LEARNING FROM COLLABORATIVE EXPLANATIONS IN ACCOUNTING EDUCATION

by

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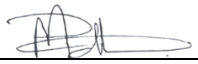

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ABSTRACT

LEARNING FROM COLLABORATIVE EXPLANATIONS IN ACCOUNTING EDUCATION

by

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Rooted in social constructivism, this thesis aims to support accounting educators in transitioning from traditional rote learning approaches to more dynamic educational approaches which broaden accounting competency development. To achieve this, this thesis introduces the use of student-led team-teaching tasks, which incorporate learning-by-explaining, through various modes (oral, video and written), to develop accounting students' conceptual and transfer knowledge, while simultaneously developing their teamwork and communication skills within a competency-based accounting education setting.

The findings indicate that student-led team-teaching tasks, which incorporate learning-by-explaining, played a beneficial role in providing accounting students with opportunities for broader competency development. These tasks not only supported accounting students' knowledge development but also created opportunities for the development of teamwork and communication skills.

In particular, the findings of this thesis indicate that weak and moderate-performing accounting students obtain comparable conceptual knowledge development benefits from all three modes (oral, video, and written) of the student-led team-teaching tasks. However, top-performing accounting students only benefited from the video mode, with decreases in conceptual knowledge observed from the oral and written modes. The mode of the explanation, therefore, played a role in the conceptual knowledge development benefits experienced by the top-performing students of this thesis.

In terms of transfer knowledge, all students, regardless of prior-performance level, experienced comparable development benefits from all three explanation modes. Therefore, the mode of the explanation did not influence the transfer knowledge development benefits from the student-led team-teaching tasks.

In terms of opportunities for teamwork and communication skills development from the student-led team-teaching tasks, incorporating learning-by-explaining, accounting students more frequently reported opportunities for teamwork skills development than for communication skills development. This trend was consistent across all task modes (oral, video and written).

When focusing solely on teamwork skills development, the mode of explanations appeared to play a role, with the video explanation mode being perceived as the most beneficial for creating opportunities for teamwork skills development. However, the mode did not appear to influence the development of communication skills, as all three modes were reported to provide comparable benefits for communication skills development.

In conclusion, this thesis offers accounting educators an exemplar task, the student-led team-teaching task, which facilitates broader competency development for accounting students. The thesis also contributes new insights to the literature on competency-based education, team-teaching, learning-by-explaining, and accounting education.

TABLE OF CONTENTS

APPENDIXES

LIST OF FIGURES

LIST OF TABLES

1 CHAPTER 1: INTRODUCTION

"In teaching others, we teach ourselves"

Traditional Proverb

The world has undergone a period of rapid transformation from an industrial to an information economy paradigm. This transformation coupled with increased globalisation, easier access to information, and advancements in big data processing has resulted in revolutionary changes to the accounting profession (Shortridge & Smith 2009; Cunha, Martins, Carvalho & Carmo 2022). The acceleration of information technologies and artificial intelligence has, for example, resulted in accountants having to shift their focus away from repetitive tasks (Cunha et al. 2022). Instead, accountants now need to focus on unexpected creative thinking challenges, which require business intelligence and the ability to build interpersonal relationships with real decision-makers (Cunha et al. 2022). The rise of the automation of functions also affects many functions within the accounting workplace (Ghani & Muhammad 2019; Tan & Laswad 2018; Bunney, Sharplin & Howitt 2015) and accountants' roles are shifting away from mere accountancy and being considered as mere bean counters to now also having to be business decision makers who need to be able to build interpersonal relationships which require of them to develop communication, interpersonal and organisational skills as part of the competencies they need to fulfill their new roles (Cunha et al. 2022; Parker & Warren 2017; International Accounting Education Standards Board (IAESB) 2014; Baldvinsdottir, Burns, Nørreklit & Scapens 2009; Smith & Briggs 1999). Accounting educators therefore need to develop well-rounded accounting students who not only have the necessary accounting knowledge but also possess the professional skills they will need to be successful within their profession (De Lange, O'Connell & Tharapos, Beatson & Oosthuizen 2023, Tharapos 2022, Cunha et al. 2022; Jackson & Meek 2021; Zhao 2018).

The professional skills that aspiring accountants need to develop as they progress towards becoming professional accountants have been outlined by the International Accounting Education Standards Board (International Accounting Education Standards Board, 2019). Professional accounting bodies have also established competency frameworks to outline

the competencies for accounting graduates (see Certified Professional Accountants (CPA) Canada 2019; Association of Chartered Certified Accountants (ACCA) 2018; South African Institute of Chartered Accountants (SAICA) 2021). Competency frameworks identify the essential competencies for professional success (Harris, Bhanji, Topps, Ross, Lieberman, Frank, Snell & Sherbino 2017; Abbasi 2014; Bolt-Lee & Foster 2003; Boritz & Carnaghan 2003). The accounting competency frameworks have identified knowledge[1] (or technical knowledge as it is also referred to), teamwork skills, and communication skills as part of the competencies that accounting graduates need to develop (Lawson, Blocher, Brewer, Cokins, Sorensen, Stout, Sundem, Wolcott & Wouters 2014; Partnership for 21st Century Skills, 2015; Plant, Barac & Sarens 2019; Dolce, Emanuel, Cisi & Ghisleril 2020). Technical knowledge, teamwork skills and communication skills are also highly valued by accounting graduates and their future employers (Keevy, Tharapos, O'Connell, Verhoef, de Lange & Beatson 2023, Dolce et al. 2020; Plant et al. 2019; Chhinzer & Russo 2018; Tan & Laswad 2018; Lawson et al. 2014).

To develop the competencies that accounting students need in order to meet the changing requirements and expectations of the accounting profession, accounting educators are urged to shift away from traditional rote learning for knowledge development only, to more dynamic teaching methods that actively engage students in conceptualising accounting knowledge while also developing the additional competencies[2] that are necessary for the changing accounting workplace (Abbasi 2014; Lawson et al 2014; Zhao, 2018; Plant et al. 2019; Jackson & Meek 2021; Jackson, Michelson & Munir 2023). The automation of accounting functions, for example, may require accounting educators to expand their focus from only emphasizing technical accounting competencies that are easily automated to emphasizing skills, like human business acumen[3] and communication skills (Tsiligiris & Bowyer 2021; ICAEW 2017), because these skills are required in order to achieve maximum

[1] The knowledge that accounting students need to develop is also referred to as a technical accounting skill (Plant, Barac & Sarens, 2019). Accounting knowledge is therefore also referred to as technical knowledge in some of the competency frameworks and in accounting education research (Dolce, Emanuel, Cisi & Ghisleril 2020; Plant, Barac & Sarens 2019; Chhinzer & Russo 2018; Tan & Laswad 2018; Lawson et al. 2014). Accountants must have robust conceptual knowledge of financial reporting (Rodgers, Simon & Gabrielsson 2017) and the ability to transfer that knowledge in the recording and reporting of economic events (Pathways Commission 2015). It is, therefore, important for accounting students to develop both conceptual and transfer knowledge of accounting.

[2] Competencies are defined as the knowledge, skills, and values that enable individuals to perform required tasks (Frank et al. 2010).

[3] Business acumen includes strategic thinking, consulting, and business advisory skills (Tsiligiris & Bowyer 2021).

effectiveness from automated models and to perform vital skills that cannot be performed by digital systems (Tsiligiris & Bowyer 2021).

Competency-based education has been proposed as a means to enable this shift in focus (Schmulian & Coetzee 2019; Zhao 2018). Competency-based education recognises that competency does not merely encompass knowledge of subject-matter, and emphasises the need to engage students in holistic tasks that integrate the knowledge, skills, and attitudes that students need for the successful completion of a professional task (Van der Vleuten 2015). Despite competency-based education being proposed as a means for broadening the competency development of accounting students, fostering 'buy-in' for competency-based education among accounting educators is challenging (Schmulian 2018). Research to support the use of competency-based education in accounting, together with educator training in the form of professional development opportunities, particularly in teaching, learning, and assessment methods in competency-based education is needed, in order to help gain accounting educator 'buy-in' (Schmulian 2018). This thesis contributes to the needed research support for competency-based accounting education as it provides an exemplar of the use of competency-based education in accounting. More specifically, this thesis explores and reports on the use of student-led team-teaching, which incorporates learning-by-explaining, as a holistic task that allows for both knowledge development and teamwork and communication skills[4] enhancement, for accounting students, in a competency-based education context. This thesis focuses on teamwork and communication skills as these skills have been identified as crucial skills in the 21st-century workplace (Bayne, Birt, Hancock, Schonfeldt & Agrawal. 2022; Mehrabi Boshrabadi & Hosseini 2021). Team-teaching tasks, assigned to student teachers as part of their professional development, necessitate teamwork and communication among the students as they plan, deliver, and/or evaluate a course (Do & Hascher 2023).

Team-teaching, which is anchored in social constructivism (Schmulian 2018) and is commonly defined as two or more teachers collaborating in the planning, delivery, and/or evaluation of a course (Baeten & Simons 2014; Carpenter, Crawford & Walden 2007; Murata 2002; Sandholtz 2000), has been used in teacher education as a task that allows student

[4] Teamwork and communication skills are also sometimes referred to in literature as soft skills, professional skills, or professional competencies (Dolce et al. 2020).

teachers[5] to practice integrating the knowledge, skills, and attitudes they need to engage in teaching tasks within their profession successfully. Team-teaching tasks have, for example, been found to be beneficial for the development of enhanced teaching, collaboration, communication, knowledge, reflection, self-confidence, and self-efficacy competencies for student teachers as part of their professional development (Howlett & Nguyen 2020; Soslau, Gallo-Fox & Scantlebury 2019; Baeten & Simons 2014; Wynn & Kromrey 2000). Given the broad range of competencies that student teachers develop as they engage in team-teaching tasks, such tasks can be considered to be holistic tasks (also referred to as integrated tasks) that provide opportunities for broader competency development, as advocated for by competency-based education.

Team-teaching also engages student teachers in the act of explaining course content, which has been found to be beneficial for knowledge acquisition. Students who prepare and present explanations of course content have been found to gain a deeper knowledge of the content they explained (Kobayashi 2019; Lachner, Ly & Nückles 2018). Learning-by-explaining (or learning-by-teaching as it is also commonly referred to) is thus recognised as a powerful instructional approach (Lachner, Backfisch, Hoogerheide, van Gog & Renkl 2020) that stimulates cognitive processes conducive to knowledge acquisition (Fiorella & Mayer 2016). Learning-by-explaining can be facilitated in various modes, such as in writing or on video (Lachner, Hoogerheide, van Gog & Renkl 2021; Hoogerheide, Deijkers, Loyens, Heijltjes & van Gog 2016; Hoogerheide, Renkl, Fiorella, Paas & van Gog 2019). The consequential explanatory features[6] of an explanation, which is influenced by the mode of that explanation, influences the type of knowledge gained. For instance, the inherent higher levels of organisation within a written explanation are beneficial for conceptual knowledge development (Lachner et al. 2018), while the increased levels of elaboration of content, as a proxy for social presence[7], found in video explanations promote transfer knowledge development (Lachner et al. 2018).

[5] Student teachers are defined in this thesis as students who are participating in teacher education and who are training to become professional teachers themselves.

[6] Explanatory features of explanations include the level of organisation, person-deictic references, and elaborations found in explanations (Lachner et al. 2018).

[7] Social presence is defined here as the degree to which someone is perceived as a "real person" (Gunawardena 1995). In experimental settings, learning-by-explaining literature which focuses on explanations of course content by students to a non-present recipient (fictitious recipient or fictitious other), as explanations are prepared on video, has been shown to bolster learning, largely due to the social presence effect linked with the non-present recipient of the explanation (Lachner et al. 2021; Hoogerheide et al. 2016).

Given the broad competency development benefits of team-teaching tasks in a teacher education context and the knowledge development benefits of learning-by-explaining, it may be beneficial for accounting educators to explore whether team-teaching tasks that engage students in learning-by-explaining could be successfully used as an integrated task to help broaden the development of accounting students' competencies. This thesis therefore specifically explores the use of student-led team-teaching, which incorporates learning-by-explaining in various modes, as a means to develop accounting students' knowledge while also allowing for opportunities for the development of teamwork and communications skills, as some of the broader competencies that accounting students require in order to be successful within the changing accounting profession.

By exploring the use of student-led team-teaching, which incorporates learning-by-explaining in various modes, as a means to develop accounting students' knowledge while also allowing for opportunities for the development of teamwork and communications skills this thesis will also address gaps in prior team-teaching and learning-by-explaining literature as follows:

- Prior team-teaching literature which explores the benefits of engaging students in the role of team-teachers, has focused on students in teacher education (refer to: Howlett & Nguyen 2020; Soslau, Gallo-Fox & Scantlebury 2019; Baeten & Simons 2014; Wynn & Kromrey 2000). This thesis extends on prior team-teaching literature as it explores the use of student-led team-teaching for the purpose of developing accounting students' knowledge, teamwork skills, and communication skills development. This thesis therefore explores the benefits of engaging students in the role of team-teachers outside of teacher education.

- Prior research which considers the learning benefits of varying modes of learning-by-explaining, primarily focused on the effects of varying modes of explanations when students were required to individually prepare explanations (Kobayashi 2021, Ribosa & Duran 2022). This thesis will explore the use of different modes of learning-by-

explaining as accounting students prepare explanations in teams rather than individually.

- Meta-analyses of prior learning-by-explaining literature have shown that learning-by-explaining literature has focused on exploring the benefits of learning-by-explaining for student learning in the form of content knowledge development (Ribosa & Duran 2022, Kobayashi, 2024). This thesis will explore the use of student-led team-teaching, which incorporates learning-by-explaining not only for content knowledge development benefits but also for the development of teamwork and communication skills.

- No to little prior literature exists which explores learning-by-explaining beyond the confounds of experimental settings and explores the use of team-teaching (as students engage in the role of team teacher) and learning-by-explaining in accounting education. This thesis will therefore extend on prior learning-by-explaining and team-teaching literature as it explores the use of learning-by-explaining and student-led team-teaching in an applied competency-based accounting education context.

1.1 SOCIAL CONSTRUCTIVISM

Social constructivism, which has been identified as a key enabling learning theory (Vygotsky 1978), plays a crucial role in competency-based accounting education (Schmulian & Coetzee 2019a), and team-teaching (Schmulian 2018). Social constructivism is a theory in sociology and communication, which posits that understanding, significance, and meaning are created through social interactions (Amineh & Asl 2015; Vygotsky 1978). Social constructivists view individuals and society as interconnected (Woo & Reeves 2007), suggesting that cognitive growth occurs first at a social (or interpersonal) level before it manifests at an individual (or intrapersonal) level (Vygotsky 1978; Daniels, 2001; Kay & Kibble, 2016). Social constructivism is grounded in specific assumptions about knowledge and learning (Amineh & Asl 2015). Social constructivism views knowledge as a product of social interaction and environmental engagement (Amineh & Asl 2015). Learning is believed to occur not within an individual in isolation, but through engaging in social interaction (Amineh & Asl 2015). Therefore, from a social constructivist perspective, knowledge is

constructed as individuals learn through social interactions within their environment or community[8].

Knowledge (from the social constructivist perspective) exists on two levels: the interpersonal (external) level and the intrapersonal (internal) level. Intrapersonal knowledge cannot be fully developed without sufficient exposure to interpersonal knowledge (Kay & Kibble 2016; Daniels 2001). The knowledge that an individual develops (intrapersonal knowledge) from their exposure to social interactions (interpersonal knowledge) is considered to be the socially agreed upon interpretation of that knowledge (Schmulian 2018). Semiotic mechanisms[9] within the learning environment aids in the development of intrapersonal knowledge from exposure to interpersonal knowledge (Kay & Kibble 2016). This is because semiotic mechanisms are suggested to function as mediators of social and individual functioning and facilitate the connection between interpersonal and intrapersonal knowledge (Kay & Kibble 2016). The use of and continued exposure to semiotic mechanisms, like cultural tools and language, provide real experiences that eventually become symbolically represented in the mind as an individual internalises external knowledge (Kay & Kibble 2016; Irby 1994). Taking the assumptions of knowledge from a social constructivist perspective into account, in an accounting education context, social interactions at the interpersonal level (which could, for example, entail interactions between accounting students or between accounting students and accounting educators) which engage accounting students in the use of accounting tools (like financial statements, accounting calculations, and accounting language) are suggested to help accounting students internalise objective (external) accounting knowledge at an intrapersonal (internal) level.

Learning, in a social constructivist paradigm, is seen as a continuous progression from an individual's current intellectual level to a higher level that more closely approximates an individual's potential (Vygotsky 1978). This progression is facilitated through engagement in social interactions within the individual's zone of proximal development (ZPD) (Vygotsky

[8] Often times social interactions occur within an individual's community of engagement or practice (Schmulian 2018). Engagement in social practice is considered to be fundamental to learning, and an individual's knowledge is considered to develop and become refined as the individual engages in and contributes to practices within their community (Wenger 1999).

[9] Semiotic mechanisms are any tools that humans use to adapt to and thrive within the context of their environment (Kay & Kibble 2016). Semiotic mechanisms can for example include cultural tools, language, symbols, writing, writing utensils, and technology used by humans in order to adapt and thrive within their environments (Kay & Kibble 2016).

1978). The ZPD represents the distance between an individual's actual development level (determined by what an individual understands or can do without assistance from a more 'knowledgeable other') and their potential development level (determined by what an individual understands or can do with assistance from a more 'knowledgeable other') (Kay & Kibble 2016; Vygotsky 1978). This 'knowledgeable other' could be an adult, a more capable peer or instructor, or, with the advent of technology, could also include video or audio support (Kay & Kibble 2016; Vygotsky 1978). The 'knowledgeable other' is instrumental in providing scaffolding support to the individual as they construct their knowledge towards a socially agreeable interpretation (Kay & Kibble, 2016; Schmulian, 2018).

Incorporating social constructivism in education requires a realignment of the teacher's (or educator's) role. Teachers need to acknowledge that despite their expertise, their advanced understanding (due to its complexity) may not always be the most effective resource for student learning and development (Kay & Kibble 2016). Teachers (or educators) should rather view learning as a social process and make use of both formal and informal resources to elevate student's knowledge and skills (Kay & Kibble 2016). Student-student interaction should be emphasised, with the teacher acting as a facilitator who provides opportunities and incentives for knowledge construction (Adams, 2006). Learning experiences, from a social constructivist perspective, should thus allow students to act as active agents in co-constructing their knowledge (Adams, 2006).

This thesis explores the use of student-student interaction in the form of team-teaching, as students actively engage in explaining their course content, with the aim of creating an opportunity for accounting students to co-construct knowledge. Social constructivism, given its relevance and applicability in accounting education (Silva 2018; Pereira & Sithole 2019; Mapuya 2021) and its support of active student engagement (Adams, 2006) through social interactions (Kay & Kibble 2016; Vygotsky 1978), is thus central this thesis.

1.2 TEAM-TEACHING

The teaching profession has traditionally characterised teaching as an individual task (OECD 2020) but has increasingly adopted team-teaching as an alternative to individualised

teaching approaches (Ostovar-Nameghi & Sheikhahmadi 2016). Although varying definitions of team-teaching exist (Lee 2013), team-teaching is commonly defined as two or more teachers collaborating and sharing responsibility for the planning, delivery, and/or evaluation of a course (Baeten & Simons 2014; Carpenter, Crawford & Walden 2007; Murata 2002; Sandholtz 2000). Teaching context can influence how teachers share responsibilities for planning, delivery, and evaluation (Robb & Gerwick 2013). Financial constraints, students' needs, curricula, and the availability of faculty for example influence how teachers share responsibility (Robb & Gerwick 2013). The level of collaboration between teachers also varies according to the five team-teaching models (Baeten & Simons 2014) and Table 1- 1 provides more detail in this regard (Baeten, Simons, Schelfhout & Pinxten 2018).

Table 1- 1 Team-teaching models.

	Model	**Role Partner 1**	**Role Partner 2**
Low level of collaboration ↓ High level of collaboration	Observation model	Full responsibility teacher	Observer
	Coaching model	Full responsibility teacher	Coach
	Assistant teaching model	Main responsibility teacher	Assistant
	Equal-status model	Identical status and responsibility	
	Teaming model	Full collaboration in the planning, delivery, and evaluation of the lesson	

The observation model, also sometimes referred to as the 'one teaching, one observing' model (Graziano & Navarette, 2012), involves one teacher observing and collecting information about effective teaching methods while the other teacher works. (Badiali & Titus 2010). An important aspect of the observation model is the analysis and discussion of the collected observational information between teachers (Badiali & Titus 2010; Graziano & Navarette, 2012). The coaching model (the second model per Table 1- 1) also places one teacher in the role of an observer but requires the observer to act as a coach, who must provide suggestions and support to the other teacher (Austin 2001; Bowman & McCormick 2000; Goker 2006). Within the coaching model, both teachers can coach each other (Nokes, Bullough, Egan, Birrell & Hansen 2008) or one of the teachers, who has particular expertise, acts as the coach and consultant to the other teacher (Austin 2001). In both the observation and coaching model, one teacher has full responsibility for the delivery of the course (Baeten & Simons 2014).

The third model (assistant teaching model) per Table 1- 1, which is sometimes referred to as the 'one teaching, one assisting' model (Cook & Friend 1995), has one teacher take the lead, while the other teacher acts as an assistant (Baeten & Simons 2014). The assistant teacher acts as a 'backup' teacher (Smith 2004) who helps to keep students attentive during class, provides student support when needed, and assists with in-class marking of work (Baeten & Simons 2014). Collaboration during the planning phase is essential in order to anticipate where the assistant teacher can provide back-up assistance during class (Badiali & Titus 2010). The first three team-teaching models (per Table 1- 1) all require one teacher to take the lead while the other teacher either observes, coaches, or assists the lead teacher. It is important to alternate roles in these three models so that both teachers can experience and learn from the different roles (Helms, Alvis & Willis 2005, Smith 2004).

The fourth model, the equal-status model (Table 1- 1), differs from the first three team-teaching models (observation, coaching, and assisting team-teaching models) as it gives both teachers equal status with no teacher taking on the lead. Three equal status team-teaching designs exist: (a) sequential teaching, (b) parallel teaching, and (c) station teaching (Baeten et al. 2018). Sequential teaching requires each team teacher to take responsibility for different lesson phases. Parallel teaching requires each team teacher to teach the same learning content to a separate subgroup of students. Lastly, station teaching divides both the learning content and the students between the teachers thus requiring each teacher to teach specific content to a subgroup of students. In the equal status model, the teachers cooperate but do not fully collaborate during the planning, delivery, and evaluation of a course (Baeten & Simons 2014).

The last team-teaching model, the teaming model (Table 1- 1), equitably shares the planning, delivery, and evaluation of a course between teachers (Nevin, Thousand & Villa 2009; Goodnough, Osmond, Dibbon, Glassman & Stevens 2009; Carpenter, Crawford & Walden 2007; Thousand et al. 2006 & Austin 2001). Teachers in this model work collaboratively (Carpenter et al. 2007) by for example exchanging ideas and theories (Al-Saaideh 2010) and taking turns leading discussions and demonstrating concepts (Cook & Friend 1995) while they are both present in the classroom (Al-Saaideh 2010, Helms et al. 2005). The teaming model therefore requires a lot of collaboration between the teachers in

this model, and has been referred to as the most collaborative team-teaching model (Nevin et al. 2009).

1.2.1 Advantages and disadvantages of team-teaching

Team-teaching is beneficial for both teachers and students. Evidence for example indicates that team-teaching can positively impact student outcomes, improve teaching practices, and reduce teacher isolation (Esterhazy, de Lange, Bastiansen & Wittek 2021; Goddard, Goddard, Sook Kim & Miller 2015; Vangrieken, Dochy, Raes & Kyndt, 2015). From a teacher's perspective, team-teaching also benefits teachers' professional and personal growth (Baeten & Simons 2016; Birrell & Bullough 2005; King 2005). It for example fosters teacher creativity and supports the construction of new knowledge about teaching (Kerin & Murphy 2015; Murphy & Scantlebury 2010; Roth & Tobin 2002), while also boosting teacher confidence and fostering trusting and meaningful relationships between teachers (Brookfield 2015; Carpenter et al. 2007; Laughlin, Nelson & Donaldson 2011). From a student perspective, team-teaching exposes students to different teaching styles, perspectives, and experiences (Brookfield 2015; Vogler & Long 2003) and also models respectful interchanges of ideas and viewpoints between teachers (Hellier & Davidson 2018). Exposing students to different viewpoints and experiences increases their synthesis of study material and fosters critical thinking (Hellier & Davidson 2018). Team-teaching also provides more support to students by providing more opportunities for getting help and feedback (Gaytan 2010; Vogler & Long 2003). Ultimately team-teaching improves student learning, increases student test scores, and improves the quality of learning material (Benjamin 2000; Colburn, Sullivan & Fox 2012, Sorensen 2004).

While team-teaching has many advantages it is also important to consider its shortcomings. Team-teaching is time-intensive and requires careful ongoing planning (Hellier & Davidson 2018). Faculty shortages and resistance to the additional hours required of team-teaching limit its implementation (Hellier & Davidson 2018; Laughlin et al. 2011& Carpenter et al. 2007). A common concern is the notion that work is being duplicated and that this duplication is associated with cost increases (Liebel, Burden & Heldal 2017; Higgins & Litzenberg, 2015; Plank 2011; Henderson, Beach & Famiano, 2009; Buckley, 1999; McDaniel & Colarulli, 1997). Teachers also need to be confident in their ability to share their classroom with a

colleague and must be open to sometimes taking on a learning role (Leavitt 2006). Although team-teaching is liked by many students (Carpenter et al 2007), team-teaching can also sometimes lead to student confusion, particularly when teachers give different instructions and different responses to the same question (Baeten & Simons 2016).

1.2.2 The use of team-teaching as part of teacher education

Field experiences are crucial in preparing future teachers for their transition into practice (Kyndt et al. 2014; Al-Hassan, Al-Barakat, and Al-Hassan 2012). Difficulties with school placements for student teachers (Nokes et al. 2008; Bullough et al. 2002;) means that traditional field experiences which involve placing one student teacher, with one mentor (Baeten & Simons 2016) are not always compatible with reality (Baeten & Simons 2016). Collaborative field placements (hosting students in pairs) have therefore been considered and researched as an alternative to individual placements of student teachers (Baeten & Simons 2016). Hosting student teachers in pairs creates opportunities for student teachers to collaborate and engage in team-teaching (Baeten & Simons 2014). Student teachers also tend to seek support with lesson plans, teaching, evaluation, and job preparation from their peers rather than from a mentor (Baeten & Simons 2014; Hsu 2005), making team-teaching a worthwhile alternative to traditional field experiences (Baeten & Simons 2014).

Team-teaching offers several advantages for student teachers (Baeten & Simons 2016), enhancing both their professional (e.g. pedagogical skills) and personal (e.g. self-confidence) development (Birrell & Bullough 2005; King 2006). From a professional growth perspective, peer observation and peer feedback during team-teaching improves student teachers' didactical, pedagogical, and classroom management skills (Bashan & Holsblat 2012; Nguyen & Baldauf 2010; Goodnough et al. 2009; Stairs et al. 2009; Jang 2008; Shin et al. 2007; Vacilotto & Cummings 2007; King 2006; Anderson, Barksdale, & Hite, 2005; Barksdale & Hite 2005; Birrell & Bullough 2005; Bullough et al. 2002; Jenkins & Veal 2002; Anderson & Radencich 2001; Kurtts & Levin 2000). The presence of a peer encourages student teachers to take more pedagogical risks which in turn results in richer and more varied lessons (Gardiner 2010; Goodnough et al. 2009; Nokes et al. 2008; Smith 2004,2002; Bullough et al. 2002). When student teachers engage in team-teaching they also experience a feeling of togetherness and shared responsibility (Vacilotto & Cummings, 2007; King 2006;

Kurtts & Levin 2000; Roth & Tobin 2001;) which offers both emotional and professional support (e.g. Goodnough, Osmond, Dibbon, Glassman & Stevens 2009; Gardiner & Robinson 2009; Bullough, Young, Birrell, Clark, Egan, Erickson, Frankovich, Brunetti & Welling 2003).

Team-teaching not only benefits student teachers but also benefits students who attend classes that are team-taught by student teachers. The presence of an additional student teacher in the classroom provides students with the following benefits: increased support; individual attention, more timely assistance, improved classroom management, and variation in teaching (Dee 2012; Gardiner 2010; Goodnough et al 2009; Nokes et al 2008; Kamens 2007; Birrell and Bullough 2005; Smith 2002, 2004; Sorensen 2004; Bullough et al. 2003 & Bullough et al. 2002).

While engaging student teachers in team-teaching provides numerous advantages, it also presents challenges. These include a lack of compatibility with peers, comparison between peers, difficulty with providing constructive feedback, increased workload, and fewer individual teaching opportunities (Baeten & Simons 2014). Lack of compatibility between peers can reduce the effectiveness of team-teaching (Stairs et al. 2009), while comparisons between peers result in increased competition and anxiety for student teachers (Stairs et al. 2009; Goodnough et al. 2009; Baker & Milner 2006). Although some student teachers are able to give straightforward and honest feedback (Goodnough et al. 2009; Shin et al. 2007), others struggle to do so (Parsons & Stephenson 2005). Increased workload occurs from time-intensive lesson planning and reflection (Gardiner & Robinson 2011; Nokes et al. 2008; Vacilotto & Cummings 2007). Lastly, fewer individual teaching opportunities (Gardiner & Robinson 2009) negatively impact their preparation for teaching in practice (Gardiner & Robinson 2011; Kamens 2007; Bullough et al. 2002).

1.3 LEARNING-BY-EXPLAINING

Learning-by-explaining (or learning-by-teaching as it is also commonly referred to) is a pedagogical method that requires a student to explain (or teach) learning material (Duran 2017; Leikin 2006). Learning-by-explaining is a multi-step process and includes various phases: preparing to explain; explaining the material; interacting with peers; and

evaluation/self-reflection (Debbané, Lee, Tse & Law 2023). The first phase (preparing to explain phase) requires the student who is preparing the explanation to learn enough to develop educational materials (Duran 2017) and plan how to convey the material (Carberry 2008). The first phase also engages the student in the process of reformulating and organising the learning material which in turn leads to a better understanding of the learning material (Gartner 1971). The second phase involves the act of actually explaining the material, and this phase allows the student who is explaining the material to test how their mind reviews and reformulates the learning material into knowledge (Duran 2017).

The third phase (interacting with peers) is found in situations that require students to explain learning material to a peer, like in peer tutoring situations. This phase includes things like explaining and responding to questions raised by tutees (Roscoe & Chi 2008). Tutors tend to be biased towards knowledge-telling during tutor sessions and tutee questions help tutors to engage in more knowledge-building activities (Roscoe & Chi 2008). The last phase of learning-by-explaining relates to self-reflection. Self-reflection allows for ideas that are found to be incorrect or lacking to be revised (Roscoe & Chi 2008). Tutor and tutee interactions (phase 3) are found to assist with reflection and elicit reflective knowledge-building activities like knowledge construction and metacognition (Roscoe & Chi 2008).

1.3.1 Learning-by-explaining to oneself and to others

Learning-by-explaining research has investigated its benefits in the following contexts: explanations to oneself (Hefter & Berthold 2020; Chebbihi, Varpio, St-Onge & Chamberland 2019; Rittle-Johnson, Loehr & Durkin 2017); explanations to others in peer tutoring situations (Roscoe & Chi 2008; Roscoe 2014; Duran, 2017); explanations to fictitious others (Hoogerheide et al. 2016; Lachner et al. 2018; Lachner, Jacob, Hoogerheide 2021); and explanations to teachable agents (Lachner, Hoogerheide, van Gog & Renkl 2022; Lee, Chauhan, Goh, Nilsen & Law 2021; Okita & Schwartz 2013).

Explaining to oneself (or self-explanation as it is sometimes referred to) is used to make new information personally meaningful (Bisra, Liu, Nesbit, Salimi & Winne 2018). Self-explanation literature reviews have supported its use as a study skill (Rittle-Johnson & Loehr 2017; Chi & Wylie 2014; Dunlosky, Rawson, Marsh, Nathan & Willingham 2013). Evidence

also suggests that students who are prompted to self-explain outperform students who only prepare notes of their course material (Lin and Atkinson 2013). A meta-analysis of the learning benefits of prompting students to prepare self-explanations also suggests that prompting students to prepare self-explanations improves their academic performance (Bisra et al. 2018).

While explaining to oneself is a self-orientated activity explanations to others require the explainer to consider the other's perspectives in creating an explanation (Wittwer & Renkl 2008). From a cognitive perspective, explaining to others promotes generative learning (Fiorella & Mayer 2016), as students organise and integrate new ideas with their existing knowledge (Fiorella 2021). The act of explaining to others also leads to more meaningful and durable learning than control activities, like restudying and summarizing (Hoogerheide et al. 2016; Fiorella & Mayer 2013; Coleman, Brown & Rivkin 1997). Learning benefits occur even when explanations are prepared for a fictitious other (Hoogerheide et al. 2019; Fiorella & Mayer 2014; Hoogerheide 2014). It is hypothesised that the learning benefits from explanations to fictitious others arise due to the social presence effect of the fictitious other student in the role of listener, which results in productive agency[10] (Hoogerheide et al. 2016).

1.3.2 Varying modes of explanations in learning-by-explaining

Research on learning-by-explaining has investigated its benefits when employing varying modes (e.g. written and video explanations) of explanations (Jacob, Lachner & Scheiter 2020; Lachner et al. 2019; Hoogerheide et al. 2018; Lachner et al. 2018). Writing an explanation necessitates deliberate planning and requires students to explore relationships and implications in their explanations, which then enable deeper knowledge construction (Bangert-Drowns, Hurley & Wilkinson 2004; Paris and Paris 2001). Writing spurs organisational strategies and encourages elaboration, while also acting as a conduit for self-reflective monitoring (Bangert-Drowns et al. 2004). Writing an explanation is particularly beneficial for conceptual knowledge development of more complex content (Lachner et al. 2018). Although written explanations appear beneficial for conceptual knowledge

[10] "Productive agency" is the belief that your actions can have an effect on another person (Schwartz, 1999; Schwartz and Okita, 2004; Okita and Schwartz, 2013b).

development of more complex content (Lachner et al. 2018), written explanations appear to offer limited learning benefits for more simplistic course content (Hoogerheide et al. 2016) and the acquisition of transfer knowledge (Lachner et al. 2018). Concept map feedback may assist in improving the transfer knowledge benefits of written explanations (Lachner and Neuburg, 2018).

Compared with written explanations, video explanations appear to foster conceptual and transfer knowledge development more effectively (Lachner et al. 2018). Although written explanations are more organised, video explanations, result in better learning and are more elaborative and comprehensive (Jacob, Lachner & Scheiter 2020; Lachner et al. 2018). Video explanations also tend to include more audience-directed utterances (first- and second-person pronouns), which indicates higher levels of perceived social engagement, which indirectly appears to result in more comprehensive explanations, which contribute to transfer knowledge development (Jacob, Lachner & Scheiter 2020; Lachner et al. 2018).

1.3.3 Benefits and challenges of learning-by-explaining for student learning

Learning-by-explaining offers numerous learning benefits (Lachner et al. 2019; Chebbihi, Varpio, St-Onge & Chamberland 2019; Hoogerheide et al. 2016; Dunlosky et al. 2013; Fiorella & Mayer 2013). In line with generative learning theory (Wittrock & Farley 2010), learning-by-explaining enables deep-level cognitive processes for the organization and integration of information which is beneficial for knowledge creation (Pilegard & Fiorella 2016; Fiorella & Mayer 2015; Fiorella & Mayer 2014). Learning-by-explaining also helps students to identify gaps in their knowledge and to articulate underlying concepts (Chebbihi, Varpio, St-Onge & Chamberland 2019). It promotes the reactivation and elaboration of existing knowledge (Chebbihi et al. 2019), and enhances text comprehension and meta-comprehension[11] (Duran, 2016; Fiorella & Mayer 2015; Fiorella & Mayer 2014; Roscoe 2014; Fukaya 2013). Learning-by-explaining is therefore recognised as a powerful instructional approach (Lachner, Backfisch, Hoogerheide, van Gog & Renkl 2020) that stimulates cognitive processes conducive to knowledge acquisition (Fiorella & Mayer 2016).

