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Do team-based written or video explanations of course content enhance accounting students' knowledge, communication, and teamwork skills?

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ABSTRACT

This study explores students' knowledge, communication, and teamwork skills development when using team-based explanations, in either written or video mode, during an assessment for learning in a competency-based accounting education context. Both modes of team-based explanation, written or video, seem to enhance conceptual and transfer knowledge among weaker and moderate-performing students. When viewed as an interconnected and indivisible process, the video explanation mode appears more beneficial for top-performing students' conceptual knowledge development than the written explanation mode. The team-based video explanation mode also appears to be the preferred method for developing teamwork skills, while both modes are perceived as beneficial for developing communication skills. Overall, the video mode of a team-based explanation assessment for learning appears to be the favored choice, as it facilitates whole-class knowledge development while also allowing greater opportunities for students' teamwork and communication skills development in a competency-based education context.

1. Introduction

Accountants must have robust conceptual knowledge of financial reporting (Rodgers et al., 2017) and the ability to transfer that knowledge in the recording and reporting of economic events (Pathways Commission, 2015). This is crucial because accountants must be equipped to deal with a wide range of business problems (Bloom & Debessay, 2012). However, accounting education programs should also strive to develop well-rounded accountants who are not only competent financial reporting technicians but also competent communicators who can effectively speak, write, read, and listen (Bloom & Debessay, 2012). Given that the fundamental objective of accounting, regardless of any sub-domain, is to provide information that facilitates decision-making (Bloom & Debessay, 2012), accountants must be capable of communicating and explaining financial reporting processes and concepts to others, both within and outside their organizations. This is crucial regardless of the recipient's familiarity with financial reporting.

In addition to communication-related skills, teamwork is another crucial skill in the 21st-century workplace (Bayne et al., 2022; Mehrabi et al., 2021). Employers value a graduate's ability to work in a team and consider their teamwork skills when assessing employability (Chhinzer & Russo, 2018). Recognizing this, the International Accounting Education Standards (IAESB, 2017) emphasize fostering teamwork skills in accountants.

The development of communication and teamwork skills, along with the acquisition of accounting knowledge, can be fostered through a competency-based approach to education (Biggs, 1999). Competency-based education presents students with holistic tasks designed to integrate knowledge, skills, and attitudes, thereby preparing students for effective engagement in professional tasks (van der Vleuten, 2015). Assessment plays an important role in competency-based education (Harris et al., 2017; Villarroel et al., 2020). Competency-based education calls for a broadened assessment approach beyond the traditional measurement and validation of a student's knowledge (Boud, 1990; Schuwirth & Van der Vleuten, 2020). It should also encompass assessment for learning to facilitate knowledge gains and skills development (Harris et al., 2017). Given this, the focus of this study is to explore the use of an assessment for learning, in the form of a team-based explanation of course content, to help accounting students acquire financial reporting content knowledge while concurrently fostering their communication and teamwork skills.

Learning-by-explaining is a powerful instructional approach

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(Lachner et al., 2020) that stimulates cognitive processes conducive to knowledge acquisition (Fiorella & Mayer, 2016). Learning-by-explaining can manifest through self-explanation or through explaining to others. While self-explanation is an introspective activity, explaining to others necessitates considering the recipient's perspectives when crafting the explanation (Wittwer & Renkl, 2008). Consequently, explaining to others often yields deeper and more durable learning compared to activities like restudying (Fiorella & Mayer, 2013; Hoogerheide et al., 2016). Explaining to others mirrors the kind of explanations accountants must provide to stakeholders such as investors, creditors, capital market agents, and the public at large. Therefore, learning-by-explaining to others could be a beneficial approach to accounting education. It could afford accounting students opportunities for deeper and more enduring knowledge development while simultaneously enabling them to hone their communication skills as they consider the information needs of a recipient in preparing their explanation.

In an educational context, learning-by-explaining to others can involve explaining course content to a peer or an unknown or fictitious recipient. This can be facilitated through various modes, such as writing or video (Hoogerheide et al., 2016; Hoogerheide et al., 2019; Lachner et al., 2021). The mode of explanation seems to influence the knowledge acquired. For instance, written explanations to others seem better suited for conceptual knowledge acquisition, owing to the inherent organization of information required in generating these explanations (Lachner et al., 2018). Conversely, video explanations, often being more elaborate, may promote transfer knowledge gains more effectively (Lachner et al., 2018).

Explanations to others can be prepared either individually or collaboratively (Ribosa & Duran, 2022). However, the bulk of existing literature on learning-by-explaining focuses on the benefits accrued when students assume the role of explainer individually instead of as part of a team (Ribosa & Duran, 2022). Furthermore, the learning-by-explaining literature mainly delves into benefits in experimental settings, centering on content knowledge development (Ribosa & Duran, 2022). This leaves a notable void in our comprehension of the benefits of learning-by-explaining in team-based contexts. Through its team-based design, this study aims to bridge this gap by offering insight from a real classroom environment into the potential knowledge and skills development benefits of different modes (written vs video) of team-based learning-by-explaining as an assessment for learning (Fig. 1).

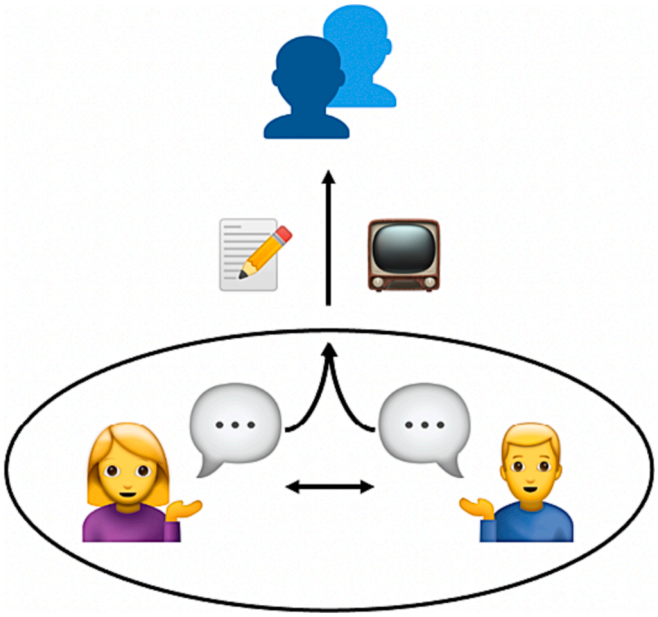

Fig. 1. Team-based explanation, in writing or employing video.

