

# Developing digital creativity through authentic assessment

Cecile Janse van Rensburg , Stephen A. Coetzee\* and Astrid Schmulian  
University of Pretoria, Pretoria, South Africa

\* CONTACT: Stephen Coetzee. Email: stephen.coetzee@up.ac.za

## Abstract

Digital creativity, the use of digital tools and technologies to explore creative ideas and new ways of displaying your ideas, research or work, is emerging as an important competency for graduates across many disciplines. The development of digital creativity competency in domains traditionally perceived as being less creative, including the accounting profession, has yet to be explored. This study reports on the use of an authentic assessment for learning to develop students' digital creativity in an undergraduate competency-based accounting course. It documents the design and development of the assessment and analyses the students' digital creative outputs as well as lived experiences. Although many of the outputs were at a lower level of digital creativity, most of the students appear to have experienced the process positively and gained insight into their course material and need for digital creativity in accounting. The design of the authentic assessment can inform the development of similar assessments in other disciplinary settings.

**Keywords:** Authentic assessment; digital creativity; social constructivism; competency-based education

## Introduction

This study reports on the use of an authentic assessment to develop students' digital creativity in an undergraduate competency-based accounting course. In particular, this study documents the design and development of the assessment and analyses the students' digital creative outputs and their reflections on developing these outputs.

The twenty first century workplace is undergoing significant transformation as a result of the Fourth Industrial Revolution (Gray 2016; Schwab 2016; Tan and Laswad 2018): 'how we communicate with one another, interact with government, purchase goods and services, and consume and create media' is all changing as a result of digital technology (ECDL Foundation 2012, 1). Individuals without the necessary digital competencies risk redundancy (Greene, Yu, and Copeland 2014; Van Laar et al. 2017; Tan and Laswad 2018; Feintzeig 2020). Creativity is another of the most needed competencies in the twenty first century workplace (World Economic Forum 2018). Creativity is the 'ability to see new opportunities, to produce original ideas, to flexibly adapt to changing situations, and to apply one's imagination to solve complex problems' (Puccio 2017).

At the intersection of digital technology and creativity is the emerging domain of digital creativity (Lee and Chen 2015). Digital creativity is the use of 'digital tools and technologies to explore creative ideas and new ways of displaying your ideas, research, or work' (University of York 2019, 1). Digital creativity involves the use of digital technology to open

up new ways of thinking, to create new juxtapositions and ways of communicating data and historical materials (Lee and Chen 2015; University of York 2019). While digital creativity has been explored from the perspective of domains traditionally perceived as creative, such as computer-generated artwork and music and the creative use of blogs and social network sites (Lee and Chen 2015), it has not yet been explored in the accounting domain, that is traditionally perceived as lacking creativity. Integrating the development of students' digital creativity into accounting courses should better prepare these students for the dynamic and fluid twenty first century workplace.

## Digital creativity in accounting

Accountants are expected to be competent critical thinkers and problem-solvers, and to be creative and innovative in their critical thinking and problem solving (Baril et al. 1998; Saemann and Crooker 1999; Lawson et al. 2014; Pinho 2015; Birkey and Hausserman 2019; Powell et al. 2020). Despite these expectations, creativity is not conventionally associated with accounting, as the subject is often labelled as narrow and boring (Mladenovic 2000; Carnegie and Napier 2010; Krom and Williams 2011; Bryant, Stone, and Wier 2011; McGowan 2012, Rossetto and Chapple 2019). Stereotypically, accounting is perceived as the processing of black and white historical data and information according to stringent rules, with right or wrong answers (Pathways Commission 2015). In reality, accountants are, however, expected to exercise judgement in solving complex problems and communicating useful data and information about complex economic events to users of that data (Figure 1) (Pathways Commission 2015).

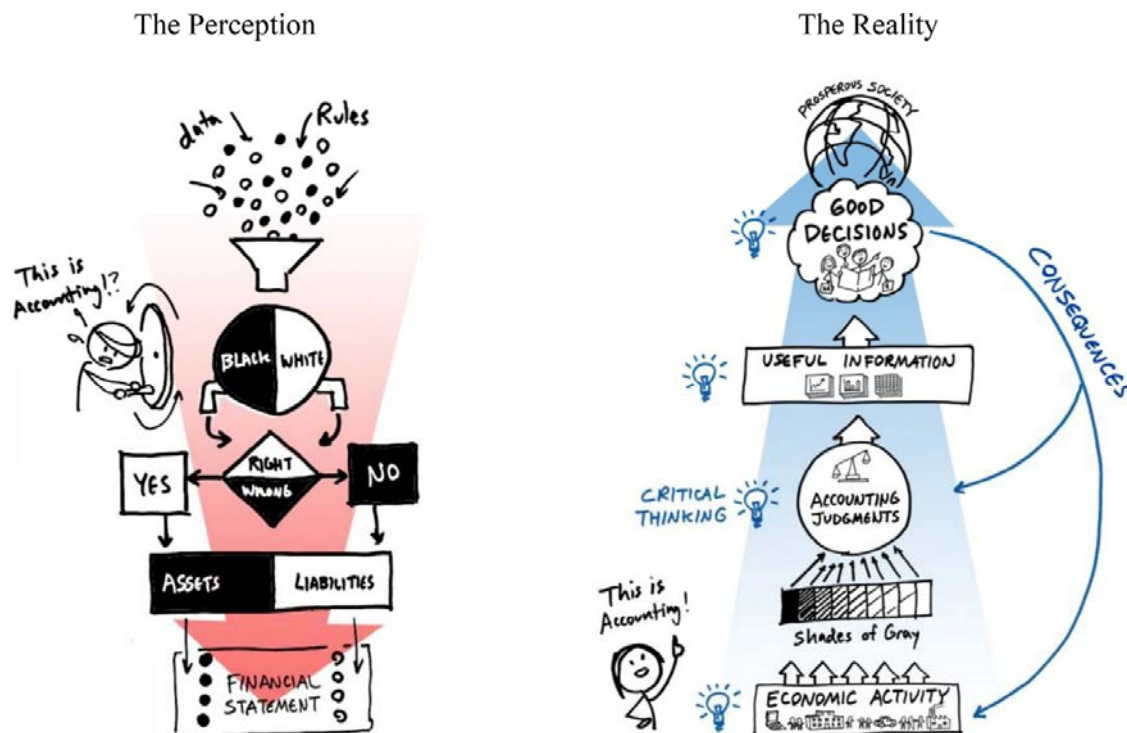


Figure 1. The perception and reality of accounting (Pathways Commission 2015).

The data and information that is communicated by accountants in the form of a company's financial reports is powerful, as it has the potential to impact investing or lending decisions and provide legitimacy to organisations (Hines 1988; Deegan and Unerman 2006). While these financial reports have traditionally been paper-based and presented in black and white, digital technology is opening up new ways of communicating useful data and information for decision making, and creating new opportunities for presenting and juxtaposing additional data and information in ways not previously possible (Figure 2).

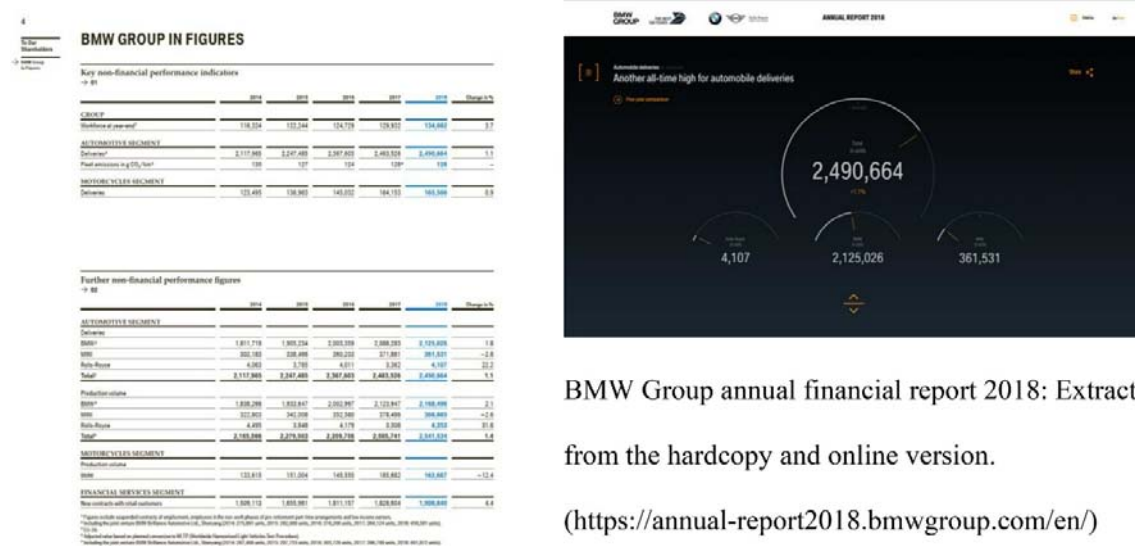


Figure 2. Paper-based versus digital financial reports.

