefficient Reliability Value of Digital Creativity Instruments

Reliability Statistics	
Cronbach’s Alpha	N of Items
0.67	5

Source: Processed primary data (2023)

The Inter-Rater Reliability correlation coefficient test results from the Interclass Correlation Coefficient for the digital creativity assessment instrument, comprising three aspects (instructions, language use, and content) in Table 10, indicate an average agreement of 0.67 among experts. This suggests that the instrument enjoys reasonable consensus among the experts. Furthermore, as elucidated in Table 11, the instrument can be regarded as possessing good reliability, with a value falling in the range of 0.60 to 0.74. Additionally, the consistency for each expert is 0.287.

*Results from the Reliability Test of Accounting Students’ Digital Creativity Indicators/Items*

The results of the reliability test employing the Inter-Rater Reliability correlation coefficient based on the Interclass Correlation Coefficient were processed using the SPSS version 25 application. The evaluation encom-

**Table 12.** Alpha Coefficient Reliability Value of Digital Creativity Indicators/Items

Reliability Statistics	
Cronbach’s Alpha	N of Items
0.61	5

Source: Processed primary data (2023)

**Table 11.** Intraclass Correlation Coefficient/ICC (1)

	Intraclass Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.287 <sup>a</sup>	.079	.580	3.018	14	56	.002
Average Measures	.669 <sup>c</sup>	.301	.874	3.018	14	56	.002

Source: Processed primary data (2023)

**Table 13.** Intraclass Correlation Coefficient/ICC (2)

	Intraclass Correlation	95% Confidence Interval		F Test with True Value 0			
		Lower Bound	Upper Bound	Value	df1	df2	Sig
Single Measures	.236 <sup>a</sup>	.088	.436	2.545	28	112	.000
Average Measures	.607 <sup>c</sup>	.325	.795	2.545	28	112	.000

Source: Processed primary data (2023)

passed 29 indicators stemming from five assessment aspects: the relevance and effectiveness aspect, the generation of novelty aspect, the elegance aspect, the genesis aspect, and digital aspect. The following are the results of the instrument reliability test, which are presented in Table 12 and Table 13.

The ICC (2) value, as indicated in Table 13, reveals an average agreement of 0.61 among experts. This suggest that the instrument possess a good reliability, falling within the range of 0.60 – 0.75, in accordance with Cicchetti et al. (2006). Furthermore, the consistency for each expert is 0.236. It's worth noting that reliability values below 0.75 are considered good, as per Reffien et al. (2022). Consequently, the digital creativity assessment instrument for accounting students, involving

creative products in digital storytelling, proves to be a valuable tool for educators to gauge students' creativity, particularly those majoring in accounting. This instrument can also aid educators in nurturing students' skills, as technological proficiency is a crucial skillset for teachers in the modern era (Blegur et al., 2023).

**Feedback and Revision Stage of AS-DST Instrument**

The AS-DST instrument, in its first part, comprises four accounting HOTS cases or questions. Prior to distributing these cases to the students, they were first subjected to expert evaluation for feedback. The outcomes of this feedback and the subsequent revisions are presented in Table 14.