This study presents an exemplar of an assessment-for-learning approach, entailing team-based written and video explanations of course content within a competency-based accounting course. This exemplar can be employed as it is or tailored to meet the learning needs in various other accounting courses and contexts. It may also guide the creation of similar assessments for learning in diverse learning environments. The insights garnered from exploring the knowledge and skills development benefits of utilizing this assessment could enhance future iterations and may pique the interest of instructors contemplating adopting this or similar assessments for learning approaches in their educational settings. This holds particular resonance for those aiming to nurture communication and teamwork-related skills alongside content knowledge acquisition. Additionally, the outcomes of this study could bolster the external validity of theories regarding the learning effects of different modes of explanations, which have primarily been formulated in experimental settings.

2. Learning-by-explaining

Learning-by-explaining is an instructional strategy that stimulates deep-level cognitive processes for organizing and integrating information, fostering deeper learning (Fiorella & Mayer, 2016). This strategy aids students in identifying gaps in their knowledge and urges them to explicitly articulate underlying concepts (Chebbihi et al., 2019). It enables them to reactivate and expand upon their existing knowledge (Chebbihi et al., 2019).

Much research on the impacts of explanations has honed in on the benefits of explaining in peer tutoring scenarios and self-explanations (Hoogerheide et al., 2016). However, a burgeoning interest has recently emerged around the benefits of non-interactive or indirect learning-by-explaining to a fictitious recipient. In experimental settings, indirect explanations of course content to such a recipient have been shown to bolster learning, largely due to the social presence[1] effect linked with the fictitious other (Hoogerheide et al., 2016; Lachner et al., 2021). The perceived role of this fictitious other as a listener seems to foster productive agency,[2] which subsequently appears to culminate in learning gains (Hoogerheide et al., 2016).

Explanation to an unknown or fictitious recipient can manifest in various forms, including written or video -based. Writing explanations necessitates deliberate planning, enabling students to explore relationships and implications in their explanations, thereby constructing a deeper knowledge of the content explained (Bangert-drowns et al., 2004; Paris & Paris, 2001). Writing explanations spurs organizational strategies and encourages elaboration while also acting as a conduit for self-reflective monitoring of a student's knowledge (Bangert-drowns et al., 2004). This can be particularly beneficial for conceptual learning of more complex content (Lachner et al., 2018). However, written explanations may offer limited learning benefits beyond restudy for more simplistic course content and may not significantly contribute to the acquisition of transfer knowledge concerning more complex course content (Hoogerheide et al., 2016; Lachner et al., 2018).

Video explanations foster conceptual and transfer knowledge development more effectively (Lachner et al., 2018). Explaining in front of a camera enhances the sense of social presence by amplifying students' impression that they are communicating information to another person (Hoogerheide et al., 2016). In experimental settings, video explanations, individually prepared by students and directed at a fictitious recipient, have led to elevated arousal levels, more elaborations, and more person-deictic references compared to written explanations (Lachner et al., 2018; Hoogerheide et al., 2019). The heightened levels

[1] Social presence is defined here as the degree to which someone is perceived as a "real person" (Gunawardena, 1995).

[2] Productive agency is the belief that your actions can affect another person (Okita & Schwartz, 2013; Schwartz, 1999).

of perceived social engagement, denoted by more person-deictic references, seem to indirectly motivate students to provide more comprehensive explanations, thereby contributing to superior transfer knowledge (Lachner et al., 2018; Jacob et al., 2020).

Although conceptual and transfer knowledge gains from written and video explanations have been identified in individual knowledge-based experimental settings, transitioning laboratory findings into real classroom practices poses a challenge (Sotola & Crede, 2021). The real-world classroom environment can trigger motivations and goals that significantly shape students' learning experiences (Darnon et al., 2012; Huguet & Kuyper, 2017). In these real classrooms, students wield more control over their learning. They may make different choices (for instance, preparing for more extended periods, restudying parts of the learning material, or engaging in repeated teaching) compared to a laboratory setting. These choices could, subsequently, affect the learning gains from student-prepared explanations (Lachner et al., 2021).

Learning-by-explaining could yield different outcomes when executed in teams versus individually. This change in the explanation format could be pivotal in a course aimed at developing both student knowledge and communication and teamwork skills, especially with a large student cohort. Recent experimental research centered on team-based video explanations suggested that collaboratively prepared video explanations might be more beneficial for learning than those prepared individually (Kobayashi, 2021). However, to our knowledge, no evidence exists to corroborate whether incorporating collaboration in the preparation and delivery of explanations influences the learning benefits from various modes of explanation. Given that collaborative explanations appear more beneficial than individual ones, it is also plausible that the collaboration facet may eclipse the previously identified variation in the learning benefits derived from different explanation modes. Hence, this study endeavors to delve into the learning and skill development benefits of collaboratively prepared explanations delivered in both written and video modes.

3. Learning-by-explaining in a competency-based accounting education context

Professional accounting programs have often come under scrutiny for their narrow purview, which tends to overemphasize technical knowledge (Bayerlein, 2015) while overlooking the broader competencies demanded of their students (Jackson & Meek, 2021). Competency-based education has been proposed as a means to furnish professional education programs with the tools to foster the development of future professional competence (Sistermans, 2020). Competency-based education shifts the focus away from merely progressing students through a curriculum based on credit hours. Instead, it accentuates the demonstration of specific skills and mastery of knowledge as the criteria for academic progression (Frank et al., 2010). Within an accounting education context, competency-based education endeavors to enhance accounting students' education and training, thereby opening opportunities to develop their abilities in delivering reliable and high-quality accounting and related professional services (Lawson et al., 2014).

The accounting profession has developed several competency frameworks for accounting education (see Certified Professional Accountants (CPA) Canada 2019; Association of Chartered Certified Accountants (ACCA) 2018; South African Institute of Chartered Accountants (SAICA) 2021). While it might seem that each professional accounting association has developed its own competency framework, there's significant overlap and commonality among them, hinting at an international consensus on the competencies required by accounting graduates. These frameworks uniformly emphasize the need for foundational competencies in communication and human relations (Lawson et al., 2014; Partnership for 21st Century Skills, 2015; Chhinzer & Russo, 2018; Plant et al., 2019; Dolce et al., 2020).

As part of honing their communication competence, accounting graduates are expected to develop robust speaking and presenting skills, paired with the ability to tailor their communication to align with specific audiences (Lawson et al., 2014). It is also imperative for accounting graduates to emerge as competent professional writers and to be proficient in employing qualitative communication tools such as electronic video s and audio media (Lawson et al., 2014). The ambit of human relations skills encompasses relationship-building and team-based management skills. These skills are pivotal for accountants, given their frequent engagement in team-based interactions with diverse co-workers, clients, customers, suppliers, and others, necessitating a sensitivity toward gender, ethnic, and multicultural diversity (Lawson et al., 2014).