[11] Student meta-comprehension is operationalized as the association between a student's judgment of his/her current comprehension and the student's actual comprehension of the subject matter (Fukaya, 2013).

Learning-by-explaining also has some challenges. Student reluctance (Atir and Risen 2024), and more anxiety and mental effort compared to restudy (Zhu, Wang, Mayer & Liu 2024) as examples of some of the challenges. Regarding student reluctance, students who feel less knowledgeable about what they have learned are more reluctant to engage in learning-by-explaining (Atir and Risen 2024). The reluctance of students does however not appear to negatively affect the learning benefits derived from learning-by-explaining (Atir and Risen 2024). Regarding anxiety and mental effort, explaining to others or oneself has been found to induce higher levels of anxiety and mental effort for students when compared to restudy (Zhu, Wang, Mayer & Liu 2024). The higher levels of anxiety do not however appear to student performance (Zhu et al. 2024). The higher mental effort (measured as greater brain activity in areas of the brain that are related to cognition) compared to restudying learning material (Zhu et al. 2024), supports the hypothesis that students engage in generative learning activities, making the additional effort appear beneficial for student learning.

1.3.4 Gaps in learning-by-explaining and team-teaching literature

While prior learning-by-explaining research details the effects of diverse explanation delivery methods—whether to oneself or others and through varying modes like written and video explanations—on knowledge development, the prevailing literature on learning-by-explaining predominantly addresses the advantages that students gain as individual teachers rather than as members of a teaching team (Ribosa & Duran 2022). Although Duran and Topping introduced a learning-by-explaining model in 2017 where students co-taught alongside their instructors (Duran & Topping 2017), scant attention has been given to the concept of students engaging in co-teaching or team-teaching as a learning strategy (Quiñones-Ramírez et al. 2023). Recent review studies of the team-teaching literature have also indicated that little experimental research that examines the benefits of team-teaching exists and that there is a need for studies which can provide hard evidence of the benefits thereof (De Weerdt, Simons, Struyf & Tack 2024; Vembye, Weiss & Bhat 2024). This thesis addresses these identified research gaps in the team-teaching and learning-by-explaining literature as it explores the benefits of varying modes of explanations in a team-teaching task, which incorporates learning-by-explaining in an applied (real-world) accounting education context.

1.4 RESEARCH AIM AND RESEARCH QUESTIONS

The primary objective of this thesis is to explore the use of student-led team-teaching tasks, which incorporate learning-by-explaining, as a means to develop accounting students' competencies in a competency-based accounting education setting. Specifically, this thesis aims to explore the use of different modes (oral, video, and written) of student-led team-teaching tasks, which incorporate learning-by-explaining, to develop accounting students' conceptual and transfer knowledge while also providing opportunities for the development of teamwork and communication skills in a competency-based accounting education setting.

The research questions addressed in this thesis are as follows:

RQ1: Do accounting students experience knowledge development benefits when they are engaged in a student-led team-teaching task, which incorporates learning-by-explaining, in a competency-based accounting education context?

RQ2: Do varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential conceptual[12] and transfer[13] knowledge benefits for accounting students, in a competency-based accounting education context?

RQ3: What are accounting students' experiences of a student-led team-teaching task, which incorporates learning-by-explaining, that is aimed at developing their knowledge, teamwork skills, and communication skills[14] in a competency-based accounting education context?

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[12] Conceptual knowledge in this thesis 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.

[13] Transfer knowledge in this thesis 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, Ly & Nückles 2018; Schwartz, Bransford & Sears 2005).

[14] This thesis focuses on teamwork and communication skills as these skills have been identified as crucial skills in the 21st-century workplace (Bayne, Birt, Hancock, Schonfeldt & Agrawal. 2022; Mehrabi Boshrabadi & Hosseini 2021). These skills are also skills that are required during team-teaching tasks which necessitates teamwork and communication among team-teachers as they plan, deliver, and/or evaluate a course (Do & Hascher 2023).

RQ4: Do accounting students experience that varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential teamwork and communication skills development opportunities in a competency-based accounting education context?

This thesis aims to make significant contributions to the team-teaching, learning-by-explaining, and accounting education literature. By addressing the four research questions, it intends to provide an evidence-based exemplar of a student-led team-teaching task, which incorporates learning-by-explaining, suitable for incorporation in a competency-based education context. This ~~endeavor~~endeavour aims to support accounting educators in their transition from traditional rote learning approaches to more dynamic educational approaches that actively engage students in the learning process and enable students to develop a broader set of competencies crucial for their professional success.

This thesis comprises two research papers, each focusing on specific research questions integral to the thesis. Research paper 1, presented in chapter 2, addresses research question 1 (RQ1), and research question 3 (RQ3). Research paper 2, presented in Chapter 3, addresses research question 2 (RQ2), and research question 4 (RQ4). The thesis also includes a combined and extended results and discussion section (presented in Chapter 4) which compares and combines the results and findings from the two research papers contained in this thesis as they relate to research questions 2 (RQ2), and 4 (RQ4).

A more holistic understanding of the effects of explanation modality on accounting students' knowledge and teamwork and communication skills development from student-led team-teaching tasks, which incorporate learning-by-explaining, is thus gained in Chapter 4 of this thesis. The organisation of the thesis effectively segregates the thesis into distinct but interconnected sections, ensuring a comprehensive exploration of the research questions.

1.5 RESEARCH METHODOLOGY

Research methodology underpins the research design of a study and considers the ontology and epistemology of a chosen research design. Ontology considers how reality is viewed (Richards 2003), while epistemology considers beliefs regarding knowledge and how

knowledge is accessed (Gall, Gall & Borg 2003). Ontological and epistemological beliefs are related to research paradigms.

Positivism is a research paradigm that views reality as something that is stable and objective (Kivunja & Kuyini 2017). Positivism thus suggests that reality is absolute and is governed by universal laws. An ontology that views reality as stable and absolute is referred to as realism (Bilgrami 2002). Positivism is associated with realism and often employs objective quantitative research designs like experiments (Kivunja & Kuyini 2017).

Interpretivism, another research paradigm, is often considered to be the opposite of positivism as it suggests that there is no single objective reality (Rehman & Althari 2016). Instead, interpretivism views reality as a combination of multiple realities that depend on individuals (Kivunja & Kuyini 2017). An ontological view which is based on the suggestion that individual views, beliefs, and interpretations are important in the construction of reality is referred to as relativism. Qualitative research designs are often prioritised within interpretivist research paradigms (Kivunja & Kuyini 2017).

Criticism of the positivist paradigm led to the emergence of post-positivism as a research paradigm. Post-positivism combines aspects of positivism and interpretivism (Grix 2004) and is an attempt to address the weaknesses of the positivist paradigm (Kivunja & Kuyini 2017). The ontological position of post-positivism is critical realism (Kivunja & Kuyini 2017). It does not believe in a single reality but rather believes that reality is formed from multiple perspectives (Creswell, 2014). Post-positivism therefore often includes both quantitative and qualitative research methods and relies on multiple methods in order to capture as much of reality as possible (Denzin & Lincoln, 2011).

This thesis is aligned with a post-positivist research paradigm as it employs a mixed method design that combines both quantitative and qualitative research methods in order to best capture the reality of the use of student-led team-teaching tasks, which incorporates learning-by-explaining, as a means to develop accounting students' competencies in a competency-based accounting education setting.

In social constructivist learning environments, mixed method studies are also increasingly recognized for their ability to unveil the deeper meanings of situations and phenomena (Denicolo 2016). These studies, combining qualitative and quantitative approaches, offer a richer and more nuanced understanding of researched topics (Lopez-Fernandez & Molina-Azorin 2011). They also open avenues for new ideas and enable answers to complex questions that may have been difficult with either a qualitative or quantitative method alone (Lopez-Fernandez & Molina-Azorin 2011).

Two main factors guide the choice of a mixed method model (Onwuegbuzie, Johnson & Collins 2009; Morgan 1998; Morse 1991): the priority or weight of the approaches and the timing or orientation of data collection (Lopez-Fernandez & Molina-Azorin 2011). The priority or the weight refers to how much emphasis is placed on either the qualitative or quantitative elements of a study. This can vary from prioritising one over the other to assigning equal status to both (Lopez-Fernandez & Molina-Azorin 2011). The timing or orientation of the data collection refers to the order of data collection, whether qualitative and quantitative data are collected simultaneously or at different stages (Lopez-Fernandez & Molina-Azorin 2011). The final design of a mixed method study is determined by a combination of these two factors ensuring a comprehensive approach to research (Lopez-Fernandez & Molina-Azorin 2011). The resulting nine potential mixed method designs are represented below (Morse 1991) (Table 1-1):

Table 1- 2 The nine potential mixed method designs

Combination of the mixed method design factors	**Mixed method design**
Equal weight is given to quantitative and qualitative data with a *simultaneous* data collection approach.	(1) QUAL + QUAN
Equal weight is given to quantitative and qualitative data with a *sequential* data collection approach.	(2) QUAL → QUAN (3) QUAN → QUAL
Different weights are given to quantitative and qualitative data with a *simultaneous* data collection approach.	(4) QUAL + quan (5) QUAN + qual
Different weights are given to quantitative and qualitative data with a *sequential* data collection approach.	(6) qual → QUAN (7) QUAL → quan (8) quan → QUAL (9) QUAN → qual

The notations per the above representation of the mixed method research designs as proposed by Morse (1991), offer a clear and concise way to represent the structure of mixed method designs. In this system, “quan” and “qual” abbreviations signify the quantitative and qualitative parts of the mixed method design, respectively. The “+” symbol indicates a simultaneous design, where both quantitative and qualitative data are collected at the same time. Conversely, the “→” symbol indicates a sequential design, implying the data collection occurs in stages, either quantitative followed by qualitative, or vice versa.

Furthermore, Morse's system includes a convention for indicating the relative weight or priority of each method within a study. When one method (either quantitative or qualitative) is given greater emphasis in the research design, its abbreviation is presented in capital letters (e.g., QUAN or QUAL), while the less emphasized method is denoted in lowercase letters (e.g., quan or qual). This notation helps researchers and readers quickly understand the structure and priority of methods in a mixed-method study.

When selecting a mixed method research design that integrates both qualitative and quantitative data, researchers often consider the following commonly identified reasons: triangulation, complementarity, development, and expansion (Lopez-Fernandez & Molina-Azorin 2011).

Triangulation is aimed at enhancing the reliability of results, by corroborating results obtained through both qualitative and quantitative research methods (Lopez-Fernandez & Molina-Azorin 2011; Jick 1979). It seeks to validate results by cross-verifying them through different methods.

Complementarity focuses on using one method to clarify, elaborate, or illustrate the results obtained from the other method (Lopez-Fernandez & Molina-Azorin 2011; Bryman 2006; Greene, Caracelli & Graham 1989). Both qualitative and quantitative results in a complementarity study measure different, yet overlapping, aspects of a phenomenon, thereby providing a richer and more elaborated understanding (Greene et al. 1989). Complementarity differs from triangulation in that it assesses overlapping or different facets

of a phenomenon, rather than attempting to corroborate the same conceptual phenomenon (Greene et al. 1989).

The development reason relates to the use of a sequential design which uses the results of one method to inform and shape the application or development of the second method (Dawadi, Shrestha & Giri 2021; Lopez-Fernandez & Molina-Azorin 2011; Greene et al. 1989). For example, a quantitative survey of students' educational aspirations might be used initially, followed by qualitative interviews with selected students to delve deeper into the factors driving these aspirations.

Expansion reasons for choosing a mixed method design aim to broaden the research inquiry's scope and depth. It involves using different research methods for various components of a study, thus expanding the research's reach and comprehensiveness (Bryman 2006; Greene et al. 1989).

Each of these reasons presents a unique way to leverage the strengths of both qualitative and quantitative methods, enriching the research outcomes and offering a more holistic understanding of the subject matter.

In this thesis, a mixed method design is adopted to gain a comprehensive understanding of the benefits and experiences associated with the use of student-led team-teaching, which incorporates learning-by-explaining, in a competency-based accounting education context. By collecting and analysing data both qualitatively and quantitatively, the thesis aims to provide a more enriched and multifaceted view. This approach is implemented as follows in the thesis:

1.5.1 Research Paper 1 (Chapter 2):

In Research Paper 1 quantitative data is collected to evaluate students' knowledge development resulting from a team-teaching task, which incorporates learning-by-explaining[15]. This involves comparing pre-test scores and post-test scores to assess the

[15] In research paper 1 the team-teaching task, which incorporates learning by explaining, is called a learning-by-team-teaching Intervention.

extent of knowledge development. Additionally, both quantitative and qualitative data are sourced from student surveys. These provide insights into students' experiences with the student-led team-teaching task, which incorporates learning-by-explaining, focusing on its effectiveness in fostering accounting knowledge development and providing opportunities for teamwork and communication skills development.

The students' survey responses play a critical role in complementing the quantitative findings. These responses elaborate and enhance the understanding of the knowledge development benefits derived from the student-led team-teaching task, which incorporates learning-by-explaining. Furthermore, these responses broaden the research's reach by providing insight into the self-reported skills development benefits of the intervention. In accounting education, self-reported skills development has been used as a proxy for actual skills development (Levant, Coulmont & Sandu 2016).

The qualitative data from the surveys thus broadens the research's reach, enabling an evaluation of not only the quantitative measure of knowledge development benefits but also the intervention's success in providing students with opportunities for communication and teamwork skills development. Therefore, the selection of a mixed method design in this research paper facilitated both complementarity and expansion.

Both quantitative and qualitative data are collected simultaneously, with equal emphasis on each method. Accordingly, the mixed method design of this research paper follows the QUAL + QUAN model as proposed by Morse (1991). This balanced approach ensures a holistic understanding of the benefits of the team-teaching task in a competency-based accounting education context.

1.5.2 Research Paper 2 (Chapter 3):

In Research Paper 2 quantitative data is collected to compare students' conceptual knowledge development and transfer knowledge from two different explanation modes (written and video) of a student-led team-teaching task, which incorporates learning-by-

explaining[16]. This involves comparing changes in students' conceptual knowledge across the two explanation modes (written and video) which require the students to teach in teams. It also involves analysing the students' transfer knowledge post-test scores to observe variations between the two explanation modes. The quantitative data from the pre-and post-test scores enable a comparison of students' knowledge development across the two explanation modes.

Additionally, quantitative data is collected to evaluate the differences in the explanatory features[17] of the two explanation modes (written and video) used in Research Paper 2. This aspect aims to provide a deeper understanding of how each explanation mode contributes to students' knowledge development.

Moreover, both quantitative and qualitative data are sourced from student surveys to analyse their experiences of the team-teaching task, which incorporates learning by explaining, with a particular focus on teamwork and communication skills. The qualitative data from these surveys serve to expand the breadth of the research findings. It offers insights into students' self-reported skills benefits derived from the two different explanation modes used in Research Paper 2.

The adoption of a mixed method design in Research Paper 2 primarily facilitates the expansion of the research paper. The simultaneous collection of quantitative and qualitative data, with a greater emphasis on the quantitative aspect, aligned with Morse's (1991) QUAN + qual design. This approach allows for a more comprehensive understanding of how the two different explanation modes used in Research Paper 2 impact students' knowledge development and create opportunities for broader skills development in a competency-based accounting education context.

[16] In Research Paper 2 the team-teaching task, which incorporates learning by explaining, is called a team-based explanation.

[17] 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). Explanatory features include the level of organisation, person-deictic references, and elaborations found in explanations.

1.5.3 Chapter 4 combines and compares data and findings from Research Paper 1 and Research Paper 2:

The purpose of Chapter 4 is to combine and compare the data and findings from Research Paper 1 and Research Paper 2 in order to provide more comprehensive insight and understanding of the effects of the different explanation modes used in Research Paper 1 (oral mode) and Research Paper 2 (written and video modes) as it relates to research questions 2 (RQ2) and 4 (RQ4) of this thesis.

For this purpose, quantitative data from Research Paper 1 and Research Paper 2 are collected to compare students' conceptual knowledge development and transfer knowledge from three different explanation modes (oral, written, and video) that are used in the two research papers. This involves comparing changes in students' conceptual knowledge across the three explanation modes and also involves analysing the students' transfer knowledge post-test scores in order to observe variations in transfer knowledge between the three explanation modes. The quantitative data from the pre-and post-test scores enable a comparison of students' knowledge development across the three explanation modes of the two research papers.

Additionally, quantitative data is collected to evaluate the differences in the explanatory features[18] of the explanations from the three explanation modes used in Research Paper 1 (oral mode) and Research Paper 2 (written and video modes). This aspect aims to provide a deeper understanding of how each explanation mode contributed to students' knowledge development.

Moreover, both quantitative and qualitative data are sourced from student surveys to analyse students' experiences of the student-led team-teaching tasks, which incorporate learning-by-explaining used in two research papers contained in this thesis, with a particular focus on teamwork and communication skills. The qualitative data from these surveys serve to expand the breadth of the research findings. It offers insights into students' self-reported

[18] 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). Explanatory features include the level of organisation, person-deictic references, and elaborations found in explanations.

skills benefits derived from the three different explanation modes used in Research Paper 1 and Research Paper 2.

The adoption of a mixed method design in chapter 4 primarily facilitates the expansion of the findings contained in chapter 4. The simultaneous collection of quantitative and qualitative data, with a greater emphasis on the quantitative aspect, aligns with Morse's (1991) QUAN + qual design. This approach allows for a more comprehensive understanding of how the three different explanation modes used in the two research papers of this thesis impact students' knowledge development and create opportunities for teamwork and communication skills development in a competency-based accounting education context.

1.5.4 Summary of the mixed method designs used in Chapter 2, Chapter 3, and Chapter 4 of this thesis:

Table 1- 3 Summary of mixed methods designs used in this thesis

	Mixed-method design:	Type of data collected:	Details of the data collected:	How the data was used:
Research Paper 1 **(Chapter 2 of this thesis)**	QUAL + QUAN (As proposed by Morse (1991))	Quantitative data	• Pre-test conceptual knowledge scores for the oral explanation mode used in this research paper. • Post-test conceptual knowledge scores for the oral explanation mode used in this research paper. • Quantitative survey data of accounting students' experiences of the oral explanation mode used in this research paper.	Pre-test and post-test scores were used to measure students' change in their conceptual knowledge after completing the student-led team-teaching task of this paper. Quantitative survey data was analysed to measure accounting students' overall experience of the student-led team-teaching task of this paper.
		Qualitative data	• Qualitative survey data of accounting students' experiences (benefits and challenges) of the oral explanation mode used in this research paper.	Qualitative survey data was collected to elaborate and enhance the understanding of the knowledge development benefits derived from the student-led team-teaching task of this paper. Furthermore, the qualitative survey responses helped to broaden the research's reach by providing insight into the self-reported skills development benefits and challenges of the intervention.

	Mixed-method design:	Type of data collected:	Details of the data collected:	How the data was used:
Research Paper 2 **(Chapter 3 of this thesis)**	QUAN + qual (As proposed by Morse (1991))	Quantitative data	• Pre-test conceptual knowledge scores for the two explanation modes (written and video). • Post-test conceptual knowledge scores for the two explanation modes (written and video) used in this research paper. • Post-test transfer knowledge scores for the two explanation modes (written and video) used in this research paper. • Quantitative survey data of accounting students' experiences of the two explanation modes (written and video) used in this research paper. • Quantitative data was collected to evaluate the differences in the explanatory features of the two explanation modes (written and video) used in Research Paper 2	Pre-test and post-test scores were used to measure students' change in their conceptual knowledge after completing the student-led team-teaching task of this paper. Quantitative survey data was analysed to measure accounting students' overall experience of the student-led team-teaching task of this paper.
		Qualitative data	• Qualitative survey data of students' experiences of the two explanation modes (written and video) used in this research paper.	Qualitative data are sourced from student surveys to analyse accounting students' experiences of the student-led team-teaching task of this paper with a particular focus on teamwork and communication skills. The qualitative data from these surveys serve to expand the breadth of the research findings. It offers insights into students' self-reported skills benefits derived from the two different explanation modes used in Research Paper 2.

	Mixed-method design:	Type of data collected:	Details of the data collected:	How the data was used:
Combination and comparison of data and findings from Research Paper 1 and Research Paper 2 **(Chapter 4 of this thesis)**	QUAN + qual (As proposed by Morse (1991))	Quantitative data	• Pre-test conceptual knowledge scores for the three explanation modes used in this thesis (oral, written, and video). • Post-test conceptual knowledge scores for the three explanation modes (oral, written, and video) used in this thesis. • Post-test transfer knowledge scores for the three explanation modes (oral, written, and video) used in the two research papers of this thesis. • Quantitative survey data of accounting students' experiences of the three explanation modes (oral, written, and video) used in this thesis. • Quantitative data was collected to evaluate the differences in the explanatory features of the three explanation modes (oral, written, and video) used in this thesis.	Pre-test and post-test scores were used to measure students' change in their conceptual knowledge after completing the student-led team-teaching tasks of this thesis. Quantitative survey data was analysed to measure accounting students' overall experience of the student-led team-teaching tasks of this thesis.
		Qualitative data	• Qualitative survey data of students' experiences of the three explanation modes (oral, written, and video) used in this thesis.	Qualitative survey data was used to analyse accounting students' experiences of the student-led team-teaching task of this thesis with a particular focus on teamwork and communication skills. The qualitative data serve to expand the breadth of the research findings. It offers insights into students' self-reported skills benefits derived from the three different explanation modes (oral, written, and video) used in the two research papers of this thesis.

1.5.5 Conceptual framework of the student-led team-teaching task of this thesis

This section provides the conceptual framework for the design of the student-led team-teaching task, which incorporates learning-by-explaining, of this thesis. The conceptual framework provides the conceptual meaning for the (a) unit; (b) treatment; (c) outcome measures; and (d) setting of the team-teaching task of this study as suggested by de Weerdt, Simons, Struyf & Tack (2024).

1.5.5.1 Unit

Units are defined as the persons or groups on which data is collected (Shadish, Cook & Campbell 2002). The thesis focuses on third-year undergraduate accounting students from a degree program focusing on International Financial Reporting Standards (IFRS).

1.5.5.2 Treatment

Three different aspects are considered when defining the team-teaching treatment of a study (De Weerdt, Simons, Struyf & Tack 2024). The three aspects are: (1) the composition of the team; (2) the appearance of the team-teaching practice; and (3) the phases included in the team-teaching practice. The application of each of these three aspects in this thesis is discussed next.

(1) Composition of the team

Traditionally team-teaching focuses on teaming teachers or student teachers together. Team-teaching literature has examined the use of team-teaching for the following teams:

- Co-teaching that involves teaming a general education teacher and a special-education teacher together (Solis, Vaughn, Swanson & McCulley 2012).
- Teams consisting of two general-education teachers (Brojčin, Banković, Glumbič & Weiss 2012).
- Teams of student teachers (e.g., Weinberg, Sebald, Stevenson & Wakefield 2020)
- Teams of teacher educators (e.g., Nevin, Thousand & Villa 2009)

- Teaming a student teacher with a mentor (e.g., Baeten & Simons 2016a)
- Teams of two subject experts with different knowledge bases (e.g., Dehnad Jalali, Shahabi, Mojgani & Bigdeli 2021)
- Teams that pair an educator with a paraprofessional (e.g., Heisler & Thousand, 2021).

This thesis explores the use of a novel form of team-teaching as it explores the use of student-led team-teaching. Teams consist of students and more specifically students outside of teacher education. Teams therefore consist of undergraduate accounting students who team-teach together.

(2) The appearance of the team-teaching practice

The appearance of the team-teaching practice is related to the team-teaching model that is applied in the study (De Weerreedt, Simons, Struyf & Tack 2024). This thesis' team-teaching task, which incorporates learning-by-explaining, is anchored in the equal-status team-teaching model This model is predominantly utilized for the paired field placement of student teachers (Baeten & Simons 2014), and it has garnered positive feedback from many student teachers (Simons, Baeten & Vanhees 2020). At its core, this model requires all teaching team members to share an equal status and responsibility in the teaching process (Baeten & Simons 2016b).

(3) Phases included in the team-teaching practice

Three main phases of team-teaching are repeatedly mentioned within team-teaching literature (De Wreedt, Simons, Struyf & Tack 2024). The three main phases are: planning, teaching, and reflection (De Wreedt, Simons, Struyf & Tack 2024). The team-teaching task, which incorporates learning-by-explaining, of this thesis requires the student-led teaching teams to collaboratively plan and teach their accounting course material. More specifically, the student teams of this thesis are tasked with collaboratively preparing and presenting an explanation of an accounting topic to a fictitious other student who missed prior classes on the topic. Every member took on the role of a team-teacher as they worked together to prepare and present their team's explanation to the fictitious other student. Every member played a pivotal role, aligning with Thousand, Villa, and Nevin's (2006)

assertion that team-teaching can involve multiple teachers sharing teaching responsibilities (Thousand et al. 2006). Consequently, the students collaboratively participated in two main phases: an explanation planning phase and an explanation delivery phase.

1.5.5.3 Outcome measures

An outcome measure is the dependent variable of the study (De Wreedt, Simons, Struyf & Tack 2024). In education research, student achievement is most often used as the outcome variable that measures the effectiveness of a treatment (Reynolds, Sammons, De Fraine, Van Damme, Townsend, Teddlie & Stringfield 2014). Non-cognitive outcome measures like well-being, engagement, and motivation have also increased in interest (Creemers & Kyriakides, 2007; Reynolds et al., 2014).

This thesis measures student achievement in the form of conceptual and transfer knowledge development as a measure of the effectiveness of the team-teaching task, which incorporates learning-by-explaining, of this thesis. The thesis also considers the development of students' teamwork and communication skills as a measure of the effectiveness of the team-teaching task, which incorporates learning-by-explaining, of this thesis.

1.5.5.4 Setting

Setting variables in studies on team-teaching can be grouped into three categories: (1) team-teacher factors; (2) interventional factors, and (3) contextual factors (De Wreedt, Simons, Struyf & Tack 2024).

(1) Team teacher factors

Team teacher factors involve variables about team teachers which may influence the way units experience a treatment and the way a treatment is implemented. Team teacher variables include both individual-and team-level variables (Gast, Schildkamp & Van Der Veen 2017). Individual level variables include teacher competencies, defined as the knowledge, skills, and attitudes required to cooperate in an effective teaching team (De

Wreedt, Simons, Struyf & Tack 2024). Team-level variables include factors like compatibility, mutual recognition, and a collective mindset (De Wreedt, Simons, Struyf & Tack 2024).

An individual-level variable considered in the design of the teaching teams of this thesis was students' prior academic performance. Prior academic performance was used to create teams that included a mix of academically stronger and weaker students, promoting the creation of heterogeneous teams. Team heterogeneity was important in the design of the teams in order to mitigate the risk of peer comparisons (Edmond & Tiggeman 2009), which may influence the way that students experience the team-teaching task of this thesis.

Team-teaching requires collaboration and shared responsibility. Teaching responsibility within a team-teaching context transitions from an individual to a collective focus, ensuring that the entire team takes responsibility for their students' learning outcomes (Bolam, Mcmahon, Stoll, Thomas, Wallace, Greenwood, Hawkey, Ingram, Atkinson & Smith 2005; Griffin & Robertson 2014). The facilitation of shared responsibility in this thesis was anchored in the grading protocols of the student-led team-teaching task, which incorporates learning-by-explaining. The equal-status model did not just demand shared responsibility, but an equitable distribution of the same. Recognizing the potential risks of unequal participation (free riding) in collaborative learning tasks, grading was implemented at both team and individual levels (Strand Norman, Rose & Lehmann 2004). The final student grade constituted a team grade (reflecting the quality of the explanation) and an individual grade (based on peer-reviewed team member effectiveness), each carrying a 50% weight. The latter employed criteria from the Comprehensive Assessment of Team Member Effectiveness (CATME) instrument (Loughry, Ohland & Moore 2007), which focused on elements, such as contributing to the team's work, interacting with teammates, team progress monitoring, quality expectations, and possessing relevant knowledge and skills.

(2) Intervention factors

Interventional factors relate to the design of experimental studies in the field of team-teaching. Five variables are considered when assessing interventional factors: (a) the way the partnership in the team is established, (b) training and professional development, (c)

shared time for planning and evaluation/reflection, (d) communication and collaboration, (e) teaching intensity (De Wreedt, Simons, Struyf & Tack 2024).

(a) The way the partnership is established

Voluntary engagement and choices in group composition generally result in better partnership development (Friend, Cook, Hurley-Chamberlain & Shamberger 2010; Van Garderen, Stormont & Goel 2012). The need to mitigate the risk of peer comparisons during the team-teaching task of this thesis which aims to benefit student learning, this study did not allow for students to pick their own teams. Future research could consider exploring whether freedom of choice in group composition would influence the benefits that students obtain from student-led team-teaching tasks, which incorporate learning-by-explaining as employed in this thesis.

(b) Training and professional development

Training and professional development initiatives are beneficial in preparing teachers to teach together (Baeten & Simons 2016a; Sweigart & Landrum 2015). The already full curriculum of the accounting students in this thesis did not allow for additional time to train students on team-teaching and how to best teach together. The inclusion of training before a team-teaching task, which incorporates learning-by-explaining, could however still be valuable, and future research could consider exploring whether including training for students improves the learning benefits they derive from a student-led team-teaching task, which incorporates learning-by-explaining.

(c) Shared time for planning and evaluation/reflection

Prior research often cites that one of the most frequently experienced challenges to collaboration is the lack of time to for structured planning and evaluation/reflection (Honigsfeld & Dove 2019; Pratt, Imbody, Wolf & Patterson 2017; Scruggs, Mastropieri & McDuffie 2007). As part of the team-teaching task, which incorporates learning-by-explaining, in this thesis students were given time as follows in order to plan and evaluate their explanations of their course material:

- An introduction session was arranged in which the team-teaching task, which incorporates learning-by-explaining was explained to students.
- Students were then given an hour in the venue after the introduction session to introduce themselves to their team members and to start planning their explanations.
- Students were given eight days to plan and complete their team-teaching task, which incorporates learning-by-explaining.

(d) Communication and Collaboration

Open discussions with the goal of modifying and enhancing teaching and learning are essential for effective team-teaching (Baeten & Simons 2014; Gurgur & Uzuner 2011). The team-teaching task, which incorporates learning-by-explaining in this thesis promoted collaboration between the student team members by including grading protocols that measure students' team-member effectiveness. The Comprehensive Assessment of Team Member Effectiveness (CATME) instrument (Loughry, Ohland & Moore 2007), which was used for this purpose focused on elements, such as contributing to the team's work, interacting with teammates, team progress monitoring, quality expectations, and possessing relevant knowledge and skills. The grade that a student would receive for their effectiveness as a team member during the team-teaching task, which incorporates learning-by-explaining weighed 50% of their final mark for this task.

(e) Teaching intensity

Building a constructive relationship during team-teaching takes time (Friend et al. 2010; Pratt 2014). Three variables that capture intensity have been identified: the duration of the team-teaching intervention; the frequency of the team-teaching sessions; and the duration of the team-teaching sessions (Dietrichson, Filges, Klokker, Viinholt, Bøg & Jensen 2020).

For the purpose of this thesis, the student-led team-teaching task, which incorporates learning-by-explaining, gave the students eight days to prepare their explanation and required the equivalent of five minutes of teaching time during the team-teaching session.

Five-minute audio and video recordings were required of the teams in the oral and video explanation modes, while students in the written explanation mode wrote a 750-word explanation. As an average person speaks around 150 words per minute (Feldstein, Dohm & Crown 2001; Simonds, Meyer, Quinlan & Hunt 2006), the 750-word limit for the written explanation teams equates to five minutes of oral or video recording time. Students were also only required to prepare for one team-teaching session.

The limitations on the teaching time (five minutes) and frequency of the team-teaching task (one team-teaching session) aimed to limit the teaching intensity of the student-led team-teaching task, which incorporates learning-by-explaining, of this thesis.

(3) Contextual factors

In traditional (team-teaching which involves teaming teachers together) team-teaching contexts, contextual factors can be grouped under class, school, and system levels. Class factors include things like class size, class composition, student characteristics, and variations in students' needs which may influence the effectiveness of team-teaching (De Wreedt, Simons, Struyf & Tack 2024; Pearl, Dieker & Kirkpatrick 2012). On a school level, school culture, and climate are important factors that play a role in successful collaboration (Kyndt, Gijbels, Grosemans & Donche 2016). School administrators should for example encourage teacher collaboration and assist team-teachers with things like scheduling, incentives, and resources (Heisler & Thousand, 2021). Infrastructure like appropriate classroom sizes in order to accommodate team-teaching should also be considered (Baeten & Simons, 2014). Lastly, when considering system-level contextual factors, the effectiveness of team-teaching may be influenced by the education system in which the team-teaching study takes place (Szumski, Smogorzewska & Karwowski 2017). This is because differences in the way team-teaching is understood, the purpose for which it is deployed, and factors like the consistency of an educational policy within the education system may influence team-teaching effectiveness (De Wreedt, Simons, Struyf & Tack 2024).

The contextual factors of this thesis are different from the traditional team-teaching context. That is because this thesis employs student-led team-teaching instead of teacher-led team-

teaching. Drawing from the examples of the traditional class, school, and system level contextual factors, this thesis considered the following in the design of its team-teaching task:

Instead of class size, class composition, and student characteristics being considered (as part of the class level contextual factors) as in traditional team-teaching contexts, this study considered team size, the composition of the teaching team, and characteristics of the students that form part of the student-led teaching-teams. More specifically the student teams for this thesis consisted of heterogeneous teams of around four to six students of varying prior academic performance levels. The use of heterogenous teams helped to mitigate the risk of peer comparisons and also ensured opportunities within the teams that allowed low-ability students to learn from medium-ability students rather than being paired only with students of the highest ability (Edmond & Tiggeman 2009).

From a perspective similar to what would be considered school level in traditional team-teaching contexts, which requires a contextual setting that encourages collaboration, the grading protocols of the team-teaching tasks, which incorporate learning-by-explaining, promote collaboration between the members of the teaching-teams. From a system-level perspective, the team-teaching task, which incorporates learning-by-explaining, of this thesis is employed as a means to enable student learning development in the form of knowledge, teamwork skills, and communication skills.

1.5.6 Methodological quality requirements

The following section provides details as to how this thesis meets methodological quality requirements. The adjusted Checklist for the Rigor of Education-Experiment Designs (CREED) as proposed by De Weerdt, Simons, Struyf & Tack 2024 is used as the quality appraisal tool. The CREED checklist was developed by Sung et al. 2019 and it focuses on the assessment of the following three types of validity: internal validity, construct validity, and statistical conclusion validity (Sung et al 2019). The three domains of validity are evaluated according to the following six criteria: (a) the type of experimental design, (b) the methods for establishing baseline equivalence, (c) the number of participants in each group,

(d) the reliability and validity of the measurements, (e) the fulfillment of statistical assumptions, and (f) the reporting of effect sizes.

1.5.6.1 Type of experimental design

This thesis employed a mix of a quasi-experiment[19] and a pre-experiment design as defined by De Weerdt, Simons, Struyf & Tack 2024. This is because this thesis does not use a control group but does however use random assignment to assign the students in this thesis between the three explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining of this thesis. The decision not to include a control group of students who only studied the learning material without explaining it in the student-led team-teaching task, which incorporates learning-by-explaining, of this thesis, is aligned with such a design choice in prior learning-by-explaining literature (Lachner, Ly & Nückles 2018). As was the case in Lachner, Ly & Nückles 2018, this thesis did not include a control group because prior learning-by-explaining research (Fiorella & Mayer 2014; Hoogerheide, Loyens & van Gog 2014) consistently showed that explaining was superior to restudying. This thesis also focused on assessing whether varying modes of explaining in a student-led team-teaching task, which incorporates learning-by-explaining, result in differential knowledge, teamwork skills, and communications skills development benefits for accounting students in a competency-based accounting education context. Random assignment was thus used to assign the students in this thesis between the three explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis.