(Source: <https://www.bmwgroup.com/en/investor-relations/financial-reports.html>)

It is, however, submitted that the teaching of accounting, and the related research that informs this teaching, continues to focus on black and white paper-based financial reports, as opposed to more digital creative approaches. This study, therefore, provides a detailed description of the design, development and facilitation of an authentic assessment for learning in a competency-based accounting course, requiring students to be digitally creative in presenting their ideas, research and work and reports on the students' outputs and their lived experiences of the assessment.

### Authentic assessment in competency-based accounting education

Assessment plays an important role in competency-based education (Boud and Falchikov 2006; Osborne, Dunne, and Farrand 2013; Ashford-Rowe, Herrington, and Brown 2014; Harris et al. 2017; Villarrol et al. 2020). Competency-based assessment facilitates learning (Boud and Falchikov 2006; Ashford-Rowe, Herrington, and Brown 2014) and provides certification of achievement to society, as an indicator of being competent to function independently in the real world (Boud and Falchikov 2006). Despite accounting education's transition to competency-based education (Abbasi 2013; Borgonovo, Friedrich, and Wells 2019), it is submitted that assessment in accounting education continues to be characterised by the high stakes summative assessment of knowledge for certification

purposes rather than competency-based assessment (Wilson 2011; Coetzee and Schmulian 2012; Venter and De Villiers 2013). Summative assessments are often isolated from the real world and based on fictitious, and often over-simplified, cases (Boud 2000; Gulikers, Bastiaens, and Kirschner 2006; Siddiq, Gochyyev, and Wilson 2017; Wiewiora and Kowalkiewicz 2019). Consequently, these assessments rarely facilitate learning and the development of graduate competencies and there is, therefore, an urgent need to change the nature of assessment (Boud 1990; Brown 2005; Van Der Vleuten and Schuwirth 2005) from purely summative approaches to competency-based assessments for learning (Schuwirth and Van der Vleuten 2011; Villarroel et al. 2018), incorporating authentic assessment tasks (Cumming and Maxwell 1999; Gulikers, Bastiaens, and Kirschner 2004; Frank et al. 2010; Harris et al. 2010; Ashford-Rowe, Herrington, and Brown 2014; Siddiq, Gochyyev, and Wilson 2017; Powell et al. 2020; Villarroel et al. 2020).

Situated learning theorists (Collins 1988; Lave and Wenger 1991) and constructivists (Vygotsky 1978) both acknowledge that learning and constructing new knowledge and competencies should occur in authentic real-world contexts (Brown, Collins, and Duguid 1989). Authentic assessment tasks represent the constructive alignment of teaching, learning and assessment within the context of the real world and allow students to construct new knowledge and develop the competencies necessary in the workplace (Ashford-Rowe, Herrington, and Brown 2014; Vos 2015; James and Casidy 2018; Farrell 2020; Powell et al. 2020; Sotiriadou et al. 2020). Through engaging with the practical problems, challenges and complexities that students are likely to encounter in the workplace, they can develop the competencies needed for the workplace (Gulikers, Bastiaens, and Kirschner 2006; Gulikers et al. 2008; Adie, Hee, and Wharton 2010; Maxwell 2012; Villarroel et al. 2020) and enhance their employability (Ashford-Rowe, Herrington, and Brown 2014; Villarroel et al. 2018; Wiewiora and Kowalkiewicz 2019).

## **The assessment**

The assessment for learning, designed and developed in this study, is one of many assessments in a 'program of assessments' (Schuwirth and Van der Vleuten 2011) administered throughout an academic year in an accounting course. Given the pressure to prepare students for the high stakes summative professional assessment at the culmination of their studies (Venter and De Villiers 2013), many of the assessments in this accounting course, and those preceding it, remain high stakes, pen-and-paper, summative assessments of learning requiring highly technical and rule-based answers (Coetzee and Schmulian 2012; 2013). However, as summative assessments of learning do not necessarily equip students for all the challenges that they might face in the workplace, an authentic assessment for learning was developed for inclusion in the targeted course's program of assessments.

## ***Learning outcome***

As a first step in the development of the authentic assessment, the learning outcome for this assessment was stated as:

Given a real-world company's publicly available financial information, students will identify and communicate faithfully represented and relevant financial information in respect of that company in a digital creative way to users of that financial information.

Guided by this learning outcome, this assessment required the students to collaboratively research *The Coca-Cola Company* and identify any particular aspects, of interest to them, that would be considered relevant to users of the financial report of the company and that can be faithfully represented. *The Coca-Cola Company* is a well-known and established brand, considered to be sufficiently researchable. The economic events associated with this business are not expected to be distant from the students' frame of reference, as most students will be able to relate to it. The students were then required to synthesise and communicate, to potential users of the company's financial report, the results of their research through a digital creative output. This output should enhance the communication of financial information currently evident on the financial reporting section of the company's website, which is largely text based (Figure 3).

CONDENSED CONSOLIDATED BALANCE SHEETS - USD (\$)		
shares in Millions, \$ in Millions	Jun. 26, 2020	Dec. 31, 2019
Accounts Receivable, Allowance for Credit Loss, Current	\$ 549	\$ 524
Property, Plant, and Equipment, Owned, Accumulated Depreciation	\$ 8,539	\$ 8,083
Common Stock, Par or Stated Value Per Share	\$ 0.25	\$ 0.25
Common Stock, Shares Authorized	11,900	11,900
Common Stock, Shares, Issued	7,040	7,040
Treasury Stock, Shares	2,745	2,760
<b>CURRENT ASSETS</b>		
Cash and cash equivalents	\$ 10,037	\$ 6,480
Short-term investments	7,551	1,467
<b>TOTAL CASH, CASH EQUIVALENTS AND SHORT-TERM INVESTMENTS</b>	<b>17,588</b>	<b>7,947</b>
Marketable Securities	2,228	3,228
Trade accounts receivable, less allowances of \$549 and \$524, respectively	3,849	3,971
Inventories	3,501	3,379
Prepaid expenses and other assets	2,205	1,886
<b>TOTAL CURRENT ASSETS</b>	<b>29,371</b>	<b>20,411</b>
EQUITY METHOD INVESTMENTS	18,189	19,025

**Figure 3.** Extract from the financial reporting section of *The Coca-Cola Company* website.

(Source: <https://investors.coca-colacompany.com/financial-information>)

### ***Design and development of the assessment***

The design and development of the authentic assessment was informed by the eight critical design elements of an authentic assessment, proposed by Ashford-Rowe, Herrington, and Brown (2014) (Table 1). Application of these elements should assist in designing an assessment that demonstrates fidelity and authenticity (Forsyth and Evans 2019).

**Table 1.** Critical design elements of authentic assessment (Ashford-Rowe, Herrington, and Brown 2014).

1. To what extent does the assessment activity challenge the assessed student?
2. Is a performance or product, required as a final assessment outcome?
3. Does the assessment activity require that transfer of learning has occurred, by means of demonstration of skill?
4. Does the assessment activity require that metacognition is demonstrated, by means of a critical reflection, self-assessment or evaluation?
5. Does the assessment require a product or performance that could be recognised as authentic by a client or stakeholder?
6. Is fidelity required in the assessment environment? And the assessment tools (actual or simulated)?
7. Does the assessment activity require discussion and feedback?
8. Does the assessment activity require that students collaborate?

### ***To what extent does the assessment activity challenge the assessed student?***

Challenge is an important factor in the learning process (Hattie 2012). Too great a challenge may demotivate students, while too little challenge may disengage learners (Larmer, Mergendoller, and Boss 2015). Determining the optimal level of challenge for a diverse student cohort is, therefore, difficult and determining this level is a matter of professional judgement for the instructor (Larmer, Mergendoller, and Boss 2015). Several different elements contributed to the challenge of this particular assessment. Firstly, the concept of digital creativity was new to the students and had not been addressed with the students during their preceding formal undergraduate education. Secondly, little structure was provided to the students; for example, the scope of financial information to include in the students' required output was left entirely at the discretion of the students. The students were also not provided with any exemplars with regards to the output required. This allowed the students an opportunity to showcase their own ideas (To and Carless 2016), but did increase the level of challenge. Lastly, given the high stakes individualistic nature of their undergraduate degree programme, collaboration in a team may present a further challenge for the students, as they rarely are exposed to collaborative work (Schmulian and Coetzee 2019).