**Table 14.** Results of Revision of The First Part of AS-DST Instrument (Accounting HOTS Cases)

No	Feedback before revision	Revision result after get feedback
1	<p><b>2. Kertahanan Pengawasan</b>                      a) Soal (Kasus-Kasus Akuntansi)                      Siswa di dapat masalah satu kasus dari 5 kasus yang disajikan di bawah ini.</p> <p><b>Kasus 1: Laporan Keuangan</b>                      Gonzales merupakan penjual boneka karakter yang rajin menyusun laporan keuangan. Salah satu laporan keuangan yang disusun adalah laporan laba rugi. Pada Kamis, 1 Juni 2023, Gonzales membeli 700 boneka karakter dengan harga per boneka karakter adalah Rp100.000. Kemudian, pada hari yang sama, Gonzales berhasil menjual 100 boneka karakter dengan harga per boneka karakter Rp100.000. Selama tujuh hari berturut-turut, Gonzales berhasil menjual 100 boneka karakter per harinya. Pada hari ke-7, Gonzales ingin mengetahui berapa laba yang diperoleh dari menjual boneka karakter selama 7 hari.                      Berdasarkan ilustrasi penjualan boneka karakter oleh Gonzales, buatlah video story telling (video cerita) yang memuat per: <i>g</i>. Jawaban tentang:                      a. Model yang dikemukakan Gonzales                      b. Laba hari ke-1, hari ke-2, hari ke-3, hari ke-4, hari ke-5, hari ke-6, dan hari ke-7                      c. Jumlah laba yang terkumpul sampai hari Minggu                      d. Laporan laba rugi Gonzales                      e. Status hari ke-1 dan status di hari ke-7</p>	<p><b>Kasus 1: Laporan Keuangan</b>                      Gonzales merupakan <i>reseller</i> boneka karakter yang rajin menyusun laporan keuangan. Salah satu laporan keuangan yang disusun adalah laporan laba rugi. Pada Kamis, 1 Juni 2023, Gonzales membeli 700 boneka karakter di Shopee dengan harga per boneka sebesar Rp50.000 dan mendapatkan gratis ongkos kirim.                      Pada hari ke-1 (Senin, 5 Juni 2023) Gonzales berhasil menjual 100 boneka karakter dengan harga per boneka karakter adalah Rp100.000. Selama tujuh hari berturut-turut, Gonzales berhasil menjual 100 boneka karakter per harinya. Pada hari ke-7 (Minggu, 11 Juni 2023), Gonzales ingin mengetahui berapa laba yang diperoleh dari menjual boneka karakter selama 7 hari.                      Berdasarkan ilustrasi penjualan boneka karakter oleh Gonzales, buatlah konten digital berupa <b>(pilih salah satu saja)</b>: video <i>story telling</i> (video cerita), komik digital, atau konten digital lainnya yang memuat pembahasan tentang:                      a. Uang yang dikeluarkan Gonzales untuk mendapatkan 700 boneka karakter                      b. Laba kotor dari penjualan boneka karakter hari ke-1, hari ke-2, hari ke-3, hari ke-4, hari ke-5, hari ke-6, dan hari ke-7                      c. Jumlah laba yang terkumpul sampai hari Minggu                      d. Saldo akhir pada akun-akun yang bersangkutan</p>
2	<p><b>Kasus 2: Pencatatan Kas Kecil</b>                      Mr. Hwang berencana mendirikan usaha konveksi baju muslimah. Mr. Hwang membagi pencatatan pengeluaran kas menjadi dua, yaitu kas besar dengan pengeluaran lebih dari Rp1.500.000 dan kas kecil kurang dari Rp1.500.000. Adapun pengeluaran kas kecil untuk pembelian Alat Tulis Kantor, konsumsi pegawai, dan pembayaran listrik dan air. Namun, Mr. Hwang mengalami kesulitan menentukan metode pencatatan kas kecil secara tetap (<i>imprest fund system</i>) atau secara fluktuatif (<i>fluctuative fund system</i>). Lebih lanjut, Mr. Hwang menginginkan adanya informasi kas kecil setiap saat guna mengambil keputusan keuangan. Berdasarkan ilustrasi rencana Mr. Hwang untuk mendirikan usaha konveksi, buatlah video <i>story telling</i> (video cerita) yang memuat pembahasan tentang:                      a. Pentingnya pencatatan kas kecil pada usaha konveksi Mr. Hwang                      b. Metode pencatatan kas kecil yang tepat untuk konveksi Mr. Hwang (<i>imprest fund system</i> atau <i>fluctuative fund system</i>)                      c. Alasan memilih metode yang dipilih (kelebihan dan kekurangan metode yang dipilih)                      d. Contoh transaksi dan pencatatan dari metode yang dipilih</p>	<p><b>Kasus 2: Pencatatan Kas Kecil</b>                      Mr. Hwang berencana mendirikan usaha konveksi baju muslimah. Mr. Hwang membagi pencatatan pengeluaran kas menjadi dua, yaitu kas besar dengan pengeluaran lebih dari Rp1.500.000 dan kas kecil dengan pengeluaran kurang dari Rp1.500.000. Pengeluaran kas kecil dilakukan untuk pembelian Alat Tulis Kantor, konsumsi pegawai, dan pembayaran listrik dan air. Namun, Mr. Hwang mengalami kesulitan untuk menentukan metode pencatatan kas kecil, apakah menggunakan pencatatan secara tetap (<i>imprest fund system</i>) atau secara fluktuatif (<i>fluctuative fund system</i>). Lebih lanjut, Mr. Hwang menginginkan adanya informasi kas kecil setiap saat, guna mengambil keputusan keuangan. Berdasarkan ilustrasi rencana Mr. Hwang untuk mendirikan usaha konveksi, buatlah konten digital berupa <b>(pilih salah satu saja)</b>: video <i>story telling</i> (video cerita), komik digital, atau konten digital bercerita lainnya yang memuat pembahasan tentang:                      a. Pentingnya pencatatan kas kecil pada usaha konveksi Mr. Hwang                      b. Metode pencatatan kas kecil yang tepat untuk konveksi Mr. Hwang (<i>imprest fund system</i> atau <i>fluctuative fund system</i>)                      c. Alasan memilih metode yang dipilih (kelebihan dan kekurangan metode yang dipilih)                      d. Contoh transaksi dan pencatatan dari metode yang dipilih</p>