1.5.6.2 Methods for establishing baseline equivalence

Baseline equivalence is used to determine whether two groups in a study have similar characteristics. Baseline equivalence between groups at the start of a study helps to eliminate the risk that effects observed at the end of the study (after an intervention for example) are not due to disparities that already existed at the start of a study (Steeger, Buckley, Pampel, Gust & Hill 2021). Random assignment helps to ensure equivalence (De

[19] As per De Weerdt, Simons, Struyf & Tack 2024, a quasi-experiment is one that uses a control group but lacks random assignment, and a pre-experiment is one that has no control group and no random assignment.

Weerdt, Simons, Struyf & Tack 2024). This thesis employed random assignment in the process of assigning students to the three explanation modes of the student-led team-teaching tasks of this thesis. Analysis of variance tests and T-tests were also used to compare the students allocated to the three explanation modes of the student-led team-teaching task, which incorporates learning-by-explaining, of this thesis. The statistically significant difference in students' prior academic performance that was identified between the three groups of students assigned to the three explanation modes of this thesis was controlled for in the regression analyses used in this thesis. This helps to ensure that the knowledge development benefits observed after students completed the student-led team-teaching tasks, which incorporate learning-by-explaining, of this study are not related to disparities that already existed at the start of the study.

1.5.6.3 Number of participants in each group

In order to derive reliable inferences from a study, it is important to have an adequate sample size (Memon, Ting, Cheah, Thurasamy, Chuah & Cham 2020). Following suggestions from De Weerdt, Simons, Struyf & Tack 2024, a minimum number of 30 participants per group should be used in order to compare groups (Fraenkel, Wallen & Hyun 2019, Chang, Huang & Wu 2006). This thesis exceeded the suggested minimum number of participants per group. More specifically, the sample size of the groups per explanation mode of this thesis is: 90 students for the oral explanation mode; 103 students for the video explanation mode; and 112 students for the written explanation mode.

1.5.6.4 Reliability and validity measurements

In order to claim that measurements are valid and reliable, a study should provide relevant evidence that the outcome measures actually score or measure what they intended to measure so that inferences are valid and reliable (Hess & Kvern, 2021; Cook et al. 2015). Evidence to support the reliability and validity of the outcome measures of this thesis are discussed next.

The knowledge development outcome measures of this thesis are defined in accordance with similar knowledge development measures applied in prior learning-by-explaining

research (Hoogerheide et al. 2016, Lachner et al. 2018; Schwartz, Bransford & Sears. 2005). To ensure the content validity of the conceptual and transfer knowledge tests used to measure student's knowledge development in this thesis, a subject-matter expert checked the correctness of the questions and possible answers. The survey instrument questions are obtained from a survey instrument that was used in previous studies on collaborative assessment tasks (Schmulian & Coetzee 2019b; Cooper 2017). This ensures the reliability of the survey instrument. To ensure the content validity of the survey instrument, two accounting education experts reviewed the survey instrument (McKenzie, Wood, Kotecki & Clark 1999). They assessed the alignment of the items with the intended construct and suggested modifications for clarity. Minimal changes were required based on their recommendations. The 7-point Likert scale question of the survey instrument included appropriate labels for each option. This bipolar continuum, recommended for optimally capturing positive or negative attitudes (Jon Krosnick, 1997), included appropriate verbal labels for each option (e.g., strongly agree or agree) to ensure clarity (Krosnick 1999) and maintain visual balance to avoid respondent confusion (Tourangeau, Couper & Conrad 2004).

1.5.6.5 Fulfillment of statistical assumptions

In order to draw valid inferences from the results of statistical tests, the fulfillment of statistical assumptions should be considered (Hoekstra et al., 2012). This thesis employed t-tests and multivariate regression analysis to measure the knowledge development benefits of the student-led team-teaching tasks, which incorporate learning-by-explaining. T-tests require independent observations and univariate normality, while multivariate regression analysis assumes multivariate normality, a linear relationship between the dependent and independent variables, no multicollinearity, and homoscedasticity (Nimon 2012). The data of this thesis was tested for these assumptions and none of the assumptions required for the statistical analysis of this thesis were violated.

1.5.6.6 Reporting effect sizes

The results for the statistical analyses reported in the research papers presented in Chapter 2 and Chapter 3 of this thesis provide the effect size measures for the statistical findings of this thesis. Effect sizes measure the effectiveness of a treatment and provide insight into the magnitude of the effect that arises from a treatment (Ellis, 2010). Reporting the effect sizes for the statistical findings of this thesis assists in providing more meaningful insight into the potential impact of student-led team-teaching tasks, which incorporate learning-by-explaining in the real world (De Weerdt, Simons, Struyf & Tack 2024).

1.6 IMPORTANCE AND BENEFITS OF THE THESIS

The findings of this thesis contribute new evidence to the team-teaching, learning-by-explaining, and accounting education literature. In particular, this thesis expands the traditional understanding of team-teaching as it shifts the focus from teacher-led team-teaching to student-led team-teaching. This novel form of team-teaching engages students in active learning as they take on the role of a teacher in a team-teaching task. While student teachers have been placed in the role of team teachers as part of their education and training to become teachers themselves (Baeten & Simons 2014), this thesis positions students outside of teacher education programs (accounting students) in such a role. The introduction of student-led team-teaching tasks in accounting education not only provides insight into the benefits of engaging students in the role of a team-teacher as part of their professional development but also provides a fresh perspective and an innovative method for actively engaging students, such as accounting students, in the learning process in a manner that enhances both their own competency development and that of their peers.

This thesis therefore broadens the scope of competency-based accounting education literature by exploring the use of student-led team-teaching tasks, which incorporate learning-by-explaining, as a means to develop competencies such as knowledge, teamwork skills, and communication skills. This thesis also provides a model of an active learning activity, in the form of a student-led team-teaching task, which incorporates learning-by-explaining. The active learning activity of this thesis can be implemented in a competency-based accounting education context to enhance and broaden competency development.

Furthermore, this thesis extends the learning-by-explaining literature, as it explores the benefits of learning-by-explaining within a team-teaching context. Previous learning-by-explaining literature has primarily focused on individual teaching contexts, where students explained course content independently rather than as part of a team (Ribosa & Duran 2022). Prior learning-by-explaining literature also emphasized the knowledge development benefits of learning-by-explaining (Kobayashi 2019; Lachner, Ly & Nückles 2018), while this thesis explores its benefits for broader competency development, within a team-teaching context. More specifically this thesis not only explores the knowledge development benefits of learning-by-explaining in a team-teaching context but also explores the benefits of such tasks for the purpose of creating opportunities for the development of teamwork and communications skills as part of the professional competencies that are critical for accounting students to develop.

Most of the existing learning-by-explaining literature, which focuses on explanations to a non-present recipient, has also primarily focused on examining the benefits of such learning-by-explaining tasks in experimental settings (Lachner, Hoogerheide, van Gog & Renkl 2021). The existing learning-by-explaining literature has also not investigated the benefits thereof in an accounting education domain. By exploring the benefits of learning-by-explaining in an applied (real-world) accounting education context, this thesis enhances the external validity of existing theories regarding learning-by-explaining. It broadens the scope of its use, assessing its effectiveness in an actual accounting classroom instead of in a laboratory setting. Additionally, this thesis expands current learning-by-explaining literature (e.g., Hoogerheide et al. 2016; Hoogerheide, Renkl, Fiorella, Paas & van Gog 2019; Lachner et al. 2018; Lachner, Hoogerheide, van Gog & Renkl 2021) which examines the effects of explanation modes on the benefits that students obtain from learning-by-explaining, as it provides new findings on the effects of these modes on students' knowledge development, particularly for students with varying levels of prior performance. It also the teamwork and communication development opportunities that arise from team-teaching tasks, which incorporate learning-by-explaining.

From a practical perspective, this thesis offers valuable insights for universities and accounting educators. It sheds light on students' perceived benefits and challenges of such

tasks, helping educators make informed decisions regarding the design and implementation of tasks aimed at broadening competency development within the accounting education curriculum. This is particularly relevant for educators who are focused on developing students' teamwork and communication skills alongside their accounting knowledge. The thesis provides evidence of the knowledge development benefits of student-led team-teaching tasks, which incorporate learning-by-explaining. It also examines the impact of explanation modes on students' knowledge gains and offers guidance for educators on selecting the most appropriate modes to develop accounting knowledge across varying student performance levels or to remediate knowledge deficits in lower-performing students.

1.7 DELIMITATIONS

This thesis explores whether engaging accounting students in student-led team-teaching tasks, which incorporate learning-by-explaining, develops their knowledge of an accounting topic and provides opportunities for the development of their teamwork and communication skills. The thesis focuses on third-year undergraduate business students from a degree program focusing on International Financial Reporting Standards (IFRS). These students are tasked with preparing and presenting a team explanation on the preparation of consolidated financial statements. They have to convey their explanation in an oral recording, video recording, or written mode, to a peer who was unable to attend the presented accounting classes.

The research is conducted over one academic year at the largest residential university in South Africa. The survey instrument of this thesis aims to gather insights into the benefits and challenges of student-led team-teaching tasks, which incorporate learning-by-explaining, from a student’s perspective.

1.8 STRUCTURE OF THE THESIS

This thesis is presented in the form of two research papers, each addressing distinct research questions of this thesis. Grounded in social constructivism, both research papers detail the design and implementation of learning-by-explaining tasks that require students to teach in teams within a competency-based accounting education context.

In both research papers, quantitative data collection plays a pivotal role in evaluating the knowledge development benefits offered by the student-led team-teaching tasks, which incorporate learning-by-explaining, to accounting students. The first paper extends its scope by incorporating qualitative data from student surveys. This addition allows students to reflect on their experiences of team-teaching accounting course content, therefore, providing a comprehensive view of the social constructivist learning experiences central to this thesis.

Furthermore, both the first and second papers collect qualitative data through student surveys in order to provide insight into the students' experiences of the student-led team-teaching tasks, which incorporate learning-by-explaining with a specific focus on their experienced opportunities for knowledge development and for teamwork and communication skills development within a competency-based accounting education context. This qualitative inquiry complements the quantitative analysis, enriching the understanding of the effectiveness and impact of student-led team-teaching, which incorporates learning-by-explaining, on students' knowledge and teamwork and communication skills development.

By employing a mixed methods research design, each paper in this thesis provides a holistic understanding of the subject matter. This approach not only quantifies the effectiveness of student-led team-teaching tasks, which incorporate learning-by-explaining, in terms of knowledge development but also qualitatively assesses the broader educational impacts, ensuring a comprehensive analysis of student-led team-teaching, which incorporates learning-by-explaining, as a pedagogical tool in accounting education. Figure 1- 1 provides a schematic representation of the outline of this thesis as discussed in Chapter 1 of this thesis.

Figure 1- 1 Schematic representation of this thesis

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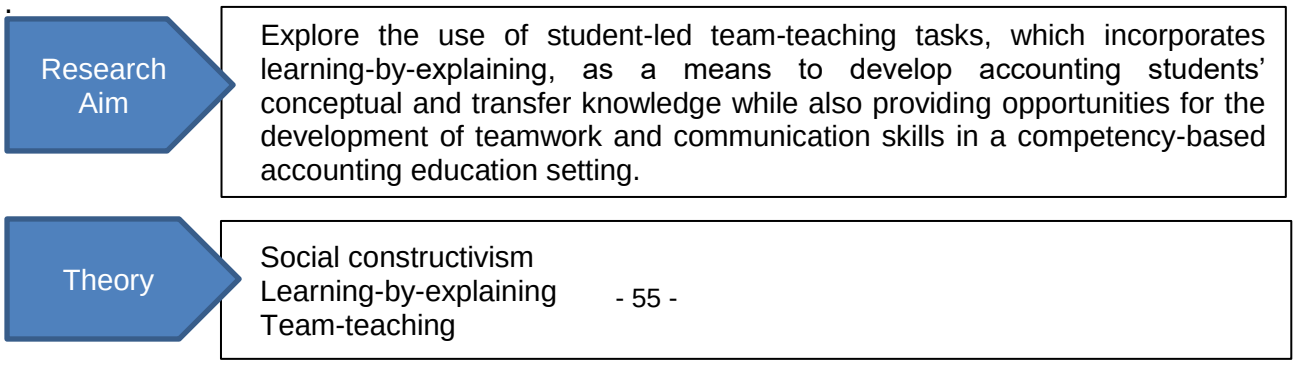

Research Questions

RQ1: Do accounting students experience knowledge development benefits when they are engaged in a student-led team-teaching task, which incorporates learning-by-explaining, in a competency-based accounting education context?

RQ2: Do varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential conceptual and transfer knowledge benefits for accounting students, in a competency-based accounting education context?

RQ3: What are accounting students' experiences of a student-led team-teaching task, which incorporates learning-by-explaining, that is aimed at developing their knowledge, teamwork skills, and communication skills in a competency-based accounting education context?

RQ4: Do accounting students experience that varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential teamwork and communication skills development opportunities in a competency-based accounting education context?

Importance & Benefits

As discussed in more detail in section 1.4 of Chapter 1, this thesis following contributions:

This thesis expands the traditional understanding of team-teaching as it shifts the focus from teacher-led team-teaching to student-led team-teaching.

This thesis therefore broadens the scope of competency-based accounting education literature by exploring the use of student-led team-teaching tasks, which incorporate learning-by-explaining, as a means to develop competencies such as knowledge, teamwork skills, and communication skills.

This thesis also provides a model of an active learning activity, in the form of a student-led team-teaching task, which incorporates learning-by-explaining.

This thesis extends the learning-by-explaining literature, as it explores the benefits of learning-by-explaining within a team-teaching context.

This thesis not only explores the knowledge development benefits of learning-by-explaining in a team-teaching context but also explores the benefits of such tasks for the purpose of creating opportunities for the development of teamwork and communications skills.

By exploring the benefits of learning-by-explaining in an applied (real-world) accounting education context, this thesis enhances the external validity of existing theories regarding learning-by-explaining.

This thesis expands current learning-by-explaining literature (e.g., Hoogerheide et al. 2016; Hoogerheide, Renkl, Fiorella, Paas & van Gog 2019; Lachner et al. 2018; Lachner, Hoogerheide, van Gog & Renkl 2021) which examines the effects of explanation modes on the benefits that students obtain from learning-by-explaining, as it provides new findings on the effects of these modes on students' knowledge development, particularly for students with varying levels of prior performance.

From a practical perspective, this thesis offers valuable insights for universities and accounting educators. It sheds light on students' perceived benefits and challenges of such tasks, helping educators make informed decisions regarding the design and implementation of tasks aimed at broadening competency development within the accounting education curriculum.

Methodology	Mixed-methods: Research Paper 1 (Chapter 2) - QUAL + QUAN design as proposed by Morse (1991) used to answer RQ1 & RQ3. Research Paper 2 (Chapter 3) - QUAN + qual design as proposed by Morse (1991) used to answer RQ2 & RQ4 Combined and extended results (Chapter 4) when considering the different explanation modes contained in Research Paper 1 and Research Paper 2 - QUAN + qual design as proposed by Morse (1991) used to add to the findings for RQ2 & RQ4

The next section of this chapter provides a chapter-by-chapter summary of each of the following chapters in this thesis.

1.8.1 Chapter 1: Introduction

This chapter provides the background of this thesis and identifies the theoretical framework that underpins this thesis. This chapter also provides the aim and research questions of this thesis and gives a summary of the research methodology applied Thereafter, this chapter outlines the importance, benefits, and delimitations of this thesis.

1.8.2 Chapter 2: Accounting Students in the Role of Equal-Status Team-Teacher for the Development of Knowledge, Teamwork, and Communication Skills Competencies

The first research paper of this thesis is presented in Chapter 2. This research paper investigates the use of student-led team-teaching, which incorporates learning-by-explaining[20], for the purpose of developing accounting students' knowledge and providing opportunities for teamwork and communication skills development in a higher education setting. The research quantifies knowledge development from the student-led team-teaching task, which incorporates learning-by-explaining, and explores students' experiences with this task through survey data. Findings suggest that engaging accounting students in a team-teaching role, specifically a sequential equal-status team-teaching role

[20] The team-teaching task, which incorporates learning-by-explaining, in Research Paper 1 is referred to as a learning-by-team-teaching intervention.

incorporating interactive teaching styles[21], significantly improves students' accounting knowledge, particularly among lower-performing students. Students reported a largely positive experience, across all student performance levels, of the task. Students specifically noted that the task provided them with knowledge, teamwork, and communication skills development opportunities. Details of students' self-reported benefits and challenges of engaging in a team-teaching role in order to enhance their accounting knowledge and to provide students with opportunities for teamwork and communication skills development are also reported in this research paper. Overall, this research paper (as part of this thesis) contributes to the existing body of knowledge on team-teaching and learning-by-explaining.

1.8.3 Chapter 3: Do Team-Based Written or Video Explanations of Course Content Develop Accounting Students' Knowledge, Teamwork Skills, and Communication Skills?

The second research paper of this thesis is presented in Chapter 3. This research paper explores accounting students' knowledge development, and opportunities for teamwork and communication skills development when using a student-led team-teaching task, which incorporates learning-by-explaining[22], in either written or video mode, as an assessment for learning[23] in a competency-based accounting education context. Both modes (written or video) of the student-led team-teaching task, which incorporates learning-by-explaining, seem to enhance conceptual and transfer knowledge among weaker and moderate-performing students. The video explanation mode, when considering the preparation and presentation of the video explanation as a whole, appears more beneficial than the written explanation mode for top-performing students' conceptual knowledge development. The team-based video explanation mode also appears to be the preferred mode for creating opportunities for students to develop teamwork skills, while both modes are perceived as beneficial for communication skills development. Taking the results of the research paper

[21] In the interactive teaching style, both teachers are present and actively collaborate in teaching, instructing, and engaging with students in the discussion. They share responsibility for planning, delivering, and assessing student learning (Letterman & Dugan 2004; White et al. 1998).
[22] The team-teaching task, which incorporates learning-by-explaining, in Research Paper 2 is referred to as a team-based explanation.
[23] The team-teaching task, which incorporates learning-by-explaining in Research Paper 2 takes the form of an assessment for learning. An assessment for learning is an assessment that is specifically intended to enhance the learning of students, rather than just measuring students' performance (Hargreaves 2007).

together, the video explanation mode appears to be the overall favored choice by accounting students, as it facilitates whole-class knowledge development while also allowing greater opportunities compared to the written explanation mode for students' teamwork and communication skills development in a competency-based accounting education context.

1.8.4 Chapter 4: Combined and Extended Results when Considering the Different Explanation Modes contained in Research Paper 1 and Research Paper 2

Chapter 4 combines and compares the data and findings from Research Paper 1 and Research Paper 2 in order to provide more comprehensive insights and understanding of the effects of explanation mode, as it relates to research questions 2 (RQ2) and 4 (RQ4) of this thesis.

1.8.5 Chapter 5: Conclusion

This chapter summarises the studies included in this thesis, alluding to the background and rationale for the thesis, its findings, and its contributions. Suggestions for future research are also made.

1.8.6 Chapter 6: Combined references

This chapter provides a complete reference list for all the references used in this thesis.

1.9 REFERENCES

Abbasi, N., 2014, 'Competency approach to accounting education: A global view', *Journal of Finance and Accountancy* 13(1), 1–18.

Adams, P., 2006, 'Exploring social constructivism: theories and practicalities', *Education* 34(3), 243–257.

Al-Hassan, O., A. Al-Barakat, & Y. Al-Hassan. 2012, 'Pre-service Teachers' Reflections During Field Experience', *Journal of Education for Teaching* 38 (4): 419–434. doi:10.1080/02607476.2012.707918.

Al-Saaideh, M. 2010, 'A rationale to adopt team teaching in prevocational education in Jordan', *Journal of Instructional Psychology*, 37(4), 269–285.

Amineh, J.R. & Asl, H.D., 2015, 'Journal of Social Sciences, Literature and Languages Review of Constructivism and Social Constructivism', *Journal of Social Sciences, Literature and Languages* 1(1), 9–16.

Anderson, N. A., & Radencich, M. C. 2001, 'The value of feedback in an early field experience: peer, teacher, and supervisor coaching', *Action in Teacher Education* 23,66–74. http://dx.doi.org/10.1080/01626620.2001.10463076.

Anderson, N. A., Barksdale, M. A., & Hite, C. E. 2005, 'Pre-service teachers' observations of cooperating teachers and peers while participating in an early field experience', *Teacher Education Quarterly* 32(4), 97–117.

Atir, S., & Risen, J. L. 2025, 'The paradox of explaining: When feeling unknowledgeable prevents learners from engaging in effective learning strategies', *Journal of Experimental Psychology: General 154*(1), 228–248. https://doi.org/10.1037/xge0001679

Austin, V. 2001, 'Teachers' beliefs about co-teaching', *Remedial and Special Education* 22(4), 245–255. http://dx.doi.org/10.1177/074193250102200408.

Badiali, B., & Titus, N. 2010, 'Co-teaching: enhancing students learning through mentor-intern partnerships', *School University Partnerships* 4(2), 74–80.

Baeten, M. & Simons, M., 2014, 'Student teachers' team teaching: Models, effects, and conditions for implementation', *Teaching and Teacher Education* 41, 92–110, doi.org/10.1016/j.tate.2014.03.010.

Baeten, M., & Simons, M. 2016a, 'Innovative field experiences in teacher education:

Student-teachers and mentors as partners in teaching', *International Journal of Teaching and Learning in Higher Education*, 28, 38–51. https://api.semanticscholar.org/CorpusID:55045663

Baeten, M. & Simons, M., 2016b, 'Student teachers' team teaching: how do learners in the classroom experience team-taught lessons by student teachers?', *Journal of Education for Teaching* 42(1), 93–105, doi.org/10.1080/02607476.2015.1135226.

Baeten, M., Simons, M., Schelfhout, W. & Pinxten, R., 2018, 'Team teaching during field experiences in teacher education: Exploring the assistant teaching model', *European Journal of Teacher Education* 41(3), 377–397, doi.org/10.1080/02619768.2018.1448780.

Baldvinsdottir, G., Burns, J., Nørreklit, H. & Scapens, R.W., 2009, 'The image of accountants: From bean counters to extreme accountants', *Accounting, Auditing and Accountability Journal* 22(6), 858–882, doi.org/10.1108/09513570910980445.

Bangert-drowns, R.L., Hurley, M.M. & Wilkinson, B., 2004, 'The Effects of School-Based Writing-to-Learn Interventions on Academic Achievement : A Meta-Analysis', *Review of Educational Research* 74(1), 29–58.

Bashan, B., & Holsblat, R. 2012, 'Co-teaching through modeling processes: professional development of students and instructors in a teacher training program', *Mentoring & Tutoring: Partnership in Learning* 20(2), 207–226. http://dx.doi.org/10.1080/13611267.2012.678972.

Benjamin, J. 2000, 'The scholarship of teaching in teams: What does it look like in practice?', *Higher Education Research & Development* 19(2):191-204.

Bilgrami, A. (2002). *Realism and Relativism*. In Source: Philosophical Issues (Vol. 12).

Birrell, J.R. & Bullough, R. V., 2005, 'Teaching with a Peer: A Follow-Up Study of the 1st Year of Teaching', *Action in Teacher Education* 27(1), 72–81, doi.org/10.1080/01626620.2005.10463375.

Bisra, K., Liu, Q., Nesbit, J. C., Salimi, F., & Winne, P. H. 2018. 'Inducing Self-Explanation: a Meta-Analysis'. *Educational Psychology Review 30*(3), 703–725. https://doi.org/10.1007/s10648-018-9434-x

Bolam, R., Mcmahon, A., Stoll, L., Thomas, S., Wallace, M., Greenwood, A., Hawkey, K., Ingram, M., Atkinson, A., & Smith, M. 2005, 'Creating and Sustaining Effective Professional Learning Communities', *Universitiy of Bristol*. www.dfes.go.uk/research

Bolt-Lee, C. & Foster, S., 2003, 'The core competency framework: A new element in the

continuing call for accounting education change in the United States', *Accounting Education* 12(1), 33–47, doi.org/10.1080/0963928031000074486.

Boritz, J.E. & Carnaghan, C.A., 2003, 'Competency-based education and assessment for the accounting profession: A critical review', *Canadian Accounting Perspectives* 2(1), 7–42, doi.org/10.1506/5K7C-YT1H-0G32-90K0.

Bowman, C. L., & McCormick, S. 2000, 'Comparison of peer coaching versus traditional supervision effects', *The Journal of Educational Research* 93(4), 256–261.

Brojčin, B., Bankovič, S., Glumbič, N., & Weiss, S. 2012, 'Effects of cooperative teaching in inclusive education', *Didactica Slovenica - Pedagoska Obzorja* 27(5), 66–79.

Bryman, A., 2006, 'Integrating quantitative and qualitative research: How is it done?', *Qualitative Research* 6(1), 97–113, doi.org/10.1177/1468794106058877.

Bullough, R., J. Young, J. Birrell, D. Clark, M. Egan, L. Erickson, M. Frankovich, J. Brunetti, and M. Welling 2003, 'Teaching with a Peer: A Comparison of Two Models of Student Teaching', *Teaching and Teacher Education* 19, 57–73.

Bunney, D., Sharplin, E. & Howitt, C., 2015, 'Generic skills for graduate accountants: the bigger picture, a social and economic imperative in the new knowledge economy', *Higher Education Research and Development* 34(2), 256–269, doi.org/10.1080/07294360.2014.956700.

Carberry. A.R. 2008, *Learning-by-teaching as a pedagogical approach and its implications on engineering education*. Ph. D. Dissertation. Tufts University.

Carpenter, D.M., Crawford, L. & Walden, R., 2007, 'Testing the efficacy of team teaching', *Learning Environments Research* 10(1), 53–65, doi.org/10.1007/s10984-007-9019-y.

Chebbihi, H., Varpio, L., St-Onge, C. & Chamberland, M., 2019, 'Self-explanation to support knowledge development for clinical reasoning: Perspectives from third year medical clerks', *MedEdPublish* 8(3), 1–11, doi.org/10.15694/mep.2019.000225.1.

Chhinzer, N. & Russo, A.M., 2018, 'An exploration of employer perceptions of graduate student employability', *Education and Training* 60(1), 104–120, doi.org/10.1108/ET-06-2016-0111.

Chi, M., & Wylie, R. 2014, 'The ICAP framework: linking cognitive engagement to active learning outcomes', *Educational Psychologist* 49(4), 219–243.

Cho, Y. H., & Jonassen, D. H. 2012, 'Learning by self-explaining causal diagrams in high-school biology', *Asia Pacific Education Review* 13(1), 171–184.

Colburn, M., Sullivan, D. & Fox, D.E. 2012, 'An examination of the impact of team teaching

on student learning outcomes and student satisfaction in undergraduate business capstone courses', *American Journal of Business Education (Online),* 5(2):149-157.

Coleman, E. B., Brown, A. L., & Rivkin, I. D. 1997, 'The Effect of Instructional Explanations on Learning from Scientific Texts', *Journal of the Learning Sciences 6*(4), 347–365. https://doi.org/10.1207/s15327809jls0604_1

Cooper, S., 2017, 'A collaborative assessment of students' placement learning', *Assessment and Evaluation in Higher Education* 42(1), 61–76, doi.org/10.1080/02602938.2015.1083093.

Cook, L., & Friend, M. 1995, 'Co-teaching: guidelines for creating effective practices', *Focus on Exceptional Children* 28(3), 1–16.

Creemers, B., & Kyriakides, L. 2007, *The dynamics of educational effectiveness: A contribution to policy, practice and theory in contemporary schools*, Routledge.

Creswell, J. W. 2014. *Qualitative enquiry and research design: choosing among five approaches*. Thousand Oaks: Sage.

Cunha, T., Martins, H., Carvalho, A. & Carmo, C., 2022, 'Not Practicing What You Preach: How Is Accounting Higher Education Preparing the Future of Accounting', *Education Sciences* 12(7), doi.org/10.3390/educsci12070432.

Daniels, H., 2001, *Vygotsky and pedagogy*, Routledge Falmer, London.

Dawadi, S., Shrestha, S. & Giri, R.A., 2021, 'Mixed-Methods Research: A Discussion on its Types, Challenges, and Criticisms', *Journal of Practical Studies in Education* 2(2), 25–36, doi.org/10.46809/jpse.v2i2.20.

Debbané, A., Lee, K. J., Tse, J., & Law, E. 2023, 'Learning by Teaching: Key Challenges and Design Implications', *Proceedings of the ACM on Human-Computer Interaction 7*(CSCW1). https://doi.org/10.1145/3579501

Dee, A. 2012, 'Collaborative Clinical Practice: An Alternate Field Experience', *Issues in Teacher Education* 21 (2): 147–163.

Dehnad, A., Jalali, M., Shahabi, S., Mojgani, P., & Bigdeli, S. 2021, 'Students' view on supportive co-teaching in medical sciences: A systematic review', *BMC Medical Education* 21(1), 522. https://doi.org/10.1186/s12909-021-02958-4

Denicolo, P., 2016, *Constructivist Approaches and Research Methods: A Practical Guide to Exploring Personal Meanings*, SAGE, doi.org/https://doi.org/10.4135/9781526402660.

Denzin, N. K., & Licoln, Y. S. (1994). *Handbook of Qualitative Research*. Sage.

Dietrichson, J., Filges, T., Klokker, R. H., Viinholt, B. C. A., Bøg, M., & Jensen, U. H. 2020,

'Targeted school-based interventions for improving reading and mathematics for students with, or at risk of, academic difficulties in Grades 7–12: A systematic review', *Campbell Systematic Reviews* 16(2), e1081. https://doi.org/10.1002/cl2.1081

Dolce, V., Emanuel, F., Cisi, M. & Ghislieri, C., 2020, 'The soft skills of accounting graduates: perceptions versus expectations', *Accounting Education* 29(1), 57–76, doi.org/10.1080/09639284.2019.1697937.

Dunlosky, J., Rawson, K., Marsh, E., Nathan, M., & Willingham, D. 2013, 'Improving students' learning with effective learning techniques', *Psychological Science in the Public Interest* 14(1), 4–58.

Duran, D., 2017, 'Learning-by-teaching. Evidence and implications as a pedagogical mechanism', *Innovations in Education and Teaching International* 54(5), 476–484, doi.org/10.1080/14703297.2016.1156011.

Duran, D. & Topping, K.J., 2017, *Evidence-based strategies to enhance learning in the classroom*, Routledge, London.

de Koning, B. B., Tabbers, H. K., Rikers, R. M. J. P., & Paas, F. 2010, 'Learning by generating vs. receiving instructional explanations: two approaches to enhance attention cueing in animations', *Computers & Education* 55(2), 681–691.

de Lange, P., O'Connell, B. T., Tharapos, M., Beatson, N., & Oosthuizen, H. 2023, 'Accounting graduate employability: employer perspectives on skills and attributes of international graduates', *Accounting Education 32*(3), 249–277. https://doi.org/10.1080/09639284.2022.2059383

de Weerdt, D., Simons, M., Struyf, E., & Tack, H. 2024, 'Studying the Effectiveness of Team Teaching: A Systematic Review on the Conceptual and Methodological Credibility of Experimental Studies', *Review of Educational Research*. https://doi.org/10.3102/00346543241262807

Edmond, T. & Tiggeman, T., 2009, 'Accounting Experiences In Collaborative Learning', *American Journal of Business Education* 2(7), 97–100, doi.org/10.19030/ajbe.v2i7.4588.

Esterhazy, R., de Lange, T., Bastiansen, S., & Wittek, A. L. 2021, 'Moving beyond peer review of teaching: A conceptual framework for collegial faculty development', *Review of Educational Research* 91(2), 237–271. https://doi.org/10.3102/0034654321990721.

Feldstein, S., Dohm, F.A. & Crown, C.L., 2001, 'Gender and speech rate in the perception of competence and social attractiveness', *Journal of Social Psychology* 141(6), 785–

806, doi.org/10.1080/00224540109600588.

Fiorella, L., & Mayer, R. E. 2014. 'Role of expectations and explanations in learning by teaching', *Contemporary Educational Psychology* *39*(2), 75–85. https://doi.org/10.1016/j.cedpsych.2014.01.001

Fiorella, L., Mayer, R.E., 2016, 'Eight Ways to Promote Generative Learning', *Educational Psychology Review* 28, 717–741, https://doi.org/10.1007/s10648-015-9348-9.

Fiorella, L., 2021, 'Fostering knowledge building in learning by teaching: A test of the drawing-facilitates-explaining hypothesis', *Applied Cognitive Psychology* 35(2), 548–558, doi.org/10.1002/acp.3774.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. 2019, *How to design and evaluate research in education* (10th ed.). McGraw-Hill.

Frank, J.R., Snell, L.S., Cate, O. Ten, Holmboe, E.S., Carraccio, C., Swing, S.R., Harris, P., Glasgow, N.J., et al., 2010, 'Competency-based medical education: Theory to practice', *Medical Teacher* 32(8), 638–645, doi.org/10.3109/0142159X.2010.501190.

Friend, M., Cook, L., Hurley-Chamberlain, D., & Shamberger, C. 2010, 'Co-teaching: An illustration of the complexity of collaboration in special education', *Journal of Educational and Psychological Consultation* 20(1), 9–27. https://doi.org/10.1080/10474410903535380

Fukaya, T. 2013, 'Explanation generation, not explanation expectancy, improves metacomprehension accuracy', *Metacognition and Learning* *8*(1), 1–18. https://doi.org/10.1007/s11409-012-9093-0

Gall, M. D., Gall, J. P., & Borg, W. R. 2003, *Educational research: An introduction* (7th ed.). Boston, MA: Pearson.

Gardiner, W., and K. Robinson. 2009, 'Paired Field Placements: A Means for Collaboration', *The New Educator* 5, 81–94.

Gardiner, W. 2010, 'Mentoring Two Student Teachers: Mentors' Perceptions of Peer Placements', *Teaching Education* 21 (3), 233–246. doi:10.1080/10476210903342102.

Gardiner, W., & Robinson, K. 2011, 'Peer field placements with preservice teachers: negotiating the challenges of professional collaboration', *The Professional Educator* 35(2).

Gartner, A. 1971, *Children teach children: Learning by teaching*. Harper & Row, Manhattan, NY 10022, USA.

Gast, I., Schildkamp, K., & Van Der Veen, J. T. 2017, 'Team-based professional

development interventions in higher education: A systematic review', *Review of Educational Research* 87(4), 736–767.

Gaytan, J. 2010, 'Instructional strategies to accommodate a team-teaching approach', *Business Communication Quarterly* 73, 82-87. http://dx.doi.org/10.1177/1080569909358097

Ghani, E.K. & Muhammad, K., 2019, 'Industry 4.0: Employers' expectations of accounting graduates and its implications on teaching and learning practices', *International Journal of Education and Practice* 7(1), 19–29, doi.org/10.18488/journal.61.2019.71.19.29.

Goddard, R., Goddard, Y., Sook Kim, E., & Miller, R. 2015, 'A theoretical and empirical analysis of the roles of instructional leadership, teacher collaboration, and collective efficacy beliefs in support of student learning', *American Journal of Education* 121(4), 501–530. https://doi.org/10.1086/681925

Goker, S. 2006, 'Impact of peer coaching on self-efficacy and instructional skills in TEFL teacher education', *System* 34, 239–254. http://dx.doi.org/10.1016/j.system.2005.12.002.

Goodnough, K., P. Osmond, D. Dibbon, M. Glassman, and K. Stevens. 2009, 'Exploring a Triad Model of Student Teaching: Pre-Service Teacher and Cooperating Teacher Perceptions', *Teaching and Teacher Education* 25, 285–296. doi:10.1016/j.tate.2008.10.003.