### ***Is a performance, or product, required as a final assessment outcome?***

Most work done by students at university is confined to notebooks, files or online folders. An authentic assessment provides an opportunity for students to develop a product that could potentially be shared beyond these notebooks, files and folders (Larmer, Mergendoller, and Boss 2015). Students may perceive such an assessment as more authentic and consequential than a graded paper that is simply filed away (Larmer, Mergendoller, and Boss 2015). The students were, therefore, required to develop a digital creative output using any available digital software, applications or solutions that could assist them to potentially present the product of their research to the users of *The Coca-Cola Company's* financial report.

***Does the assessment activity require that transfer of learning has occurred, by means of demonstration of skill?***

An authentic assessment should support the idea that knowledge and skills learnt in one area can be applied within another, often unrelated, area (Ashford-Rowe, Herrington, and Brown 2014). In the instance of this assessment, the students were required to transfer their knowledge of financial reporting, which had to date been applied in presenting black and white paper-based financial reports, to an alternative digital creative medium. Given that this medium is unrelated to the students' course content, the students were referred to the Substitution Augmentation Modification Redefinition (SAMR) model. The SAMR model, represented as a ladder, is a four-level approach to selecting, using and evaluating technology in education (Puentedura 2014; Hamilton, Rosenberg, and Akcaoglu 2016). The purpose of suggesting the SAMR model was to inform and guide the students' technology integration efforts, and to discourage students from submitting a purely digitised output, as opposed to a fully digital creative output – that demonstrates a higher level of digital integration.

***Does the assessment activity require that metacognition is demonstrated, by means of a critical reflection, self-assessment or evaluation?***

Reflection is widely acknowledged as a means to enable students to extend their learning experiences beyond the classroom and is regarded as a critical element of authentic assessment (Ashford-Rowe, Herrington, and Brown 2014). When reflection is applied to an individual's own thinking process, this is referred to as metacognition. In a professional real-world workplace, the ability to reflect, evaluate and self-monitor thoughts and tasks is critical to independent work performance (Ashford-Rowe, Herrington, and Brown 2014). The students were, therefore, encouraged to formally reflect on their individual learning as part of the assessment process, utilising the reflection instrument of Schmulian and Coetzee (2019).

***Does the assessment require a product or performance that could be recognised as authentic by a client or stakeholder?***

Authenticity is a complex concept, but it's generally synonymous with making a learning experience as 'real' as possible (Larmer, Mergendoller, and Boss 2015). Authenticity can be addressed in four thinkable ways, possibly at the same time (Strobel et al. 2013). Firstly, context authenticity requires authentic assessments or activities to resemble real life experiences (Strobel et al. 2013). This assignment included a suspension of reality and required the students to take the role of an accountant responsible for aspects of the financial reporting of *The Coca-Cola Company*. Secondly, task authenticity requires students to make decisions in practical contexts (Strobel et al. 2013), such as those that the students were required to make by the unstructured problem posed to them. Thirdly, the assessment may strive for impact authenticity which requires that the product of the authentic assessment should potentially have an impact on a real-world audience (Strobel et al. 2013),

such as potentially influencing the decisions of users of the financial information presented by *The Coca-Cola Company*. Lastly an authentic assessment may have personal or value authenticity in that the assessment makes the experience authentic on a personal level for the students (Strobel et al. 2013) through, for example, allowing the students to engage with content or a task that is personally valued by them.

***Is fidelity required in the assessment environment? And the assessment tools (actual or simulated)?***

In designing an authentic assessment, the instructor should consider the fidelity of the environment within which the assessment is to occur, as well as the use of any tools that would be considered appropriate to this environment (Ashford-Rowe, Herrington, and Brown 2014). Therefore, to what extent would reality need to be suspended and to what degree would an authentic real-world environment and tools need to be simulated. In reporting actual financial information of *The Coca-Cola Company*, reality is suspended to the extent that students play the role of an accountant for *The Coca-Cola Company*. However, very little simulation was required beyond this, as students were required to use actual financial information of *The Coca-Cola Company* and to present this information in a digital creative manner using universally available digital software and applications.

***Does the assessment activity require discussion and feedback?***

The ability to discuss and give and receive feedback is critical to workplace performance, and should, therefore, be included in an authentic assessment activity (Ashford-Rowe, Herrington, and Brown 2014). Team members represent one of the apparent sources of feedback in student learning teams and peer feedback can enhance teamwork processes (Schmulian and Coetzee 2019), therefore, this assessment was designed to be collaborative with student teams working together to develop the digital creative output. In addition to peer feedback, at the conclusion of the assessment, the instructors provided holistic feedback on the assessment. The digital creative outputs of the highest scoring student teams were showcased, debated and discussed. As part of the instructor feedback, exemplars of digital creative financial reports of current real-world companies were also provided to the students (Figure 4).





Twitter 2018 Annual Report

Kickstarter 2016 Annual Report

(<https://twitter.com/TwitterData/status/1070272742849687553>)

(<https://www.kickstarter.com/year/2016#Welcome>)

**Figure 4.** Exemplars.

***Does the assessment activity require that students collaborate?***

Team assessment places the emphasis on authentic interactions and teamwork and students learning to collaborate (Schmulian and Coetzee 2019), which is an indispensable skill in the modern workplace (Ashford-Rowe, Herrington, and Brown 2014). To encourage authenticity, students were clustered into teams based on their prior academic achievement in the course. Teams were formed by randomly selecting students from these clusters to form teams of approximately five students. Each team included academically stronger and weaker students. Students were not cognisant of how these teams were selected. A numerical sorted list, based on student numbers, was published, indicating the name of each students' team and the respective team members. Each team then had the responsibility to contact each other and arrange for a workable approach to deliver the required digital creative output.

***Time allowed***

In addition to incorporating the eight critical design elements of an authentic assessment (Ashford-Rowe, Herrington, and Brown 2014) in the design and development of this particular authentic assessment, consideration was given to the time allowed for the student teams to complete the required digital creative outputs. The assessment required

the students to follow a process of inquiry to guide their research activities. To allow students the opportunity to develop their digital creativity competency, this process of inquiry should be over a longer, rather than shorter period of time (Larmer, Mergendoller, and Boss 2015). Developing competencies such as problem solving and creativity within a digital environment requires time and involvement. Furthermore, sufficient time is required to allow collaborating teams the opportunity to go through the various developmental phases of forming, storming, norming and performing (Tuckman 1965). The students were given a month to create their teams' digital creative output.

## **The outputs**

The total student cohort ( $N = 493$ ) were clustered into 99 student teams, yielding 99 outputs. These outputs were analysed by the authors, who are the instructors on the course. The authors independently categorised the outputs based on the primary functionality thereof, the level of creativity demonstrated, and the level, in terms of the SAMR model (Table 2), that the chosen functionality enabled the optimal communication of the content in a digital manner. Where outputs combined various functionalities (e.g. websites including links to presentations, presentations including videos etc.), the dominant function was noted. The authors also independently formed a perception of the level of creativity of each output, but this by its nature was a more subjective process. In evaluating the level at which the functionality of the chosen digital platform enabled the optimal communication of the selected content in a digital manner, the authors considered whether the student teams' use of the platform optimised the communication of the content. LinkedIn, for example, supports the communication of content in longer text-based posts with embedded links to external sites, whereas Instagram is more visual in its use of images, panels and stories. Where the student teams' use of their chosen platform merely substituted typed, black and white PDF financial reports, the output was considered at the substitution level. Where the student teams redefined the communication of financial information through optimally using the affordances of their chosen platform, in a way that would have been inconceivable without the use of the functionality of that technology, the output was considered at the redefinition level. The analysis of the outputs was repeated independently at a later point in time. The authors then independently scrutinised and resolved discrepancies between their initial and subsequent analyses. Thereafter the categorisation of the outputs was analysed together, and differences between resolved through discussion.

Most of the student teams attempted to be digitally creative by using digital tools and technologies to display their ideas, research or work. However, when applying the SAMR model to evaluate the level of digital integration in their outputs (Table 2), many of the outputs were at the lowest level of substitution and augmentation ( $n = 49$ ), as the student teams did not optimally embrace the functionality of their chosen digital platforms in modifying ( $n = 46$ ) or redefining ( $n = 4$ ) the communication of financial information. The chosen platforms were often only used as a source to provide links to existing information in PDF format on the website of *The Coca-Cola Company*, with little attempt at optimal use of the platforms' features to achieve modification or redefinition of financial reporting. This

was not unexpected, given that this assessment was the first to challenge the students to be digitally creative.