Source: Processed data (2023)

For second part of AS-DST instrument, the expert also gave feedback and revision for better assessment rubric of digital creativity. After the validation and reliability process

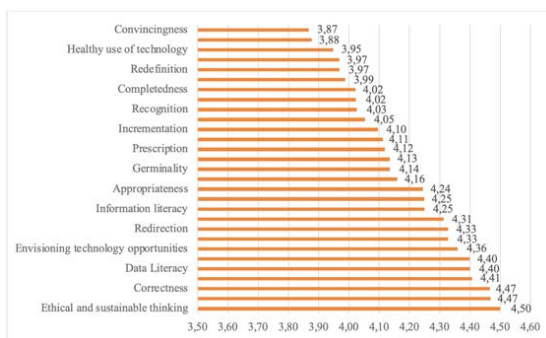
is complete, Table 15 shows the indicators/items suitable to be used as a rubric for measuring accounting students' digital creativity.

**Table 15.** Digital Creativity Indicators After Revision Process with Experts

No	Indicator	Indicator Explanation
Criteria 1: Relevance and effectiveness		
1	Correctness	AS-DST as the product can be a medium to solve the problem accurately
2	Performance	AS-DST successfully explains the chosen accounting method well
3	Appropriateness	Answers in AS-DST are in accordance with applicable accounting policies
Criteria 2: Generation of novelty		
4	Diagnosis	AS-DST can overcome deficiencies in the material presented by teachers
5	Prescription	The steps to resolve the case indicate alternative ways of resolving the case
6	Prognosis	AS-DST shows that the integration of technology in accounting learning will increase students' understanding of accounting
7	Replication	AS-DST can be replicated for other accounting productive subjects
8	Redefinition	AS-DST helps others who view it to choose the suitable method
9	Combination	Students use accounting terms that are officially used in accounting digital storytelling content
10	Incrementation	AS-DST is an extension of existing solutions
11	Reconstruction	The information conveyed is not limited to the material presented by the teacher in the textbook
12	Redirection	AS-DST is the result of adopting existing ideas, which are then developed in the students' way
13	Reinitation	AS-DST is an entirely new concept
14	Generation	AS-DST shows how to solve problems even if they are ineffective
Criteria 3: Elegance		
15	Recognition	People who view AS-DST understand the meaning of the content created
16	Convincingness	People who view AS-DST are confident that the information submitted by students is correct
17	Pleasingness	AS-DST is attractive to look at
18	Completedness	AS-DST is a complete solution to solve the problem
19	Harmoniousness	All elements used to create AS-DST fit together in an internally consistent way