Despite the increasing demand for a transition to competency-based accounting education, it is posited that accounting education assessments continue to be hallmarked by high-stakes assessments of learning for certification purposes (Coetzee & Schmulian, 2012; Venter & de Villiers, 2013; Wilson, 2011). This traditional approach stands in stark contrast to competency-based assessments for learning. Employing learning-by-explaining as a team-based assessment for learning could be an exemplar of an assessment that can be incorporated into an accounting education program to aid in the much-anticipated shift towards competency-based assessment for learning. Utilizing learning-by-explaining in this manner may prove beneficial for this purpose for the following reasons:

- Learning-by-explaining immerses students in active engagement with study material, facilitating awareness of their knowledge gaps while aiding them in elaborating, organizing, and integrating their knowledge (Duran, 2017; Fiorella, 2021).
- The concept of having to generate an explanation of study material with another in mind – even in the absence of a physical presence (a fictitious other) – may furnish an opportunity for students to develop communication competencies. These include presentation skills that entail the ability to recognize and adapt their communication to a specific audience, as the accounting profession requires.
- Team-based explanations of course content within a diverse group of students present an opportunity for students to engage in a team-based interaction. These interactions necessitate sensitivity towards gender, ethnic, and multicultural diversity and require engagement in relationship-building as they negotiate and collaborate to determine the optimal approach to explain their course content. This scenario should enable students to hone human relations skills, including teamwork skills, that are requisite in their profession.
- Written and video -prepared explanations may furnish the requisite opportunities for accounting students to refine their professional writing and dialogue skills. Engaging in explanations across these diverse modes has also proven beneficial for the development of conceptual and transfer knowledge development (Lachner et al., 2018).

By delving into team-based learning-by-explaining as a form of assessment for learning within an accounting course aiming to nurture both knowledge and competencies, this study expands the limited research scrutinizing the use of collaboratively prepared and presented explanations by teams of students. More specifically, it endeavors to shed light on the impact of diverse modes of such assessments on students' knowledge acquisition, communication capabilities, and teamwork skills development within a competency-based accounting education environment. This gives rise to the following research questions:

1. *(RQ1) What are the effects of team-based written and video explanations to fictitious others during an assessment for learning on students' conceptual and transfer knowledge?*

2. *(RQ2) What are students' experiences of developing their communication and teamwork skills during team-based written and video explanations to fictitious others?*

4. Research method

To probe these research questions, students from a final year accounting course (n = 330) were tasked, as an assessment for learning, to prepare a team-based explanation of the preparation of consolidated financial statements for a fictitious recipient. Before preparing the team-based explanation, the students partook in a tutorial on preparing consolidated financial statements. Post tutorial, but before the assessment for learning, the students were directed to study for an individual assessment of knowledge[3] that gauged their knowledge of the preparation of consolidated financial statements. This assessment of knowledge functioned as the pre-test for the study. After the pre-test, the students were provided instructions (https://bit.ly/448d8HZ) to draft a team-based explanation of the topic for a fictitious student who had missed the tutorial. Upon completion of the assessment for learning, the students individually participated in an unannounced post-test assessment of knowledge.

For the team-based explanation, students were grouped based on their prior academic performance in the preceding accounting course. Students were randomly selected from each group to form teams of approximately six, ensuring that each team included both academically stronger and weaker students (Schmulian and Coetzee, 2019). The team allocation procedure aligns with recommendations from accounting education research, which advocates for instructors to form heterogeneous teams comprising around four to six students (Edmond & Tiggeman, 2009). Subsequently, the teams were randomly designated to either the written or video explanation mode.

Students in the written explanation mode were directed to write a 750-word explanation collaboratively. Considering that the average person speaks around 150 words per minute (Feldstein et al., 2001; Simonds et al., 2006), student teams assigned to the video explanation mode were instructed to collaboratively prepare a five-minute video explanation, equating to approximately 750 words (750 words / 150 words per minute).

Students delegated to the video explanation mode were not explicitly directed to ensure that each team member was featured in the video explanations. Consequently, some students emerged as presenters within these teams, while others were categorized as non-presenters. However, the students in the video explanation mode were instructed to draft a script to prepare their video explanation. Consequently, two principal differentiating factors could precipitate varying learning benefits between the written and video explanation modes.

Firstly, students from the video explanation mode, who also presented on the video recording, may be perceived as dedicating additional time to the assessment task compared to the non-presenters in the video explanation mode and students allocated to the written explanation mode. Both the non-presenters in the video explanation mode and the students assigned to the written explanation mode were engaged in developing a written explanation as part of the assessment task but did not partake in presenting their team explanation on video.

Secondly, the characteristics of student-prepared explanations might diverge between the two modes. Written explanations exhibit greater organization, while video explanations often include more elaborations and personal references (Lachner et al., 2018). Both of these differential factors are considered in the analysis of the results. Given that the second differentiating factor (explanatory features) cannot be gauged at the individual student level (as explanations were prepared in teams), this factor will be evaluated at the team level.

4.1. Influence of team-based written and video explanations on conceptual and transfer knowledge (RQ1)

To delve into the impact of the team-based written and video explanations to fictitious others as an assessment for learning on students' conceptual and transfer knowledge (RQ1), two exploratory ordinary least squares (OLS) regressions were used to concurrently explore the association between the students' conceptual and transfer knowledge and the two explanation modes (written vs video) while controlling for prior academic performance, gender, first language, and presenter status[4]:

$$AP = \beta_0 + \beta_1 ExplanationMode + \beta_2 PriorPerf + \beta_3 Gender + \beta_4 Language + \beta_5 Presenter + \in \quad (1)$$

4.1.1. Dependent variable

In the respective regressions, Academic Performance (AP) denotes the change in a student's conceptual knowledge (ΔCK) or a student's transfer knowledge (TK). Conceptual knowledge in this paper refers to the accounting domain knowledge students would require to prepare consolidated financial statements. This includes knowledge of the accounting principles and procedural application of these accounting principles in the preparation of consolidated financial statements. Transfer knowledge in this paper refers to accounting students' ability to apply their conceptual knowledge (as explained above) acquired in one accounting scenario to a different context (e.g., different industries, business, or financial scenarios). Transfer knowledge was thus conceptualized as successfully reinterpreting learned information (Lachner et al., 2018; Schwartz et al., 2005).