**Table 2.** Summary of analysis of digital creative outputs.

Functionality of output		Number of student teams (N=99)
Presentations		43
Websites		24
Videos		13
Smartphone applications		8
Social media platforms		6
Other		5
Level of digital integration		Number of student teams (N=99)
<b>Transformation</b>		
Redefinition	Technology allows for the creation of new tasks, previously inconceivable	4
Modification	Technology allows for significant task redesign	46
<b>Enhancement</b>		
Substitution and Augmentation	Technology acts as a direct substitute with no or little functional change or improvement	49
Level of creativity		Number of student teams (N=99)
Output is presented in a conventional manner and merely a repetition of current information on the website.		16
Output is presented in an original and creative manner.		68
Output is presented in a highly creative manner. Demonstrates willingness to be experimental and enhances current information on the website.		15



**Figure 5.** Presentation including hyperlinks and graphs at the modification level.

The majority of the student teams developed **presentations** ( $n = 43$ ), using platforms such as PowerPoint, Prezi, Google Slides or Beautiful.ai, or **websites** ( $n = 24$ ), using platforms such as wixsite.com and weebly.com. The inclusion of audio, links to existing Coca-Cola videos, graphs, summarised tables and/or hyperlinks in the presentations and websites, were considered as either augmentation or modification of information, depending on whether the inclusion enhanced or transformed the existing information of *The Coca-Cola Company*. An example is provided in Figure 5.

The authors' perceptions were that the student teams' attempts at creativity primarily manifested in the visual elements of these outputs as opposed to the manner in which the information was communicated or through the choice or integration of media, applications or other resources. For example, changes in operating cash flows were in one instance illustrated with reference to glasses filled at different levels with Coca-Cola (Figure 6).



**Figure 6.** Website explaining changes in cash flows in a creative manner.

Outputs in the form of **videos** ( $n = 13$ ) were primarily narrated PowerPoint presentations, with existing Coca-Cola videos embedded. The videos were generally recognised as less static than the websites and presentations due to the added sound, voice overs and movement, but the nature and format of financial information included were very similar. Coca-Cola images and backtrack sounds used in these videos provided a creative dimension. An example of a video output at the modification level is provided in Figure 7.



Figure 7. Video output at the modification level.

Eight student teams ( $n = 8$ ) endeavoured to develop a **smartphone application** to present information to users of *The Coca-Cola Company's* financial reports. One of these student teams was successful at developing and publishing a fully functional application (Figure 8). This application incorporated internal and external sources with interactive links to news feeds, analyst presentations and social media sites, resulting in the redefinition of existing financial information relating to *The Coca-Cola Company*. This student team optimally embraced the functionality of a smartphone application.

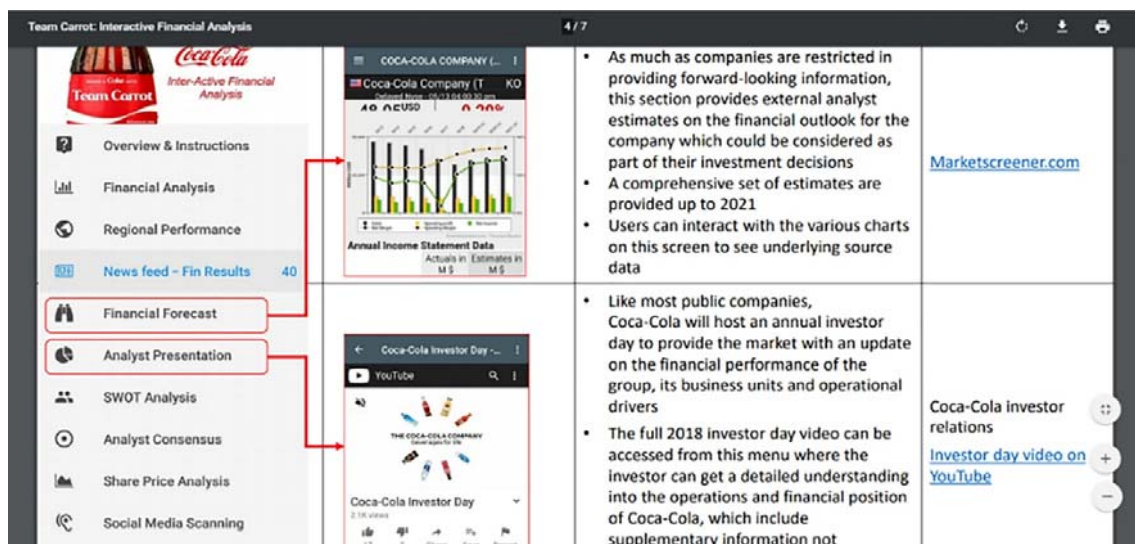


Figure 8. Smartphone application at the redefinition level.

The other student teams ( $n = 7$ ) were unable to publish their smartphone application prototypes given software cost and publishing restrictions for mobile applications, but

demonstrated its intended functionality on either a PowerPoint presentation, video or other source. These applications were mostly creatively designed with links to a variety of other resources.

The student teams that selected **social media platforms** ( $n = 6$ ) to communicate their chosen financial information used Instagram ( $n = 3$ ), blogs ( $n = 2$ ) and Twitter ( $n = 1$ ). The student teams demonstrated creativity in their willingness to be experimental with modern and popular forms of social media communication, thereby enhancing the presentation and reach of current financial information. The level of digital integration of these outputs were a mix between the modification and redefinition levels. When the functionality of the selected platform, e.g. Instagram’s stories functionality, was not optimally embraced, the level of digital integration was deemed to be at the modification level (Figure 9), as opposed to instances where the student teams optimally embraced the functionality of the platform, resulting in the redefinition of information (Figure 10).

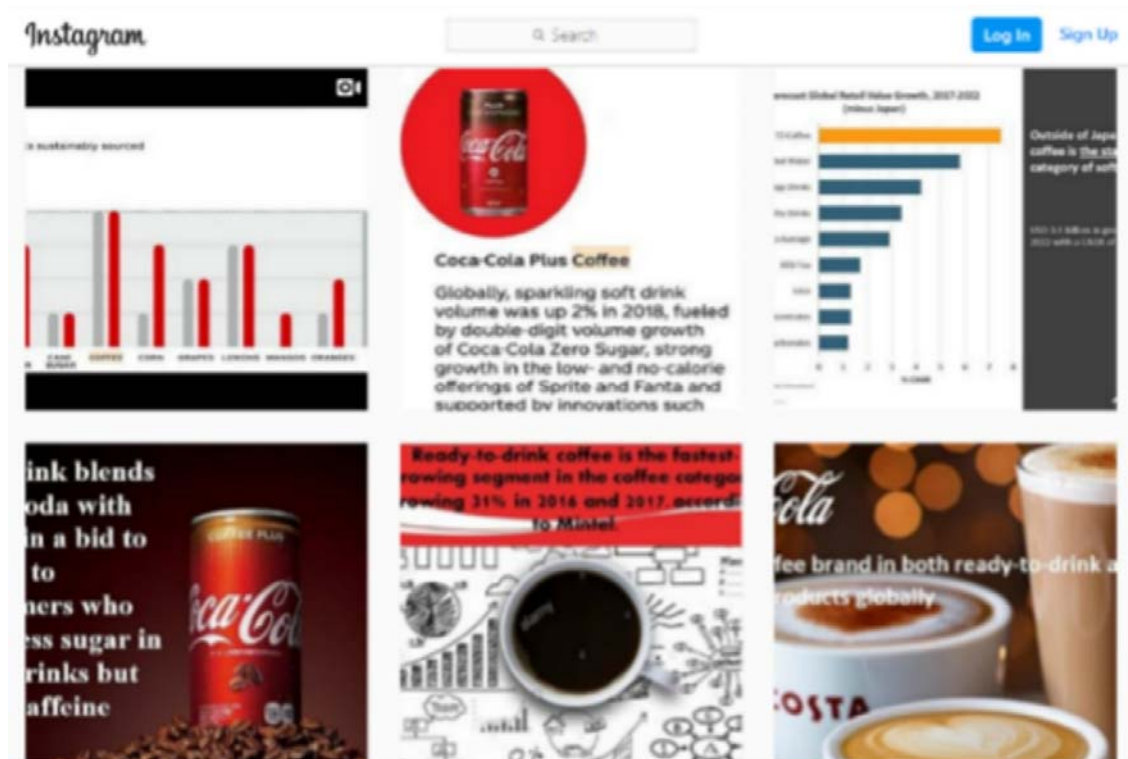
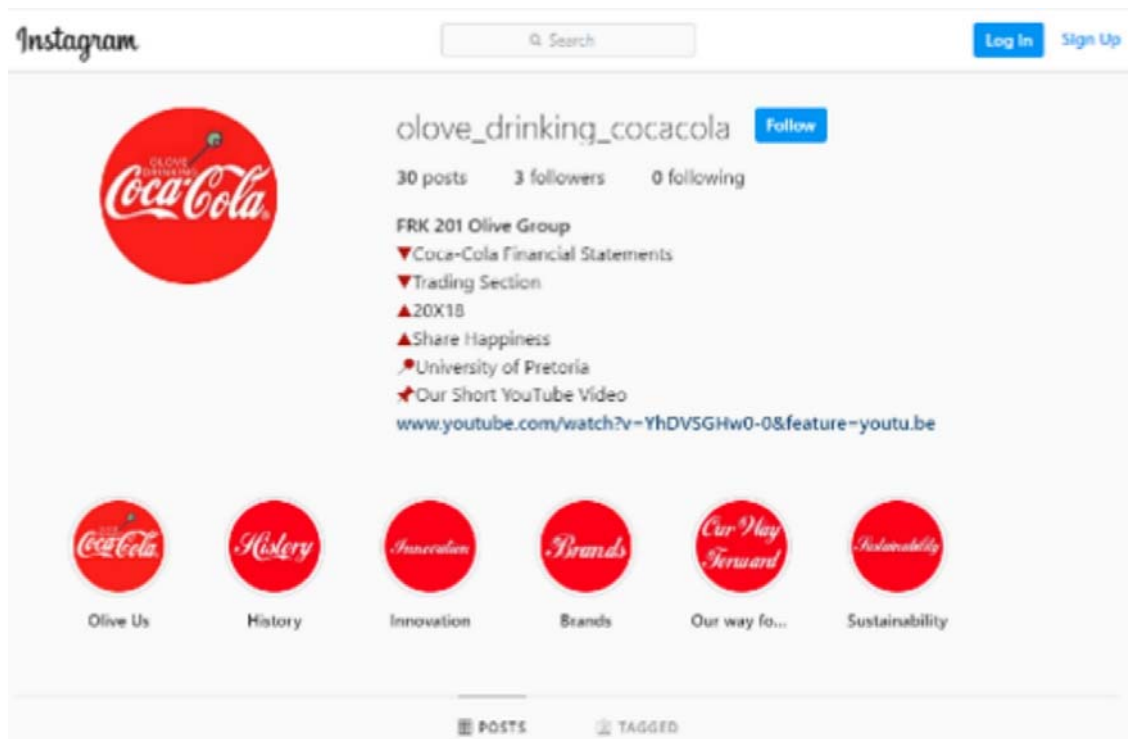