Graziano, K., & Navarette, L. 2012, 'Co-teaching in a teacher education classroom: collaboration, comprise, and creativity', *Issues in Teacher Education* 21(1), 109–126.

Greene, J.C., Caracelli, V.J. & Graham, W.F., 1989, 'Toward a Conceptual Framework for Mixed-Method Evaluation Designs', *Educational Evaluation and Policy Analysis* 11(3), 255–274, from https://www.jstor.org/stable/1163620.

Griffin, P. and Robertson, P., 2014, 'Professional learning teams and decision-making.', *Assessment for teaching* 1, 13–25. https://doi.org/10.3102/0034654317704306

Grix, J. 2004, *The Foundations of Research*. New York, NY: Palgrave Macmillan

Gunawardena, C.N., 1995, 'Social Presence Theory and Implications for Interaction and Collaborative Learning in Computer Conferences', *International Journal of Educational Telecommunications* 1(2), 147–166.

Gurgur, H., & Uzuner, Y. 2011, 'Examining the implementation of two co-teaching models: Team teaching and station teaching', *International Journal of Inclusive Education* 15(6), 589–610. https://doi.org/10.1080/13603110903265032

Hargreaves, E., 2007, 'The validity of collaborative assessment for learning', *Assessment in Education: Principles, Policy and Practice* 14(2), 185–199, doi.org/10.1080/09695940701478594.

Harris, P., Bhanji, F., Topps, M., Ross, S., Lieberman, S., Frank, J.R., Snell, L. & Sherbino, J., 2017, 'Evolving concepts of assessment in a competency-based world', *Medical Teacher* 39(6), 603–608, doi.org/10.1080/0142159X.2017.1315071.

Hellier, S., & Davidson, L. 2018, 'Team teaching in nursing education', *Journal of continuing Education in Nursing 49*(4), 186–192. https://doi.org/10.3928/00220124-20180320-09

Helms, M., Alvis, J., &Willis, M. 2005, 'Planning and implementing shared teaching: an MBA team-teaching case study', *Journal of Education for Business* 8,29–34.

Heisler, L. A., & Thousand, J. S. 2021, 'A guide to co-teaching for the SLP: A tutorial', *Communication Disorders Quarterly* 42(2), 122–127. https://doi.org/10.1177/1525740119886310

Honigsfeld, A., & Dove, M. G. 2019, Preparing teachers for co-teaching and collaboration. In L. C. de Oliveira (Ed.), *The handbook of TESOL in K-12* (pp. 405–421). Wiley. https://doi.org/10.1002/9781119421702.ch26

Hoogerheide, V., Loyens, S. M. M., & van Gog, T. 2014, 'Effects of creating video-based modeling examples on learning and transfer', *Learning and Instruction 33*, 108–119. https://doi.org/10.1016/j.learninstruc.2014.04.005

Hoogerheide, V., Deijkers, L., Loyens, S.M.M., Heijltjes, A. & van Gog, T., 2016, 'Gaining from explaining: Learning improves from explaining to fictitious others on video, not from writing to them', *Contemporary Educational Psychology* 44, 95–106, doi.org/10.1016/j.cedpsych.2016.02.005.

Hoogerheide, V., Renkl, A., Fiorella, L., Paas, F. & van Gog, T., 2019, 'Enhancing Example-Based Learning: Teaching on Video Increases Arousal and Improves Problem-Solving Performance', *Journal of Educational Psychology* 111(1), 45–56, doi.org/10.1037/edu0000272.

Howlett, K.M. & Nguyen, H.L., 2020, 'Autoethnographic reflections of an international graduate teaching assistant's co-teaching experiences', *Journal of International Students* 10(2), 401–419, doi.org/10.32674/jis.v10i2.774.

ICAEW, 2017, 'Understanding the Impact of Technology in Audit and Finance', *Understanding the impact of technology in audit and finance* 14, from https://www.icaew.com/-/media/corporate/files/middle-east-hub/understanding-the-

impact-of-technology-in-audit-and-finance.ashx.

International Accounting Education Standards Board™, 2019, *International Education Standard 3, Initial Professional Development – Professional Skills (Revised)*, NY: IFAC, New York.

International Accounting Education Standards Board (IAESB), 2014, 'IES 4: Initial Professional Development – Professional Values, Ethics, and Attitudes', *International Federation of Accountants* (January), 1–15.

Irby, D.M., 1994, ' What clinical teachers in medicine need to know', *Academic Medicine* 65 (9), 333–342, doi.org/10.1097/00001888-199405000-00003.

Jackson, D. & Meek, S., 2021, 'Embedding work-integrated learning into accounting education: the state of play and pathways to future implementation', *Accounting Education* 30(1), 63–85, doi.org/10.1080/09639284.2020.1794917.

Jackson, D., Michelson, G. & Munir, R., 2023, 'Developing accountants for the future: new technology, skills, and the role of stakeholders', *Accounting Education* 32(2), 150–177, doi.org/10.1080/09639284.2022.2057195.

Jang, S. 2008, 'Innovations in science teacher education: effects of integrating technology and team-teaching strategies', *Computers & Education* 51, 646–659. http://dx.doi.org/10.1016/j.compedu.2007.07.001.

Jenkins, J., & Veal, M. 2002, 'Preservice teachers' PCK development during peer coaching', *Journal of Teaching in Physical Education* 22,49–68.

Jick, T.D., 1979, 'Mixing Qualitative and Quantitative Methods : Triangulation in Action', *Administrative Science Quarterly* 24(4), 602–611.

Jon A. Krosnick, L.R.F., 1997, 'Designing Rating Scales for Effective Measurement in Surveys', in *Survey Measurement and Process Quality*, M.C. L. Lyberg, P. Biemer, Ed., Wiley-Interscience, New York, pp. 141–164, doi.org/https://doi.org/10.1002/9781118490013.ch6.

Kamens, M. 2007. 'Learning about Co-teaching: A Collaborative Student Teaching Experience for Preservice Teachers.' *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children* 30 (3), 155–166. doi:10.1177/088840640703000304.

Kay, D. & Kibble, J., 2016, 'Learning theories 101: Application to everyday teaching and scholarship', *Advances in Physiology Education* 40(1), 17–25, doi.org/10.1152/advan.00132.2015.

Keevy, M., Tharapos, M., O'Connell, B. T., Verhoef, G., de Lange, P., & Beatson, N. J. 2023, 'Using an extended professional project to develop professional skills among rural South African accounting students', *Accounting Education*. https://doi.org/10.1080/09639284.2023.2283441

Kerin, M. & Murphy, C. 2015. 'Exploring the impact of coteaching on pre-service music teachers', *Asia-Pacific Journal of Teacher Education* 43(4), 309–323.

King, S., 2006, 'Promoting paired placements in initial teacher education. The use of paired placements in England', *International Research in Geographical and Environmental Education* 15(4), 370–386.

Kivunja, C., & Kuyini, A. B. 2017, 'Understanding and Applying Research Paradigms in Educational Contexts', *International Journal of Higher Education* *6*(5), 26. https://doi.org/10.5430/ijhe.v6n5p26

Kobayashi, K., 2019, 'Learning by Preparing-to-Teach and Teaching: A Meta-Analysis', *Japanese Psychological Research* 61(3), 192–203, doi.org/10.1111/jpr.12221.

Krosnick, J.A., 1999, 'Survey Research', *Annual Review of Psychology* 50, 537–567, doi.org/10.1097/ALN.0000000000002436.

Kurtts, S. A., & Levin, B. B. 2000, 'Using peer coaching with preservice teachers to develop reflective practice and collegial support', *Teaching Education* 11(3), 297–310. http://dx.doi.org/10.1080/713698980.

Kyndt, E., V. Donche, D. Gijbels, and P. Van Petegem. 2014, 'Workplace Learning within Teacher Education: The Role of Job Characteristics and Goal Orientation', *Educational Studies*, 40 (5), 515–532. doi:10.1080/03055698.2014.936829.

Kyndt, E., Gijbels, D., Grosemans, I., & Donche, V. 2016, 'Teachers' everyday professional development: Mapping informal learning activities, antecedents, and learning outcomes', *Review of Educational Research* 86(4), 1111–1150. https://doi.org/10.3102/0034654315627864

Lachner, A., Ly, K.T. & Nückles, M., 2018, 'Providing Written or Oral Explanations? Differential Effects of the Modality of Explaining on Students' Conceptual Learning and Transfer', *Journal of Experimental Education* 86(3), 344–361, doi.org/10.1080/00220973.2017.1363691.

Lachner, A., Backfisch, I., Hoogerheide, V., van Gog, T. & Renkl, A., 2020, 'Timing Matters! Explaining Between Study Phases Enhances Students' Learning', *Journal of Educational Psychology* 112(4), 841–853, doi.org/10.1037/edu0000396.

Lachner, A., Hoogerheide, V., van Gog, T. & Renkl, A., 2021, 'Learning-by-Teaching Without Audience Presence or Interaction: When and Why Does it Work?', *Educational Psychology Review*, doi.org/10.1007/s10648-021-09643-4.

Lachner, A., Jacob, L., & Hoogerheide, V. 2021, 'Learning by writing explanations: Is explaining to a fictitious student more effective than self-explaining?' *Learning and Instruction*, *74* 101438. https://doi.org/10.1016/j.learninstruc.2020.101438

Laughlin, K., Nelson, P., & Donaldson, S. 2011, 'Successfully applying team teaching with adult learners', *Journal of Adult Education* 40,11-17.

Lawson, R.A., Blocher, E.J., Brewer, P.C., Cokins, G., Sorensen, J.E., Stout, D.E., Sundem, G.L., Wolcott, S.K., & Wouters, M.J.F., 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.org/10.2308/iace-50673.

Lee, S.H.S. 2013, 'An evaluation on a team teaching by university students and lecturers in Australia', *Journal of Language Teaching & Research* 4(5), 914–923.

Lee, K. J., Chauhan, A., Goh, J., Nilsen, E., & Law, E. 2021, 'Curiosity Notebook: The Design of a Research Platform for Learning by Teaching', *Proceedings of the ACM on Human-Computer Interaction*, *5*(CSCW2). https://doi.org/10.1145/3479538

Leikin, R. 2006, *Learning by teaching: The case of Sieve of Eratosthenes and one elementary school teacher*. Routledge, Oxfordshire, England, UK, 115–140

Letterman, M.R. & Dugan, K.B., 2004, 'Team Teaching a Cross-Disciplinary Honors Course: Preparation and Development', *College Teaching* 52(2), 76–79.

Levant, Y., Coulmont, M. & Sandu, R., 2016, 'Business simulation as an active learning activity for developing soft skills', *Accounting Education* 25(4), 368–395, doi.org/10.1080/09639284.2016.1191272.

Lin, L., & Atkinson, R. K. 2013, 'Enhancing learning from different visualizations by self-explanation prompts', *Journal of Educational Computing Research* 49(1), 83–110.

Lopez-Fernandez, O. & Molina-Azorin, J.F., 2011, 'The use of mixed methods research in the field of behavioural sciences', *Quality and Quantity* 45(6), 1459–1472, doi.org/10.1007/s11135-011-9543-9.

Loughry, M.L., Ohland, M.W. & Moore, D.D., 2007, 'Development of a Theory-Based Member Effectiveness', *Educational and Psychological Measurement* 67(3), 505–524, doi.org/10.1177/0013164406292085.

Mapuya, M., 2021, 'First-year accounting student teachers' constructivist learning experiences, the lecturer's role and implications for curriculum implementation', *International Journal of Learning, Teaching and Educational Research* 20(1), 103–119, doi.org/ 10.26803/ijlter.20.1.6.

McKenzie, J.F., Wood, M.L., Kotecki, J.E. & Clark, J.K., 1999, 'Establishing content validity: using qualitative and quantitative steps', *American Journal of Health Behaviour* 4(23), 311–318.

Memon, M. A., Ting, H., Cheah, J.-H., Thurasamy, R., Chuah, F., & Cham, T. H. 2020, 'Sample size for survey research: Review and recommendations', *Journal of Applied Structural Equation Modeling*, 4(2), i–xx. https://doi.org/10.47263/JASEM.4(2)01

Morgan, D.L., 1998, 'Practical strategies for combining qualitative and quantitative methods: Applications to health research', *Qualitative Health Research* 8(3), 362–376, doi.org/10.1177/104973239800800307.

Morse, J.M., 1991, 'Approaches to qualitative-quantitative methodological triangulation', *Nursing Research* 40(2), 120–123, doi.org/10.1097/00006199-199103000-00014.

Murata, R., 2002, 'What does team teaching mean? a case study of interdisciplinary teaming', *Journal of Educational Research* 96(2), 67–77, doi.org/10.1080/00220670209598794.

Murphy, C. & Scantlebury, K. (Eds.). 2010, *Co-teaching in international contexts*. London: Springer.

Nevin, A., Thousand, J., & Villa, R. 2009, 'Collaborative teaching for teacher educators—What does the research say?', *Teaching and Teacher Education* 25(4), 569–574. https://doi.org/10.1016/j.tate.2009.02.009

Nguyen, H., & Baldauf, R. 2010, 'Effective peer mentoring for EFL pre-service teachers' instructional practicum practice', *The Asian EFL Journal Quarterly* 12(3), 40–61.

Nimon, K. F. 2012, 'Statistical assumptions of substantive analyses across the general linear model: A mini-review'. In *Frontiers in Psychology* (Vol. 3, Issue AUG). https://doi.org/10.3389/fpsyg.2012.00322

Nokes, J., Bullough, R., Egan, W., Birrell, J., & Hansen, J. 2008, 'The paired-placement of student teachers: an alternative to traditional placements in secondary schools', *Teaching and Teacher Education* 24, 2168–2177. http://dx.doi.org/10.1016/j.tate.2008.05.001.

OECD. (2020). TALIS 2018 results: Vol. II. *Teachers and school leaders as valued*

professionals. OECD Publishing. https://doi.org/10.1787/23129638

Okita, S. Y., & Schwartz, D. L. 2013, 'Learning by Teaching Human Pupils and Teachable Agents: The Importance of Recursive Feedback', *Journal of the Learning Sciences*, *22*(3), 375–412. https://doi.org/10.1080/10508406.2013.807263

Onwuegbuzie, A.J., Johnson, R.B. & Collins, K.M.T., 2009, 'Assessing legitimation in mixed research: A new framework', *Quality and Quantity* 45(6), 1253–1271, doi.org/10.1007/s11135-009-9289-9.

Ostovar-Nameghi, S. A., & Sheikhahmadi, M. 2016, 'From Teacher Isolation to Teacher Collaboration: Theoretical Perspectives and Empirical Findings', *English Language Teaching 9*(5), 197. https://doi.org/10.5539/elt.v9n5p197

Parker, L.D. & Warren, S., 2017, 'The presentation of the self and professional identity: countering the accountant's stereotype', *Accounting, Auditing and Accountability Journal* 30(8), 1895–1924, doi.org/10.1108/AAAJ-09-2016-2720.

Partnership for 21 st Century Skills, 2015, 'Partnership for 21St Century Skills-Core Content Integration', *Ohio Department of Education* 1–70, from www.P21.org.

Pathways Commission, 2015, *In Pursuit of Accounting's Curricula of the Future*, from http://commons.aaahq.org/posts/c0a7037eea.

Pearl, C., Dieker, L. A., & Kirkpatrick, R. M. 2012, 'A five-year retrospective on the Arkansas department of education co-teaching project', *Professional Development in Education* 38(4), 571–587. https://doi.org/10.1080/19415257.2012.668858

Pereira, L. & Sithole, B., 2019, 'Towards Constructivist Learning and Teaching in Accounting Education', *Journal of Emerging Trends in Educational Research and Policy Studies* 10(1), 1–9.

Plant, K., Barac, K. & Sarens, G., 2019, 'Preparing work-ready graduates – skills development lessons learnt from internal audit practice', *Journal of Accounting Education* 48, 33–47, doi.org/10.1016/j.jaccedu.2019.06.001.

Pratt, S. 2014, 'Achieving symbiosis: Working through challenges found in co-teaching to achieve effective co-teaching relationships', *Teaching and Teacher Education* 41, 1–12. https://doi.org/10.1016/j.tate.2014.02.006

Pratt, S. M., Imbody, S. M., Wolf, L. D., & Patterson, A. L. 2017, 'Co-planning in co-teaching', *Intervention in School and Clinic* 52(4), 243–249. https://doi.org/10.1177/1053451216659474

Quiñones-Ramírez, F., Duran, D. & Viladot, L., 2023, 'Co-Teaching with High School

Students for Music Teaching', *Education Sciences* 13(10), 1–17, doi.org/https://doi.org/10.3390/educsci13100972.

Rehman, A. A., & Alharthi, K. 2016, 'An Introduction to Research Paradigms', *International Journal of Educational Investigations, 3*(8), 51–59.

Reynolds, D., Sammons, P., De Fraine, B., Van Damme, J., Townsend, T., Teddlie, C., & Stringfield, S. 201, 'Educational effectiveness research (EER): A state-of-the art review', *School Effectiveness and School Improvement* 25(2), 197–230. https://doi.org/10.1080/09243453.2014.885450

Ribosa, J. & Duran, D., 2022, 'Do students learn what they teach when generating teaching materials for others? A meta-analysis through the lens of learning by teaching', *Educational Research Review* 37(July), 100475, doi.org/10.1016/j.edurev.2022.100475.

Richards, K., 2003. *Qualitative inquiry in TESOL*. New York, NY: Palgrave Macmillan.

Rittle-Johnson, B., Loehr, A.M. & Durkin, K., 2017, 'Promoting self-explanation to improve mathematics learning: A meta-analysis and instructional design principles', *ZDM - Mathematics Education* 49(4), 599–611, doi.org/10.1007/s11858-017-0834-z.

Robb, M. & Gerwick, M. 2013, 'Team teaching: a resource guide for nurse educators', *Teaching and Learning in Nursing,* 8(3):78–82.

Rodgers, W., Simon, J. & Gabrielsson, J., 2017, 'Combining experiential and conceptual learning in accounting education: A review with implications', *Management Learning* 48(2), 187–205, doi.org/10.1177/1350507616669479.

Roscoe, R. D., Michelene, A. E., & Chi, T. H. 2008, 'Tutor learning: the role of explaining and responding to questions', *Instructional Science 36*(4), 321–350. https://doi.org/10.1007/s11251-007-9034-5

Roth, W.M. & Tobin, K. 2002, *At the elbow of one another: learning to teach by co-teaching*. New York, NY: Peter Lang.

Sandholtz, J., 2000, 'Interdisciplinary Team Teaching as a Form of Professional Development', *Teacher Education Quarterly* 27(3), 39–54.

Schmulian, A., 2018, Approaches To Social Constructivist Accounting Education, University of Pretoria.

Schmulian, A. & Coetzee, S.A., 2019a, 'To Team or Not to Team: an Exploration of Undergraduate Students' Perspectives of Two Teachers Simultaneously in Class', *Innovative Higher Education* 44(4), 317–328, doi.org/10.1007/s10755-019-9466-2.

Schmulian, A. & Coetzee, S.A., 2019b, 'Students' experience of team assessment with immediate feedback in a large accounting class', *Assessment and Evaluation in Higher Education* 44(4), 516–532, doi.org/10.1080/02602938.2018.1522295.

Schwartz, D.L., Bransford, J.D. & Sears, D., 2005, 'Efficiency in Innovation and Transfer', *Transfer of Learning from a Modern Multidisciplinary Perspective* 1–51.

Scruggs, T. E., Mastropieri, M. A., & McDuffie, K. A. 2007, 'Co-teaching in inclusive classrooms: A metasynthesis of qualitative research', *Exceptional Children* 73(4), 392–416. https://doi.org/10.1177/001440290707300401

Shadish, W. R., Cook, T. D., & Campbell, D. T. 2002. *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shin, E., Wilkins, E., & Ainsworth, J. 2007, 'The nature and effectiveness of peer feedback during an early clinical experience in an elementary education program', *Action in Teacher Education* 28(4), 40–52. http://dx.doi.org/10.1080/01626620.2007.10463428.

Shortridge, R.T. & Smith, P.A., 2009, 'Understanding the changes in accounting thought', *Research in Accounting Regulation* 21(1), 11–18, doi.org/10.1016/j.racreg.2008.11.010.

Silva, I., 2018, 'How learning theories can be applied in accounting education', *Millenium* 2(7), 13–20, doi.org/10.29352/mill0207.01.00181.

Simons, M., Baeten, M., & Vanhees, C. 2020, 'Team teaching during field experiences in teacher education: Investigating student teachers' experiences with parallel and sequential teaching', *Journal of Teacher Education* 71(1), 24–40. https://doi.org/10.1177/0022487118789064

Simonds, B.K., Meyer, K.R., Quinlan, M.M. & Hunt, S.K., 2006, 'Effects of Instructor Speech Rate on Student Affective Learning, Recall, and Perceptions of Nonverbal Immediacy, Credibility, and Clarity', *Communication Research Reports* 23(3), 187–197, doi.org/10.1080/08824090600796401.

Smith, M. & Briggs, S., 1999, 'From bean-counter to action hero: Changing the image of the accountant', *Management Accounting* 77, 28–30, from http://proquest.umi.com/pqdweb?did=38205206&Fmt=7&clientId=14273&RQT=309&VName=PQD.

Smith, J. 2002, 'The Development of Tandem Teaching Placements', *Mentoring & Tutoring: Partnership in Learning* 10 (3), 253–274. doi:10.1080/1361126022000022507.

Smith, J. 2004, 'Developing paired teaching placements', *Educational Action Research*

12(1), 99–125.

Solis, M., Vaughn, S., Swanson, E., & McCulley, L. 2012, 'Collaborative models of instruction: The empirical foundations of inclusion and co-teaching', *Psychology in the Schools* 49(5), 498–510. https://doi.org/10.1002/pits.21606

Sorensen, P. 2004, 'Learning To Teach Collaboratively: The Use of Subject Pairs in the School Practicum', *Canadian Journal of Educational Administration and Policy, 32.*

Stairs, A., Corrieri, C., Fryer, L., Genovese, E., Panaro, R., & Sohn, C. 2009, 'Inquiry into partnered student teaching in an urban school university partnership', *School University Partnerships* 3(1), 75–89.

Steeger, C. M., Buckley, P. R., Pampel, F. C., Gust, C. J., & Hill, K. G. 2021, 'Common methodological problems in randomized controlled trials of preventive interventions', *Prevention Science* 22(8), 1159–1172. https://doi.org/10.1007/s11121-021-01263-2

Strand Norman, C., Rose, A.M. & Lehmann, C.M., 2004, 'Cooperative learning: Resources from the business disciplines', *Journal of Accounting Education* 22(1), 1–28, doi.org/10.1016/j.jaccedu.2004.01.001.

Sung, Y. T., Lee, H. Y., Yang, J. M., & Chang, K. E. 2019, 'The quality of experimental designs in mobile learning research: A systemic review and self-improvement tool', In *Educational Research Review* (28). https://doi.org/10.1016/j.edurev.2019.05.001

Sweigart, C. A., & Landrum, T. J. 2015, 'The impact of number of adults on instruction: Implications for co-teaching', *Preventing School Failure: Alternative Education for Children and Youth*, 59(1), 22–29. https://doi.org/10.1080/1045988X.2014.919139

Szumski, G., Smogorzewska, J., & Karwowski, M. 2017, 'Academic achievement of students without special educational needs in inclusive classrooms: A meta-analysis', *Educational Research Review*, 21, 33–54. https://doi.org/10.1016/j.edurev.2017.02.004

Tan, L.M. & Laswad, F., 2018, 'Professional skills required of accountants: what do job advertisements tell us?', *Accounting Education* 27(4), 403–432, doi.org/10.1080/09639284.2018.1490189.

Tharapos, M. 2022, 'Opportunity in an uncertain future: reconceptualising accounting education for the post-COVID-19 world', *Accounting Education 31*(6), 640–651. https://doi.org/10.1080/09639284.2021.2007409

Thousand, J.S., Villa, R.A. & Nevin, A.I., 2006, 'The many faces of collaborative planning and teaching', *Theory into Practice* 45(3), 239–248,

doi.org/10.1207/s15430421tip4503_6.

Tsiligiris, V. & Bowyer, D., 2021, 'Exploring the impact of 4IR on skills and personal qualities for future accountants: a proposed conceptual framework for university accounting education', *Accounting Education* 30(6), 621–649, doi.org/10.1080/09639284.2021.1938616.

Vacilotto, S., & Cummings, R. 2007, 'Peer coaching in TEFL/TESL programmes', *ELT Journal*, 61(2) 153–160. http://dx.doi.org/10.1093/elt/ccm008.

Vangrieken, K., Dochy, F., Raes, E., & Kyndt, E. 2015, 'Teacher collaboration: A systematic review', *Educational Research Review* 15, 17–40. https://doi.org/10.1016/j.edurev.2015.04.002

Vembye, M. H., Weiss, F., & Hamilton Bhat, B. 2024, 'The Effects of Co-Teaching and Related Collaborative Models of Instruction on Student Achievement: A Systematic Review and Meta-Analysis', In *Review of Educational Research* 94 (3), 376–422. https://doi.org/10.3102/00346543231186588

Vogler, K.E., & Long, E. 2003, 'Team teaching two sections of the same undergraduate course', *College Teaching* 51, 123-126.

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

Van der Vleuten, C.P.M., 2015, 'Competency-based education is beneficial for professional development', *Perspectives on Medical Education* 4(6), 323–325, doi.org/10.1007/s40037-015-0232-6.

Van Garderen, D., Stormont, M., & Goel, N. 2012, 'Collaboration between general and special educators and student outcomes: A need for more research', *Psychology in the Schools* 49(5), 483–497. https://doi.org/10.1002/pits.21610

Weinberg, A. E., Sebald, A., Stevenson, C. A., & Wakefield, W. 2020, 'Toward conceptual clarity: A scoping review of coteaching in teacher education', *The Teacher Educator* 55(2), 190–213. https://doi.org/10.1080/08878730.2019.1657214

Wenger, E., 1999, *Communities of practice: Learning, meaning, and identity*, Cambridge University Press.

White, C.S., Henley, J.A. & Brabston, M.E., 1998, 'To Team Teach or Not to Team Teach—That Is the Question: A Faculty Perspective', *Marketing Education Review* 8(3), 13–23, doi.org/10.1080/10528008.1998.11488640.

Wittwer, J. & Renkl, A., 2008, 'Why instructional explanations often do not work: A framework for understanding the effectiveness of instructional explanations', *Educational Psychologist* 43(1), 49–64, doi.org/10.1080/00461520701756420.

Woo, Y. & Reeves, T.C., 2007, 'Meaningful interaction in web-based learning: A social constructivist interpretation', *Internet and Higher Education* 10(1), 15–25, doi.org/10.1016/j.iheduc.2006.10.005.

Wynn, M. & Kromrey, J., 2000, 'Paired Peer Placement with Peer Coaching to Enhance Prospective Teachers' Professional Growth in Early Field Experience', *Action in Teacher Education* 22(sup2), 73–83, doi.org/10.1080/01626620.2000.10463041.

Zhao, Q., 2018, 'Study on Integrated Competency-based Accounting Education', 205(Iccese), 890–893, doi.org/10.2991/iccese-18.2018.203.

Zhu, W., Wang, F., Mayer, R. E., & Liu, T. 2024, 'Effects of explaining a science lesson to others or to oneself: A cognitive neuroscience approach'. *Learning and Instruction 91*. https://doi.org/10.1016/j.learninstruc.2024.101897.

2 CHAPTER 2: ACCOUNTING STUDENTS IN THE ROLE OF EQUAL-STATUS TEAM-TEACHER FOR THE DEVELOPMENT OF KNOWLEDGE, TEAMWORK AND COMMUNICATION SKILLS COMPETENCIES

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2.1 INTRODUCTION

The landscape of education is continually evolving with the incorporation of new teaching methodologies, the integration of advanced technology, and shifts in industry demands, all of which necessitate the re-evaluation and innovation of educational approaches. For instance, there is a growing emphasis on encouraging accounting educators to shift away from traditional rote learning practices and, instead, actively engage students in not only conceptualizing their accounting knowledge but also in developing the skills required in the 21st century workplace (Bayne, Birt, Hancock, Schonfeldt & Agrawal 2022; Loureiro & Silva 2019; Bloom & Debessay 1984). In the context of accounting education, 'competency' denotes the observable and measurable abilities of an accounting professional to integrate and apply their knowledge, skills, values, and judgments to achieve desired outcomes within specific business or financial contexts. This not only encompasses technical expertise but also essential soft skills (or professional skills), such as collaboration or teamwork, communication, and ethical reasoning.

With the rise of automation affecting many functions in the accounting workplace (Ghani & Muhammad 2019; Tan & Laswad 2018; Bunney, Sharplin & Howitt 2015), accounting education programs must pivot their focus. Instead of just teaching basic accounting competencies that are easily automated, there is an increasing need to emphasize competencies, like human business acumen and communication skills (Tsiligiris & Bowyer 2021; ICAEW 2017). Consequently, it is crucial for accounting students to cultivate

competencies, like teamwork and communication skills (Tsiligiris & Bowyer 2021; van Laar, van Deursen, van Dijk & de Haan 2017).

Effective communication is particularly crucial for accountants, as the fundamental objective of accounting, in all its sub-domains, is to convey information that facilitates decision making by various stakeholders, including existing and potential investors, lenders, creditors, and employees (Bloom & Debessay 1984). Therefore, accounting students must become adept communicators, capable of elucidating financial reporting processes and concepts to stakeholders with diverse levels of familiarity or understanding of financial reporting information.

Another essential skill for the 21st century workplace is teamwork (Bayne et al. 2022; Mehrabi Boshrabadi & Hosseini 2021). The advent of the fourth industrial revolution and the proliferation of digital technologies in the accounting profession necessitate the development of teamwork skills. This equips accountants to collaborate effectively with other specialists on the outputs generated by automated processes (ICAEW 2017).

Competency-based education has been advocated as an educational approach that enables the construction of knowledge and the development of other professional competencies (Sistermans 2020; Van der Vleuten 2015). Competency-based education entails providing holistic tasks[24] that enable students to practice integrating the skills, knowledge, and attitudes needed to successfully engage with a professional task (Van der Vleuten 2015). Team-teaching, which is commonly defined as “two or more teachers collaborating on the planning, delivery, and /or evaluation of a course” (Baeten & Simons 2014; Carpenter, Crawford & Walden 2007; Murata 2002; Sandholtz 2000), has been used in teacher education as an integrated task, offering benefits in teaching, collaboration, reflection, learning, self-confidence, and self-efficacy for student-teachers’ professional development (Howlett & Nguyen 2020; Baeten & Simons 2014; Wynn & Kromrey 2000). Thus, team-teaching can be considered an example of a holistic task in a competency-based education program with both knowledge and skills development benefits (Wilson, Ho & Brookes 2018; Jang, Lasry, Miller & Mazur 2017). For example, tasks involving team-

[24] Holistic tasks can also be referred to as integrated tasks.

teaching, assigned to student teachers as part of their professional development, necessitate teamwork and communication among the students as they plan, deliver, and/or evaluate a course (Do & Hascher 2023).

Social constructivism is a theoretical perspective that emphasizes the role of social interactions and culture in constructing knowledge (Wenger 1999). It posits that learning is a socially mediated activity and that individuals construct new knowledge through interactions with others and their environment (Wenger 1999). Rooted in this social constructivist perspective, team-teaching emphasizes the inseparability of the individual from social influences and the crucial role of sociocultural contexts in teaching and learning (Baeten & Simons 2014; Palincsar 1998). This perspective suggests that interactions and dialogues engage individuals in the process of knowledge construction, enabling them to create meaning from new experiences (Falkner & Falkner 2012; Pena-Shaff & Nicholls 2004; Jonassen, Davidson, Collins, Campbell & Haag 1995). As such, team-teaching facilitates learning among student teachers by promoting the exchange of ideas, introducing alternative perspectives, providing advice, negotiating meaning, and leveraging each other's knowledge and skills (Do & Hascher 2023; Baeten & Simons 2014). This approach has been successfully used in teacher education, earning praise for its numerous benefits for professional development. These include emotional and professional support (Goodnough, Osmond, Dibbon, Glassman & Stevens 2009; Stairs, Corrieri, Fryer, Genovese, Panaro & Sohn 2009), personal growth (Baeten & Simons 2014), increased dialogue (Sorensen 2014), the opportunity to learn from team members during teaching (Howlett & Nguyen 2020; Wynn & Kromrey 2000), and the reduction in feelings of isolation (Kelchtermans 2006).

While team-teaching has proven successful in integrating skills, knowledge, and attitude benefits within teacher education, its effectiveness for integrated knowledge and skills development in other fields has received little attention. Considering the similarities in the competencies, particularly teamwork and communication skills, which accounting graduates need to develop and the competency development benefits of team-teaching found in teacher education, team-teaching as an integrated learning task for learning and competency development for accounting students is explored in this research paper.

2.2 LITERATURE REVIEW

2.2.1 Team-teaching

Team-teaching is rooted in social constructivism (Baeten & Simons 2014; Vygotsky 1978). Social constructivism suggests that integrating new concepts with existing knowledge and experience is enhanced by social interactions with others and engagements in authentic learning activities and tasks (Falkner & Falkner 2012; Woo & Reeves 2007; Pena-Shaff & Nicholls 2004; Jonassen et al. 1995). These social interactions often occur within an individual's community of engagement, such as their place of study or work. Consequently, from a social constructivist perspective, a person's knowledge is constructed and competencies are developed as they participate and contribute to community activities (Wenger 1999). Through interactions with others, meaning is negotiated, and relationships are built toward a common purpose (Wenger 1999). For example, team teachers learn from each other's knowledge and skills as they jointly participate and engage in the activities of their teaching community (Baeten & Simons 2014). In other words, members of a teaching team operate in each other's zone of proximal development (Smith 2004).

The 'zone of proximal development' concept, initially proposed by psychologist Lev Vygotsky, represents the difference between what learners can do without help and what they can achieve with guidance and encouragement from a skilled partner (Subban 2006; John-Steiner & Mahn 1996). Therefore, interactions within this zone support a person's construction of knowledge and skill development toward what would be considered a socially agreeable interpretation of that knowledge or skill (Schmulian & Coetzee 2019b). For instance, student teachers who are learning to become professional teachers benefit at both a professional (teaching competencies) and personal (e.g., self-confidence) level by working within their own zone of proximal development as they team teach alongside more experienced teachers (Baeten & Simons 2016; King 2006; Birrell & Bullough 2005).

Student teachers who engage in team-teaching with other teachers in their teaching community have also shown benefits in terms of growth competence, adaptive expertise, and collaborative expertise (Soslau, Gallo-Fox & Scantlebury 2019). Growth competence is akin to learning how to learn from one's own teaching through a process of self-reflection.

At the same time, adaptive expertise relates to a teacher's ability to adapt their teaching in response to student cues and contextual demands (Soslau et al. 2019). The development of collaborative expertise includes the ability of student teachers to share their expertise, recognize their co-responsibility for student learning, and become active agents in their own development (Soslau et al. 2019). The level of collaboration between teaching partners varies according to the five models of team-teaching (Baeten & Simons 2014). Table 2- 1 provides an overview of the five models and the level of collaboration per model (Baeten, Simons, Schelfhout & Pinxten 2018).

Table 1- 4 Team-teaching models.

	Model	**Role Partner 1**	**Role Partner 2**
Low level of collaboration ↓ High level of collaboration	Observation model	Full responsibility teacher	Observer
	Coaching model	Full responsibility teacher	Coach
	Assistant teaching model	Main responsibility teacher	Assistant
	Equal-status model	Identical status and responsibility	
	Teaming model	Full collaboration in the planning, delivery, and evaluation of the lesson	

Among these models, the equal-status model is particularly relevant for this research paper, as this model facilitates an environment in which both teachers actively contribute to the teaching process and share equal responsibility for the learning outcomes. As a result, teachers engaged in the equal-status model are more likely to engage in meaningful dialogue, share their expertise, and learn from one another, thus enhancing their own professional development and the quality of instruction delivered to the students. Furthermore, the equal-status model, with its parallel, sequential, and station teaching designs (Baeten et al. 2018), offers a flexible framework that can be adapted to various teaching contexts and content areas, making it a suitable choice for exploring the knowledge and competency development benefits of students engaged in learning-by-team-teaching.