The pre-test measured the students' conceptual knowledge (CK), while the post-test evaluated both conceptual knowledge (CK) and transfer knowledge (TK) of the preparation of consolidated financial statements. The conceptual knowledge section of the post-test remained largely consistent with the pre-test, albeit with alterations in business names, amounts, and dates for the post-test to circumvent memory effects. The transfer knowledge section of the post-test required students to reinterpret learned knowledge by modifying aspects of the economic event from the contact session. The solution to the pre-test was only provided after the post-test. In adherence to the university's quality control procedure, both the pre-and post-tests were reviewed by a subject-matter expert. Another subject-matter expert, blind to this study, marked answers to both the pre-and post-test.

Change in conceptual knowledge (ΔCK) is delineated as the difference between the students' percentage scores in the conceptual knowledge pre-and post-test. Transfer knowledge (TK) corresponds to the student's percentage score for the transfer knowledge section of the post-test.

4.1.2. Variable of interest

Explanation mode is an indicator variable coded one for a team-based video explanation or zero for a team-based written explanation. Given that this study investigated the influence of the team-based explanation mode, the coefficients on this variable were not predicted.

4.1.3. Control variables

PriorPerf denotes a student's prior academic performance, measured as the student's percentage mark obtained in the pre-test of this study. Considering that learning in teams may yield differential benefits on the

[3] A copy of the conceptual knowledge pre-test and post-test are available at: https://bit.ly/3Ngf9uQ. A copy of the transfer knowledge test is available at: https://bit.ly/3Ngefi1.

[4] This exploratory multivariate analysis will unavoidably be parsimonious and would not be adequate to predict students' conceptual and transfer knowledge.

academic performance of lower- or higher-performing students (Giuliodori et al., 2008; Koles et al., 2010; Mahoney & Harris-Reeves, 2019), the sign of the coefficient for *PriorPerf* in the regressions was not predicted. Including this control variable also controls for any differences in the pre-test scores between students from the video and written explanation modes.

Gender was coded as one for females and zero otherwise. At the same time, *Language* was coded as one for students whose home language is English (which is also the instruction language) and zero otherwise. Given the mixed findings regarding the influence of gender (Gammie et al., 2003; Engel, 2018) and the difference between home language and instruction language (Coetzee & Schmulian, 2013; Coetzee, Schmulian, & Kotze, 2014; Wagner & Huang, 2011) on accounting students' academic performance, the sign of the coefficients for *Gender* and *Language* was not predicted.

Presenter was coded as one if a student from the video explanation mode served as a presenter and zero if a student was either a non-presenter in the video explanation mode or was allocated to the written explanation mode. This variable served as a proxy for the extra time spent on task by the presenters. It aided in determining if explanation mode, aside from additional time on task, contributed to any learning gains from the assessment task. Extra time on task is anticipated to result in beneficial learning gains and is thus predicted to have a positive coefficient. To collect this data, students from the video explanation mode were asked to complete a survey indicating whether they served as a presenter.

4.2. Differences in the explanatory features of the explanations provided by the written and video teams

To measure differences in the explanatory features between the two explanation modes, the written explanations submitted by the teams from the written explanation mode were compared to transcribed versions of the video explanations provided by the teams from the video explanation mode. Due to its holistic nature, the level of organization was measured on a molar level (global analysis) for each of the aspects of the consolidation process that needed to be explained rather than on a molecular level of single sentences (Lachner et al., 2018). A well-organized explanation pinpointed the main points, underscored central concepts, and was structured meaningfully. Each aspect of the topic[5] that students were required to explain was given a score out of four for how well the essence of that element (concept) was identified and a rating for how clearly the topic was explained. A rating out of four was also given for the overall consistency of the presentation (i.e., logical order of the presentation). A subject-matter expert, who was blind to this study, scored the explanations. Each elaboration and person-deictic reference was counted to measure the elaborations and personal references in the explanations. In respect of person-deictic references, the number of first-person pronouns (e.g., I, my, we, us) and second-person pronouns (e.g., you, your, yours) in the explanations were counted (Lachner et al., 2018). An elaboration was determined as a statement in which a student linked previous information in the study material to their prior knowledge by including examples, reporting their own experiences, or making analogies (Lachner et al., 2018).

4.3. Students' experiences developing their communication and teamwork skills during the team-based written and video explanations to fictitious others (RQ2)

A mixed-methods survey was used to collect quantitative and qualitative data to delve into students' experiences of developing their communication and teamwork skills during the written and video team-based explanations (RQ2). Qualitative data were gathered via an open-ended question, while quantitative data were generated using a scaled Likert attitude response (1- extremely negative to 7- extremely positive). The survey instrument's questions were based on items used in previous studies that explored students' experiences of collaborative assessment tasks (Cooper, 2017; Schmulian & Coetzee, 2019). The items provide insight into students' overall perspective of using the team-based explanation as an assessment for learning to develop communication and teamwork skills. Additionally, they shed light on students' perceptions regarding the intended focus of the assessment. This aided in gleaning insight into whether students perceived the assessment solely as a measure of knowledge or as an instrument also aimed at gauging skills development.

To affirm the content validity of the survey instrument (McKenzie et al., 1999), two accounting education experts scrutinized it. These experts evaluated the degree to which the items encapsulated the construct of interest and recommended additions, deletions, or modifications to ensure clarity of all the items. These recommendations were incorporated into the survey instrument, resulting in minimal changes. The survey instrument questions are presented in Table 1.

4.4. Statistical analysis

An alpha level of 0.05 was used for all statistical analyses. The data were scrutinized for potential confounding effects stemming from outliers. Box plot analysis was employed to identify any outliers.

4.5. Respondent profile

The final sample of students for RQ1 amounted to 215 students (Table 2). This sample was obtained after excluding the data of those students who did not give consent for their data to be analyzed (n = 44), did not participate in the pre-test (n = 6) or post-test (n = 4), were repeating the course (n = 37), did not complete the survey (17), or were identified as outliers following box plot analysis (7).

The demographic variables were generally comparable across the two explanation modes (Table 3). There were no significant differences between the video and written explanation modes concerning gender ($X^2(2) = 1.14$, $p = 0.29$) and language ($X^2(2) = 0.19$, $p = 0.67$).

The analysis of students' experiences of the team-based explanation assessment (RQ2) involved 227 students (69 %), after removing students who did not give consent for their data to be used (44) and after discarding responses from students who had mistakenly submitted two responses to the survey (8). Among the 227 survey responses, 120 (53 %) were from students in the video explanation mode, and 107 (47 %) were from students in the written explanation mode.