Figure 9. Instagram output at modification level.



**Figure 10.** Instagram output at redefinition level.

The level of creativity in all outputs provided little evidence of the students' ability to see new opportunities, to produce original ideas, to flexibly adapt to changing situations and apply imagination to solve complex problems. It is, however, submitted that this is a standard that is challenging to attain for a first attempt at digital creativity, particularly in an environment not characterised as being creative.

### **Students' lived experiences**

In addition to providing a detailed description of the design and development of the authentic assessment and analysing the student teams' digital creative outputs, the students' reflections on their experiences of the assessment were analysed. Understanding more about the students' lived experiences of the assessment may improve the process of enabling students to develop their digital creativity. The methodology for this study, therefore, includes some characteristics of phenomenology (Husserl [1900], 2002) as it seeks to understand the phenomenon of an authentic assessment with a digital creative output through the eyes of the students taking part in it. Such an interpretive phenomenological approach can provide 'startling new insights' into education related issues (Van der Mescht 2004, 1), such as this authentic assessment for learning.

### **Survey approach**

A mixed methods approach was adopted. Quantitative data were generated using a yes/no response and a scaled Likert-attitude response (1 – very negative to 7 – very positive). Open

response questions were used to collect qualitative data, to gain a deeper understanding of the students' lived experiences of the assessment. The survey instrument primarily drew on questions from an instrument developed by Schmulian and Coetzee (2019), modified to reflect the particular focus of this study. Selected open response questions, included in the study by Wiewiora and Kowalkiewicz (2019), were added to explore the students' perceptions of financial reporting in general as a consequence of the authentic assessment. The survey instrument was independently reviewed by subject matter experts and education specialists for design and clarity. Suggestions following this review were incorporated into the final instrument. The survey was delivered using *Google Forms* following ethical clearance obtained from the institutional review board. The survey instrument questions are presented in Table 3.

**Table 3.** Survey instrument questions.

- On a scale of 1 (very negative) to 7 (very positive), rate your overall experience of being required to develop a digital creative output.
- Tell us of your experience in developing a digital creative output.
- How did you experience developing a digital creative output, in comparison to the 'Required' of a traditional Financial Reporting assessment / assignment?
- If you designed an assessment that required a digital creative output, what would you do differently and why?
- What do you think this assessment, that required a digital creative output, was actually assessing?
- Did this assessment, that required a digital creative output, challenge your own perceptions of financial reporting?
- Why did this assessment, that required a digital creative output, challenge your own perceptions of financial reporting, or why did it not?
- Would you want to experience an assessment similar to this assessment that required a digital creative output, again during your degree?
- Why would you, or why would you not, want to experience an assessment, similar to this assessment that required a digital creative output, again during your degree?
- Is there anything we should have asked you about in your reflection, but haven't?
- Is there anything further that comes to mind in your reflection that you would like to add?

### ***Analysis***

The quantitative data were analysed in SPSS statistics 26.0. An initial data integrity check was performed and descriptive statistics and frequencies were calculated. Means and standard deviations are unsuitable for ordinal Likert scale responses (Jamieson 2004; Sullivan and Artino 2013). Consequently, the median was used as the measure of central tendency for Likert scale ordinal data (Jamieson 2004; Sullivan and Artino 2013).

The qualitative data from the survey instrument were analysed through a content analysis and by identifying themes from the reflections provided by the students (Cooper 2017). Basic themes were developed and coded using NVivo 12.

### ***Descriptive statistics***

The survey responses ( $n = 428$ ) amounted to a 87% response rate. The majority of the students (75%;  $n = 319$ ) experienced the development of a digital creative output as either 'very positive', 'positive' or 'slightly positive' (Median = 6) (Table 4). 88% of the students ( $n = 376$ ) indicated that this assessment challenged their own perceptions of financial reporting (Table 4), while the majority of students (62%;  $n = 264$ ) indicated that they would want to experience an assessment similar to this assessment again (Table 4).



**Table 4.** Students’ experience of the authentic assessment.

Quantitative survey questions	On a scale of 1 (very negative) to 7 (very positive), rate your overall experience of being required to develop a digital creative output.	Did this assessment, that required a digital creative output, challenge your own perceptions of financial reporting?		Would you want to experience an assessment similar to this assessment that required a digital creative output, again during your degree?	
		Yes (n)	No (n)	Yes (n)	No (n)
<b>Total (n = 428)</b>	<b>Median</b> 6	376	52	264	164
<b>Overall experience</b>				<b>Total (n = 428)</b>	
				<b>n</b>	<b>%</b>
Very negative				7	1.6
Negative				16	3.7
Slightly negative				31	7.2
Neutral				55	12.9
Slightly positive				97	22.7
Positive				162	37.9
Very positive				60	14.0

### Qualitative analysis

The qualitative analysis provided deeper insights into, and a richer understanding of, the initial quantitative results, and confirmed the general positivity from the students. A student commented that *‘the experience was quite impressive since it let me to do something which is different from dealing with financial information recording as usual, it enabled me to use creativity though I was still dealing with the financial information but it brought more fun and thinking out of the box’*.

The authenticity of developing a digital creative output for *The Coca-Cola Company*, in particular, appears to have contributed to the students’ positive experience. The students commented that the assessment provided *‘fantastic exposure to what could be coming in the future in terms of financial reporting’* and *‘prepared [them] for the workplace and the technological changes in the corporate world’*. In developing the digital creative outputs, the students *‘read through integrated and sustainability reports and followed the news of a company. This is something new and gave me real life application to the knowledge I have from university and to see how everything links’*. The assessment also made the students appreciate that it is *‘important to understand the financials fully in order to present the financials in a new and creative way’*; *‘It made me realise there is a difference between being able to do the questions and truly understand financial statements in their entirety’*.