The parallel design of the equal-status model divides the class into subgroups and requires each team teacher to teach the same learning content or activity to a subgroup of students. The sequential design divides learning content or activities between the team teachers, with each teacher responsible for a different lesson phase. Lastly, the station design splits the

class into subgroups and also splits the learning content, with each teacher teaching specific content to a subgroup of students.

Within the five team-teaching models, it is also crucial to consider the different styles of team-teaching that can be employed. These three basic team-teaching styles (Letterman & Dugan 2004; White, Henley & Brabston 1998) are:

(1) Participant–observer: in this style, both teachers are present for all the classes; however, one teacher primarily leads the instruction while the other observes. The observer may provide support, assistance, or supplementary instruction as needed, but does not lead the instruction independently.
(2) Interactive: in the interactive style, both teachers are present and actively collaborate in teaching, instructing, and engaging with students in the discussion. They share responsibility for planning, delivering, and assessing student learning.
(3) Rotational: in the rotational style, each teacher is responsible for teaching different parts of the course and is only present when it is their turn to teach. This approach allows for the specialization and efficient use of each teacher's expertise.

Table 2- 2 presents a mapping of the team-teaching styles that can be applied within each team-teaching model, illustrating the versatility and adaptability of these approaches to various educational settings and objectives.

Table 1- 5 Mapping of team-teaching styles across team-teaching models.

Team-Teaching Model	Team-Teaching Style
Observation model	Participant–observer Rotational
Coaching model	Participant–observer
Assistant teaching model	Participant–observer Rotational
Equal-status model	Interactive Participant–observer Rotational
Teaming model	Interactive

Students who are exposed to team-teaching in their classroom environment reap various benefits from their teachers' collaborative efforts. These benefits include learning beyond

mere knowledge accumulation (Shibley 2006), increased classroom engagement (Donnison, Edwards, Itter, Martin & Yager 2009), increased timely feedback (Fuller & Bail 2011), and a richer learning experience resulting from exposure to multiple teaching styles and diverse perspectives on course material (Hanusch, Obijiofor & Volcic 2009; Nokes, Bullough, Egan, Birrell & Merrell Hansen 2008; Tobin, Roth & Zimmermann 2001). While the research has demonstrated professional development benefits for student teachers from team-teaching (Baeten & Simons 2014) and learning benefits for students who are exposed to team-teaching by their teachers (Schmulian & Coetzee 2019b; Hanusch et al. 2009; Nokes et al. 2008; Shibley 2006), little is known about the potential knowledge and competency development benefits for students from other disciplines who engage in the role of team teacher as part of their learning process (Quiñones-Ramírez, Duran & Viladot 2023). By examining students' experiences from different disciplines who engage in team-teaching, researchers can better understand the underlying mechanisms that drive any resultant knowledge and competency development.

When assessing the benefits of team-teaching in other disciplines, it is also essential to acknowledge the disadvantages experienced by student teachers who engage in the role of team teacher. Acknowledging these disadvantages and being aware of their potential impact in other disciplines provides a more balanced view of its use. Some disadvantages of engaging in the role of team teacher noted by student teachers include a lack of compatibility with peers, comparison between peers, difficulties experienced between team teachers when providing constructive feedback, increased workload, and less practice in individual teaching (Baeten & Simons 2014). These disadvantages should be carefully considered when involving students in team-teaching roles across different disciplines to mitigate their impacts.

2.2.2 Learning-by-Teaching

The current literature on the learning-by-teaching (or learning-by-explaining as it is also commonly referred to) approach primarily focuses on students' self-generating explanations to themselves (Hefter & Berthold 2020; Chebbihi, Varpio, St-Onge & Chamberland 2019; Rittle-Johnson, Loehr & Durkin 2017), their peers, or an unknown or fictitious other through video or written explanations (Lachner, Hoogerheide, van Gog & Renkl 2021; Hoogerheide,

Deijkers, Loyens, Heijltjes & van Gog 2016, Hoogerheide, Renkl, Fiorella, Paas & van Gog 2019). This literature indicates that learning-by-teaching is a powerful instructional approach Lachner, Ly & Nückles 2018; Fiorella & Mayer 2014; Schwartz & Okita 2004). Explaining to oneself is a self-orientated activity, while explanations to peers or an unknown or fictitious other require the explainer to consider the other's perspectives in creating an explanation (Wittwer & Renkl 2008). Consequently, the act of explaining to others leads to more meaningful and durable learning than control activities, like restudying and summarizing (Hoogerheide et al. 2016; Fiorella & Mayer 2013; Coleman, Brown & Rivkin 1997). From a cognitive perspective, explaining to others promotes generative learning (Fiorella & Mayer 2016). It encourages students to make sense of their learning material while organizing and integrating new ideas with their existing knowledge (Fiorella 2021).

Explanations to others can also be presented orally. The research findings indicate that although written explanations are more organised, oral explanations, like video explanations, result in better learning and are more elaborative and comprehensive (Jacob, Lachner & Scheiter 2020; Lachner et al. 2018). Oral explanations also tend to include more audience-directed utterances (first- and second-person pronouns), which indicates higher levels of social presence in oral explanations (Lachner et al. 2018; Hoogerheide et al. 2016).

While abundant research details the effects of diverse explanation delivery methods—whether to oneself or others, and through oral, video, or written modes—on knowledge development, the prevailing literature on the learning-by-teaching method predominantly addresses the advantages students gain as individual teachers rather than as members of a teaching team (Ribosa & Duran 2022). Although Duran and Topping introduced a learning-by-teaching model in 2017 where students co-taught alongside their instructors (Duran & Topping 2017), scant attention has been given to the concept of students engaging in co-teaching or team-teaching as a learning strategy (Quiñones-Ramírez et al. 2023). Consequently, there is a noticeable gap in understanding the benefits and processes when students engage in team-teaching as part of their learning process. To address this, this research paper aims to investigate the use of team-teaching among accounting students as part of their learning process. The decision to focus on accounting students stems firstly from the discipline's emphasis on the need to develop both theoretical knowledge and practical competencies, and secondly from the overlap of the ability of team-teaching to

develop teamwork and communication skills and the need for these competencies to be developed by accounting students.

The insights achieved from investigating the knowledge and competency development benefits for students, who co-plan and co-deliver an explanation of their course content in the role of team teachers, can have significant implications for curriculum design and instructional strategies, not only in accounting education but also in the broader context of higher education. This leads to the following research questions:

RQ1: How does the team-teaching of course content impact students' conceptual knowledge of accounting content?

RQ2: What are the experiences of accounting students in terms of knowledge and competency development when team-teaching course content?

By addressing these research questions, this research paper aims to contribute to the growing body of research examining the role of team-teaching in facilitating learning-by-teaching within the context of a higher education course where students are required to team-teach as part of their learning process. Specifically, this research paper explores the effects of team-teaching on accounting students' knowledge and competency development. Through this, the research paper hopes to provide greater insights into the learning-by-team-teaching process and how it can be harnessed to enhance higher education instruction and learning.

2.3 MATERIALS AND METHODS

This research paper evaluated the efficacy of engaging students in the role of team-teacher to support their conceptual knowledge of an accounting topic while simultaneously facilitating the development of their teamwork and communication skills. Specifically, third-year students from an undergraduate business degree program focusing on International Financial Reporting Standards were tasked with collaboratively creating an oral recording or podcast in which they explained the preparation of consolidated financial statements to a peer who could not attend the class. A copy of the complete instructions given to the

students is available at https://bit.ly/3A7irdD or can be seen in Appendix A which can be found in section 2.8 of Chapter 2 of this thesis.

This task aligned with the course learning objectives by requiring students to thoroughly understand the preparation of consolidated financial statements, a key concept in International Financial Reporting Standards, and to articulate this understanding to their peers. Additionally, by working collaboratively, students develop their teamwork and communication skills, which are essential skills for success in the accounting profession. This approach was consistent with the broader pedagogical goals of the course, which emphasized active learning, peer teaching, and the development of practical skills.

2.3.1 The Application of an Equal-status Team-teaching Model in this Research Paper's Learning-by-Team-Teaching Intervention

This research paper's learn-by-team-teaching intervention was anchored in the equal-status team-teaching model. This model is predominantly utilized for the paired field placement of student teachers (Baeten & Simons 2014), and it has garnered positive feedback from many student teachers (Simons, Baeten & Vanhees 2020). Notably, student teachers appreciate the model for its non-intimidating, enjoyable experience and for its contributions to their professional development (Simons et al. 2020). At its core, this model requires all teaching team members to share an equal status and responsibility in the teaching process (Baeten & Simons 2016). The subsequent sections discuss how both aspects were applied in this research paper.

2.3.2 Equal-Status

In the context of this research paper, students assumed the role of team-teachers. They were grouped into teams of five or six, tasked with collaboratively preparing and presenting an accounting topic to a fictitious other student who missed prior classes on the topic. Every member took on the role of a team-teacher as they worked together to prepare and present their team's explanation to the fictitious other student. Every member played a pivotal role, aligning with Thousand, Villa, and Nevin's (2006) assertion that team-teaching can involve multiple teachers sharing teaching responsibilities (Thousand et al. 2006). Consequently,

the students collaboratively participated in two main phases: an explanation planning phase and an explanation delivery phase. The equal-status model allowed for the incorporation of varying elements of the three team-teaching styles across these phases. While the planning phase necessitated a close collaboration, with each team member being required to be present and contribute equally, the delivery phase granted flexibility. The delivery phase did not explicitly require all team members to be present, and the team-teaching style for the delivery phase was not pre-determined. This allowed students the flexibility to include their entire team in this phase (interactive) or to have only some present. The flexibility allowed in this phase accommodated independent work (participant–observer) or, on occasions where expert knowledge was required, could allow stronger team members to present parts of the team's explanation (rotational).

2.3.3 Shared Responsibility

Team-teaching inherently underscores collaboration and shared responsibility. In this teaching approach, teaching responsibility transitions from an individual to a collective focus, ensuring that the entire team takes responsibility for their students' learning outcomes (Bolam et al. 2005; Griffin & Robertson 2014). In the context of this research paper, the emphasis was on learning rather than teaching. The student teams were responsible for preparing and presenting an accounting topic, with their performance contributing to their final course grade. This approach suggests that students might perceive their teams' grades as a reflection of their shared responsibility.

The facilitation of shared responsibility in this research paper was anchored in the grading protocols for the intervention. The equal-status model did not just demand shared responsibility, but an equitable distribution of the same. Recognizing the potential risks of unequal participation (free riding) in collaborative learning tasks, grading was implemented at both team and individual levels (Strand Norman, Rose & Lehmann 2004). The final student grade constituted a team grade (reflecting the quality of the explanation) and an individual grade (based on peer-reviewed team member effectiveness), each carrying a 50% weight. The latter employed criteria from the Comprehensive Assessment of Team Member Effectiveness (CATME) instrument (Loughry, Ohland & Moore 2007), which focused on

elements, such as contributing to the team's work, interacting with teammates, team-progress monitoring, quality expectations, and possessing relevant knowledge and skills.

2.3.4 Allocation to Teacher Teams

The team allocation process aimed to create heterogeneous teams of a maximum of six students each to help mitigate the risk of peer comparisons (Edmond & Tiggeman 2009). To facilitate this, students were first grouped into six clusters based on their previous accounting course grades, ranging from a cluster of the strongest students to a cluster of the weakest students. All students with grades above 65% were included in the first cluster, all students with grades between 65% and 60% in another, and so on. Once the clusters were formed, a random number was allocated to each student within each cluster using the random number function in Microsoft Excel. Students within the clusters were then listed in ascending order according to their random numbers. Teams were then formed by allocating one student from each cluster to a team using a top-down approach. This ensured that each team comprised a mix of academically stronger and weaker students, promoting the creation of heterogeneous teams. Most teams included 6 students, though a few had 5, resulting in 26 teams. Students without a prior year mark comparable to the rest of the sample were grouped into separate teams and were not considered in the results of this research paper.

2.3.5 Consideration of the Disadvantages of Team-teaching as Identified by Student Teachers

When assigning accounting students, the role of team-teacher, as they were allocated to teams who would collaboratively prepare and present a team explanation, the following considerations were made in light of the disadvantages noted by student teachers who participated in team-teaching.

Lack of compatibility between peers: accounting education research has identified various challenges associated with teamwork, including the emergence of conflicts between team members due to free riders, a lack of clear leadership, inter-group rivalry, failure to rapidly recognize group problems, and lack of direction during problem-solving tasks (Strand Norman, Rose & Lehmann 2004). Several authors who examined these challenges in the

context of accounting education suggested that evaluations at both individual and group levels may mitigate the eroding effects of team conflicts on the benefits of learning in teams (Strand Norman et al. 2004). Therefore, the design of this research paper incorporated both an individual- and group-level grade as part of the process of engaging the students in a team-teaching role.

Peer comparisons: peer comparisons may be interpreted as an impact of status differences. Accounting education research suggests that a course instructor should form heterogeneous groups of around four to six students to help mitigate this risk (Edmond & Tiggeman 2009). It is also beneficial to ensure opportunities within the group that allow low-ability students to learn from medium-ability students rather than being paired only with students of the highest ability (Edmond & Tiggeman 2009). This was considered in the formation of the teacher-teams for this research paper, as the teams included both academically stronger and weaker students.

Difficulties in providing constructive feedback: it was observed that accounting students felt confident in their ability to provide constructive feedback during collaborative learning tasks (Chan 2015). However, despite this confidence, it may still be beneficial to consider suggestions from other fields of study. These suggest training students on providing constructive feedback and creating an institutional culture of safety around feedback (Lerchenfeldt, Mi & Eng 2019). While this research paper did not specifically control for this disadvantage, it evaluated student feedback on their experiences of engaging in the role of a team-teacher. This was performed to determine if students mention the difficulty of providing constructive feedback as a disadvantage in an accounting education context.

Increased workload disadvantages: this refers to the time-intensive work required to collaboratively prepare, plan, and reflect with a peer (Baeten & Simons 2014). The increased time requirements were mainly due to increased peer dialogue (Baeten & Simons 2014). While increased dialogue is beneficial from a social constructivist learning perspective, assessing the benefits of team-teaching tasks for accounting students may be necessary considering the extra time such tasks may require. This was evaluated as part of the students' survey feedback on engaging in the role of a team-teacher.

2.3.6 The Use of Podcasts

Utilizing podcasts as a delivery method is inspired by the learning-by-teaching literature. Previous research in this field has examined individually prepared student explanations to a fictitious other delivered in various formats, whether orally, via video, or written. Such interventions have consistently demonstrated benefits for students in terms of conceptual knowledge enhancement (Ribosa & Duran 2022; Jacob et al. 2020; Hoogerheide et al. 2016).

Podcasts stand out for their flexibility and accessibility. These qualities make them particularly useful in large-group educational settings, where implementing traditional team-teaching methods can pose logistical challenges. Additionally, the widespread availability of smart devices, which most students own and can easily record audio with, facilitates this approach (Coetzee, Leith & Schmulian 2019). Recent studies have shown that oral explanations yield learning outcomes comparable to those from video explanations. The latter is already established as beneficial for both conceptual and transfer knowledge growth (Lachner et al. 2018). Furthermore, compared to written formats, oral explanations typically exhibit greater depth, as they are more elaborative and comprehensive, promoting deeper learning (Jacob et al. 2020; Lachner et al. 2018).

Given this context, the choice of using podcasts for delivering team explanations in this research paper aligned with the sequential design of the equal-status team-teaching model. Since podcasts inherently allow for only one speaker at a time, each team member would sequentially contribute to the overall team's explanation. The division means each team member would naturally oversee a distinct phase of the team explanation. It is worth noting that the sequential design was identified as a preferred approach among the student teachers. They perceived it as offering greater opportunities for collaboration, professional development, personal growth, and a more manageable workload (Simons et al. 2020). Furthermore, the increased collaboration potential in the sequential design complemented the objective of fostering teamwork skills among accounting students.

2.3.7 Accounting Topic Selection: Preparation of Consolidated Financial Statements

The consolidation topic of the intervention was chosen because the course's instructors identified the topic as challenging for the students. In explaining the preparation of consolidated financial statements, the students were instructed to explain how the revaluation of the equipment (at acquisition) and the accumulated loss of the subsidiary (at acquisition) should be treated in preparing the analyses of the owners' equity of the subsidiary. These instructions required the student teams to express their domain[25] knowledge of the preparation of consolidated financial statements as they explained the principles of the revaluation of equipment and accumulated losses of a subsidiary and how this affected the preparation of the analysis of owners' equity that was prepared as part of the process of preparing the consolidated financial statements of a group of companies. The instructions were thus designed to provide the students with an opportunity to explain their conceptual knowledge of the topic.

2.3.8 Measurement of Knowledge Development (RQ1)

To measure the knowledge development benefits of learning by team-teaching (RQ1), the students' pre-and post-test scores for assessments that measured their conceptual knowledge before and after the intervention were compared. Before the students were required to prepare their team explanations, they were asked to study for an assessment designed to test their individual knowledge of preparing consolidated financial statements. This assessment served as the pre-test for this research paper. Following the completion of the pre-test, the learning-by-team-teaching intervention was announced. After submitting their team explanations, the students completed an unannounced post-test. The post-test remained largely unchanged from the pre-test; however, to avoid memory effects, certain elements were altered, such as the businesses' names, the amounts, and the 'arrears period' for unpaid preference dividends. The solution to the pre-test was provided to the students only after the post-test. A copy of the pre-test and post-test are available at https://bit.ly/3KNAhqP.

[25] This includes knowledge of the accounting principles and procedural application of these accounting principles in the preparation of consolidated financial statements.

A subject-matter expert evaluated both tests to ensure the pre- and post-test validities. Another subject-matter expert, who was blind to this research paper, marked the answers to both the pre- and post-tests. This approach helped maintain the integrity of the assessment process and provided a fair evaluation of the students' knowledge development throughout the learning-by-team-teaching intervention.

Paired-sample *t*-tests, performed using SPSS version 21, were utilized to analyze students' knowledge differences before and after completing their team explanations. A box plot analysis was employed to identify any potential outliers that may have had a confounding effect on the results for RQ1. In addition to evaluating the overall impact of the intervention, the analysis also considered whether the intervention had differential knowledge benefits for students with varying prior academic performances. This consideration was important as collaboration could lead to different learning outcomes for students with differing academic performances (Mahoney & Harris-Reeves 2019; Koles, Stolfi, Borges, Nelson & Parmelee 2010; Giuliodori, Lujan & DiCarlo 2008). The intervention occurred during the second semester, coinciding with the presentation of the topic in the course and following approval from the institutional review board. The research paper adhered to the principles of the Declaration of Helsinki and received ethical approval from the University's Institutional Review Board (protocol code EMS106/19, approved on 6 June 2019).

2.3.9 Measurement of Student Experiences (RQ2)

A survey approach was employed to address the second research question (RQ2) on students' experiences of the learning-by-team-teaching intervention. The survey consisted of mainly open-ended questions for qualitative insights, and a 7-point Likert scale (1: extremely negative to 7: extremely positive) question, which provided quantitative data regarding the students' overall experiences of the intervention. The questions were adapted verbatim from previous studies on collaborative assessment tasks (Schmulian & Coetzee 2019a; Cooper 2017), with modifications to suit the context of this research paper's team-teaching task. This approach aimed to capture students' experiences and perspectives on competency development during the intervention.

To ensure content validity, two accounting education experts reviewed the survey instrument (McKenzie, Wood, Kotecki & Clark 1999). They assessed the alignment of the items with the intended construct and suggested modifications for clarity. Minimal changes were required based on their recommendations. The final survey questions are presented in Table 2- 3.

Table 1- 6 Survey instrument questions.

- Tell us about your experience of the collaborative preparation of your team's explanation—how was it for you? (Describe the process from start to finish and how it felt—what was going on for you/others, what worked or did not work for you?).
- How did you experience collaboratively preparing a team explanation as a form of assessment, in comparison to the "requirements" of a traditional financial reporting assessment/assignment?
- What do you ALL think the collaborative preparation of your team's explanation as a form of assessment was actually assessing?
- 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.
- If you designed this assessment that required you to collaboratively prepare an explanation, what would you do differently and why?
- Were you one of the team members who spoke for the oral recording (i.e., did your voice appear in the oral recording)?
- Is there anything we should have asked you about in your reflection on the collaborative preparation of your team's explanation but have not?
- Why would you, or why would you not, want to be assessed again in this manner?
- Is there anything further that comes to mind in your reflection that you would like to add?

While the survey predominantly consisted of open-ended questions for detailed feedback, one specific question (the fourth question in Table 2- 3) utilized a 7-point Likert scale (1— extremely negative to 7— extremely positive). This bipolar continuum, recommended for optimally capturing positive or negative attitudes (Jon Krosnick, 1997), included appropriate verbal labels for each option (e.g., strongly agree or agree) to ensure clarity (Krosnick 1999)

and maintain visual balance to avoid respondent confusion (Tourangeau, Couper & Conrad 2004). Using open-ended questions allowed students to articulate their experiences comprehensively, facilitating the comparison of responses in this research paper with the findings from teacher education research.

The survey instrument was administered online through *Google Forms*, and the link to the form was shared via the learning management system (LMS) following approval from the institutional review board. To maximize the response rate (Phillips, Reddy & Durning 2016), students were pre-notified about the survey's availability, and reminders were sent to encourage participation. The quantitative data collected from the survey were analysed using SPSS version 21. An initial data integrity check was conducted and descriptive statistics were calculated. In analyzing the responses from an ordinal Likert scale response, reporting means and standard deviations were not considered suitable as their meanings were unclear (Sullivan & Artino 2013; Jamieson 2004). The median of the responses to close-ended questions was considered to provide a more useful representation of the data (Sullivan & Artino 2013). Therefore, the median was used as the primary measure of central tendency for the ordinal scale data obtained from the Likert scale question in the survey instrument (Sullivan & Artino 2013; Jamieson 2004).

The qualitative data from the survey instrument were analysed through a content analysis, with themes identified from the students' reflections (Cooper 2017). Basic themes were developed and coded (coded responses were scrutinized at a later point in time and any inconsistencies between the initial and subsequent analyses were resolved) using NVivo 12, which facilitated in understanding the students' experiences and perspectives on the learning-by-team-teaching intervention and its potential impacts on their knowledge and competency development. The qualitative analysis also provided an opportunity to achieve insights into aspects of the learning-by-team-teaching intervention that may have needed improvements to enhance its effectiveness.

2.3.10 Participants

The final sample for analyzing the effects of the learning-by-team-teaching intervention on students' knowledge (RQ 1) totaled 119 students. This number was achieved after removing

students who did not provide consent for their data to be analysed (n = 21), did not complete the pre-test (n = 6) or post-test (n = 7), transferred from another degree or university (n = 6), and after removing outliers identified the following boxplot analysis (n = 5). The sample size for RQ1 exceeded the required sample size of 27 as determined by the a priori power analysis for paired-sample t-tests (GPower, Version 3.1.9.7). Power was set to 0.80, α-error to 0.05, and the medium effect size to 0.5. The effect size was determined with reference to the average effect size of learning-by-teaching interventions that required preparing-to-teach and teaching as part of the learning process (Kobayashi 2019).

For RQ2, 113 students (71%) of a total of 133 students responded to the survey instrument. A test for non-response bias was performed. The prior performance data of all students registered for the course from which the survey sample of students originated were available. A chi-squared test was performed on the student's prior performance levels (low, moderate, and top performers) to identify if the sample was representative of the total student population enrolled in the course. No indication of a response bias was identified as there was no significant difference between the sample and total student population ($X2(2) = 1.40$, $p = 0.50$). The sample size of students used for this research paper's exploration of the use of a learning-by-team-teaching intervention was in line with the sample sizes of prior research that assessed the benefits of learning-by-teaching interventions (Ribosa & Duran 2022)

2.4 RESULTS

The results are presented in two parts. The first part analyses the learning-by-team-teaching intervention's effect on students' knowledge (RQ1). The second part explores students' experiences of the intervention for knowledge and competency development based on the results from the survey instrument (RQ2).

2.4.1 Knowledge Benefits of the Learning-by-Team-Teaching Intervention (RQ1)

The mean pre-test score of 62.61% significantly increased to a mean post-test score of 65.65% ($t = 2.53$, $p = 0.006$, $d = 0.24$) (Table 2- 4). The increase suggests that the learning-

by-team-teaching intervention assists the students in improving their knowledge of the course content.

Table 1- 7 Students' pre- and post-test knowledge (*n* = 114).

	Minimum	Maximum	Mean	Std. Dev
Pre-test percentage	21.62	100.00	62.61	17.19
Post-test percentage	18.91	100.00	65.65	17.34

To better understand this preliminary observation, the entire sample of students was classified into three performance categories based on their pre-test scores: low, moderate, and top performers. These categories corresponded to students who scored at the 33rd, 66th, and 100th percentiles, respectively. This division was selected to evenly distribute the sample for a more nuanced analysis. Specifically, students at or below the 33rd percentile were classified as low performers, those between the 33rd and 66th percentiles as moderate performers, and those above the 66th percentile as top performers. It is essential to acknowledge that this method of categorization was just one of several possible methods, and it was chosen because it provided a balanced representation of the data distribution.

The mean pre-test scores of both low (8.11% change, t = 3.88, $p < 0.001$, d = 0.65) and moderate-performing students (5.33% change, t = 2.46, $p = 0.010$, d = 0.41) revealed a significant increase in the post-test results (Table 2- 5). Conversely, the top performers' mean pre-test scores decreased significantly by 3.28% in the post-test (t = −2.06, $p = 0.023$, d = 0.32). These results suggest that the learning-by-team-teaching intervention benefits the lower-performing students the most. Differential learning benefits for lower- or higher-performing students are commonly identified in team-based learning settings (Mahoney & Harris-Reeves 2019; Koles et al. 2010; Giuliodori et al. 2008). The differential knowledge development benefits may also be attributed to the students not having the opportunity, beyond that of participating in the intervention, to restudy for the post-test. Consequently, some knowledge degradation, particularly for top-performing students participating in the intervention, may have occurred because of the passing of time and the associated spacing effects on learning between the pre-test and post-test (Carpenter, Cepeda, Rohrer, Kang & Pashler 2012).

Table 1- 8 Change in knowledge per prior performance category.

	Low performers (*n* = 36)		Moderate Performers (*n* =36)		Top Performers (*n* = 42)	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Pre-test %	42.49	8.89	62.31	3.09	80.12	8.33
Post-test %	50.60	12.97	67.64	14.14	76.83	13.54
Change %	8.11	12.51	5.33	13.03	−3.28	10.31

The increased standard deviation in the post-test percentages compared to the pre-test percentages (Table 2- 5) signifies that the learning-by-team-teaching intervention may have varying effects on different students. This variance might be linked to whether a student was involved in the presentation during the delivery phase of the learning-by-team-teaching intervention. Consequently, the change in knowledge for presenters (*n* = 48) and non-presenters (*n* = 51) was explored (Table 2- 6). The sample size for the analysis, which assessed the variation in knowledge based on presenter status, was reduced by 15. This reduction was necessitated because, out of the initial 114 students sampled for Research Question 1 (RQ1), 15 students did not complete the survey. In this survey, students were asked to indicate whether they presented their team's explanation in the oral recording. Therefore, the sample size for this analysis stands at 99. Pre-test scores for the presenters and non-presenters did not demonstrate a significant difference (t = 1.05, *p* = 0.148, d = 0.21). However, the presenters' knowledge changed (increased) by 4.05%, while the non-presenters increased by 1.01%. While the change in knowledge between the presenters and non-presenters was not significantly different (t = 1.17, *p* = 0.123, d = 0.235), it is worth noting that there was an improvement that could have tangible real-world implications. Even a 3% increase in understanding can have valuable academic effects for individual students. In practical terms, this improvement might translate into a more solid comprehension of coursework, leading to a better academic performance over time.

Table 1- 9 Change in knowledge for presenters and non-presenters.

	Presenters (*n* = 48)		Non-Presenters (*n* = 51)	
	Mean	Std. Dev	Mean	Std. Dev
Pre-test %	61.93	17.20	65.55	17.01
Post-test %	65.99	17.52	66.56	16.08

Change %	4.05	14.23	1.01	11.69

Upon further inspection, no significant difference in the change in knowledge between presenters and non-presenters was identified for any of the prior performance categories (Table 2-7). This suggests that the knowledge benefits of the learning-by-team-teaching intervention are not influenced by presenter status.

Table 1-10 Change in knowledge for presenters and non-presenters per prior performance category.

Panel A: Low performers				
	Presenters (*n* = 17)		Non-Presenters (*n* = 11)	
	Mean	Std. Dev	Mean	Std. Dev
Pre-test %	43.72	8.61	41.03	10.31
Post-test %	53.74	15.11	47.91	10.54
Change %	10.02	15.81	6.88	10.84
Panel B: Moderate performers				
	Presenters (*n* = 13)		Non-Presenters (*n* = 19)	
	Mean	Std. Dev	Mean	Std. Dev
Pre-test %	61.54	3.68	62.45	2.53
Post-test %	67.15	15.91	66.71	13.18
Change %	5.61	15.31	4.26	12.00
Panel C: Top performers				
	Presenters (*n* = 18)		Non-Presenters (n = 21)	
	Mean	Std. Dev	Mean	Std. Dev
Pre-test %	79.43	9.09	81.21	8.21
Post-test %	76.73	13.50	76.19	12.11
Change %	−2.70	8.54	−5.02	9.30

In summary, the findings for RQ1 suggest that the learning-by-team-teaching intervention is beneficial for the knowledge development of low and moderate performers. Although the top performers may not have obtained knowledge benefits, they may still have benefited from the team-teaching intervention in terms of competency development. The subsequent

analysis of students' survey responses regarding their experiences of the learning-by-team-teaching intervention may provide further insights.

2.4.2 Students' Experiences of the Learning-by-Team-Teaching Intervention (RQ2)

The vast majority of the respondent students (86%; *n* = 99) were positive about the learning-by-team-teaching intervention, rating their overall experience as at least four out of seven (median = 6) (Table 2- 8). Students praised the intervention as "*very useful*" and remarked that they "*took a lot from this project*". They believed it would "*help [them] to pass the course*," attributing this optimism to the intervention's diverse learning opportunities. In particular, they noted that the intervention was "*a clever way of making sure students not only learn the application but understand why and how things are done*." Numerous students highlighted the generative learning benefits (Fiorella & Mayer 2014; Mayer 2014) afforded by the learning-by-team-teaching intervention, describing it as a different or unique approach. "*This is a way different angle. Instead of just calculating traditional required questions, I had to think what is the easiest and understandable way to explain the required*".

Many students reported that a collaboration with their teammates significantly enhanced their learning. They noted, "*Talking to [their] group members gave [them] deeper insight into certain topics because [they] all had different ways of interpreting the information and different ways of explaining it.*" They further commented, *"[M]any concepts started making sense after we engaged [with each other] about them.*" Students also appreciated the process of the scaffolding. One student shared, "*It helped me understand the work better by explaining it to someone else.*" The diverse range of interpretations within the team was also valued. "*I received a lot of different versions of how people understood consolidations, and this made me aware of how differently people grasp the concept of consolidations, and this gave rise to me either helping people understand the concept of consolidations or learning new things about consolidations*".

Students also acknowledged the learning-by-team-teaching intervention as a significant avenue for developing various competencies. They primarily reported improved teamwork skills, but also highlighted a broad range of other skills fostered through the intervention. These skills align with the competency areas for generic skills as prescribed in the Revised

International Education Standard (IES 3), Initial Professional Development—Professional Skills:

Intellectual skills: problem-solving, thinking, and analytical skills.
Interpersonal and communication skills: communication, the ability to explain, the ability to listen, and interpretation of skills.
Personal and organisational skills: resilience, time management, leadership, creativity, organisation, and responsibility.

Table 1- 11 Students' experiences of the team-teaching initiative.

Quantitative Survey 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	*M* = 5.70 (SD = 1.13)/ Median = 6.00	
	Total (*n* = 113)	
	n	%
7 Extremely positive	30	26.55
6	41	36.28
5	26	23.01
4	12	10.62
3	2	1.77
2	2	1.77
1 Extremely negative	0	0.00

Despite the overwhelmingly positive feedback, a few challenges were identified with the learning-by-team-teaching intervention. A small number of students raised concerns about non-participation by specific team members, mainly due to potential free-riding effects inherent in team-based activities. This concern was, however, pre-empted by the inclusion of both the individual- and team-level grading of the intervention. Some students suggested increasing the five-minute limit for the explanation and extending the overall time allocated for completing the project. The opportunity to select their team members and to have a wider choice of topics and explanation formats also emerged among their suggestions.

Given that the data for RQ1 revealed varying levels of knowledge benefits among low-, moderate-, and high-performing students, a regression analysis (the dependent variable for the regression was students' rating of their overall experience of the intervention, while the two independent variables were dummy variables for top performers (1 = top performer, 0 = otherwise) and moderate performers (1 = moderate performer, 0 = otherwise)) was performed to examine potential disparities in students' perceptions of the benefits of the intervention across these performance categories. Three students who participated in the survey, but did not participate in the pre-test, were excluded from this analysis, as they could not be classified into a prior performance category. The regression results, which were not tabulated, revealed that the average overall experience of both the top ($t = -0.87$, $p = 0.388$) and moderate ($t = 1.52$, $p = 0.131$) performing students did not significantly differ from the overall experience of the low-performing students. This non-significant result is noteworthy, suggesting that, regardless of the differential effects on knowledge gain, all performance groups perceive the learning-by-team-teaching intervention as equally beneficial. It indicates that the intervention potentially offers competency development advantages regardless of the student's performance level. To further examine this, a comparison of the most frequently mentioned skills was conducted per the prior performance category (Table 2- 9).

Table 1- 12 Percentage of students from each prior performance category who indicated that the intervention promoted the assessment of skills development.

Most Frequently Mentioned Skills	Top Performers (*n* = 43)	Moderate Performers (*n* = 39)	Low Performers (*n* = 28)
Interpersonal and communication skills: teamwork	72%	54%	61%
Interpersonal and communication skills: communication	37%	33%	18%

Table 2-9 reveals that top performers are particularly convinced that the learning-by-team-teaching intervention enhances teamwork skill development. Moderate and low performers also have strong beliefs about the intervention's capacity to boost teamwork skills, with 54% of moderate performers and 61% of low performers indicating that the intervention fosters their teamwork abilities. Additionally, roughly a third of the students classified as top (37%)

and moderate (33%) performers believe that the intervention advances their communication skill development.

2.5 DISCUSSION

This research paper aimed for a better understanding of team-teaching benefits outside of teacher education and to explore the use of a learn-by-team-teaching intervention as a means to broaden competency development to allow for both knowledge and teamwork and communication skills development among students in disciplines outside of teacher education. This research paper focused on the knowledge and skills development of students who, as members of a teacher-team consisting of five or six individuals, co-planned and co-delivered an explanation of their course content via a podcast to a fictitious peer, in the role of team-teachers.

The first research question (RQ 1) investigated how the team-teaching of course content impacted students' knowledge of accounting coursework. The literature review highlighted that team-teaching, rooted in social constructivism, enhanced learning through social interactions and engagements in authentic activities (Baeten & Simons 2014; Svinicki 2004; Vygotsky 1978). Through team-teaching, student teachers operated within each other's zone of proximal development, learning from each other's knowledge and skills (Baeten & Simons 2014; Smith 2004). The findings of the current research paper reinforce these principles, indicating that accounting students collaboratively construct their understanding of accounting concepts when they engage in team-teaching, thereby facilitating their knowledge development. In finding knowledge development benefits for accounting students who engage in a team-teaching task, this research paper can add to the current understanding of the learning benefits of team-teaching as it provides evidence of such benefits outside of teacher education. The knowledge development findings of this research paper also expand on the current team-teaching literature as it provides evidence of differential learning benefits from team-teaching tasks for students with different prior performance levels. This could potentially indicate that weaker students, even inside teacher education, may achieve more in terms of their knowledge from team-teaching tasks than higher-performing students. This should be investigated further.