5. Results

5.1. Influence of team-based written and video explanations on conceptual and transfer knowledge (RQ1)

5.1.1. Descriptive statistics and preliminary analysis of conceptual knowledge and transfer knowledge development from the team-based explanation assessment for learning

The initial analysis found that students assigned to the written

Table 1
Survey instrument questions.

- On a scale of 1 (extremely negative) to 7 (extremely positive), rate your overall experience of the collaborative preparation of your team's explanation to a fictitious other student who could not attend the contact sessions.
- What ALL do you think the collaborative preparation of your team's explanation as a form of assessment was actually assessing?

[5] Students were asked to explain three aspects (value adjustments at acquisition of a subsidiary, accumulated losses of a subsidiary at acquisition, and the effects of preference shares in a subsidiary on the consolidation procedures) of the consolidated financial statements topic, in their team-based explanations.

Table 2
Sample composition for RQ1.

Description	Number
Total number of student participants	330
Less students who did not give consent for their data to be included in the study	44
Less students who did not write pre-test	6
Less students who did not write post-test	4
Less students who were repeating the course	37
Less students from the video explanation mode who did not complete the survey to indicate whether they were a presenter or not	17
Less outliers identified	7
The total sample of students for RQ1	215
Sample split between the video and written explanation modes:	
Number of students who collaboratively prepared video explanations	103
Number of students who collaboratively prepared written explanations	112

explanation mode exhibited significantly superior pre-test knowledge (t = -3.06, p = 0.001, d = 0.42) compared to those assigned to the video explanation mode (Table 4).

However, after the team-based explanation, there was no significant difference in students' post-test conceptual knowledge scores (t = 0.18, p = 0.43, d = 0.03) or students' transfer knowledge development (t = 1.088, p = 0.139, d = 0.149) between the two team-based explanation modes. Furthermore, the video explanation group exhibited a significantly greater conceptual knowledge change than the written explanation group (t = 4.016, p < 0.001, d = 0.55). These initial findings suggest that the students assigned to the video explanation mode gained more conceptual knowledge from the team-based explanation. This is, however, before controlling for differences in the pre-test knowledge between the two explanation modes, which will be addressed in the forthcoming regression analysis.

5.1.2. Regression analysis of conceptual knowledge development from the team-based explanation assessment for learning

The mode of the team-based explanation (video or written) ceases to significantly (t-statistic = 1.12, p = 0.26) influence the students' conceptual knowledge gains (Table 5) when controlling for the student's pre-test knowledge, gender, language, and additional time spent on task by the video explanation mode presenters. This finding implies that both video and written team-based explanation modes equally bolster students' conceptual knowledge gains. This insight adds to the existing understanding of the effects of explanation modes in learning-by-explaining literature. It proposes that the distinction between written and video explanation modes does not differentially affect students' conceptual knowledge development when the explanations are collaboratively prepared and presented. This indicates that the similar conceptual knowledge development benefits observed when students individually prepare and present written and video explanations (Hoogerheide et al., 2016; Lachner et al., 2018) remain unaffected by a change in explanation preparation and delivery from an individual to a collaborative setting.

This perspective, however, precedes the consideration of the significantly negative coefficient for prior performance (t-statistic = -5.87p = 0.00) (Table 5) as indicated by the regression analysis. The significantly negative coefficient for prior performance may indicate that the learning benefits derived from this study's team-based explanation assessment may vary for students from different prior performance levels. This differentiation might stem from the team-based nature of the explanation (Giuliodori et al., 2008; Koles et al., 2010; Mahoney & Harris-Reeves, 2019).

To explore this hypothesis, the entire sample of students was stratified based on their prior performance. Students were categorized into three performance tiers at the 33rd, 66th, and 100th percentile (low, moderate, and top performers) (Table 6).

The analysis of the conceptual knowledge change across the three tiers of prior performance highlights that the video explanation mode holds a significant advantage solely for top-performing students (t = 3.40, p < 0.001, d = 0.76). This insight suggests that the learning benefits from written and video team-based explanations vary for top-performing students. Given the team-based design of the assessment, this outcome could result from free-riding (unequal participation by team members). Prior accounting education research has acknowledged free-riding as a concern in teamwork tasks (Strand Norman, Rose, & Lehmann, 2004). The evident benefit for top-performing students in the

Table 4
Descriptive statistics.

	Video explanation mode		Written explanation mode	
	Mean	Std. Dev	Mean	Std. Dev
Prior performance (Pre-test conceptual knowledge)[1]	57.28	19.88	65.18	17.95
Post-test conceptual knowledge	64.77	20.04	64.31	17.47
Change in conceptual knowledge	7.27	15.50	−0.88	14.26
Transfer knowledge	28.64	19.06	25.81	18.95

[1] The significant difference in students' prior performance (t = 3.06, p = 0.001, d = 0.42) between the video and written explanation modes per Table 4 is controlled for in the regression analyses of this study by including the students' conceptual knowledge pre-test scores as a control variable (prior performance) in the regression analyses.

Table 5
Regression results – Conceptual knowledge.

Regression results for the association between team-based explanation mode and the change in students' conceptual knowledge from the pre-test to the post-test (ΔCK)

Variables	Prediction	Unstandardized B	t-statistic	Sig.
(Constant)		20.01	5.62	0.00**
Mode (Video)	±	2.88	1.12	0.26
PriorPerf	±	−0.29	−5.87	0.00**
Gender	±	−3.39	−1.78	0.08
Language	±	−0.37	−0.18	0.85
Presenter	+	5.14	1.84	0.07
F-statistic = 13.05 (p < 0.001)		Significance:		
Adjusted R^2 = 0.22		**p < 0.01		
n = 215		* p < 0.05		

Table 3
Demographic variables.

	Video explanation mode		Written explanation mode		Total	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Gender:						
Female	59	57.29	56	50.00	115	53.49
Other	44	42.71	56	50.00	100	46.51
Home Language:						
English	33	32.04	39	34.82	72	33.49
Other	70	67.96	73	65.18	143	66.51

Table 6
Change in conceptual knowledge for each prior performance category per explanation mode.

	Video explanation mode Low (n = 41) Moderate (n = 28) Top (n = 34)						Written explanation mode Low (n = 26) Moderate (n = 39) Top (n = 47)					
	Pre-test conceptual knowledge		Post-test conceptual knowledge		Change in conceptual knowledge		Pre-test conceptual knowledge		Post-test conceptual knowledge		Change in conceptual knowledge	
Prior performance categories:	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev
Low	36.72	11.03	50.82	18.21	13.57	15.78	40.85	9.97	48.75	17.25	7.90	14.11
Moderate	62.07	4.25	67.08	15.08	5.02	15.21	61.19	4.49	62.65	14.33	1.46	13.72
Top	78.14	8.16	79.68	13.35	1.54	12.78	81.94	8.45	74.30	12.82	−7.65	11.47

video explanation mode might suggest that they shouldered most of the workload for the assessment task. They might, for instance, have predominantly assumed the presenter role in the video teams.