The student responses alluded to each of the four thinkable ways of authenticity (Strobel et al. 2013). Firstly, in terms of context authenticity, a student commented that *‘I feel that the experience was incredibly superior to traditional financial reporting assignments, as it actually required us to engage with real-world information in a unique and interesting way, which I believe benefits us students more than what a traditional financial reporting assignment would, as these traditional assignments are essentially re-iterations of the assessments an[d] year tests that we already perform’*. Secondly, the students acknowledged the task authenticity of the assessment in *‘assessing [their] ability to research*

*financial information that [they] think would be relevant to the different users of the financial statements'. Thirdly, students commented on the impact authenticity of the task and that the assessment made them, 'think in a different sort of way, because the creative digital output of mine will be seen by the public. This changed the way I wanted to present my information, because you would not only want the information to be accurate and relevant, you also want it to be easy to interact with and have nice aesthetics to it'. Lastly, the personal/value authenticity of the assessment made the students realise 'that in this current age, financial reporting must now include information besides purely financial information – as an example financial reporting now should place emphasis on the impact firms have on the environment'.*

Despite the authenticity of the assessment being widely recognised amongst the students, some did not share this view – *'I believe it is unnecessary and irrelevant to the degree'; 'I cannot see its relevance to the main skills and training that the degree is supposed to equip one with' and 'It didn't test my knowledge of what I'm studying, but rather tested my creativity and computer skills'*. Comments such as these suggest that some students are not yet mindful of the significant transformation that is taking place in the twenty first century workplace, including the accounting profession.

The objective of financial reporting is the provision of useful information to users of financial reports (International Accounting Standards Board (IASB)) 2018) and this assessment appears to have enabled the students to gain deeper and more practical insights of this objective. *'Since financial reports are usually just black and white numbers that doesn't always mean something to the users, it challenged me into seeing the financial reports from the point of view of the users and think about what they want to see and what they might not understand'*. A few students were, however, of the opinion that the assessment did not challenge their perception of financial reporting with comments such as *'a creative digital output is just a different way of representing financial reporting data, I still perceive financial reporting in the same way as before'*.

Many students highlighted the challenges that they initially encountered with the assessment in that they *'didn't know exactly what was meant [by] a digital creative output'* and were operating, resulting in *'substantial amount[sic] of struggles in coming up with proper ideas'*. For most this initial apprehension subsided and *'became a learning experience'; 'It was hard at first, but I learned a lot this way'*.

While many students found the project to be *'very relatable as it was digital so we had a lot of ideas, because we live on the net'*, many others commented that they *'lack technological knowledge'*. This divide in opinion may be indicative of the digital divide present in South African society where only 56,3% of South Africans were internet users during 2020 (Statista 2020). Additionally, although the students were referred to the SAMR model for the required level of digital integration as part of the assessment instructions, numerous students requested that *'more guidance as to the kinds of digital outputs that one could use [should be given]'*.

There were again two distinct cohorts amongst the students with regards to the perception of the creativity aspect of this assessment. On the one hand, students embraced the project as *'it is essential to think creatively in an ever-changing business world and come up with*

*creative and effective solutions to problems*'. Conversely, true to the perceived stereotypical nature of accountants, other students *'did not like being creative or having to think of creative things*'. Some students *'didn't like how open minded the assignment was... as "creative" is very subjective*'. This may be symptomatic of the accounting profession, in some instances, remaining the career choice of the 'wrong type of student' as a consequence of their misperception of the profession (McDowall and Jackling 2010).

The ingrained fixation of the students with pass rates in the high stakes summative assessments typical of the accounting profession (Wilson 2011; Coetzee and Schmulian 2012) was also evident in comments such as *'we can rather spend time doing more questions and to better understand the work we are currently doing and writing exams on!*' Lastly, while a few students appreciated *'how much freedom [they] had with regards to what [they] think will be relevant to the users of financial statements*', many students did request *'more guidelines on the content of the output*'.

Despite these concerns, the majority of the students' lived experiences of the digital creative authentic assessment was positive and was summarised by a student as follows:

In the beginning, it was quite hard to figure out how information about an entity's financial statements could be creatively displayed on a digital platform, but once our team figured out how we could do it, it was quite fun and interesting to develop this digital platform that contains relevant and faithful information. It helped me to identify information that I thought to be faithful and relevant and it also gave me a deeper insight about how all the standards intertwine with one another. I did not just see the [financial reporting] standards as separate standards that deals with topics separately, but I identified standards that 'work' together to provide the relevant and faithful information. For me, the experience was insightful and fun.

## **Conclusion**

The twenty first century workplace requires accounting professionals to be creative in their roles as critical thinkers and problem solvers in an increasingly digital environment (Powell et al. 2020). To enable students to develop the necessary digital creativity competence to support them in these roles, this paper reports on the design and development of an authentic assessment, informed by the eight critical design elements of an authentic assessment proposed by Ashford-Rowe, Herrington, and Brown (2014).

Although many students were positive about the assessment, their digital creative outputs were mostly simplistic adoptions of traditional office platforms (e.g. *Microsoft PowerPoint*), with links to existing financial information in PDF format. Student attempts at creativity primarily manifested in the visual elements (e.g. video) included in their outputs. The limited evidence of digital creativity competence in the students' outputs was not unexpected, given that the accounting profession is not typically associated with creativity, and this was the first assessment in their higher education programme to challenge the students to be digitally creative. Those student teams that did not display a high level of digital creativity need to be provided with additional opportunities. Despite the student

teams' outputs mostly being at a low level, many students suggested that they had gained deeper knowledge and understanding of the objective of financial reporting.

Based on the analysis of the student teams' outputs and the students' perceptions of the assessment, the assessment met its objective of exposing accounting students to the domain of digital creativity and providing them with an opportunity to develop their competence. However, given that only half of the student teams involved were able to display digital creativity at a transformed level, there remains potential for further development. Students could, for example, be referred to the resources and links provided by the *University of York's Digital Creativity Skills Guide* (<https://subjectguides.york.ac.uk/skills/digital-creativity>) (University of York 2019). This guide provides links to various creative prompts and activities. Students could also be referred to *Digital Creativity* (<http://digitalcreativitytools.everythingability.com>), which provides activities 'to help you in getting started creating', and *Random Digital Creativity Generator* ([https://script.google.com/a/up.ac.za/macros/s/AKfycbzWLCnH5NFIW9fmGqPddiwZcvJfQqWnxMVY\\_uvRCEIMYFYfhkw8/exec?random=yes](https://script.google.com/a/up.ac.za/macros/s/AKfycbzWLCnH5NFIW9fmGqPddiwZcvJfQqWnxMVY_uvRCEIMYFYfhkw8/exec?random=yes)), which randomly suggests applications, images, resources and tools that could be combined and used to create digital creative outputs.

The generalisability and replicability of students' perceptions to other institutions may be limited, as this study examined students' perceptions at a single university. However, this study provides a detailed description of the design and development of the authentic assessment, informed by literature, which can subsequently inform the use of this, or a similar, assessment in other settings. Future multicentre and longitudinal research exploring the actual learning effects and competency development of this, and other interventions targeted on developing students' digital creativity competency over time, is strongly encouraged.

This research contributes to the authentic assessment and accounting education literature by introducing digital creativity to these domains' research agenda's, particularly in contexts not traditionally associated with creativity. The development of authentic assessments that move beyond the rote learning of knowledge play an important role in enabling the development of competencies, such as digital creativity, necessary for success in a rapidly changing twenty first century workplace.

## **Acknowledgements**

We would like to thank Professor Kim Watty and her colleagues at the Deakin Business School, Professor Phillip Dawson and his colleagues at the Deakin Centre for Research in Assessment and Digital Learning (CRADLE), and the participants at the British Accounting and Finance Association's Accounting Education Special Interest Group Conference 2021, for their feedback on earlier drafts of this article.

## **Disclosure statement**

No potential conflict of interest was reported by the authors.

## Notes on contributors

**Cecile Janse van Rensburg** is conducting a Ph.D. study at the Department of Accounting at the University of Pretoria (UP) on the topic of “approaches to digital learning and authentic assessment in accounting education”.

**Stephen A. Coetzee, PhD**, is a professor at the University of Pretoria, South Africa. His research interest is competency-based accounting education.

**Astrid Schmulian, PhD**, is an associate professor at the University of Pretoria, South Africa. Her research interest is competency-based accounting education.

## References

Abbasi, N. 2013. “Competency Approach to Accounting Education: A Global View.” *Journal of Finance and Accountancy* 13 (1): 1–18.

Adie, L. E., L. Hee, and L. Wharton. 2010. “Incorporating Authentic Assessment into Different University Learning Scenarios.” In *Emerging Trends in Higher Education Learning and Teaching: Proceedings of the TARC International Conference on Learning and Teaching* (pp. 82–90). Tunku Abdul Rahman College.

Ashford-Rowe, K., J. Herrington, and C. Brown. 2014. “Establishing the Critical Elements That Determine Authentic Assessment.” *Assessment & Evaluation in Higher Education* 39 (2): 205–222. doi:10.1080/02602938.2013.819566.

Baril, C. P., B. M. Cunningham, D. R. Fordham, R. L. Gardner, and S. K. Wolcott. 1998. “Critical Thinking in the Public Accounting Profession: Aptitudes and Attitudes.” *Journal of Accounting Education* 16 (3-4): 381–406. doi:10.1016/S0748-5751(98)00023-2.