The second research question (RQ 2) explored students' experiences of knowledge and skills development when team-teaching. Consistent with the findings from previous literature on teacher education (Soslau et al. 2019; Baeten & Simons 2016), the students reported a growth in competence, adaptive expertise, and collaborative expertise. Notably, team-teaching stimulated a fresh perspective among students on their coursework. This team-based design facilitated social constructive knowledge development. A prominent highlight from the feedback was the universal recognition across all students, irrespective of their prior academic standings, of the intervention's pivotal role in honing skills, such as intellectual, interpersonal and communication, personal, and organisational skills.

Considering the survey's outcomes (RQ 2), it is evident that the benefits and pitfalls of team-teaching as experienced by accounting students largely mirror the findings from student teachers involved in team-teaching during their professional development.

Most Frequently Noted Benefits*:*

- Collaborative learning benefits (Howlett & Nguyen 2020; Simons et al. 2020; Wynn & Kromrey 2000) — the accounting students consistently emphasized the knowledge construction benefits afforded by the collaborative nature of the team-teaching intervention.

- Support for Professional Development (Simons et al. 2020; Goodnough et al. 2009) — a significant number of accounting students pinpointed the potential of the intervention in developing critical professional competencies, such as intellectual, interpersonal and communication skills, and organisational skills, aligning with the Revised International Education Standard (IES 3) (International Accounting Education Standards Board, 2019). The most frequently mentioned skills the students mentioned were interpersonal and communication skills.

Additional Benefits:

- Increased dialogue (Sorensen 2014) — a shared sentiment among some accounting students and student teachers was the learning benefits from discussions with their

peers. This dialogue granted a variety of insights into the topic, assisting in effective scaffolding. The dual benefits of both receiving and providing explanations among peers were recurrently underscored.

- Personal growth benefits (Simons et al. 2020; Barahona 2017) — a segment of students recognized opportunities for honing resilience, time management, leadership, and organisation skills.

Commonly Identified Disadvantages:

- Peer compatibility issues (Simons et al. 2020) — a recurrent challenge was the non-participation of team members, prompting suggestions for the self-selection of team members.

- Increased workload (Simons et al. 2020) — an often-mentioned feedback was the extended time needed for the intervention, with students proposing an extended timeframe for the entire intervention.

A novel insight that this research paper provided was the consistent observation that the benefits from team-teaching interventions extended to all students, irrespective of their past academic performances. While the research paper provides preliminary evidence of the potential of team-teaching in refining both knowledge and skills, it also confirms that educators need to balance the benefits and disadvantages when deciding to implement the intervention and when designing it.

In terms of educational practice, this research paper urges higher education stakeholders, particularly in disciplines balancing knowledge and practical competencies, to consider team-teaching as a learning intervention. The practical educational considerations that educators need to be aware of when implementing such interventions include:

- Managing peer incompatibilities. Educators implementing learning-by-team-teaching interventions should proactively mitigate learning impediments caused by peer incompatibility. Allowing students to choose their teams may be one option, but the

associated disadvantages of student learning must be carefully considered. Previous research on teacher education suggests promoting strong student relationships early in the team placement stage and encouraging communication between team members throughout the intervention (Do & Hascher 2023; Simons et al. 2020).

- Organisational support and time management. Providing organisational support is crucial for the success of a team-teaching intervention. Educators can support students by aligning the intervention with less busy periods in their academic calendars and allocating time for team meetings (Do & Hascher 2023).

- Careful planning, execution, and educator training are crucial for the success of any team-teaching intervention. Educational institutions should consider providing training to educators who wish to implement such interventions. This training should equip them with the skills needed to guide their students in effective communication and collaboration, which are critical to the success of the intervention (Do & Hascher 2023).

2.6 CONCLUSION

This research paper set out to examine the role of team-teaching in promoting knowledge and skills development among accounting students in higher education. This research paper aimed to bridge a gap in the current literature, which primarily focuses on team-teaching within teacher education. It also sought to explore the potential benefits for students in other disciplines who, as members of teacher-teams of five or six individuals, co-planned and co-delivered an explanation of the course content via a podcast to a fictitious peer in the role of team-teachers.

The findings suggest that team-teaching, as a form of learning-by-teaching, is a powerful instructional approach in higher education that transcends disciplinary boundaries. The accounting students in this research paper reported improved knowledge and enhanced skills in the topics they taught, supporting the idea that team-teaching encourages active learning, promotes a greater comprehension, and supports the development of skills, such as teamwork (or collaboration), communication, and critical thinking.

Moreover, this research paper provided empirical evidence supporting the notion that team-teaching models and styles could be adapted effectively to various learning contexts beyond teacher education. The application of team-teaching in an accounting course, created an environment conducive to collaborative learning and fostered a sense of shared responsibility for learning outcomes among students. This suggests that team-teaching can potentially be a significant factor in cultivating collaborative cultures within higher education, enhancing academic outcomes, and fostering a sense of community among students.

A noteworthy observation that arose from the research paper was the enhanced knowledge development for low-performing students, particularly when they were presenters in the team-teaching process. Future research may further investigate this by determining whether the benefits observed resulted from the additional time spent on the intervention or were directly linked to the act of presenting.

Although this research paper offered valuable insights into the benefits of team-teaching for student learning in accounting education, it also set the stage for future research. Further explorations are needed to delve deeper into the learning benefits of learning-by-team-teaching in other disciplinary contexts and using different modes of explanation. These alternative modes of explanation may, for example, enable the development of additional competencies, such as creativity skills. Future studies might also consider investigating the long-term effects of team-teaching on students' academic performance and career development, providing even more compelling evidence of the enduring benefits of this pedagogical approach. Future research can also investigate the means to mitigate some of the challenges of the learning-by-team-teaching intervention identified by students in this research paper. The identified challenges included peer compatibility challenges (like the non-participation of team members) and workload challenges.

The research paper has several limitations that warrant consideration. Firstly, the research paper aimed at providing insights into the benefits of team-teaching from a student's perspective, which may have resulted in a one-sided view of the benefits of a team-teaching intervention, for both knowledge and skills development. Future research should consider investigating the educators' views on the benefits of such a team-teaching intervention to provide a more holistic perspective. Secondly, this research paper specifically focused on

accounting students' experiences of a sequential equal-status team-teaching design. Future research could potentially compare students from other disciplines' experiences of a team-teaching intervention with a parallel or station design. A comparison of students' experiences of varying designs of the equal-status model used in this research paper's team-teaching intervention may contribute to improving student learning practices. Thirdly, the survey instrument of this research paper did not specifically focus on asking students about their experienced benefits and disadvantages of the learning-by-team-teaching intervention. Future research may consider designing a survey instrument that more specifically addresses this aspect, which can possibly provide a more detailed and comprehensive list of the benefits and disadvantages. Fourthly, increased sample sizes may strengthen the generalizability of this research paper's findings and assist in formulating stronger conclusions from the findings. Lastly, longitudinal research with other groups of students would also help improve the design of such an intervention, as it would provide insights into the long-term effects and sustainability of the observed benefits.

In conclusion, this research paper underscored the importance of team-teaching in promoting collaborative learning in higher education. The findings encourage educational institutions to consider implementing team-teaching methods to enhance their students' learning experience and outcomes. Ultimately, by promoting innovative teaching methods, such as team-teaching, educators can foster more engaging and effective learning environments that prepare students for academic success and a dynamic, collaborative professional world.

Lastly, this research paper added to the limited research exploring the influence of team-teaching on students' learning processes, particularly in disciplines other than teacher education. Therefore, the continuous exploration of the potential benefits of team-teaching for students from various disciplines and a further investigation of how to best implement this approach in different educational contexts remains crucial.

2.7 REFERENCES

Baeten, M. & Simons, M., 2014, 'Student teachers' team teaching: Models, effects, and conditions for implementation', *Teaching and Teacher Education* 41, 92–110, doi.org/10.1016/j.tate.2014.03.010.

Baeten, M. & Simons, M., 2016, 'Student teachers' team teaching: how do learners in the classroom experience team-taught lessons by student teachers?', *Journal of Education for Teaching* 42(1), 93–105, doi.org/10.1080/02607476.2015.1135226.

Baeten, M., Simons, M., Schelfhout, W. & Pinxten, R., 2018, 'Team teaching during field experiences in teacher education: Exploring the assistant teaching model', *European Journal of Teacher Education* 41(3), 377–397, doi.org/10.1080/02619768.2018.1448780.

Barahona, M., 2017, 'Exploring models of team teaching in initial foreign/second language teacher education: A study in situated collaboration', *Australian Journal of Teacher Education* 42(12), 144–161, doi.org/10.14221/ajte.2017v42n12.9.

Bayne, L., Birt, J., Hancock, P., Schonfeldt, N. & Agrawal, P., 2022, 'Best practices for group assessment tasks', *Journal of Accounting Education* 59, 100770, doi.org/10.1016/j.jaccedu.2022.100770.

Birrell, J.R. & Bullough, R. V., 2005, 'Teaching with a Peer: A Follow-Up Study of the 1st Year of Teaching', *Action in Teacher Education* 27(1), 72–81, doi.org/10.1080/01626620.2005.10463375.

Bloom, R. & Debessay, A., 1984, 'Educating Professional Accountants for the Twenty-First Centurv : A Point of View', *The Journal of Business Education* 4(59), 159–162, doi.org/10.1080/00219444.1984.10534117.

Bolam, R., Mcmahon, A., Stoll, L., Thomas, S., Wallace, M., Greenwood, A., Hawkey, K., Ingram, M., et al., 2005, from www.dfes.go.uk/research.

Bunney, D., Sharplin, E. & Howitt, C., 2015, 'Generic skills for graduate accountants: the bigger picture, a social and economic imperative in the new knowledge economy', *Higher Education Research and Development* 34(2), 256–269, doi.org/10.1080/07294360.2014.956700.

Carpenter, D.M., Crawford, L. & Walden, R., 2007, 'Testing the efficacy of team teaching', *Learning Environments Research* 10(1), 53–65, doi.org/10.1007/s10984-007-9019-y.

Carpenter, S.K., Cepeda, N.J., Rohrer, D., Kang, S.H.K. & Pashler, H., 2012, 'Using Spacing

to Enhance Diverse Forms of Learning: Review of Recent Research and Implications for Instruction', *Educational Psychology Review* 24(3), 369–378, doi.org/10.1007/s10648-012-9205-z.

Chan, D., 2015, 'The Effect of Cooperative Learning on Students' Attitude in First-Year Principles of Accounting Course', *Business Education Innovation Journal* 7(2), 107–116, doi.org/10.1016/0748-5751(95)00032-1.

Chebbihi, H., Varpio, L., St-Onge, C. & Chamberland, M., 2019, 'Self-explanation to support knowledge development for clinical reasoning: Perspectives from third year medical clerks', *MedEdPublish* 8(3), 1–11, doi.org/10.15694/mep.2019.000225.1.

Coetzee, S.A., Leith, K. & Schmulian, A., 2019, 'Accounting students access to social media related resources and the risk of tacit social exclusion', *Accounting Education* 28(5), 465–483, doi.org/10.1080/09639284.2019.1641116.

Coleman, E.B., Brown, A.L. & Rivkin, I.D., 1997, 'The Effect of Instructional Explanations on Learning from Scientific Texts', *Journal of the Learning Sciences* 6(4), 347–365, doi.org/10.1207/s15327809jls0604_1.

Cooper, S., 2017, 'A collaborative assessment of students' placement learning', *Assessment and Evaluation in Higher Education* 42(1), 61–76, doi.org/10.1080/02602938.2015.1083093.

Do, M.L. & Hascher, T., 2023, 'Peer cooperation during teaching in paired field placements: Forms and challenges', *Frontline Learning Research* 11(1), 94–122, doi.org/10.14786/flr.v11i1.1305.

Donnison, S., Edwards, D., Itter, D., Martin, D. & Yager, Z., 2009, 'Reflecting on improving our practice: Using collaboration as an approach to enhance first year transition in higher education', *Australian Journal of Teacher Education* 34(3), 18–29, doi.org/10.14221/ajte.2009v34n3.2.

Duran, D. & Topping, K.J., 2017, *Evidence-based strategies to enhance learning in the classroom*, Routledge, London.

Edmond, T. & Tiggeman, T., 2009, 'Accounting Experiences In Collaborative Learning', *American Journal of Business Education* 2(7), 97–100, doi.org/10.19030/ajbe.v2i7.4588.

Falkner, K. & Falkner, N.J.G., 2012, 'Supporting and structuring "contributing student pedagogy" in Computer Science curricula', *Computer Science Education* 22(4), 413–443, doi.org/10.1080/08993408.2012.727713.

Fiorella, L., 2021, 'Fostering knowledge building in learning by teaching: A test of the drawing-facilitates-explaining hypothesis', *Applied Cognitive Psychology* 35(2), 548–558, doi.org/10.1002/acp.3774.

Fiorella, L. & Mayer, R.E., 2013, 'The relative benefits of learning by teaching and teaching expectancy', *Contemporary Educational Psychology* 38, 281–288, doi.org/10.1016/j.cedpsych.2013.06.001.

Fiorella, L. & Mayer, R.E., 2014, 'Role of expectations and explanations in learning by teaching', *Contemporary Educational Psychology* 39(2), 75–85, doi.org/10.1016/j.cedpsych.2014.01.001.

Fiorella, L., Mayer, R.E., 2016, 'Eight Ways to Promote Generative Learning', *Educational Psychology Review* 28, 717–741, https://doi.org/10.1007/s10648-015-9348-9.

Fuller, R.G. & Bail, J., 2011, 'Team teaching in the online graduate: Collaborative Instruction', *International Journal of Information and Communication Technology Education* 7(4), 72–83.

Ghani, E.K. & Muhammad, K., 2019, 'Industry 4.0: Employers' expectations of accounting graduates and its implications on teaching and learning practices', *International Journal of Education and Practice* 7(1), 19–29, doi.org/10.18488/journal.61.2019.71.19.29.

Giuliodori, M.J., Lujan, H.L. & DiCarlo, S.E., 2008, 'Collaborative group testing benefits high- and low-performing students', *Advances in Physiology Education* 32(4), 274–278, doi.org/10.1152/advan.00101.2007.

Goodnough, K., Osmond, P., Dibbon, D., Glassman, M. & Stevens, K., 2009, 'Exploring a triad model of student teaching: Pre-service teacher and cooperating teacher perceptions', *Teaching and Teacher Education* 25(2), 285–296, doi.org/10.1016/j.tate.2008.10.003.

Griffin, P. and Robertson, P., 2014, 'Professional learning teams and decision-making.', *Assessment for teaching* 1, 13–25.

Hanusch, F., Obijiofor, L. & Volcic, Z., 2009, 'Theoretical and Practical Issues in Team-Teaching a Large Undergraduate Class', *International Journal of Teaching and Learning in Higher Education* 21(1), 66–74, from http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ896243&site=ehost-live.

Hefter, M.H. & Berthold, K., 2020, 'Preparing learners to self-explain video examples: Text or video introduction?', *Computers in Human Behavior* (110), 106404,

doi.org/10.1016/j.chb.2020.106404.

Hoogerheide, V., Deijkers, L., Loyens, S.M.M., Heijltjes, A. & van Gog, T., 2016, 'Gaining from explaining: Learning improves from explaining to fictitious others on video, not from writing to them', *Contemporary Educational Psychology* 44, 95–106, doi.org/10.1016/j.cedpsych.2016.02.005.

Hoogerheide, V., Renkl, A., Fiorella, L., Paas, F. & van Gog, T., 2019, 'Enhancing Example-Based Learning: Teaching on Video Increases Arousal and Improves Problem-Solving Performance', *Journal of Educational Psychology* 111(1), 45–56, doi.org/10.1037/edu0000272.

Howlett, K.M. & Nguyen, H.L., 2020, 'Autoethnographic reflections of an international graduate teaching assistant's co-teaching experiences', *Journal of International Students* 10(2), 401–419, doi.org/10.32674/jis.v10i2.774.

ICAEW, 2017, 'Understanding the Impact of Technology in Audit and Finance', *Understanding the impact of technology in audit and finance* 14, from https://www.icaew.com/-/media/corporate/files/middle-east-hub/understanding-the-impact-of-technology-in-audit-and-finance.ashx.

International Accounting Education Standards Board™, 2019, *International Education Standard 3, Initial Professional Development – Professional Skills (Revised)*, NY: IFAC, New York.

Jacob, L., Lachner, A. & Scheiter, K., 2020, 'Learning by explaining orally or in written form ? Text complexity matters', *Learning and Instruction* 68, 101344, doi.org/10.1016/j.learninstruc.2020.101344.

Jamieson, S., 2004, 'Likert scales: How to (ab)use them', *Medical Education* 38(12), 1217–1218, doi.org/10.1111/j.1365-2929.2004.02012.x.

Jang, H., Lasry, N., Miller, K. & Mazur, E., 2017, 'Collaborative exams: Cheating? Or learning?', *American Journal of Physics* 85(3), 223–227, doi.org/10.1119/1.4974744.

John-Steiner, V. & Mahn, H., 1996, 'Sociocultural Contexts for Teaching and Learning', *Educationaly Psychologist* 31 (3/4), 191–206, doi.org/10.1002/0471264385.wei0707.

Jon A. Krosnick, L.R.F., 1997, 'Designing Rating Scales for Effective Measurement in Surveys', in *Survey Measurement and Process Quality*, M.C. L. Lyberg, P. Biemer, Ed., Wiley-Interscience, New York, pp. 141–164, doi.org/https://doi.org/10.1002/9781118490013.ch6.

Jonassen, D., Davidson, M., Collins, M., Campbell, J. & Haag, B.B., 1995, 'Constructivism

and Computer-Mediated Communication in Distance Education', *American Journal of Distance Education* 9(2), 7–26, doi.org/10.1080/08923649509526885.

Kelchtermans, G., 2006, 'Teacher collaboration and collegiality as workplace conditions. A review', *Zeitschrift fur Padagogik* 52(2), 220–237, doi.org/10.25656/01.

King, S., 2006, 'Promoting paired placements in initial teacher education . The use of paired placements in England', *International Research in Geographical and Environmental Education* 15(4), 370–386.

Kobayashi, K., 2019, 'Learning by Preparing-to-Teach and Teaching: A Meta-Analysis', *Japanese Psychological Research* 61(3), 192–203, doi.org/10.1111/jpr.12221.

Kobayashi, K., 2021, 'Effects of collaborative versus individual preparation on learning by teaching', *Instructional Science* 49(6), 811–829, doi.org/10.1007/s11251-021-09561-6.

Koles, P.G., Stolfi, A., Borges, N.J., Nelson, S. & Parmelee, D.X., 2010, 'The impact of team-based learning on medical students' Academic Performance', *Academic Medicine* 85(11), 1739–1745, doi.org/10.1097/ACM.0b013e3181f52bed.

Krosnick, J.A., 1999, 'Survey Research', *Annual Review of Psychology* 50, 537–567, doi.org/10.1097/ALN.0000000000002436.

van Laar, E., van Deursen, A.J.A.M., van Dijk, J.A.G.M. & de Haan, J., 2017, 'The relation between 21st-century skills and digital skills: A systematic literature review', *Computers in Human Behavior* 72, 577–588, doi.org/10.1016/j.chb.2017.03.010.

Lachner, A., Ly, K.T. & Nückles, M., 2018, 'Providing Written or Oral Explanations? Differential Effects of the Modality of Explaining on Students' Conceptual Learning and Transfer', *Journal of Experimental Education* 86(3), 344–361, doi.org/10.1080/00220973.2017.1363691.

Lachner, A., Hoogerheide, V., van Gog, T. & Renkl, A., 2021, *Learning-by-Teaching Without Audience Presence or Interaction: When and Why Does it Work?*, doi.org/10.1007/s10648-021-09643-4.

Lerchenfeldt, S., Mi, M. & Eng, M., 2019, 'The utilization of peer feedback during collaborative learning in undergraduate medical education: A systematic review', *BMC Medical Education* 19(1), 1–10, doi.org/10.1186/s12909-019-1755-z.

Letterman, M.R. & Dugan, K.B., 2004, 'Team Teaching a Cross-Disciplinary Honors Course: Preparation and Development', *College Teaching* 52(2), 76–79.

Loughry, M.L., Ohland, M.W. & Moore, D.D., 2007, 'Development of a Theory-Based Member Effectiveness', *Educational and Psychological Measurement* 67(3), 505–524,

doi.org/10.1177/0013164406292085.

Loureiro, M. & Silva, R., 2019, 'Differences in communication skills between business, economics and management university students', *Proceedings of the European Conference on Knowledge Management, ECKM* 2(2), 700–707, doi.org/10.34190/KM.19.167.

Mahoney, J.W. & Harris-Reeves, B., 2019, 'The effects of collaborative testing on higher order thinking: Do the bright get brighter?', *Active Learning in Higher Education* 20(1), 25–37, doi.org/10.1177/1469787417723243.

Mayer, R.E., 2014, 'Cognitive theory of multimedia learning.', in *The Cambridge Handbook of Multimedia Learning*, 2nd ed, Cambridge University Press, New York, pp. 31–48, from https://doi.org/10.1017/CBO9780511816819.004.

McKenzie, J.F., Wood, M.L., Kotecki, J.E. & Clark, J.K., 1999, 'Establishing content validity: using qualitative and quantitative steps', *American Journal of Health Behaviour* 4(23), 311–318.

Mehrabi Boshrabadi, A. & Hosseini, M.R., 2021, 'Designing collaborative problem solving assessment tasks in engineering: an evaluative judgement perspective', *Assessment and Evaluation in Higher Education* 46(6), 913–927, doi.org/10.1080/02602938.2020.1836122.

Murata, R., 2002, 'What does team teaching mean? a case study of interdisciplinary teaming', *Journal of Educational Research* 96(2), 67–77, doi.org/10.1080/00220670209598794.

Nokes, J.D., Bullough, R. V., Egan, W.M., Birrell, J.R. & Merrell Hansen, J., 2008, 'The paired-placement of student teachers: An alternative to traditional placements in secondary schools', *Teaching and Teacher Education* 24(8), 2168–2177, doi.org/10.1016/j.tate.2008.05.001.

Palincsar, A.S., 1998, 'Social Constructivist Perspectives on Teaching and Learning', *Annual Review of Psychology* 49(1), 345–375, doi.org/10.1146/annurev.psych.49.1.345.

Pena-Shaff, J.B. & Nicholls, C., 2004, 'Analyzing student interactions and meaning construction in computer bulletin board discussions', *Computers and Education* 42(3), 243–265, doi.org/10.1016/j.compedu.2003.08.003.

Phillips, A.W., Reddy, S. & Durning, S.J., 2016, 'Improving response rates and evaluating nonresponse bias in surveys: AMEE Guide No. 102', *Medical Teacher* 38(3), 217–228,

doi.org/10.3109/0142159X.2015.1105945.

Quiñones-Ramírez, F., Duran, D. & Viladot, L., 2023, 'Co-Teaching with High School Students for Music Teaching', *Education Sciences* 13(10), 1–17, doi.org/https://doi.org/10.3390/educsci13100972.

Ribosa, J. & Duran, D., 2022, 'Do students learn what they teach when generating teaching materials for others? A meta-analysis through the lens of learning by teaching', *Educational Research Review* 37(July), 100475, doi.org/10.1016/j.edurev.2022.100475.

Rittle-Johnson, B., Loehr, A.M. & Durkin, K., 2017, 'Promoting self-explanation to improve mathematics learning: A meta-analysis and instructional design principles', *ZDM - Mathematics Education* 49(4), 599–611, doi.org/10.1007/s11858-017-0834-z.

Sandholtz, J., 2000, 'Interdisciplinary Team Teaching as a Form of Professional Development', *Teacher Education Quarterly* 27(3), 39–54.

Schmulian, A. & Coetzee, S.A., 2019a, 'To Team or Not to Team: an Exploration of Undergraduate Students' Perspectives of Two Teachers Simultaneously in Class', *Innovative Higher Education* 44(4), 317–328, doi.org/10.1007/s10755-019-9466-2.

Schmulian, A. & Coetzee, S.A., 2019b, 'Students' experience of team assessment with immediate feedback in a large accounting class', *Assessment and Evaluation in Higher Education* 44(4), 516–532, doi.org/10.1080/02602938.2018.1522295.

Schwartz, D.L. & Okita, S., 2004, *The Productive Agency in Learning by Teaching Unpublished manuscript.*

Shibley, I.A., 2006, 'Interdisciplinary Team Teaching: Negotiating Pedagogical Differences', *College Teaching* 54(3), 271–274, doi.org/10.3200/CTCH.54.3.271-274.

Simons, M., Baeten, M. & Vanhees, C., 2020, 'Team Teaching During Field Experiences in Teacher Education: Investigating Student Teachers' Experiences With Parallel and Sequential Teaching', *Journal of Teacher Education* 71(1), 24–40, doi.org/10.1177/0022487118789064.

Sistermans, I.J., 2020, 'Integrating competency-based education with a case-based or problem-based learning approach in online health sciences', *Asia Pacific Education Review* 21(4), 683–696, doi.org/10.1007/s12564-020-09658-6.

Smith, J.D.N., 2004, 'Developing paired teaching placements', *Educational Action Research* 12(1), 99–126, doi.org/10.1080/09650790400200241.

Sorensen, P., 2014, 'Collaboration, dialogue and expansive learning: The use of paired and

multiple placements in the school practicum', *Teaching and Teacher Education* 44, 128–137, doi.org/10.1016/j.tate.2014.08.010.

Soslau, E., Gallo-Fox, J. & Scantlebury, K., 2019, 'The Promises and Realities of Implementing a Coteaching Model of Student Teaching', *Journal of Teacher Education* 70(3), 265–279, doi.org/10.1177/0022487117750126.

Stairs, A.J., Corrieri, C., Fryer, L., Genovese, E., Panaro, R. & Sohn, C., 2009, 'Inquiry Into Partnered Student Teaching in an Urban School – University Partnership', *School-University Partnerships* 3(1), 75–89.

Strand Norman, C., Rose, A.M. & Lehmann, C.M., 2004, 'Cooperative learning: Resources from the business disciplines', *Journal of Accounting Education* 22(1), 1–28, doi.org/10.1016/j.jaccedu.2004.01.001.

Subban, P., 2006, 'Differentiated instruction: A research basis', *International Education Journal* 7(7), 935–947.

Sullivan, G.M. & Artino, A.R., 2013, 'Analyzing and Interpreting Data From Likert-Type Scales', *Journal of Graduate Medical Education* 5(4), 541–542, doi.org/10.4300/jgme-5-4-18.

Svinicki, M.D., 2004, *Learning and motivation in the postsecondary classroom.*, Anker Publishing Co.

Tan, L.M. & Laswad, F., 2018, 'Professional skills required of accountants: what do job advertisements tell us?', *Accounting Education* 27(4), 403–432, doi.org/10.1080/09639284.2018.1490189.

Thousand, J.S., Villa, R.A. & Nevin, A.I., 2006, 'The many faces of collaborative planning and teaching', *Theory into Practice* 45(3), 239–248, doi.org/10.1207/s15430421tip4503_6.

Tobin, K., Roth, W.-M. & Zimmermann, A., 2001, 'Learning to Teach Science in Urban Schools', *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching* 38(8), 941–964, doi.org/10.1111/ssm.12441.

Tourangeau, R., Couper, M.. & Conrad, F., 2004, 'Spacing , Position , and Order : Interpretive Heuristics for Visual Features of Survey Questions', *The Public Opinion Quarterly* 68(3), 368–393.

Tsiligiris, V. & Bowyer, D., 2021, 'Exploring the impact of 4IR on skills and personal qualities for future accountants: a proposed conceptual framework for university accounting

education', *Accounting Education* 30(6), 621–649, doi.org/10.1080/09639284.2021.1938616.

Van der Vleuten, C.P.M., 2015, 'Competency-based education is beneficial for professional development', *Perspectives on Medical Education* 4(6), 323–325, doi.org/10.1007/s40037-015-0232-6.

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

Wenger, E., 1999, *Communities of practice: Learning, meaning, and identity*, Cambridge University Press.

White, C.S., Henley, J.A. & Brabston, M.E., 1998, 'To Team Teach or Not to Team Teach—That Is the Question: A Faculty Perspective', *Marketing Education Review* 8(3), 13–23, doi.org/10.1080/10528008.1998.11488640.

Wilson, L., Ho, S. & Brookes, R.H., 2018, 'Student perceptions of teamwork within assessment tasks in undergraduate science degrees', *Assessment and Evaluation in Higher Education* 43(5), 786–799, doi.org/10.1080/02602938.2017.1409334.

Wittwer, J. & Renkl, A., 2008, 'Why instructional explanations often do not work: A framework for understanding the effectiveness of instructional explanations', *Educational Psychologist* 43(1), 49–64, doi.org/10.1080/00461520701756420.

Woo, Y. & Reeves, T.C., 2007, 'Meaningful interaction in web-based learning: A social constructivist interpretation', *Internet and Higher Education* 10(1), 15–25, doi.org/10.1016/j.iheduc.2006.10.005.

Wynn, M. & Kromrey, J., 2000, 'Paired Peer Placement with Peer Coaching to Enhance Prospective Teachers' Professional Growth in Early Field Experience', *Action in Teacher Education* 22(sup2), 73–83, doi.org/10.1080/01626620.2000.10463041.

2.8 APPENDIX FOR RESEARCH PAPER 1

APPENDIX A — INSTRUCTIONS GIVEN TO STUDENTS FOR RESEARCH PAPER 1 OF THIS THESIS

Instructions:

A fellow student could not attend the contact sessions (classes) that explained the preparation of the ordinary and preference shareholders' analyses of owners' equity, for a group of companies in which a parent entity has a controlling interest in a subsidiary that has both ordinary and preference share capital in issue. The fellow student also missed the contact sessions that explained how to treat an upward revaluation (for consolidation purposes) of the equipment of a subsidiary at acquisition and how accumulated losses of a subsidiary at acquisition will affect the preparation of the analyses.

Your team is required to produce a *five-minute oral only explanation*[26] of the preparation of the ordinary and preference shareholders' analyses of owners' equity, for a group of companies in which a parent entity has a controlling interest in a subsidiary, which has both ordinary and preference share capital in issue. The equipment of the subsidiary needed to be revalued upwards at the date when the parent obtained control of the subsidiary (at acquisition) and the subsidiary had an accumulated loss at acquisition. The revaluation of the equipment is for consolidation purposes only and has not been recorded in the separate financial statements of the subsidiary.

The collaboratively prepared explanation must explain the above to your fellow student who missed the contact sessions. The oral explanation must be **voice recorded (you must only hear voices explaining with no visual element)**.

Before preparing your explanation, please outline how you would structure your explanation in bullet points.

[26] Each team is only required to prepare one explanation. The explanation that is submitted by a team is therefore the explanation that the team collaboratively produced.

Important: Take care that your explanation is understandable for the fellow student, who missed the contact sessions, without any further learning material. That said you should include the main steps to be followed in the preparation of both the ordinary and preference shareholders' analyses of the owners' equity for a subsidiary, which has both ordinary and preference share capital in issue. You should also explain how the revaluation of the equipment (at acquisition) and the accumulated loss of the subsidiary (at acquisition) should be treated in the preparation of the analyses of the owners' equity of the subsidiary.

Teams must ensure that they stick to the time limit for their explanation.

For an explanation of the grade calculation for the assignment, please refer to point 2.8.2.

Calculation of grade for the assignment:

Your individual total grade will be calculated as follows:

- A portion of your total grade will be the grade that your team receives for their collaboratively prepared explanation.
- A portion of your total grade will be the collaboration mark you received from your team members (refer to point 2.8.3). Each team member will be required to give an ***anonymous*** evaluation of each team member's individual level of collaboration in collaboratively preparing the team's explanation.

NOTE: It is not possible for your team members to determine what grades you gave them for the evaluation of their collaboration. The evaluation is completely anonymous and each team member will only receive the overall average score they received from their team as a whole.

Marks for your level of collaboration in preparing the explanation:

Peer review by individual team members:

An individual grade will be allocated to each team member, based on that team member's level of collaboration.

The peer reviews are completely anonymous. No team member will know what rating he/she received from any other team member.

The peer review of team members will be done by completing a survey using the Ipeer functionality on ClickUP, once the team explanation has been submitted. The peer review questions will be as follows:

Please rate **each team member's** effectiveness individually on a ***scale of 1 (strongly disagree) to 7 (strongly agree)*** for each of the following questions:

Category 1: Contributing to the team's work:

1. The specific team member did a fair share of the team's work.
2. The specific team member fulfilled their responsibilities to the team.
3. The specific team member came to team meetings prepared.
4. The specific team member completed work in a timely manner.
5. The specific team member did work that was complete and accurate.
6. The specific team member made important contributions to the team's final product.
7. The specific team member kept trying when faced with difficult situations.
8. The specific team member offered to help teammates when it was appropriate.

Category 2: Interacting with team mates:

9. The specific team member communicated effectively.
10. The specific team member facilitated effective communication in the team.
11. The specific team member exchanged information with teammates in a timely manner.
12. The specific team member provided encouragement to other team members.
13. The specific team member expressed enthusiasm about working as a team.
14. The specific team member heard what teammates had to say about issues that affected the team.

15. The specific team member got team input on important matters before going ahead.
16. The specific team member accepted feedback about strengths and weaknesses from teammates.
17. The specific team member used teammates' feedback to improve performance.
18. The specific team member let other team members help when it was necessary.

Category 3: Keeping the team on track:

19. The specific team member stayed aware of fellow team members' progress.
20. The specific team member assessed whether the team was making progress as expected.
21. The specific team member stayed aware of external factors that influenced team performance.
22. The specific team member provided constructive feedback to others on the team.
23. The specific team member motivated others on the team to do their best.
24. The specific team member made sure that everyone on the team understood important information.
25. The specific team member helped the team to plan and organize its work.

Category 4: Expecting quality:

26. The specific team member expected the team to succeed.
27. The specific team member believed that the team could produce high-quality work.
28. The specific team member cared that the team produced high-quality work.
29. The specific team member believed that the team should achieve high standards.

Category 5: Having relevant knowledge and skills:

30. The specific team member had the skills and expertise to do excellent work.
31. The specific team member had the skills and abilities that were necessary to do a good job.
32. The specific team member had enough knowledge of teammates' jobs to be able to fill in if necessary.
33. The specific team member knew how to do the jobs of other team members.

3. CHAPTER 3: DO TEAM-BASED WRITTEN OR VIDEO EXPLANATIONS OF COURSE CONTENT DEVELOP ACCOUNTING STUDENTS' KNOWLEDGE, TEAMWORK SKILLS, AND COMMUNICATION SKILLS?

Publication: Pollock, M., Schmulian, A. and Coetzee, S. A. (2023) 'Do team-based written or video explanations of course content enhance accounting students' knowledge, communication, and teamwork skills?', *Journal of Accounting Education, (65)*

3.1 INTRODUCTION

Accountants must have robust conceptual knowledge of financial reporting (Rodgers, Simon & Gabrielsson 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 1984). 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 1984). Given that the fundamental objective of accounting, regardless of any sub-domain, is to provide information that facilitates decision-making (Bloom & Debessay 1984), accountants must be capable of communicating and explaining financial reporting processes and concepts to others, both within and outside their organisations. 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, Birt, Hancock, Schonfeldt & Agrawal. 2022; Mehrabi Boshrabadi & Hosseini 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 teamwork and communication 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, Bhanji, Topps, Ross, Lieberman, Frank, Snell & Sherbino 2017; Villarroel, Boud, Bloxham, Bruna & Bruna 2020). Competency-based education calls for a broadened assessment approach beyond the traditional measurement and validation of a student's knowledge (Schuwirth & Van der Vleuten 2020; Boud 1990). It should also encompass assessment for learning[27] to facilitate knowledge gains and skills development (Harris et al. 2017). Given this, the focus of this research paper 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 teamwork and communication skills.