The distribution of presenters among the three prior performance tiers within the video explanation teams was examined to determine if this was potentially the case. However, the data does not affirm that the top performers benefited the most due to majorly taking on the presenter role. The distribution shows that 66 % of the low performers, 71 % of the moderate performers, and 50 % of the top performers assumed the presenter role in the team-based video explanations. Therefore, the top performers do not appear to have a heavier workload in preparing the video explanations. Accordingly, the findings per Table 6 do not appear to have been impacted by free riding in the team-based assessment.

While the findings per Table 6 were not influenced by free-riding, gaining a better understanding of the differential benefits experienced by the top-performing students from the video explanation mode would be beneficial. To further probe the significant effect identified among the top-performing students, a regression analysis, retaining the same variables as in the regression per Table 5, was explicitly conducted for this performance category (Panel A of Table 7). The results from this regression will assist in discerning whether the video explanation mode or the isolated act of presenting on camera (presenter control variable, which could also signify extra time spent on task) is associated with the beneficial conceptual knowledge development gains observed among top performers from the video explanation mode.

Following this, it's notable that there might be a possibility of knowledge degradation among top-performing students in the written explanation mode. This could be attributed to their limited opportunity for further review between the pre-test and post-test. Moreover, the potential spacing effect on learning, as noted by Carpenter et al. (2012), might play a role in explaining the varying learning benefits across different prior performance categories for each explanation mode (Giuliodori et al., 2008; Koles et al., 2010; Mahoney & Harris-Reeves, 2019). It is crucial for future studies to pinpoint the specific reasons for this potential knowledge degradation among top-performing students who utilized the written explanation mode.

The regression results (Panel A of Table 7) indicate that, when controlling for presenter status for top-performing students, the video mode of the team-based explanation does not result in a significantly greater increase in conceptual knowledge when compared to the written explanation mode ($t = 1.87$, $p = 0.07$). Similarly, the regression results suggest that the isolated act of presenting on camera (as indicated by the presenter control variable) does not result in a significantly greater increase in conceptual knowledge than in the written explanation mode ($t = 0.99$, $p = 0.32$).

The lack of significant findings for both the video explanation mode and the presenter control variable in isolation could potentially suggest that it is not the isolation of these two elements of the video explanation mode that results in the beneficial conceptual knowledge gains of the video mode that results in more beneficial conceptual knowledge gains.

Table 7
Regression analysis for conceptual knowledge change for top prior performing performers.

Panel A:
Regression results for the association between team-based explanation mode and students' change in the conceptual knowledge from the pre-test to the post-test (ΔCK)

Variables	Prediction	Unstandardized B	t-statistic	Sig.
(Constant)		19.74	1.45	0.15
Mode (Video)	±	6.48	1.87	0.07
PriorPerf	+	−0.32	−1.97	0.05*
Gender	±	−2.27	−0.80	0.42
Language	±	0.34	0.12	0.90
Presenter	+	4.10	0.99	0.32
F-statistic = 3.46 (p = 0.007)		Significance:		
Adjusted $R^2 = 0.13$		**p < 0.01		
n = 81		* p < 0.05		

Panel B:
Regression results (not controlling for presenter status) for the association between team-based explanation mode and students' change in the conceptual knowledge from the pre-test to the post-test (ΔCK)[1]

Variables	Prediction	Unstandardized B	t-statistic	Sig.
(Constant)		20.57	1.51	0.13
Mode (Video)	±	8.49	3.00	0.00**
PriorPerf	+	−0.33	−2.05	0.04*
Gender	±	−2.16	−0.76	0.45
Language	±	0.50	0.18	0.86
F-statistic = 4.073 (p = 0.005)		Significance:		
Adjusted $R^2 = 0.13$		**p < 0.01		
n = 81		* p < 0.05		

[1]Running this same regression for low and moderate performing students does not find a significant coefficient for explanation mode.

Instead, it might be the combination of these two elements that yields more beneficial conceptual knowledge gains for the top-performing students. In this light, it can be argued that creating video explanations is a holistic and symbiotic process where script preparation and video presentation are intricately intertwined and mutually influential. These components do not exist independently but rather shape and inform one another, culminating in the final product – the video explanation. The message and its delivery are synergistically created, and this interplay may dictate the overall effectiveness and reception of the video explanation. By examining these elements in isolation, there is a risk of losing sight of the intrinsic relationship between the two, potentially diminishing the understanding of the video explanation phenomenon as a whole. For this reason, panel B of Table 7 presents the regression results for the video explanation mode as a unit without separately controlling for presenter status.

The regression results differ significantly when analyzing the full scope of the video explanation mode as a single entity. As indicated in Panel B of Table 7, the video explanation mode, viewed as a whole, facilitates significantly greater conceptual knowledge development compared to the written explanation mode ($t = 3.004$, $p < 0.00$).

5.1.3. Regression analysis of transfer knowledge development from the team-based explanation assessment for learning

The regression analysis results (per Table 8) align with the findings in the descriptive statistics (Table 4) and indicate no significant difference ($t = 1.82$, $p = 0.07$) between students' transfer knowledge emanating from the two explanation modes (Table 8). This outcome suggests that written and video explanations similarly impact transfer knowledge development when they are prepared in teams within authentic classroom settings, mirroring the effects observed when they were individually prepared in preceding experimental settings (Hoogerheide et al., 2016). The transitions in the modality of explanation preparation — from individual to collaborative undertakings and from experimental to real classroom environments — do not seemingly alter the influence of explanation mode on students' transfer knowledge advancement.

To determine if there are any differential benefits of explanation mode per prior performance category, an analysis of the transfer knowledge benefits per prior performance category is presented in Table 9. Independent t-tests, comparing the transfer knowledge per explanation mode across all three prior performance categories, yield insignificant differences in transfer knowledge for the low ($t = 0.67$, $p = 0.25$, $d = 0.17$), moderate ($t = 1.08$, $p = 0.14$, $d = 0.27$) and top ($t = 0.56$, $p = 0.29$, $d = 0.13$) performers. Consequently, the mode of the team-based explanation assessment for learning does not seem to provide differential benefits across any of the prior performance categories concerning transfer knowledge development.