Birkey, R., and C. Hausserman. 2019. “Inducing Creativity in Accountants’ Task Performance: The Effects of Background, Environment, and Feedback.” In *Advances in Accounting Education: Teaching and Curriculum Innovations*, edited by T.G. Calderon, 109–133. Emerald Publishing Limited.

Borgonovo, A., B. Friedrich, and M. Wells. 2019. *Competency-Based Accounting Education, Training, and Certification: An Implementation Guide*. The World Bank, Washington, DC.

Boud, D. 1990. “Assessment and the Promotion of Academic Values.” *Studies in Higher Education* 15 (1): 101–111. doi:10.1080/03075079012331377621.

Boud, D. 2000. “Sustainable Assessment: Rethinking Assessment for the Learning Society.” *Studies in Continuing Education* 22 (2): 151–167. doi:10.1080/713695728.

- Boud, D., and N. Falchikov. 2006. "Aligning Assessment with Long-Term Learning." *Assessment & Evaluation in Higher Education* 31 (4): 399–413. doi:10.1080/02602930600679050.
- Brown, J. S., A. Collins, and P. Duguid. 1989. "Situated Cognition and the Culture of Learning." *Educational Researcher* 18 (1): 32–42. doi:10.3102/0013189X018001032.
- Brown, S. 2005. "Assessment for Learning." *Learning and Teaching in Higher Education* 1: 81–89.
- Bryant, S. M., D. Stone, and B. Wier. 2011. "An Exploration of Accountants, Accounting Work, and Creativity." *Behavioral Research in Accounting* 23 (1): 45–64. doi:10.2308/bria.2011.23.1.45.
- Carnegie, G. D., and C. J. Napier. 2010. "Traditional Accountants and Business Professionals: Portraying the Accounting Profession after Enron." *Accounting, Organizations and Society* 35 (3): 360–376. doi:10.1016/j.aos.2009.09.002.
- Coetzee, S. A., and A. Schmulian. 2012. "A Critical Analysis of the Pedagogical Approach Employed in an Introductory Course to IFRS." *Issues in Accounting Education* 27 (1): 83–100. doi:10.2308/iace-10220.
- Coetzee, S. A., and A. Schmulian. 2013. "The Effect of IFRS Adoption on Financial Reporting Pedagogy in South Africa." *Issues in Accounting Education* 28 (2): 243–251. doi:10.2308/iace-50386.
- Collins, A. 1988. "Cognitive Apprenticeship and Instructional Technology." Technical Report. No 6899, Cambridge, MA: BBN Labs Inc.
- Cooper, S. 2017. "A Collaborative Assessment of Students' Placement Learning." *Assessment & Evaluation in Higher Education* 42 (1): 61–76. doi:10.1080/02602938.2015.1083093
- Cumming, J., and G. S. Maxwell. 1999. "Contextualising Authentic Assessment." *Assessment in Education: Principles, Policy and Practice* 6 (2): 177–194. doi:10.1080/09695949992865.
- Deegan, C., and J. Unerman. 2006. *Financial Accounting Theory: European Edition*. Maidenhead: McGraw-Hill.
- ECDL Foundation. 2012. "The Role of Digital Proficiency as a 21st Century Competence." Accessed March 5 2021. [https://ec.europa.eu/futurium/en/system/files/ged/ecdl\\_foundation\\_-\\_digital\\_proficiency\\_as\\_a\\_21st\\_century\\_competence.pdf](https://ec.europa.eu/futurium/en/system/files/ged/ecdl_foundation_-_digital_proficiency_as_a_21st_century_competence.pdf)
- Farrell, C. 2020. "Do International Marketing Simulations Provide an Authentic Assessment of Learning? A Student Perspective." *The International Journal of Management Education* 18 (1): 100362. doi:10.1016/j.ijme.2020.100362.

Feintzeig, R. 2020. "The Vanishing Executive Assistant." *The Wall Street Journal*. Accessed March 5 2021. <https://www.wsj.com/articles/the-vanishing-executive-assistant-11579323605>

Forsyth, H., and J. Evans. 2019. "Authentic Assessment for a More Inclusive History." *Higher Education Research & Development* 38 (4): 748–761. doi:10.1080/07294360.2019.1581140.

Frank, J. R., L. S. Snell, O. T. Cate, E. S. Holmboe, C. Carraccio, S. R. Swing, P. Harris, et al. 2010. "Competency-Based Medical Education: Theory to Practice." *Medical Teacher* 32 (8): 638–645. doi:10.3109/0142159X.2010.501190.

Gray, A. 2016. "The 10 Skills You Need to Thrive in the Fourth Industrial Revolution." Accessed March 5 2021. <https://www.weforum.org/agenda/2016/01/the-10-skills-you-need-to-thrive-in-the-fourth-industrial-revolution>

Greene, J. A., S. B. Yu, and D. Z. Copeland. 2014. "Measuring Critical Components of Digital Literacy and Their Relationships with Learning." *Computers & Education* 76: 55–69. doi:10.1016/j.compedu.2014.03.008.

Gulikers, J. T., T. J. Bastiaens, and P. A. Kirschner. 2004. "A Five-Dimensional Framework for Authentic Assessment." *Educational Technology Research and Development* 52 (3): 67–86. doi:10.1007/BF02504676.

Gulikers, J. T., T. J. Bastiaens, and P. A. Kirschner. 2006. "Authentic Assessment, Student and Teacher Perceptions: The Practical Value of the Five-Dimensional Framework." *Journal of Vocational Education & Training* 58 (3): 337–357. doi:10.1080/13636820600955443.

Gulikers, J. T., L. Kester, P. A. Kirschner, and T. J. Bastiaens. 2008. "The Effect of Practical Experience on Perceptions of Assessment Authenticity, Study Approach, and Learning Outcomes." *Learning and Instruction* 18 (2): 172–186. doi:10.1016/j.learninstruc.2007.02.012.

Hamilton, E. R., J. M. Rosenberg, and M. Akcaoglu. 2016. "The Substitution Augmentation Modification Redefinition (SAMR) Model: A Critical Review and Suggestions for Its Use." *TechTrends* 60 (5): 433–441. doi:10.1007/s11528-016-0091-y.

Harris, P., F. Bhanji, M. Topps, S. Ross, S. Lieberman, J. R. Frank, L. Snell, J. Sherbino, and International CBME Collaborators. 2017. "Evolving Concepts of Assessment in a Competency-Based World." *Medical Teacher* 39 (6): 603–608. doi:10.1080/0142159X.2017.1315071.

Harris, P., L. Snell, M. Talbot, R. M. Harden, and International CBME Collaborators. 2010. "Competency-Based Medical Education: Implications for Undergraduate Programs." *Medical Teacher* 32 (8): 646–650. doi:10.3109/0142159X.2010.500703.

Hattie, J. 2012. *Visible Learning for Teachers: Maximizing Impact on Learning*. London: Routledge.

- Hines, R. D. 1988. "Financial Accounting: In Communicating Reality, We Construct Reality." *Accounting, Organizations and Society* 13 (3): 251–261. doi:10.1016/0361-3682(88)90003-7.
- Husserl, E. [1900] 2002. *Logical Investigations*. Translated by J. M. Findlay. London: Routledge.
- International Accounting Standards Board (IASB). 2018. *The Conceptual Framework for Financial Reporting*. London: IFRS Foundation.
- James, L. T., and R. Casidy. 2018. "Authentic Assessment in Business Education: Its Effects on Student Satisfaction and Promoting Behaviour." *Studies in Higher Education* 43 (3): 401–415. doi:10.1080/03075079.2016.1165659.
- Jamieson, S. 2004. "Likert Scales: How to (ab) Use Them?" *Medical Education* 38 (12): 1217–1218. doi:10.1111/j.1365-2929.2004.02012.x.
- Krom, C. L., and S. V. Williams. 2011. "Tell Me a Story: Using Creative Writing in Introductory Accounting Courses to Enhance and Assess Student Learning." *Journal of Accounting Education* 29 (4): 234–249. doi:10.1016/j.jaccedu.2012.06.003.
- Larmer, J., J. Mergendoller, and S. Boss. 2015. *Setting the Standard for Project Based Learning*. Alexandria: ASCD.
- Lave, J., and E. Wenger. 1991. *Situated Learning: Legitimate Peripheral Participation*. Cambridge University Press.[Q7]
- Lawson, R. A., E. J. Blocher, P. C. Brewer, G. Cokins, J. E. Sorensen, D. E. Stout, G. L. Sundem, S. K. Wolcott, and M. J. Wouters. 2014. "Focusing Accounting Curricula on Students' Long-Run Careers: Recommendations for an Integrated Competency-Based Framework for Accounting Education." *Issues in Accounting Education* 29 (2): 295–317. doi:10.2308/iace-50673.
- Lee, M. R., and T. T. Chen. 2015. "Digital Creativity: Research Themes and Framework." *Computers in Human Behavior* 42: 12–19. doi:10.1016/j.chb.2014.04.001.
- Maxwell, T. W. 2012. "Assessment in Higher Education in the Professions: Action Research as an Authentic Assessment Task." *Teaching in Higher Education* 17 (6): 686–696. doi:10.1080/13562517.2012.725220.
- McDowall, T., and B. Jackling. 2010. "Attitudes towards the Accounting Profession: An Australian Perspective." *Asian Review of Accounting* 18 (1): 30–49. doi:10.1108/13217341011045999.
- McGowan, S. 2012. "Going beyond the Numbers in Teaching Financial Accounting: The Newsletter as an Assignment Option." *Issues in Accounting Education* 27 (4): 1095–1117. doi:10.2308/iace-50207.