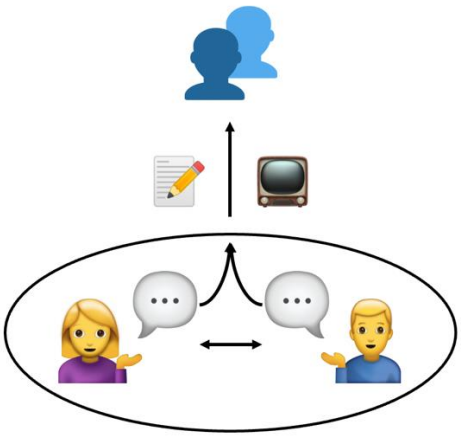
Learning-by-explaining is a powerful instructional approach (Lachner, Backfisch, Hoogerheide, van Gog & Renk 2020) that stimulates cognitive processes conducive to knowledge acquisition (Fiorella & Mayer 2016). Learning-by-explaining can manifest through self-explanation or through explaining to others. 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, Deijkers, Loyens, Heijltjes & van Gog. 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.

[27] An assessment for learning is an assessment which is specifically intended to enhance the learning of students, rather than just measuring students' performance (Hargreaves 2007).

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, Renkl, Fiorella, Paas & van Gog 2019; Lachner, Hoogerheide, van Gog & Renkl 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 organisation of information required in generating these explanations (Lachner, Ly & Nückles 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 knowledge development (Ribosa & Duran 2022). This leaves a notable void in the comprehension of the benefits of learning-by-explaining in team-based contexts. Through its team-based design, this research paper 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 or video) of team-based learning-by-explaining as an assessment for learning (Figure 3- 1).

Figure 3- 1 Team-based explanation, in writing or employing video



This research paper 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 educators contemplating adopting this or similar assessments for learning approaches in their educational settings. This holds particular resonance for those aiming to nurture teamwork and communication-related skills alongside content knowledge acquisition. Additionally, the outcomes of this research paper could bolster the external validity of theories regarding the learning effects of different modes of explanations, which have primarily been formulated in experimental settings.

3.2 LEARNING-BY-EXPLAINING

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

Much research on the impact 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 other. In experimental settings, indirect explanations of course content to such a recipient have been shown to bolster learning, largely due to the social presence[28] effect linked with the fictitious other (Lachner et al. 2021; Hoogerheide et al. 2016). The perceived role of this fictitious other as a listener seems to foster productive agency[29], which subsequently appears to culminate in learning gains (Hoogerheide et al. 2016).

[28] Social presence is defined here as the degree to which someone is perceived as a “real person” (Gunawardena, 1995).
[29] Productive agency is the belief that your actions can affect another person (Okita & Schwartz 2013; Schwartz 1999).

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 and Paris, 2001). Writing explanations spurs organisational 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 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, Lachner & Scheiter 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, Dompnier & Poortvliet 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 teamwork and communication 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 research paper endeavors to delve into the learning and skill development benefits of collaboratively prepared explanations delivered in both written and video modes.

3.3 LEARNING-BY-EXPLAINING IN A COMPETENCY-BASED ACCOUNTING EDUCATION CONTEXT

Professional accounting programs have often come under scrutiny for their narrow view, 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, Blocher, Brewer, Cokins, Sorensen, Stout, Sundem, Wolcott & Wouters 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 skills in communication and human relations (Lawson et al. 2014; Partnership for 21st Century Skills, 2015; Chhinzer and Russo, 2018; Plant, Barac & Sarens 2019. 2019; Dolce, Emanuel, Cisi & Ghisleril 2020).

As part of honing their communication skills, 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 videos 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 (Venter & de Villiers 2013; Coetzee & Schmulian 2012; 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 (Fiorella 2021; Duran 2017).

- 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 skills, this research paper 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 explanations 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:

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?

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

3.4 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 contact session (class) on preparing consolidated financial statements. Post class, but before the assessment for learning, the students were directed to study for an individual assessment of knowledge[30] that gauged their knowledge of the preparation of consolidated financial statements. This assessment of knowledge functioned as the pre-test for the research paper. After the pre-test, the students were provided instructions (refer to Appendix B in section 3.9 of Chapter 3 of this thesis or it can also be found at: https://bit.ly/448d8HZ) to draft a team-based explanation of the topic for a fictitious student who had missed the class. 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 & Coetzee 2019a). The team allocation procedure aligns with recommendations from accounting education research, which advocates for the formation of 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.

[30] 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.

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, Dohm & Crown 2001; Simonds, Meyer, Quinlan & Hunt. 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 assigned 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 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 organisation, 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.

3.4.1 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[31] were used to concurrently explore the association between the students' conceptual and transfer knowledge and the two explanation modes (written or video) while controlling for prior academic performance, gender, first language, and presenter status:

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

3.4.1.1 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 research 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 research 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 determined as successfully reinterpreting learned information (Lachner et al. 2018; Schwartz, Bransford & Sears. 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,

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

both the pre-and post-tests were reviewed by a subject-matter expert. Another subject-matter expert, blind to this research, marked the 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.

3.4.1.2 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 research paper investigated the influence of the team-based explanation mode, the coefficients on this variable were not predicted.

3.4.1.3 Control variables

PriorPerf denotes a student's prior academic performance, measured as the student's percentage mark obtained in the pre-test of this research paper. Considering that learning in teams may yield differential benefits on the academic performance of lower- or higher-performing students (Giuliodori, Lujan & DiCarlo 2008; Koles, Stolfi, Borges, Nelson & Parmelee 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, Gammie & Duncan 2003; Engel, 2018) and the difference between home language and instruction language (Coetzee, Schmulian & Kotze 2014; Coetzee &

Schmulian 2013; Wagner & Huang 2011) on accounting students' academic performance, the signs of the coefficients for *Gender* and *Language* were 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.

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

To measure differences in the explanatory features (level of organisation, person-deictic references and elaborations) 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 organisation 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-organised explanation pinpointed the main points, underscored central concepts, and was structured meaningfully. Each aspect of the topic[32] 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 research paper, scored the explanations. Each elaboration and person-deictic reference was counted to measure the level of elaborations and personal references in the explanations. In respect of person-deictic references, the

[32] 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.

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).

3.4.3 Students' experiences developing their teamwork and communication 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 teamwork and communication 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 (Schmulian & Coetzee 2019a; Cooper 2017). The items provide insight into students' overall perspective of using the team-based explanation as an assessment for learning to develop teamwork and communication skills. Additionally, these items 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, Wood, Kotecki & Clark. 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 3- 1.

Table 3- 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?

3.4.4 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 and remove any outliers.

3.4.5 Respondent Profile

The final sample of students for RQ1 amounted to 215 students (Table 3- 2). This sample was obtained after excluding the data of those students who did not give consent for their data to be analysed (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 (n = 17), or were identified as outliers following box plot analysis (n = 7).

The demographic variables were generally comparable across the two explanation modes (Table 3- 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 (n = 44) and after discarding responses from students who had mistakenly submitted two responses to the survey (n = 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.

Table 3- 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 research paper	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

Table 3- 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

3.5 RESULTS

3.5.1 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 explanation mode exhibited significantly higher pre-test conceptual knowledge ($t = -3.06$, $p = 0.001$, $d = 0.42$) compared to those assigned to the video explanation mode (Table 3- 4).

Table 3- 4 Descriptive statistics.

	Video explanation mode		Written explanation mode	
	Mean %	Std. Dev	Mean %	Std. Dev
Prior performance (Pre-test conceptual knowledge) [33]	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

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 score ($t = 1.09$, $p = 0.139$, $d = 0.149$) between the two team-based explanation modes. Furthermore, the video explanation group exhibited a significantly greater conceptual knowledge change than the written explanation group ($t = 4.02$, $p < 0.001$, $d = 0.55$). 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.

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

The mode of the team-based explanation (video or written) does not significantly (t-statistic = 1.12, $p = 0.26$) influence the students' conceptual knowledge change (Table 3- 5) when controlling for the student's pre-test knowledge (*PriorPerf*), 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 change. This insight adds to the existing understanding of the effects of explanation modes in learning-by-explaining literature. It proposes that the distinction

[33] 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 3- 4 is controlled for in the regression analyses of this thesis by including the students' conceptual knowledge pre-test scores as a control variable (prior performance) in the regression analyses.

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 = -5.87 p = 0.00) (Table 3- 5) as indicated by the regression analysis. The significantly negative coefficient for prior performance may indicate that the learning benefits derived from this research paper'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).

Table 3- 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	.00**
Mode (Video)	±	2.88	1.12	.26
PriorPerf	±	-0.29	-5.87	.00**
Gender	±	-3.39	-1.78	.08
Language	±	-0.37	-0.18	.85
Presenter	+	5.14	1.84	.07
F-statistic = 13.05 (p < .001)		Significance:		
Adjusted R^2 = .22		**p < .01		
n = 215		* p < .05		

To explore this hypothesis, the entire sample of students was stratified based on their prior performance. Students were categorised into three performance tiers at the 33rd, 66th, and 100th percentile (low, moderate, and top performers) (Table 3- 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 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 3- 6 do not appear to have been impacted by free-riding in the team-based assessment.

While the findings per Table 3-6 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 could 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 3-5, was explicitly conducted for this performance category (Panel A of Table 3-7). 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.

Table 3- 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

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 3-7) 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. 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 3-7 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 whole. As indicated in Panel B of Table 3- 7, the video explanation mode, viewed as a whole, facilitates significantly greater conceptual knowledge change compared to the written explanation mode (t = 3.004, p < 0.00).

Table 3- 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 (∆CK)

Variables	Prediction	Unstandardized B	t-statistic	Sig.
(Constant)		19.74	1.45	.15
Mode (Video)	±	6.48	1.87	.07
PriorPerf	+	-0.32	-1.97	.05*
Gender	±	-2.27	-.80	.42
Language	±	0.34	.12	.90
Presenter	+	4.10	.99	.32
F-statistic = 3.46 (p = .007)		Significance:		
Adjusted R^2 = .13		**p < .01		
n = 81		* p < .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)[34]

Variables	Prediction	Unstandardized B	t-statistic	Sig.
(Constant)		20.57	1.51	.13
Mode (Video)	±	8.49	3.00	.00**
PriorPerf	+	-0.33	-2.05	.04*
Gender	±	-2.16	-.76	.45
Language	±	0.50	.18	.86
F-statistic = 4.073 (p = .005)		Significance:		
Adjusted R^2 = .13		**p < .01		
n = 81		* p < .05		

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

The regression analysis results (per Table 3-8) align with the findings in the descriptive statistics (Table 3-4) and indicate no significant difference (t = 1.82, p = 0.07) between students' transfer knowledge emanating from the two explanation modes (Table 3- 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 development.

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

Table 3- 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)[35]

Variables	Prediction	Unstandardized B	t - statistic	Sig.
(Constant)		12.80	2.64	.01**
Mode (Video)	±	6.37	1.82	.07
PriorPerf	+	.17	2.48	.01**
Gender	±	-1.18	-.46	.65
Language	±	7.65	2.79	.01**
Presenter	+	-3.10	-0.81	.42
F- statistic = 3.53 (p = .004)		Significance:		
Adjusted R^2 = .06		**p < .01		
n=215		* p < .05		

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 3-9. 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.

[35] 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 3- 7.

Table 3- 9 Transfer knowledge per 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)	
	Transfer knowledge		Transfer knowledge	
Prior performance categories:	Mean %	Std. Dev	Mean %	Std. Dev
Low	26.22	19.68	23.07	17.21
Moderate	27.68	19.25	22.65	18.63
Top	32.35	18.09	29.97	19.71

3.5.4 Explanatory features of the video and written team-based explanations

The degree of organisation 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 organisation ($m = 57.26\%$) 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 organised 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 research paper. It suggests that the manner of preparation and presentation (individually as in prior research, or collaboratively as in this research paper) 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 (namely, level of organisation, person-deictic references, and elaborations) between explanation modes (written and video) 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 research paper, the observed differences in the explanatory features 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 organisation and the social presence indicators (person-deictic references, and elaborations) in this research paper 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 organisation, elaboration, and personal references) between team-based written and video explanations mediate the learning benefits of top-performing students.

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

3.5.5.1 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 3- 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 3-10. Notably, students from the written explanation mode reported significantly higher satisfaction levels with their overall experience than those in the video explanation mode ($t = 2.84$, $p = 0.002$, $d = 1.10$). The overwhelmingly positive response by students from both explanation modes was also complemented by the students recognizing the assessment as an opportunity to develop communication and teamwork skills (Table 3- 11). As detailed in Table 3- 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.

Table 3- 10 Students' experiences of the team-based explanation assessment for learning.

	Video explanation mode M = 5.50 (SD = 1.17) Median = 6 Total (n = 120)		Written explanation mode M = 5.92 (SD = 1.01) Median = 6 Total (n = 107)		Total M = 5.7 (SD = 1.12) Median = 6 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%

Table 3- 11 Percentage of students who indicated that the team-based explanation assessment task assessed their teamwork and communication skill development.

	Video explanation mode (n = 120)		Written explanation mode (n = 107)	
Prior performance categories:	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%

Overall, the findings per Table 3-11 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. These educators might want to include a peer evaluation of communication skills in the grading of such an assessment. In summary, the findings in Table 3- 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.

3.6 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-based explanations in a real classroom setting. A noteworthy insight from this research paper 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 explanation mode does not reduce conceptual knowledge for top performers. This insight is crucial for educators contemplating adopting the assessment design from this research paper 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 research paper 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 research paper extends previous research, showcasing that written explanations exhibit higher organisation, 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 research paper. 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 educators aiming to use the assessment for learning from this research paper 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 video presentation) emerges as the most beneficial. This mode underpins knowledge development of the whole class and provides students with ample opportunities for developing teamwork skills.

3.7 CONCLUSION

Many disciplines need to incorporate competency-based learning tasks that bolster students' content knowledge and facilitate the development of various soft skill competencies, including teamwork and communication skills. Therefore, this research paper 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 research paper underscore the comparable merits of video and written explanations for conceptual knowledge development. This is because the findings from this research paper 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 development benefits of video team-based explanations for top-performing students, future research should probe whether divergences in the explanatory features (namely, level of organisation, person-deictic references, and elaborations) of written and video team-based explanations contribute to the differential conceptual knowledge benefits identified in this research paper. A future 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, findings from Hoogerheide et al. (2016), suggest that lower to moderate levels of transfer task complexity may mitigate the impact of explanation modality. 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 could reproduce the differential explanation modality effects seen in individual explanation settings (Lachner et al. 2018).

The benefits of written and video team-based assessments for learning to develop teamwork and communication skills were also investigated in the competency-based accounting education context within which this research paper takes place. Mirroring the findings on conceptual knowledge development, the results about the skills development benefits 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 educators 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 teamwork and communication skills development. This recommendation is predicated upon the findings of this research paper 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 further investigate student and educator 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.

3.8 REFERENCES

Bangert-drowns, R.L., Hurley, M.M. & Wilkinson, B., 2004, 'The Effects of School-Based Writing-to-Learn Interventions on Academic Achievement : A Meta-Analysis', *Review of Educational Research* 74(1), 29–58.

Bayerlein, L., 2015, 'Curriculum innovation in undergraduate accounting degree programmes through "virtual internships"', *Education and Training* 57(6), 673–684, doi.org/10.1108/ET-09-2014-0110.

Bayne, L., Birt, J., Hancock, P., Schonfeldt, N. & Agrawal, P., 2022, 'Best practices for group assessment tasks', *Journal of Accounting Education* 59, 100770, doi.org/10.1016/j.jaccedu.2022.100770.

Biggs, J., 1999, 'What the student does: Teaching for enhanced learning', *International Journal of Phytoremediation* 21(1), 57–75, doi.org/10.1080/0729436990180105.

Bloom, R. & Debessay, A., 1984, 'Educating Professional Accountants for the Twenty-First Centurv : A Point of View', *The Journal of Business Education* 4(59), 159–162, doi.org/10.1080/00219444.1984.10534117.

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

Chebbihi, H., Varpio, L., St-Onge, C. & Chamberland, M., 2019, 'Self-explanation to support knowledge development for clinical reasoning: Perspectives from third year medical clerks', *MedEdPublish* 8(3), 1–11, doi.org/10.15694/mep.2019.000225.1.

Chhinzer, N. & Russo, A.M., 2018, 'An exploration of employer perceptions of graduate student employability', *Education and Training* 60(1), 104–120, doi.org/10.1108/ET-06-2016-0111.

Coetzee, S.A. & Schmulian, A., 2012, 'A critical analysis of the pedagogical approach employed in an introductory course to IFRS', *Issues in Accounting Education* 27(1), 83–100, doi.org/10.2308/iace-10220.

Coetzee, S.A. & Schmulian, A., 2013, 'The effect of IFRS adoption on financial reporting pedagogy in South Africa', *Issues in Accounting Education* 28(2), 243–251, doi.org/10.2308/iace-50386.

Coetzee, S.A., Schmulian, A. & Kotze, L., 2014, 'Communication apprehension of South African accounting students: The effect of culture and language', *Issues in Accounting*

Education 29(4), 505–525, doi.org/10.2308/iace-50850.

Connolly, P., Keenan, C. & Urbanska, K., 2018, 'The trials of evidence-based practice in education: a systematic review of randomised controlled trials in education research 1980–2016', *Educational Research* 60(3), 276–291, doi.org/10.1080/00131881.2018.1493353.

Cooper, S., 2017, 'A collaborative assessment of students' placement learning', *Assessment and Evaluation in Higher Education* 42(1), 61–76, doi.org/10.1080/02602938.2015.1083093.

Darnon, C., Dompnier, B. & Poortvliet, M.., 2012, 'Achievement goals in educational contexts. A social psychology perspective.', *Social and Personality Psychology Compass* 6(10), 760–771.

Dolce, V., Emanuel, F., Cisi, M. & Ghislieri, C., 2020, 'The soft skills of accounting graduates: perceptions versus expectations', *Accounting Education* 29(1), 57–76, doi.org/10.1080/09639284.2019.1697937.

Duran, D., 2017, 'Learning-by-teaching. Evidence and implications as a pedagogical mechanism', *Innovations in Education and Teaching International* 54(5), 476–484, doi.org/10.1080/14703297.2016.1156011.

Edmond, T. & Tiggeman, T., 2009, 'Accounting Experiences In Collaborative Learning', *American Journal of Business Education* 2(7), 97–100, doi.org/10.19030/ajbe.v2i7.4588.

Engel, A.M., 2018, 'Literature Review of Student Characteristics and Performance in an Accounting Course', *Community College Journal of Research and Practice* 42(10), 748–751, doi.org/10.1080/10668926.2017.1328320.

Feldstein, S., Dohm, F.A. & Crown, C.L., 2001, 'Gender and speech rate in the perception of competence and social attractiveness', *Journal of Social Psychology* 141(6), 785–806, doi.org/10.1080/00224540109600588.

Fiorella, L., 2021, 'Fostering knowledge building in learning by teaching: A test of the drawing-facilitates-explaining hypothesis', *Applied Cognitive Psychology* 35(2), 548–558, doi.org/10.1002/acp.3774.

Fiorella, L. & Mayer, R.E., 2013, 'The relative benefits of learning by teaching and teaching expectancy', *Contemporary Educational Psychology* 38, 281–288, doi.org/10.1016/j.cedpsych.2013.06.001.

Fiorella, L., Mayer, R.E., 2016, 'Eight Ways to Promote Generative Learning', *Educational*

Psychology Review 28, 717–741, https://doi.org/10.1007/s10648-015-9348-9.

Frank, J.R., Snell, L.S., Cate, O. Ten, Holmboe, E.S., Carraccio, C., Swing, S.R., Harris, P., Glasgow, N.J., et al., 2010, 'Competency-based medical education: Theory to practice', *Medical Teacher* 32(8), 638–645, doi.org/10.3109/0142159X.2010.501190.

Gammie, E., Paver, B., Gammie, B. & Duncan, F., 2003, 'Gender differences in accounting education.pdf', *Accounting Education* 12(2), 177–196.

Giuliodori, M.J., Lujan, H.L. & DiCarlo, S.E., 2008, 'Collaborative group testing benefits high- and low-performing students', *Advances in Physiology Education* 32(4), 274–278, doi.org/10.1152/advan.00101.2007.

Hargreaves, E., 2007, 'The validity of collaborative assessment for learning', *Assessment in Education: Principles, Policy and Practice* 14(2), 185–199, doi.org/10.1080/09695940701478594.

Harris, P., Bhanji, F., Topps, M., Ross, S., Lieberman, S., Frank, J.R., Snell, L. & Sherbino, J., 2017, 'Evolving concepts of assessment in a competency-based world', *Medical Teacher* 39(6), 603–608, doi.org/10.1080/0142159X.2017.1315071.

Hoogerheide, V., Deijkers, L., Loyens, S.M.M., Heijltjes, A. & van Gog, T., 2016, 'Gaining from explaining: Learning improves from explaining to fictitious others on video, not from writing to them', *Contemporary Educational Psychology* 44, 95–106, doi.org/10.1016/j.cedpsych.2016.02.005.

Hoogerheide, V., Renkl, A., Fiorella, L., Paas, F. & van Gog, T., 2019, 'Enhancing Example-Based Learning: Teaching on Video Increases Arousal and Improves Problem-Solving Performance', *Journal of Educational Psychology* 111(1), 45–56, doi.org/10.1037/edu0000272.

Huguet, P. & Kuyper, H., 2017, 'Applying Social Psychology to the Media', in *Applied Social Psychology: Understanding and Addressing Social and Practical Problems*, L. Steg, K. Keizer, A.. Buunk, & T. Rothengatter, Eds., Cambridge University Press, pp. 172–192, doi.org/10.4135/9781071800591.n7.

Jackson, D. & Meek, S., 2021, 'Embedding work-integrated learning into accounting education: the state of play and pathways to future implementation', *Accounting Education* 30(1), 63–85, doi.org/10.1080/09639284.2020.1794917.

Jacob, L., Lachner, A. & Scheiter, K., 2020, 'Learning by explaining orally or in written form ? Text complexity matters', *Learning and Instruction* 68, 101344, doi.org/10.1016/j.learninstruc.2020.101344.

Kobayashi, K., 2021, 'Effects of collaborative versus individual preparation on learning by teaching', *Instructional Science* 49(6), 811–829, doi.org/10.1007/s11251-021-09561-6.

Koles, P.G., Stolfi, A., Borges, N.J., Nelson, S. & Parmelee, D.X., 2010, 'The impact of team-based learning on medical students' Academic Performance', *Academic Medicine* 85(11), 1739–1745, doi.org/10.1097/ACM.0b013e3181f52bed.

Lachner, A., Ly, K.T. & Nückles, M., 2018, 'Providing Written or Oral Explanations? Differential Effects of the Modality of Explaining on Students' Conceptual Learning and Transfer', *Journal of Experimental Education* 86(3), 344–361, doi.org/10.1080/00220973.2017.1363691.

Lachner, A., Backfisch, I., Hoogerheide, V., van Gog, T. & Renkl, A., 2020, 'Timing Matters! Explaining Between Study Phases Enhances Students' Learning', *Journal of Educational Psychology* 112(4), 841–853, doi.org/10.1037/edu0000396.

Lachner, A., Hoogerheide, V., van Gog, T. & Renkl, A., 2021, 'Learning-by-Teaching Without Audience Presence or Interaction: When and Why Does it Work?', *Educational Psychology Review*, doi.org/10.1007/s10648-021-09643-4.

Lawson, R.A., Blocher, E.J., Brewer, P.C., Cokins, G., Sorensen, J.E., Stout, D.E., Sundem, G.L., Wolcott, S.K. & Wouters, M.J.F., 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.org/10.2308/iace-50673.

Mahoney, J.W. & Harris-Reeves, B., 2019, 'The effects of collaborative testing on higher order thinking: Do the bright get brighter?', *Active Learning in Higher Education* 20(1), 25–37, doi.org/10.1177/1469787417723243.

McKenzie, J.F., Wood, M.L., Kotecki, J.E. & Clark, J.K., 1999, 'Establishing content validity: using qualitative and quantitative steps', *American Journal of Health Behaviour* 4(23), 311–318.

Mehrabi Boshrabadi, A. & Hosseini, M.R., 2021, 'Designing collaborative problem solving assessment tasks in engineering: an evaluative judgement perspective', *Assessment and Evaluation in Higher Education* 46(6), 913–927, doi.org/10.1080/02602938.2020.1836122.

Okita, S.Y. & Schwartz, D.L., 2013, 'Learning by Teaching Human Pupils and Teachable Agents: The Importance of Recursive Feedback', *Journal of the Learning Sciences* 22(3), 375–412, doi.org/10.1080/10508406.2013.807263.

Paris, S.G. & Paris, A.H., 2001, 'Classroom applications of research on self-regulated learning', *Educational Psychologist* 36(2), 89–101, doi.org/10.1207/S15326985EP3602_4.

Partnership for 21 st Century Skills, 2015, 'Partnership for 21St Century Skills-Core Content Integration', *Ohio Department of Education* 1–70, from www.P21.org.

Pathways Commission, 2015, *In Pursuit of Accounting's Curricula of the Future*, from http://commons.aaahq.org/posts/c0a7037eea.

Plant, K., Barac, K. & Sarens, G., 2019, 'Preparing work-ready graduates – skills development lessons learnt from internal audit practice', *Journal of Accounting Education* 48, 33–47, doi.org/10.1016/j.jaccedu.2019.06.001.

Ribosa, J. & Duran, D., 2022, 'Do students learn what they teach when generating teaching materials for others? A meta-analysis through the lens of learning by teaching', *Educational Research Review* 37(July), 100475, doi.org/10.1016/j.edurev.2022.100475.

Rodgers, W., Simon, J. & Gabrielsson, J., 2017, 'Combining experiential and conceptual learning in accounting education: A review with implications', *Management Learning* 48(2), 187–205, doi.org/10.1177/1350507616669479.

Schmulian, A. & Coetzee, S.A., 2019, 'Students' experience of team assessment with immediate feedback in a large accounting class', *Assessment and Evaluation in Higher Education* 44(4), 516–532, doi.org/10.1080/02602938.2018.1522295.

Schuwirth, L.W. & Van der Vleuten, C.P., 2020, 'A History of Assessment in Medical Education', *Advances in Health Sciences Education* 25(5), 1045–1056.

Schwartz, D.L., 1999, 'The productive agency that drives collaborative learning', *Collaborative learning: Cognitive and computational approaches* 197–218, doi.org/10.1016/j.cbpra.2007.04.002.Preventing.

Schwartz, D.L., Bransford, J.D. & Sears, D., 2005, 'Efficiency in Innovation and Transfer', *Transfer of Learning from a Modern Multidisciplinary Perspective* 1–51.

Simonds, B.K., Meyer, K.R., Quinlan, M.M. & Hunt, S.K., 2006, 'Effects of Instructor Speech Rate on Student Affective Learning, Recall, and Perceptions of Nonverbal Immediacy, Credibility, and Clarity', *Communication Research Reports* 23(3), 187–197, doi.org/10.1080/08824090600796401.

Sistermans, I.J., 2020, 'Integrating competency-based education with a case-based or problem-based learning approach in online health sciences', *Asia Pacific Education*

Review 21(4), 683–696, doi.org/10.1007/s12564-020-09658-6.

Sotola, L.K. & Crede, M., 2021, 'Regarding Class Quizzes: a Meta-analytic Synthesis of Studies on the Relationship Between Frequent Low-Stakes Testing and Class Performance', *Educational Psychology Review* 33(2), 407–426, doi.org/10.1007/s10648-020-09563-9.

Strand Norman, C., Rose, A.M. & Lehmann, C.M., 2004, 'Cooperative learning: Resources from the business disciplines', *Journal of Accounting Education* 22(1), 1–28, doi.org/10.1016/j.jaccedu.2004.01.001.

Venter, E.R. & de Villiers, C., 2013, 'The accounting profession's influence on academe: South African evidence', *Accounting, Auditing and Accountability Journal* 26(8), 1246–1278, doi.org/10.1108/AAAJ-06-2012-01027.

Villarroel, V., Boud, D., Bloxham, S., Bruna, D. & Bruna, C., 2020, 'Using principles of authentic assessment to redesign written examinations and tests', *Innovations in Education and Teaching International* 57(1), 38–49, doi.org/10.1080/14703297.2018.1564882.

Van der Vleuten, C.P.M., 2015, 'Competency-based education is beneficial for professional development', *Perspectives on Medical Education* 4(6), 323–325, doi.org/10.1007/s40037-015-0232-6.

Wagner, R.M. & Huang, J.C., 2011, 'Relative Performance Of English Second Language Students In University Accounting Courses', *American Journal of Business Education* 4(5), 31–38, doi.org/10.19030/ajbe.v4i5.4222.

Wilson, R.M.S., 2011, 'Alignment in accounting education and training', *Accounting Education* 20(1), 3–16, doi.org/10.1080/09639284.2011.555940.

Wittwer, J. & Renkl, A., 2008, 'Why instructional explanations often do not work: A framework for understanding the effectiveness of instructional explanations', *Educational Psychologist* 43(1), 49–64, doi.org/10.1080/00461520701756420.

3.9 APPENDIX FOR RESEARCH PAPER 2

APPENDIX B — INSTRUCTIONS GIVEN TO STUDENTS FOR RESEARCH PAPER 2 OF THIS THESIS

A fellow student could not attend the contact sessions (classes) that explained the preparation of the ordinary and preference shareholders' analyses of owners' equity, for a group of companies in which a parent entity has a controlling interest in a subsidiary that has both ordinary and preference share capital in issue. The fellow student also missed the contact sessions that explained how to treat an upward revaluation (for consolidation purposes) of the equipment of a subsidiary at acquisition and how accumulated losses of a subsidiary at acquisition will affect the preparation of the analyses.

3.9.1 Instructions:

Your team has been allocated to either the video or written explanation setting for the assignment. If you are in the video explanation setting, please refer to point 3.9.1.1. If you are in the written explanation setting, please refer to point 3.9.1.2.

3.9.1.1 Video explanation mode instructions:

Your team is required to produce a five-minute video explanation of the preparation of the ordinary and preference shareholders' analyses of owners' equity, for a group of companies in which a parent entity has a controlling interest in a subsidiary which has both ordinary and preference share capital in issue. The equipment of the subsidiary needed to be revalued upwards at the date when the parent obtained control of the subsidiary (at acquisition) and the subsidiary also had an accumulated loss at acquisition. The revaluation of the equipment is for consolidation purposes only and has not been recorded in the separate financial statements of the subsidiary.

The collaboratively prepared explanation must explain the above to your fellow student who missed the contact sessions. The explanation must be video recorded (only students

standing in front of a camera while explaining the topic – no animations or PowerPoint videos are allowed).
Before preparing your explanation, please outline how you would structure your explanation in bullet points.

Important: Take care that your explanation is understandable for the fellow student, who missed the contact sessions, without any further learning material. That said, you should include the main steps to be followed in the preparation of both the ordinary and preference shareholders' analyses of the owners' equity for a subsidiary which has both ordinary and preference share capital in issue. You should also explain how the revaluation of the equipment (at acquisition) and the accumulated loss of the subsidiary (at acquisition) should be treated in the preparation of the analyses of the owners' equity of the subsidiary. Teams must ensure that they stick to the time limit for their explanation. For an explanation of the grade calculation for the assignment, please refer to point 3.9.1.3.

3.9.1.2 Written explanation mode instructions:

Your team is required to produce a written explanation of the preparation of the ordinary and preference shareholders' analyses of owners' equity, for a group of companies in which a parent entity has a controlling interest in a subsidiary which has both ordinary and preference share capital in issue. The equipment of the subsidiary needed to be revalued upwards at the date when the parent obtained control of the subsidiary (at acquisition) and the subsidiary also had an accumulated loss at acquisition. The revaluation of the equipment is for consolidation purposes only and has not been recorded in the separate financial statements of the subsidiary.

The collaboratively prepared explanation must explain the above to your fellow student who missed the contact sessions. Your explanation must be in writing. Your written explanation must be approximately 750 words in length. The written explanation may not vary more than 25 words from the 750 words (i.e. it may not be longer than 775 words or shorter than 725 words). Before preparing your explanation, please outline how you would structure your explanation in bullet points.

Important: Take care that your explanation is understandable for the fellow student, who missed the contact sessions, without any further learning material. That said, you should include the main steps to be followed in the preparation of both the ordinary and preference shareholders' analyses of the owners' equity for a subsidiary which has both ordinary and preference share capital in issue. You should also explain how the revaluation of the equipment (at acquisition) and the accumulated loss of the subsidiary (at acquisition) should be treated in the preparation of the analyses of the owners' equity of the subsidiary. Teams must ensure that they stick to the word limit for their written explanation. For an explanation of the grade calculation for the assignment, please refer to point 3.9.1.3.

3.9.1.3 Calculation of grade for the assignment:

Your individual total grade will be calculated as follows:

- A portion of your total grade will be the grade that your team receives for their collaboratively prepared explanation.
- A portion of your total grade will be the collaboration mark you received from your team members (refer to point 3.9.1.3.1). Each team member will be required to give an anonymous evaluation of each team member's individual level of collaboration in collaboratively preparing the team's explanation.

NOTE: It is not possible for your team members to determine what grades you gave them for the evaluation of their collaboration. The evaluation is completely anonymous and each team member will only receive the overall average score they received from their team as a whole.

3.9.1.3.1 Marks for your level of collaboration in preparing the explanation:

Peer review by individual team members:

An individual grade will be allocated to each team member, based on that team member's level of collaboration.

The peer reviews are completely anonymous. No team member will know what rating he/she received from any other team member.

The peer review of team members will be done by completing a survey using the Ipeer functionality on ClickUP, once the team explanation has been submitted. The peer review questions will be as follows:

Please rate **each team member's** effectiveness individually on a ***scale of 1 (strongly disagree) to 7 (strongly agree)*** for each of the following questions:

Category 1: Contributing to the team's work:

1. The specific team member did a fair share of the team's work.
2. The specific team member fulfilled their responsibilities to the team.
3. The specific team member came to team meetings prepared.
4. The specific team member completed work in a timely manner.
5. The specific team member did work that was complete and accurate.
6. The specific team member made important contributions to the team's final product.
7. The specific team member kept trying when faced with difficult situations.
8. The specific team member offered to help teammates when it was appropriate.

Category 2: Interacting with team mates:

9. The specific team member communicated effectively.
10. The specific team member facilitated effective communication in the team.
11. The specific team member exchanged information with teammates in a timely manner.
12. The specific team member provided encouragement to other team members.
13. The specific team member expressed enthusiasm about working as a team.
14. The specific team member heard what teammates had to say about issues that affected the team.
15. The specific team member got team input on important matters before going ahead.
16. The specific team member accepted feedback about strengths and weaknesses from teammates.

17. The specific team member used teammates' feedback to improve performance.
18. The specific team member let other team members help when it was necessary.

Category 3: Keeping the team on track:

19. The specific team member stayed aware of fellow team members' progress.
20. The specific team member assessed whether the team was making progress as expected.
21. The specific team member stayed aware of external factors that influenced team performance.
22. The specific team member provided constructive feedback to others on the team.
23. The specific team member motivated others on the team to do their best.
24. The specific team member made sure that everyone on the team understood important information.
25. The specific team member helped the team to plan and organize its work.

Category 4: Expecting quality:

26. The specific team member expected the team to succeed.
27. The specific team member believed that the team could produce high-quality work.
28. The specific team member cared that the team produced high-quality work.
29. The specific team member believed that the team should achieve high standards.

Category 5: Having relevant knowledge and skills:

30. The specific team member had the skills and expertise to do excellent work.
31. The specific team member had the skills and abilities that were necessary to do a good job.
32. The specific team member had enough knowledge of teammates' jobs to be able to fill in if necessary.
33. The specific team member knew how to do the jobs of other team members.