5.1.4. Explanatory features of the video and written team-based explanations

The degree of organization of the team-based written explanations significantly diverged from that in team-based video explanations ($t = 2.69$, $p = 0.004$, $d = 0.37$), with written explanations exhibiting a higher level of organization ($m = 57.26$ %) compared to video explanations ($m = 54.74$ %). This finding suggests that written explanations, whether prepared individually by students (Lachner et al., 2018) or in teams, tend to be more organized than video explanations.

In respect of the social presence effects of the explanation modes, the team-based video explanations (mean = 36.16) contained more person-deictic references compared to the team-based written explanations (mean = 4.83), and this difference was significant ($t = 15.57$, $p < 0.001$, $d = 2.13$). Similarly, the team-based video explanations contained more (mean = 6.26) elaborations than the team-based written explanations (mean = 5.72), with this difference also being significant ($t = 1.82$, $p = 0.04$, $d = 0.25$). A correlation analysis between the two social presence indicators revealed that the number of person-deictic references and elaborations are significantly correlated (Pearson correlation = 0.23, $p < 0.001$ and Spearman correlation = 0.21, $p = 0.002$).

The elevated levels of social presence in the team-based video explanations, compared to the team-based written explanations, suggest that higher levels of social presence in video explanations prevail even when explanations are collaboratively prepared and presented. This finding augments the current learning-by-explaining literature by implying that video explanations yield higher levels of social presence, whether prepared individually (Jacob et al., 2020; Lachner et al., 2018) or collaboratively, as in this study. It suggests that the manner of preparation and presentation (individually or collaboratively) for a video explanation does not alter the social presence effects of the video mode, supporting the notion that the social presence effects may be triggered by the presence of a camera in video explanations (Hoogerheide et al., 2016).

Previous research suggests that the differences in explanatory features between explanation modes mediate the learning benefits students experience from learning-by-explaining in experimental settings that require the individual preparation of such explanations (Lachner et al., 2018). Given the outcomes from the regression analyses for both conceptual and transfer knowledge development in this study, the observed differences in the explanatory features (namely, level of organization, person-deictic references, and elaborations) between the written and video explanations do not appear to alter or impact the combined learning outcomes significantly – in terms of both conceptual and transfer knowledge – that low and moderate performing students derive from these two modes of team-based explanations. However, this may not be true for top-performing students' conceptual knowledge development.

Given that both the level of organization and the social presence indicators in this study are assessed at a team level, the sample sizes for evaluating any potential mediating effects of the explanatory features on top-performing students' conceptual knowledge development are significantly reduced. Therefore, future research, which includes larger sample sizes for these team-based measures, could further investigate whether the differences in these explanatory features (level of organization, elaboration, and personal references) between team-based written and video explanations mediate the learning benefits of top-performing students.

Table 8
Regression results – Transfer knowledge.

Regression results for the association between team-based explanation mode and students' performance in the transfer knowledge post-test (TK)[1]

Variables	Prediction	Unstandardized B	t - statistic	Sig.
(Constant)		12.80	2.64	0.01**
Mode (Video)	±	6.37	1.82	0.07
PriorPerf	+	0.17	2.48	0.01**
Gender	±	−1.18	−0.46	0.65
Language	±	7.65	2.79	0.01**
Presenter	+	−3.10	−0.81	0.42
F- statistic = 3.53 (p = 0.004)		Significance:		
Adjusted $R^2 = 0.06$		**p < 0.01		
n = 215		* p < 0.05		

[1] The overall findings from the regression for transfer knowledge do not change when the regression is run for the video mode in its full capacity (i.e. when not separately controlling for presenter status) as was done in panel B of Table 7.

Table 9
Transfer knowledge per prior performance category per explanation mode.

Prior performance categories:	Video explanation mode Low (n = 41) Moderate (n = 28) Top (n = 34)		Written explanation mode Low (n = 26) Moderate (n = 39) Top (n = 47)	
	Transfer knowledge		Transfer knowledge	
	Mean %	Std. Dev	Mean %	Std. Dev
Low performers	26.22	19.68	23.07	17.21
Moderate performers	27.68	19.25	22.65	18.63
Top performers	32.35	18.09	29.97	19.71

5.2. Students' experiences of developing their communication and teamwork skills during the team-based written and video explanations to fictitious others (RQ2)

5.2.1. Descriptive statistics

In the conducted survey, a vast majority of the respondent students (89 %; n = 202) reported a positive experience of the team-based explanation assessment for learning (Median = 6) (Table 10), indicating that the assessment was generally perceived as highly beneficial. A detailed breakdown of respondents' experiences based on the explanation mode is provided in Table 10. Notably, students from the written explanation mode reported significantly higher satisfaction levels with their overall experience than those in the video explanation mode ($t = 2.84$, $p = 0.002$, $d = 1.10$). This overwhelmingly positive response was further complemented by the students recognizing the assessment as an

Table 10
Students' experiences of the team-based explanation assessment for learning.

	Video groups		Written groups		Total	
	M = 5.50 (SD = 1.17) Median = 6		M = 5.92 (SD = 1.01) Median = 6		M = 5.7 (SD = 1.12) Median = 6	
	Total (n = 120)		Total (n = 107)		Total (n = 227)	
On a scale of 1 (extremely negative) to 7 (extremely positive), rate your overall experience of the collaborative preparation of your team's explanation to a fictitious other student that could not attend the contact sessions.	No:	Percentage	No:	Percentage	No:	Percentage
7	24	20 %	35	33 %	59	26 %
6	41	34 %	38	36 %	79	35 %
5	36	30 %	28	26 %	64	28 %
4	12	10 %	3	3 %	15	7 %
3	5	4 %	2	2 %	7	3 %
2	1	1 %	1	1 %	2	1 %
1	1	1 %	0	0 %	1	0 %

opportunity to develop teamwork and communication skills (Table 11). As detailed in Table 11, the video explanation mode seemed to offer more advantages for developing teamwork skills, with 69 % of the students reporting opportunities for improving their teamwork skills, compared to 59 % from the written explanation. This discrepancy can largely be attributed to top-performing students benefiting more from the video explanation mode regarding teamwork skill development.