No	Indicator	Indicator Explanation
<b>Criteria 4: Genesis</b>		
20	Foundationally	AS-DST can be used as an option for further development of the problem of resolving accounting cases
21	Transferability	AS-DST indirectly explains the context of the question
22	Germinality	AS-DST shows a new way to solve the problem
23	Seminality	AS-DST attracts the attention of laypeople who previously did not understand accounting
<b>Criteria 5: Digital</b>		
24	Data Literacy	AS-DST shows the ability to collect, generate, process, and analyze several data that help in the decision-making process
25	Information literacy	AS-DST demonstrates the ability to transform data into information that students can use
26	Envisioning technology opportunities	AS-DST shows that students can utilize technology well
27	Ethical and sustainable thinking	AS-DST produced by students has a sustainable impact on the ideas generated by developing them into better content
28	Digital collaboration	Students in creating AS-DST communicate and collaborate effectively through digital channels
29	Healthy use of technology	Students in making AS-DST understand the benefits and dangers of technology on a person's mental and physical health

Source: Adopted and developed from Cropley & Cropley (2008). Guan et al. (2021). Haller et al. (2011) and Canina & Bruno (2021)



**Figure 1.** Expert's Ranking of the indicator of digital creativity through Students' Output (Accounting Student Digital Story Telling)

Figure 1 presents the expert ranking of digital creativity indicators. The indicator that secured the top position, with a weighted average score of 4.5 was "ethical and sustainable thinking", derived from digital criteria. According to the guidelines and toolkit in "Digital Creativity for Developing Digital Maturity

Future" (2017) by Canina & Bruno (2021), the digital creative products (digital storytelling) created by students demonstrate that their content incorporates ideas with ethical and sustainable implications. Individuals who employ digital technology in their daily activities are expected to ensure the well-being of themselves and their community. This indicates that students who use digital content to solve accounting cases showcase ai technology can aid individual students in addressing educational challenges. Furthermore, the digital creativity assessment process, incorporating ethical and sustainable thinking indicators, represent a transformative step in the teaching and learning process aimed at enhancing education quality in support of the United Nations Agenda for Sustainable Development 2030 (Burbules et al., 2020).

On the other hand, the indicator that received the lowest ranking with a weighted average of 3.87 is “convincingness”, which is derived from the elegance criteria (Cropley & Cropley, 2008). “Convincingness,” defined as “people who see a creative digital storytelling product believe that the information conveyed is correct”. Expert assessments indicated that the student’s digital creative product fell within the medium category (3 out of 5), suggesting that the experts had reservations about the narrative presented by the student.

**The Outputs**

AS-DST content created by 177 students was assessed by experts and researchers (Chang & Yu, 2015; Kao et al., 2023; Yang et al., 2020) utilizing 29 indicators from digital creativity (Canina & Bruno, 2021; Cropley & Cropley, 2008). The results obtained include the type of content, application or software used by accounting students and the quantity of applications used by each student.

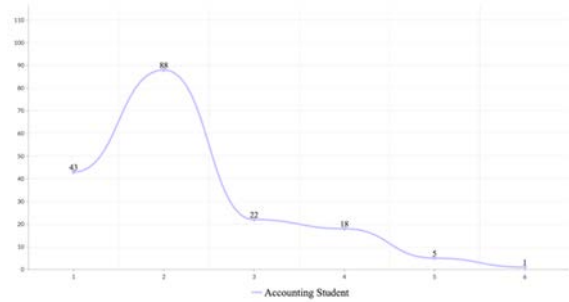
**Table 16.** The Type of Content

The Type of Content	Number of Accounting Student
Presentations	8
Videos:	
Video animation	4
Mixed media	134
Screen recorded video	2
Video interactive	29

Source: Processed primary data (2023)