- Mladenovic, R. 2000. "An Investigation into Ways of Challenging Introductory Accounting Students' Negative Perceptions of Accounting." *Accounting Education* 9 (2): 135–155. doi:10.1080/09639280010000147.
- Osborne, R., E. Dunne, and P. Farrand. 2013. "Integrating Technologies into "Authentic" Assessment Design: An Affordances Approach." *Research in Learning Technology* 21: 1–18. doi:10.3402/rlt.v21i0.21986.
- Pathways Commission. 2015. The Pathways Commission: in Pursuit of Accounting's Curricula of the Future. American Accounting Association. Accessed April 18 2021. <https://aaahq.org/Portals/0/images/education/Pathways/15-9-61866.pdf?ver=2021-02-23-175219-123>
- Pinho, K. 2015. "Deloitte to Launch Career Education Program at Cornerstone Schools." Accessed March 5 2021. <https://www.craigslist.com/article/20150422/NEWS/150429945/deloitte-to-launch-career-education-program-at-cornerstone-schools/>
- Powell, L., D. Lambert, N. McGuigan, A. Prasad, and J. Lin. 2020. "Fostering Creativity in Audit through Co-Created Role-Play." *Accounting Education* 29 (6): 605–639. doi:10.1080/09639284.2020.1838929.
- Puccio, G. 2017. "Creativity: A Skill to Cultivate in the 21st Century." Accessed March 5 2021. <https://www.developintelligence.com/blog/2017/09/creativity-skill-cultivate-21st-century/>
- Puentedura, R. 2014. "Building Transformation: An Introduction to the SAMR Model." Accessed April 18, 2021. [http://www.hippasus.com/rrpweblog/archives/2014/08/22/BuildingTransformation\\_AnIntroductionToSAMR.pdf](http://www.hippasus.com/rrpweblog/archives/2014/08/22/BuildingTransformation_AnIntroductionToSAMR.pdf)
- Rossetto, C., and S. Chapple. 2019. "Creative Accounting? The Critical and Creative Voice of Students." *Assessment & Evaluation in Higher Education* 44 (2): 216–232. doi:10.1080/02602938.2018.1492700.
- Saemann, G. P., and K. J. Crooker. 1999. "Student Perceptions of the Profession and Its Effect on Decisions to Major in Accounting." *Journal of Accounting Education* 17 (1): 1–22. doi:10.1016/S0748-5751(99)00007-X.
- Schmulian, A., and S. A. Coetzee. 2019. "Students' Experience of Team Assessment with Immediate Feedback in a Large Accounting Class." *Assessment & Evaluation in Higher Education* 44 (4): 516–532. doi:10.1080/02602938.2018.1522295.
- Schuwirth, L. W., and C. P. Van der Vleuten. 2011. "Programmatic Assessment: From Assessment of Learning to Assessment for Learning." *Medical Teacher* 33 (6): 478–485. doi:10.3109/0142159X.2011.565828.

Schwab, K. 2016. "The Fourth Industrial Revolution: What It Means, How to Respond." Accessed March 5 2021. <https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/>

Siddiq, F., P. Gochyyev, and M. Wilson. 2017. "Learning in Digital Networks—ICT Literacy: A Novel Assessment of Students' 21st Century Skills." *Computers & Education* 109: 11–37. doi:10.1016/j.compedu.2017.01.014.

Sotiriadou, P., D. Logan, A. Daly, and R. Guest. 2020. "The Role of Authentic Assessment to Preserve Academic Integrity and Promote Skill Development and Employability." *Studies in Higher Education* 45 (11): 2132–2148. doi:10.1080/03075079.2019.1582015.

Statista. 2020. "Internet User Penetration in South Africa from 2015 to 2025." Accessed March 5 2021. <https://www.statista.com/statistics/484933/internet-user-reach-south-africa/>

Strobel, J., J. Wang, N. R. Weber, and M. Dyehouse. 2013. "The Role of Authenticity in Design-Based Learning Environments: The Case of Engineering Education." *Computers & Education* 64: 143–152. doi:10.1016/j.compedu.2012.11.026.

Sullivan, G. M., and A. R. Artino, Jr. 2013. "Analyzing and Interpreting Data from Likert-Type Scales." *Journal of Graduate Medical Education* 5 (4): 541–542. doi:10.4300/JGME-5-4-18.

Tan, L. M., and F. Laswad. 2018. "Professional Skills Required of Accountants: What Do Job Advertisements Tell Us?" *Accounting Education* 27 (4): 403–432. doi:10.1080/09639284.2018.1490189.

To, J., and D. Carless. 2016. "Making Productive Use of Exemplars: Peer Discussion and Teacher Guidance for Positive Transfer of Strategies." *Journal of Further and Higher Education* 40 (6): 746–764. doi:10.1080/0309877X.2015.1014317.

Tuckman, B. W. 1965. "Developmental Sequence in Small Groups." *Psychological Bulletin* 63 (6): 384–399. doi:10.1037/h0022100.

University of York. 2019. "Digital Creativity." Accessed March 5 2021. <https://subjectguides.york.ac.uk/skills/digital-creativity> [

Van der Mescht, H. 2004. "Phenomenology in Education: A Case Study in Educational Leadership." *Indo-Pacific Journal of Phenomenology* 4 (1): 1–16. doi:10.1080/20797222.2004.11433887.

Van Der Vleuten, C. P., and L. W. Schuwirth. 2005. "Assessing Professional Competence: From Methods to Programmes." *Medical Education* 39 (3): 309–317. doi:10.1111/j.1365-2929.2005.02094.x.

Van Laar, E., A. J. Van Deursen, J. A. Van Dijk, and J. De Haan. 2017. "The Relation between 21st-Century Skills and Digital Skills: A Systematic Literature Review." *Computers in Human Behavior* 72: 577–588. doi:10.1016/j.chb.2017.03.010.

Venter, E. R., and C. De Villiers. 2013. "The Accounting Profession's Influence on Academe: South African Evidence." *Accounting, Auditing & Accountability Journal* 26 (8): 1246–1278. doi:10.1108/AAAJ-06-2012-01027.

Villarroel, V., S. Bloxham, D. Bruna, C. Bruna, and C. Herrera-Seda. 2018. "Authentic Assessment: Creating a Blueprint for Course Design." *Assessment & Evaluation in Higher Education* 43 (5): 840–854. doi:10.1080/02602938.2017.1412396.

Villarroel, V., D. Boud, S. Bloxham, D. Bruna, and C. Bruna. 2020. "Using Principles of Authentic Assessment to Redesign Written Examinations and Tests." *Innovations in Education and Teaching International* 57 (1): 38–49.

Vos, L. 2015. "Simulation Games in Business and Marketing Education: How Educators Assess Student Learning from Simulations." *The International Journal of Management Education* 13 (1): 57–74. doi:10.1016/j.ijme.2015.01.001.

Vygotsky, L. S. 1978. *Mind in Society: The Development of Higher Psychological Processes*, edited by M. Cole, V. John-Steiner, V. Scribner, and S.E. Souberman. Cambridge, MA: Harvard University Press.

Wiewiora, A., and A. Kowalkiewicz. 2019. "The Role of Authentic Assessment in Developing Authentic Leadership Identity and Competencies." *Assessment & Evaluation in Higher Education* 44 (3): 415–430. doi:10.1080/02602938.2018.1516730.

Wilson, R. M. 2011. "Alignment in Accounting Education and Training." *Accounting Education* 20 (1): 3–16. doi:10.1080/09639284.2011.555940.

World Economic Forum. 2018. "The Future of Jobs Report 2018." Accessed March 5 2021. [http://www3.weforum.org/docs/WEF\\_Future\\_of\\_Jobs\\_2018.pdf](http://www3.weforum.org/docs/WEF_Future_of_Jobs_2018.pdf)