Regarding communication skills, both modes were similarly beneficial: 28 % from the video explanation mode and 27 % from the written explanation mode reported opportunities for communication skill development. Overall, the findings per Table 11 seem to suggest that the students experienced the assessment for learning to be more focused on the assessment of teamwork skills rather than on the assessment of communication skill development. The grading instructions for the team-based explanation assessment task may have contributed to this perception, as students were required to complete an anonymous peer evaluation of each team member's effectiveness in their role as a team member, which contributed 50 % of the final grade for the assessment. This grading structure may have led students to place greater importance on teamwork skills. Educators interested in implementing a similar task in their courses should consider this finding. They might want to include a peer evaluation of communication skills in the grading of such an assessment. In summary, the findings in Table 11 indicate that the video explanation mode of the team-based explanation assessment seems to offer superior benefits for teamwork skill development compared to the written explanation mode.

6. Discussion

The findings regarding conceptual knowledge development echo outcomes from prior experimental research, which reported comparable benefits between both explanation modes when explanations are individually prepared (Lachner et al., 2018). This consistency extends to team-prepared explanations in a real classroom setting. A noteworthy insight from this study is that when considered holistically without dissecting the elements of message and delivery, the video explanation mode proves more beneficial for top-performing students' conceptual knowledge development. Unlike the written explanation mode, the video mode does not reduce conceptual knowledge for top performers. This insight is crucial for instructors contemplating adopting the assessment design from this study in their courses. Given that both modes seem beneficial for low and moderate-performing students, while the video explanation mode, in its full capacity, better supports the conceptual knowledge development of top-performing students', the team-based video explanation mode appears to be the optimal choice for fostering holistic classroom conceptual knowledge development.

Regarding transfer knowledge development, the results from team-based video and written explanations suggest comparable benefits in both experimental settings, when explanations are individually prepared (Hoogerheide et al., 2016), and in real classroom environments, when explanations are collaboratively prepared. This suggests a consistent performance of both modes across different instructional contexts in facilitating transfer knowledge development.

Taken together, the knowledge development findings from this study suggest that although prior research has indicated that the incorporation of collaboration in learning-by-explaining appears to enhance its learning benefits (Kobayashi, 2021), it does not appear to eclipse the differential learning benefits of different modes of explanations in learning-by-explaining.

The synthesis of findings regarding explanatory features from both modes of explanations in this study extends previous research, showcasing that written explanations exhibit higher organization, while video explanations contain more elaborations and personal references, irrespective of whether they are prepared individually (Lachner et al., 2018) or in teams as per this study. In light of the divergent learning benefits observed for top-performing students in video and written team-based explanations concerning conceptual knowledge development, future research should investigate whether these explanatory features act as mediators in the learning benefits of top-performing students within a team-based explanatory setting.

The reflection on students' experiences with the team-based explanation underscores that both modes facilitated a primarily positive learning experience. Yet, a notable distinction emerged, with more students finding the video explanation mode more conducive to developing teamwork skills than the written mode. Conversely, both modes were adjudged equally effective for advancing communication skills.

In summary, for instructors aiming to use the assessment for learning from this study as an exemplar for enhancing students' knowledge, communication, and teamwork skills, the team-based video explanation mode in its full spectrum (which includes both script preparation and

Table 11
Percentage of students who indicated that the team-based explanation assessment task assessed their teamwork and communication skill development.

	Video mode (n = 120)		Written mode (n = 107)	
Prior-performance category	Teamwork skills	Communication Skills	Teamwork skills	Communication Skills
Low	69 %	23 %	64 %	14 %
Moderate	63 %	33 %	67 %	31 %
Top	78 %	30 %	50 %	33 %
Total (all students per mode)	69 %	28 %	59 %	27 %

video presentation) emerges as the most beneficial. This mode underpins holistic class knowledge development and provides students with ample opportunities for developing teamwork skills.

7. Conclusion

Many disciplines need to incorporate competency-based learning tasks that bolster students' content knowledge and facilitate the development of various competencies, including communication and teamwork skills. Therefore, this study explored the use of different modes of a team-based explanation as an assessment for learning within a competency-based accounting education context, focusing on developing students' knowledge, communication, and teamwork skills.

The insights from this study underscore the comparable merits of video and written explanations for conceptual knowledge development. This is because the findings from this study resonate with similar findings from experimental settings, which incorporated individually prepared explanations. This suggests that video and written explanation modes provide comparable conceptual knowledge development benefits in experimental and real classroom settings, whether individual or collaborative explanation preparation is required. However, a divergent outcome emerges: when perceived as an integrated, inseparable process, team-based video explanations appear to offer superior conceptual knowledge development benefits for top-performing students compared to written team-based explanations. This suggests that the video mode of a team-based explanation, used as an assessment for learning, could be a more favorable design choice for facilitating comprehensive class-wide conceptual knowledge development.

To delve deeper into the superior conceptual knowledge advantage of video team-based explanations for top-performing students, future research should probe whether divergences in the explanatory features of written and video team-based explanations contribute to the differential conceptual knowledge benefits identified in this study. A review of peer evaluations and student surveys might unveil additional insights into possible team-learning dynamics that may affect the differing conceptual knowledge benefits that top-performing students gain from the two modes of the team-based explanation used as an assessment for learning.

In terms of transfer knowledge development, the insights garnered from this study resonate with the findings of Hoogerheide et al. (2016), suggesting that lower to moderate levels of transfer task complexity may mitigate the impact of explanation modality, irrespective of whether the explanations are prepared individually or in teams. Future research could explore whether increased levels of task complexity impact the comparative effects of team-based explanation modality for transfer knowledge. Such exploration would help determine whether increased levels of task complexity can reproduce the differential explanation modality effects seen in Lachner et al. (2018).

The benefits of written and video team-based assessments for learning to develop communication and teamwork skills were also investigated in the competency-based accounting education context within which this study takes place. Mirroring the findings on conceptual knowledge development, the results about the skills development advantages of the two modes of the team-based explanation suggest that the video explanation mode would once again be the preferred choice. This is because students assigned to the video mode more frequently reported finding the team-based video explanation successful in offering opportunities for teamwork skills development. Regarding opportunities for communication skills development, both explanation modes seemed equally beneficial. Cumulatively, these findings suggest that the video explanation mode of the assessment task is superior for competency development purposes when the objective is to develop both teamwork and communication skills.

In conclusion, for instructors operating in competency-based learning environments, video team-based explanation assessments for learning are recommended if their objective is to foster both conceptual and transfer knowledge across all performance categories of students while also providing them with opportunities for communication and teamwork skills development. This recommendation is predicated upon the findings of this study and may be subject to the availability of time and resources within the institution. As a final proposition for future research, it would be beneficial to investigate further student and instructor experiences of the two modes of the team-based explanation. This could uncover additional factors, such as time and resource constraints, that may influence the decision to implement such an assessment and any decisions regarding the modality of such an assessment.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

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