**Figure 2.** Application or Software Each Accounting Student Used



**Figure 3.** Number of Applications or Software Each Accounting Student Used

The number of outputs presented in Table 16 reveals that students generated 177 AS-DST content items, reflecting the digital creativity of accounting students. The AS-DST creations primarily took the form of presentations and videos, addressing various cases such as financial reports of service companies, petty cash, cash recording and accrual systems, as well as ways to acquire fixed assets that are profitable for entrepreneurs. Among the outputs, presentations (n = 8) were typically developed using tools like PowerPoint and Prezi. Notably, the study observed a substantial number of video outputs, suggesting that students had a positive response to the AS-DST assignment, particularly in the video format (Suhana & Purwadi, 2023). The videos created by students exhibited diversity in their formats, including video animation (n = 4), mixed media presentations (n = 134), screen-recorded videos (n = 2), and interactive videos (n = 29). These videos provided a comprehensive explanation of the content, complemented with sound, background music, moving visuals, and more, to convey more elaborate information compared to presentations alone.

In terms of application, Capcut emerged as the most widely used by accounting students to produce AS-DST content, with 142 students utilizing this platform. The Capcut application serves as a valuable medium that aids in home-based learning and enhances students’ digital creativity (Wulandari, 2023). Its



use is associated with various educational benefits, including improved learning outcomes (Holisah et al., 2023), enhanced students' learning motivation (Matitu & Santiago, 2023), and enrich learning resources (Vergara-Barberán et al., 2023). In summary, Capcut has proven to be a key application for empowering students to create digital creative products.

## CONCLUSION

In the pursuit of digital creativity assessment development, this study has employed a structured approach, encompassing five essential stages of instrument development by Ediyanto et al. (2022): information gathering, planning, establishing the initial product (e.g. four accounting cases and digital creativity rubric), validating, and feedback or revision stage. The digital creativity instrument employed in this study was adapted and developed from Cropley & Cropley (2008), Guan et al. (2021), Haller et al. (2011) and Canina & Bruno (2021). This study rigorously assessed these digital creativity indicators for validity using Aiken's V content validity index, achieving a high V value (minimum 0.80). While all 29 indicators were evaluated, seven of them initially fell below the 0.80 threshold, namely diagnosis (0.70), prescription (0.70), prognosis (0.75), combination (0.75), reconstruction (0.75), reinitiation (0.75), and generation (0.75) necessitating revision. Following expert-guided refinements, these indicators were reassessed for validity, eventually yielding a suite of 29 digital creativity indicators, all surpassing the 0.80 threshold. Furthermore, the study subjected the instrument to a reliability test using ICC, achieving reliability values within the "good" range, reinforcing its robustness. Hence, the instrument is now equipped to measure accounting students' digital creativity effectively, particularly through the creation of digital storytelling content. The study's findings have also unveiled specific indicators, with "ethical and sustainable learning" claiming the top position, and "convincingness" occupying the last rank. Additionally, based

on creative digital storytelling outputs produced by accounting students, the three most frequently used applications are Capcut, Canva, and Microsoft PowerPoint. The research results highlight that, on average, each student employs two applications or software tools to generate digital creative products.

The implications of this research are manifold, with teachers and instructors gaining the capacity to employ student digital creativity instruments to assess digital creativity across various domains, extending beyond accounting. These instruments can be seamlessly integrated into technology-based learning approach, for instance, adopting the heutagogy learning model in conjunction with an authentic assessment model (Janse van Rensburg et al., 2022). Utilizing digital creativity instruments represents a valuable teaching strategy to facilitate 21st-century learning by harnessing the power of technology (Septiana et al., 2023). Importantly, this assessment instrument can bolster students' grasp of the subject matter as it necessitates storytelling skills.

This research does carry some limitations, chiefly that it was conducted within a single district and exclusively within one department at SMK, thus curtailing its generalizability to all vocational school students. Moreover, the study engaged a limited number of experts (five) to evaluate the instrument. For future research, scholars are encouraged to explore digital creativity through a broader spectrum of digital creative products, beyond digital storytelling. Alternative validity and reliability testing methods may also be considered, along with an expansion in the number of experts involved.

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