4. CHAPTER 4: COMBINED AND EXTENDED RESULTS WHEN CONSIDERING THE DIFFERENT EXPLANATION MODES CONTAINED IN RESEARCH PAPER 1 AND RESEARCH PAPER 2

In this thesis, students were required, in their teaching teams, to collaboratively prepare an oral recording (podcast) (Chapter 2, Research Paper 1), a video recording, and a written explanation (Chapter 3, Research Paper 2) of course content. This chapter of the thesis provides a combination and comparison, as far as possible, of the data and findings from the two research papers contained in this thesis as they relate to the differential effects of explanation modality on the findings for research question 2 (RQ2) and research question 4 (RQ4) of this thesis:

RQ2: Do varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential conceptual and transfer knowledge benefits for accounting students, in a competency-based accounting education context?

RQ4: Do accounting students experience that varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential teamwork and communication skills development opportunities in a competency-based accounting education context?

The aim of this chapter of the thesis is not to override the individual findings and contributions of the two research papers contained in this thesis, but rather to add an additional layer of understanding to the differential effects of the modality of explanations on the findings for RQ2 and research RQ4 of the thesis. This chapter of the thesis combines and compares data and findings related to RQ2 and RQ4 of the thesis that are similar in nature and measurement across the two research papers in this thesis. The measurement of the benefits of the student-led team-teaching tasks, which incorporate learning-by-explaining (referred to as learning-by-team-teaching intervention in Research Paper 1 and a team-based explanation in Research Paper 2) was largely consistent. This allows for an overall combination and comparison of the data and findings regarding the knowledge and teamwork skills, and communication skills development benefits of the student-led team-

teaching tasks, which incorporate learning-by-explaining, from the two research papers included in this thesis.

The first part of this chapter (Chapter 4) of the thesis compares the knowledge development benefits of the student-led team-teaching tasks, which incorporate learning-by-explaining, from Research Paper 1 and Research Paper 2. The combination and comparison of the knowledge development data from the varying modes of explanations from the two research papers of this thesis are done to provide greater insight into the findings from the individual research papers to answer RQ2 of this thesis. Students' knowledge development in the form of conceptual and transfer knowledge from the student-led team-teaching tasks, which incorporate learning-by-explaining, in an oral (Research Paper 1), video (Research Paper 2), and written (Research Paper 2) mode are compared. This is made possible because the data for students' change in conceptual knowledge was collected from the same student cohort and measured in the same manner in both Research Paper 1 and Research Paper 2. Although Research Paper 1 did not specifically report on students' transfer knowledge, as this was not an aim of Research Paper 1, it was, however, possible to compute transfer knowledge for the sample of students contained in Research Paper 1. Transfer knowledge for this part of Chapter 4 was thus computed and measured for the sample of students from Research Paper 1 in the same manner as it was done for the sample of students from Research Paper 2. This, therefore, also allowed for a comparison of transfer knowledge benefits across all three modes (oral, video, and written) of the student-led team-teaching tasks, which incorporate learning-by-explaining, contained in the two research papers of this thesis.

The second part of Chapter 4 combines the data from Research Paper 1 and Research Paper 2 in order to provide more comprehensive insight into the findings from the two research papers of this thesis in answering RQ4 of this thesis. This is made possible because the survey data used to answer RQ4 of this thesis is available from the collected survey data in Research Paper 1 and Research Paper 2. The survey questions for the purposes of RQ4 are contained in the surveys used in both research papers and the data for these research questions were collected from the same student cohort and measured in the same manner across both research papers.

4.1 PART 1 OF CHAPTER 4: OVERALL RESULTS FOR RQ2

This section of the thesis provides an overarching comparison of the conceptual and transfer knowledge development benefits from all three modes (oral, video, and written) of the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis. It thus combines and compares the conceptual and transfer knowledge findings from Research Paper 1 and Research Paper 2. It starts with combining and comparing the conceptual knowledge data and then combines and compares the transfer knowledge data.

In order to report on the combination and comparison of the knowledge development benefits from the varying modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, contained in Research Paper 1 and Research Paper 2, this section will make use of exploratory ordinary least squares (OLS) regression analysis, as was done in Research Paper 2 of this thesis. The OLS regression analysis is performed in order to explore the association between the students' conceptual knowledge development and their transfer knowledge with the three explanation modes (oral, written, and video) of the student-led team-teaching tasks, which incorporate learning-by-explaining, from the two research papers. The regression formulas (one for conceptual knowledge and one for transfer knowledge) are the same as those used in Research Paper 2, except that an indicator variable for the oral explanation mode is now added. The regressions thus control for prior academic performance, gender, first language, and presenter status[36] as was done in Research Paper 2 (Chapter 3).

The exploratory OLS regression for conceptual knowledge development is as follows:

$$\Delta CK = \beta_0 + \beta_1 OralMode + \beta_2 WrittenMode + \beta_3 PriorPerf + \beta_4 Gender + \beta_5 Language + \beta_6 Presenter + \epsilon$$

The exploratory OLS regression for transfer knowledge is as follows:

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

$$TK = \beta_0 + \beta_1 OralMode + \beta_2 WrittenMode + \beta_3 PriorPerf + \beta_4 Gender + \beta_5 Language + \beta_6 Presenter + \epsilon$$

Dependent variables

As was done in Research Paper 2, ΔCK denotes the change in a student's conceptual knowledge. Change in conceptual knowledge (ΔCK) is delineated as the difference between the students' percentage scores in the conceptual knowledge pre-and post-test. Conceptual knowledge refers to the accounting domain knowledge that 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.

TK, as was done in Research Paper 2, denotes a student's transfer knowledge and 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 determined as successfully reinterpreting learned information (Lachner, Ly & Nückles 2018; Schwartz, Bransford & Sears 2005) as was done in Research Paper 2 (Chapter 3) of this thesis.

Variables of interest

Oralmode is an indicator variable coded one for an oral explanation or zero for a written or video explanation. Given that this part of the thesis explores the influence of the explanation mode of student-led team-teaching tasks, which incorporate learning-by-explaining, on students' knowledge, the coefficients on this variable were not predicted.

Writtenmode is an indicator variable coded one for a written explanation or zero for an oral or video explanation. Given that this part of the thesis explores the influence of the explanation mode of team-teaching tasks which incorporate learning-by-explaining, on students' knowledge, the coefficients on this variable were not predicted.

Control variables

The control variables are defined as they were in Research Paper 2. *PriorPerf* denotes a student's prior academic performance, measured as the student's percentage mark obtained in the pre-test[37] of this thesis. As learning in teams may yield differential benefits on the academic performance of lower- or higher-performing students (Giuliodori, Lujan & DiCarlo 2008; Koles, Stolfi, Borges, Nelson & Parmelee 2010; Mahoney & Harris-Reeves, 2019), the sign of this coefficient in the regressions was not predicted. Including this control variable also controls for any potential differences in students' pre-test scores, across the three modes of the student-led team-teaching tasks, which incorporate learning-by-explaining.

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 language of instruction) and zero otherwise. Again, as noted in Research Paper 2, mixed findings exist for the influence of gender (Gammie, Gammie & Duncan 2003; Engel, 2018) and the difference between home language and instruction language (Coetzee, Schmulian & Kotze 2014; Coetzee & Schmulian 2013; Wagner & Huang 2011) on accounting students' academic performance. As such, the sign of the coefficients for *Gender* and *Language* were not predicted.

Presenter was coded as one if a student from the oral or video explanation mode served as a presenter, and zero if a student was either a non-presenter in the oral or 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. Extra time on task was identified as a potential factor that may influence the learning benefits that students experience because students who presented (delivered) either an oral or a video explanation may have been considered to have spent extra time on the student-led team-teaching task, which incorporates learning-by-explaining, compared to students who prepared a written explanation. The instructions for the student-led team-teaching tasks, which incorporate

[37] The same pre-test was used for Research Paper 1 and Research Paper 2 of this thesis.

learning-by-explaining, specifically required the following of the students from the three explanation modes:

- Students in the written explanation mode were required to write an explanation.
- Students in the oral explanation mode were required to prepare a script and then deliver an oral recording of their team explanation.
- Students in the video explanation mode were required to prepare a script and then deliver a video recording of their team explanation.

The script writing for the oral and video explanation modes could be considered equal to some degree to the written explanation mode, as writing a script would also entail writing an explanation. Not all students in the oral and video explanation mode emerged as presenters, as some team members in the oral and video explanation mode only participated in preparing the script for their team's oral or video explanation. Students who were presenters (i.e. the students who delivered the oral or video recording of their team's explanation) in the oral or video explanation mode could thus have been considered to have spent extra time on task, compared to the students who were allocated to the written explanation mode, or compared to students who were only involved in preparing the script for their team's oral or video explanation. The *Presenter* control variable aided in determining if explanation mode, aside from additional time on task, contributed to any learning gains from the student-led team-teaching task, which incorporates learning-by-explaining. 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 oral and video explanation mode were asked to complete a survey[38] indicating whether they served as a presenter.

[38] Although the researcher did have access to the oral and video recordings of the team explanations, students were not asked to identify themselves in the oral and video recordings of the team explanations. It was thus not possible to identify which students were presenters in the oral and video recordings other than by asking students to indicate this via the survey instrument of the thesis.

Sample of students for Part 1 of Chapter 4

The sample of students used to provide the overall combination and comparison of the knowledge development benefits (in the form of conceptual and transfer knowledge) of the oral, video, and written explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, from the two research papers of this thesis is drawn from the samples that were used in the two research papers of this thesis. Data for all the regression variables for this part of Chapter 4 was thus collected from the data used in Research Paper 1 and Research Paper 2. The 305-student sample size for this part of Chapter 4 was thus determined by including 90 students from the oral mode (114 students from the first research paper in Chapter 2 of this thesis less, 15 students for whom the presenter control variable could not be determined[39] and 9 students who were repeaters[40]), 103 students from the video mode (as per Research Paper 2), and 112 students from the written mode (as per Research Paper 2). As per Research Paper 1 and Research Paper 2, this sample was determined after excluding the data of those students who did not give consent for their data to be analysed (n = 65), did not participate in the pre-test (n = 12) or post-test (n = 11), for whom a prior year mark could not be obtained or who were repeating the course (n = 52), did not complete the survey (32), or was identified as outliers following box plot analysis (12).

4.1.1 Conceptual knowledge findings related to RQ2 of this thesis

Table 4-1 provides a comparison of the conceptual knowledge findings from Research Paper 1 and Research Paper 2.

[39] Students were asked to voluntarily complete a survey in which they were asked to indicate if they were a presenter in their oral presentation. The survey results were not used for the purpose of Research Paper 1. Of the total 114 students included in Research Paper 1, 15 students did not complete the survey. These 15 students were excluded from this part of the analysis as they do not have a value for the presenter control variable of the regression analysis.

[40] Repeat students were not excluded from the data analysis in Research Paper 1. Repeat students, were, however, excluded from Research Paper 2. To allow for the overall comparison between the two research papers contained in this thesis, repeaters were removed from the data from Research Paper 1.

Table 4- 1 Overall change in conceptual knowledge per explanation mode

	Oral mode		Video mode		Written mode	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Prior performance (Pre-test conceptual knowledge)	64.11	16.77	57.28	19.88	65.18	17.95
Post-test conceptual knowledge	66.19	16.52	64.77	20.04	64.31	17.47
Change in conceptual knowledge	2.07	13.10	7.27	15.50	-0.88	14.26

The findings per Table 4-1 appear to indicate that the mean pre-test conceptual knowledge percentage of the students from the video explanation mode is less than the mean pre-test conceptual knowledge percentages of students from the other two (oral and written) explanation modes. The mean post-test conceptual knowledge percentages of the students from the three explanation modes however appear to be more similar to each other, with the students from the oral explanation mode having the largest mean post-test conceptual knowledge percentage. Table 4-1 also appears to indicate that the mean change in conceptual knowledge percentage of students from the video explanation appears to be the highest. Analysis of variance of the pre-test conceptual knowledge scores, per the first row of Table 4-1, indicates that the pre-test conceptual knowledge of students from the three explanation modes is significantly different ($F = 5.697$, $p = 0.004$) from each other. Post hoc Scheffe test [41] results indicate that, although students were randomly[42] assigned to the three explanation modes, the pre-test scores of students from written and video explanation mode ($I\text{-}J = 7.89$, $p = 0.007$) and the oral and video explanation mode ($I\text{-}J = 6.83$, $p = 0.036$) are significantly different[43] from each other. The pre-test scores for students from the oral and written explanation mode ($I\text{-}J = -.06$, $p = 0.58$) are, however, not significantly different from

[41] Statistically significant one-way ANOVA test results give rise to multiple comparison problems. Post-hoc tests help to clarify between which groups, used in the one-way ANOVA, significant differences exist (Juarros-Basterretxea et al. 2024).

[42] As explained in Research Paper 2 the allocation of students to teams in the three explanation modes was performed as follows: Students were first grouped based on their prior academic performance in the preceding accounting course. Students were then randomly selected from each group to form teams of approximately six, ensuring that each team included both academically stronger and weaker students (Schmulian & Coetzee 2019a). The team allocation procedure aligns with recommendations from accounting education research, which advocates for the formation of heterogeneous teams comprising around four to six students (Edmond & Tiggeman 2009). Subsequently, the teams were randomly designated to either the oral, written, or video explanation mode.

[43] Differences in the students' pre-test conceptual knowledge between the explanation modes are addressed in the forthcoming regression analysis. The forthcoming regression analysis controls for the differences in the pre-test conceptual knowledge of students from the three explanation modes.

each other. The significant differences in the pre-test scores between the written and video explanation modes as per Table 4-1 align with the preliminary findings per Research Paper 2 (Chapter 3), which also found that the pre-test scores for students' conceptual knowledge were significantly different between the written and video explanation modes.

An analysis of variance of the change in conceptual knowledge for the three explanation modes indicates that the change in conceptual knowledge, between the three explanation modes, is significantly different ($F = 8.772$, $p < 0.001$). Scheffe post hoc test results indicate that the change in conceptual knowledge between the written and the video explanation modes are significantly different ($I\text{-}J = -8.14$, $p < 0.001$) from each other. The change in conceptual knowledge for the oral explanation mode is also significantly different from the change in conceptual knowledge for the video explanation mode ($I\text{-}J = -5.207$, $p = 0.04$). The change in conceptual knowledge for the oral explanation mode is, however, not significantly different from the written explanation mode ($I\text{-}J = 2.94$, $p = 0.35$).

The preliminary findings with respect to the change in conceptual knowledge appear to indicate that the written and oral explanation modes are less beneficial for conceptual knowledge development when compared to the video explanation mode. The written explanation mode may even be detrimental to conceptual knowledge development. This preliminary indication does, however, not control for the significant difference in the pre-test conceptual knowledge of the students from the written and oral explanation modes compared to that of students in the video explanation mode. To control for differences in the pre-test conceptual knowledge of students from the three explanation modes and to provide more informative findings, the regression analysis which controls for students' pre-test knowledge (*PriofPerf*), gender, language, and presenter status was performed (Table 4-2).

Table 4- 2 Regression results – Conceptual knowledge

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

Variables	Prediction	Unstandardized B	t-statistic	Sig.
(Constant)		24.46	7.64	< 0.001**
OralMode	±	-2.46	-1.27	0.21
WrittenMode		-4.12	-1.90	0.60
PriorPerf	±	-0.30	-7.27	< 0.001**
Gender	±	-3.34	-2.16	0.03*
Language	±	0.31	0.20	0.85
Presenter	+	3.06	1.58	0.12
F-statistic = 14.26 (p < .001)		Significance:		
Adjusted R^2 = .21		**p < .01		
n = 305		* p < .05		

The regression results per Table 4-2 indicate that neither the oral (t = -1.27, p = 0.21) nor the written (t = -1.90, p = 0.60) explanation mode result in significantly less conceptual knowledge development benefits compared to the video explanation mode. Prior performance (pre-test conceptual knowledge) does however have a significant coefficient (t = -7.27, p < 0.001). The significantly negative coefficient for prior performance potentially indicates, as has been found in other team-based learning tasks (Mahoney & Harris-Reeves 2019; Koles, Stolfi, Borges, Nelson & Parmelee 2010; Giuliodori et al. 2008), that the knowledge development benefits derived from the student-led team-teaching tasks, which incorporate learning-by-explaining, may vary for students from different prior performance levels. To explore this, the entire sample of students was stratified based on their prior performance as was done in Research Paper 2 of this thesis. Students were categorised into three prior performance levels at the 33rd, 66th, and 100th percentile (low, moderate, and top performers). Table 4-3 provides the details of the change in conceptual knowledge per explanation mode and per the students' level of prior performance.

An analysis of variance for the low performers (F = 2.88, p = 0.06) indicates that no significant difference exists between the pre-test scores for the low performers from the oral, video, and written explanation modes. A Welch t-test was performed for the moderate

performers as the homogeneity of variance test for the moderate performers failed (Levene's test failed for the moderate performers). The Welch t-test results ($t = 0.71$, $p = 0.50$) indicate that the pre-test scores for the moderate-performing students from the three modes do not differ significantly. Lastly, analysis of variance results for the top-performing students also indicates that there is no significant difference in the pre-test scores for the top performers across the three modes ($F = 2.05$, $p = 0.13$).

As no significant difference exists between the pre-test scores for the low, moderate, and top performers across the three explanation modes, an analysis of variance will be used to compare the changes in the students' conceptual knowledge per prior performance category across the three explanation modes. One-way analysis of variance results indicates that the change in conceptual knowledge for the low ($F = 1.62$, $p = 0.20$) and moderate performers ($F = 0.77$, $p = 0.47$) is not significantly different across the three explanation modes. This is, however, not the case for the top-performing students.

The change in conceptual knowledge for the top performers is significantly different across the three explanation modes ($F = 6.70$, $p = 0.002$). Scheffe post hoc test results indicate that the change in conceptual knowledge of top performers between the written and the video explanation modes is significantly different (I-J = -9.19, $p < 0.00$) from each other, but that the change in conceptual knowledge of top performers for the oral explanation mode is not significantly different from the written (I-J = 3.22, $p = 0.43$) or video (I-J = -5.97, $p = 0.09$) explanation mode.

The findings from the analysis of variance for the change in conceptual knowledge confirm the findings from Research Paper 2 which also found that the top-performing students appear to be most affected by the explanation mode. Top performers who prepared written explanations, compared to those who prepared oral and video explanations, appear worse off in terms of conceptual knowledge development. The analysis of variance results does not control for gender, language, and presenter status. Given the significant difference in change in conceptual knowledge identified for the top-performing students, a regression analysis for this group of students which controls for gender, language, and presenter status as was done in Research Paper 2 was performed (Table 4-4).

Table 4- 3 Conceptual knowledge per prior performance category and explanation mode

Panel A:
Pre and post-test conceptual knowledge per prior performance category and explanation mode

	Oral mode Low (n = 24) Moderate (n = 30) Top (n = 36)				Video mode Low (n = 41) Moderate (n = 28) Top (n = 34)				Written mode Low (n = 26) Moderate (n = 39) Top (n = 47)			
	Pre-test conceptual knowledge		Post-test conceptual knowledge		Pre-test conceptual knowledge		Post-test conceptual knowledge		Pre-test conceptual knowledge		Post-test conceptual knowledge	
Prior performance categories:	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev
Low	42.79	9.82	50.79	13.61	36.72	11.03	50.82	18.21	40.85	9.97	48.75	17.25
Moderate	62.25	2.97	67.39	14.28	62.07	4.25	67.08	15.08	61.19	4.49	62.65	14.33
Top	79.88	8.63	75.45	12.28	78.14	8.16	79.68	13.35	81.94	8.45	74.30	12.82

Panel B:
Change in conceptual knowledge per prior performance category and explanation mode

	Oral mode Low (n = 24) Moderate (n = 30) Top (n = 36)		Video mode Low (n = 41) Moderate (n = 28) Top (n = 34)		Written mode Low (n = 26) Moderate (n = 39) Top (n = 47)	
	Change in conceptual knowledge		Change in conceptual knowledge		Change in conceptual knowledge	
Prior performance categories:	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev
Low	7.96	14.00	13.57	15.78	7.90	14.11
Moderate	5.14	13.53	5.02	15.21	1.46	13.72
Top	-4.43	8.98	1.54	12.78	-7.65	11.47

The regression results indicate that top-performing students from both the oral (t = -2.14, p = 0.03) and the written (t = -2.69, p = 0.01) explanation mode experience significantly less change in conceptual knowledge compared to top-performing students who were required to prepare a video explanation[44](Table 4-4). Paper 2 (refer to Table 3-7 of this thesis) also found marginally significant (t = -1.87, p = 0.07) differences in the conceptual knowledge development of top-performing students who had prepared written explanations versus top-performing students who had prepared video explanations. The results per Table 4-4 confirm those findings and find an even stronger significance in the difference between the change in conceptual knowledge experienced by students from the written explanation mode versus students from the video explanation mode[45].

Table 4- 4 Regression results – Conceptual knowledge for top-performing students

Regression results for the association between explanation mode and the change in students' conceptual knowledge from the pre-test to the post-test for top-performing students (∆CK)

Variables	Prediction	Unstandardized B	t-statistic	Sig.
(Constant)		19.50	1.85	0.07
OralMode	±	-5.76	-2.14	0.03*
WrittenMode		-7.84	-2.69	0.01**
PriorPerf	±	-0.23	-1.81	0.07
Gender	±	-2.10	-0.95	0.34
Language	±	0.86	0.39	0.70
Presenter	+	2.18	0.81	0.42
F-statistic = 3.14 (p = .007)		Significance:		
Adjusted R^2 = .100		**p < .01		
n = 117		* p < .05		

[44] Untabulated regression results for a regression analysis which does not control for presenter status confirm the results per Table 4-4.

[45] The sample sizes used for the regression in Table 4-4 are larger than the sample sizes used for the regression in Table 3-7. This increases the power of the regression analysis. The increased power could explain the greater significance found in Table 4-4 when comparing the conceptual knowledge change for students from the written explanation mode with the change in conceptual knowledge for students from the video explanation mode for top-performing students.

Taking the results from Table 4-3 and Table 4-4 together, the video explanation mode appears to be the most beneficial mode of a student-led team-teaching task, which incorporates learning-by-explaining, if the aim is to achieve conceptual knowledge development for all students in an accounting classroom. This is because the video explanation mode provides similar conceptual knowledge development benefits to the other two explanation modes (oral and written) for low and moderate performers, but is significantly more beneficial for the conceptual knowledge development of top-performing students when compared to the oral and written explanation mode.

The differential conceptual knowledge development benefits of top-performing students from the video explanation mode may be related to the following influences[46] which were identified in Research Paper 2 of this thesis:

- Differences in the explanatory features resulting from the different modes of the explanations contained in this thesis; or
- Free-riding effects caused by the team-based design of the student-led team-teaching tasks, which incorporate learning-by-explaining.

Each of these aspects is discussed next.

4.1.1.1 Explanatory features of different explanation modes

The first possible factor that could have resulted in the differential conceptual knowledge development of the top-performing students relates to the explanatory features that are linked to the mode of an explanation. As noted in Research Paper 2, individually prepared video explanations have, for example, been found to contain more elaborations and personal references, as proxies for social presence, when compared to individually prepared written explanations (Lachner et al. 2018). The level of organisation of individually prepared written explanations has also been found to be higher than that of individually prepared video

[46] Although the potential influences listed here were discussed in Research Paper 2, Research Paper 2 only considered these influences for the written and video explanation modes. This chapter discusses the potential influences listed here by also considering these influences for the oral explanation mode. The findings regarding the potential influences listed may thus be different or add more understanding compared to the findings noted in Research Paper 2.

explanations (Lachner et al. 2018). These explanatory features have been found, in settings that required students to individually prepare explanations, to have mediating effects on students' knowledge development from the preparation of such explanations (Lachner et al. 2018). To determine whether these previously identified differences, relating to the explanatory features of different modes of an explanation, are also experienced in student-led team-teaching tasks, which incorporate learning-by-explaining, the level of organisation and the level of elaborations and personal references in this thesis' explanations are examined next.

The level of organisation was measured in the same manner as in Research Paper 2. A well-organised explanation pinpointed the main points, underscored central concepts, and was structured meaningfully. Each aspect of the topic[47] that students were required to explain was given a score out of four for how well the essence of that aspect was identified and how clearly the aspect 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 thesis, scored the explanations.

The level of social presence (as measured by the number of elaborations and personal references) was also measured in the same manner as per Research Paper 2. 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 is a statement in which a student links previous information in the study material to their prior knowledge by including examples, reporting their own experiences, or making analogies (Lachner et al. 2018).

The total sample of explanations included in this section of Chapter 4, includes 67 explanations, which consist of 22 oral explanations, 22 written explanations, and 23 video explanations. This analysis is done on a team level as explanations were prepared by teacher-teams. Table 4-5, provides the details of the level of organisation per explanation mode.

[47] Students were asked to explain three aspects (value adjustments at the 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 explanations.

Table 4- 5 Level of organisation per explanation mode

	Oral explanation mode		Video explanation mode		Written explanation mode	
	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev
Organisation score	58.44	7.19	54.74	6.54	57.27	7.18

The level of organisation between the three explanation modes failed Levene's test of homogeneity of variance. A Welch t-test was thus run to test the difference in the level of organisation between the three explanation modes. The Welch t-test results indicate that the level of organisation between the three explanation modes (oral, video, and written) are significantly different from each other ($t = 7.57$, $p < 0.001$). The post hoc Games-Howell test found that the level of organisation of the oral (I-J = 3.70, $p < 0.001$) and written (I-J = 2.53, $p = 0.02$) explanations, were significantly different from the level of organisation of the video explanations, but that the level of organisation between the oral (I-J = 1.17, $p = 0.48$) and written explanations do not differ significantly from each other.

Although this section of the thesis finds that differences in the level of organisation between the three explanation modes do exist, the student-prepared explanations contained in the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis, were prepared at a team level and the sample sizes for evaluating any potential mediating effects of the explanatory features on top-performing students' conceptual knowledge are therefore significantly reduced and are not large enough for meaningful mediation analysis.

The overall mean number of personal references and elaborations (as proxies of social presence) per explanation mode are presented in Table 4-6. The video explanation mode contained the largest number of personal references (mean = 36.16), followed by the oral explanation mode (mean = 14.43) and the written explanation mode (mean = 4.83). Welch t-test[48] results indicate that the number of personal references in the oral, video, and written explanations is significantly different from each other ($t = 134.62$, $p < 0.001$). Post hoc

[48] The number of personal references between the three explanation modes failed the Levene's test of homogeneity of variance and a Welch t-test was therefore performed to test the differences in the number of personal references between the three explanation modes.

Games-Howell test finds that the number of personal references in the oral explanations is significantly less than the number of personal references in the video explanations (I-J = -21.81, $p < 0.001$) and is significantly more than the number of personal references in the written explanations (I-J = 9.51, $p < 0.001$). The written explanations were also found to contain significantly fewer personal references compared to the video explanations (I-J = -31.33, $p < 0.001$). As was seen with the number of personal references, the oral (mean = 2.69) and video (mean = 2.51) explanation modes contained more elaborations than the written explanation mode (mean = 2.14). Welch t-test[49] results for the number of elaborations indicate that there is a significant difference in the number of elaborations between the three explanation modes ($t= 4.92$, $p = 0.008$). As found in Research Paper 2, the video explanation mode contained significantly ($t = 1.82$, $p = 0.04$) more elaborations compared to the written explanation mode. The number of elaborations between the oral and video explanation modes was not significantly different from each other ($t = 0.825$, $p = 0.20$). While the oral explanation mode contained significantly ($t = 3.184$, $p < 0.01$) more elaborations than the written explanation mode.

Correlation analysis reveals that the two social presence indicators (personal references and elaborations) are significantly correlated (Pearson correlation = 0.20, $p < 0.001$ and Spearman correlation = 0.11, $p = 0.057$). Taking the results of the two social presence indicators together, the oral and video explanation modes appear to contain more social presence indicators than the written explanation mode. The findings from this thesis regarding the social presence indicators align with similar findings in settings where explanations were individually prepared by students (Lachner et al. 2018).

[49] The number of elaborations between the three explanation modes also failed the Levene's test of homogeneity of variance and a Welch t-test was therefore performed to test the differences in the number of elaborations between the three explanation modes.

Table 4- 6 Level of personal references and elaborations per explanation mode

	Oral explanation mode		Video explanation mode		Written explanation mode	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Personal references	14.34	9.76	36.16	20.55	4.83	5.37
Elaborations	2.69	1.49	2.51	1.60	2.14	1.08

As was noted when considering the level of organisation of the explanations arising from the student-led team-teaching tasks, which incorporate learning-by-explaining, the explanations of this thesis were prepared in teams. The sample sizes for evaluating any potential mediating effects of the number of elaboration and personal references on top-performing students' conceptual knowledge are thus significantly reduced and are not large enough for meaningful mediation analysis.

4.1.1.2 Free-riding effects

The second potential reason for the differential conceptual knowledge development benefits of top-performing students, as highlighted in Research Paper 2 of this thesis, may be the possibility of free-riding resulting from the team-based design of team-teaching tasks (Strand Norman et al. 2004). The findings from Research Paper 2 indicated that the top performers from the video explanation mode did not appear to have taken on a heavier workload in comparison to the low and moderate performers from the video explanation mode in preparing their explanations. Additionally, this chapter, which also considers the oral explanation mode, which was not addressed in Research Paper 2, finds that the percentage of top performers acting as presenters in the video (50% of the top performers) and oral (46% of the top performers) explanation modes are similar ($t = 0.32$, $p = 0.75$) to one another. The similarity in the percentage of presenters from the top performance category for both the video and the oral explanation modes provides further support to suggest that the top performers from the video explanation mode do not appear to have taken on a greater workload (as measured by presenter status) compared to the workload of top performers from the oral explanation mode. The results for conceptual knowledge development that find that the top performers from the video explanation mode gained the most from the student-

led team-teaching tasks, which incorporate learning-by-explaining, do therefore not appear to be influenced by free-riding by students within the video explanation mode.

4.1.1.3 Discussion of the conceptual knowledge findings related to RQ2

An overall comparison of the conceptual knowledge development benefits of the three explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, finds that similar conceptual knowledge development benefits are experienced by low and moderate-performing students from all three modes of the student-led team-teaching tasks, which incorporate learning-by-explaining. The video explanation mode, however, appears to provide significantly more conceptual knowledge development benefits for top-performing students when compared to the other two modes (which also appear detrimental to top-performing students' conceptual knowledge development). These findings suggest that a change in the manner of explanation preparation and delivery, from individual preparation and delivery to collaborative preparation and delivery, in the form of student-led team-teaching tasks, which incorporate learning-by-explaining, do not change the null effects of explanation modality found when explanations were individually prepared (Lachner, Ly & Nückles 2018). This is because this thesis finds similar null effects of explanation modality for low and moderate-performing students' conceptual knowledge development from student-led team-teaching tasks, which incorporate learning-by-explaining. This thesis however provides novel findings when it comes to top-performing students. This thesis finds that explanation modality does appear to affect the conceptual knowledge development of top-performing students when explanations are prepared by students in teams as they engage in a student-led team-teaching task, which incorporates learning-by-explaining.

Future research could consider investigating whether the differential effects of explanation modality on top-performing students' conceptual knowledge also exist when students individually prepare explanations. Future research could also consider investigating potential reasons as to why the differences in top-performing students' conceptual knowledge development occur from different modes of explanations when they are prepared in teams where students engage in student-led team-teaching tasks, which incorporate learning-by-explaining. A possible reason identified in this thesis and that could be

investigated by future research, includes the effects of differences in the explanatory features of different modes of explanations.

Future research could also consider investigating the effects, of different means of creating team heterogeneity and different team sizes, on the conceptual knowledge findings of this thesis. The team allocation process of this thesis aimed at creating heterogeneous teams of a maximum of six students per team in order to mitigate the risk of peer comparisons[50] (Edmond & Tiggeman 2009). Using a mix of academically stronger and weaker students is a way supported in literature as a means to achieve heterogeneity of teams (Edmond & Tiggeman 2009). The teams of this thesis were thus designed to include a mix of academically stronger and weaker students, promoting the creation of heterogeneous teams (Edmond & Tiggeman 2009). The multicultural environment of South Africa (the country of this study) in which intercultural teamwork is prevalent and necessary (Schmulian & Coetzee 2019a), creates an alternative means to produce heterogeneity by creating teams of diverse cultural backgrounds. Future research may consider investigating whether different means of creating team heterogeneity, like the use of cultural diversity, may result in different conceptual knowledge development benefits from student-led team-teaching tasks, which incorporate learning-by-explaining, in different modes, as this is beyond the scope of this thesis. Following Edmond and Tiggeman's (2009) recommendation to form teams of four to six students to reduce peer comparison risks, this thesis employed teams of six. Team teaching, defined as two or more teachers collaborating on course planning, delivery, and/or evaluation (Baeten & Simons, 2014; Carpenter et al., 2007; Murata, 2002; Sandholtz, 2000), allows for varying team sizes. Future research could explore how different team sizes impact the benefits of student-led team-teaching tasks incorporating learning-by-explaining.

The scope of this thesis was also limited to exploring the use of student-led team-teaching tasks, which incorporate learning-by-explaining in a higher education context with a specific focus on accounting students in a competency-based accounting education setting. Team-

[50] Peer comparisons may be interpreted as an impact of status differences. Accounting education research suggests that a course instructor should form heterogeneous groups of around four to six students to help mitigate this risk (Edmond & Tiggeman 2009). It is also beneficial to ensure opportunities within the group that allow low-ability students to learn from medium-ability students rather than being paired only with students of the highest ability (Edmond & Tiggeman 2009). This was considered in the formation of the teams for this thesis, as the teams included both academically stronger and weaker students.

teaching in the form of teachers or student teachers teaching together has been successfully used at other education levels (e.g. Nokes et al. 2008; Laughlin 2011). To increase the external validity of this thesis' findings future research could consider investigating whether student-led team-teaching tasks, which incorporate learning-by-explaining, could also be successfully implemented at other education levels (like in secondary education or adult training contexts). It may also be beneficial to determine whether student-led team-teaching tasks, which incorporate learning-by-explaining could also successfully benefit broader competency development in other subject areas, like medicine, which also support competency-based education (Van der Vleuten 2015).

The novel findings from this thesis regarding the modality effects of student-led team-teaching tasks, which incorporate learning-by-explaining, for top-performing students may have practical implications for accounting educators. Accounting educators who wish to implement student-led team-teaching tasks, which incorporate learning-by-explaining, in their accounting classrooms, should, for example, consider the effect of explanation mode on their entire classroom and may decide to use such tasks for different reasons. If the aim is to achieve conceptual knowledge development for an entire accounting classroom, accounting educators could consider making use of student-led team-teaching tasks, which incorporate learning-by-explaining, in a video explanation mode. This is because the video explanation mode appears to be the mode that benefits all levels of students in terms of their conceptual knowledge development. If, however, the aim of such tasks is focused on remediation for low and moderate-performing students, then accounting educators may choose between either explanation mode, as all three modes (oral, written, and video) appear to provide comparative conceptual knowledge development benefits for low and moderate-performing students.

4.1.1.4 Transfer knowledge findings related to RQ2

In Chapter 3 (Research Paper 2) of this thesis, students were required to engage in student-led team-teaching tasks, which incorporate learning-by-explaining, as they collaboratively prepared and presented explanations of course content in written and video explanation modes. Research paper 2 measured students' conceptual knowledge development and transfer knowledge from the two modes. Chapter 2 (Research Paper 1) did not specifically

measure students' transfer knowledge from the team-teaching task, which incorporated learning-by-explaining, of Research Paper 1. This section of the thesis will provide an overarching comparison of students' transfer knowledge after completing the student-led team-teaching tasks, which incorporate learning-by-explaining, in the three modes (oral, written, and video) contained in this thesis.

To perform the overarching comparison, students' transfer knowledge from the preparation of their oral explanations in Research Paper 1 was collected and measured in the same manner as it was collected and measured in Research Paper 2 for written and video explanations. Differences in transfer knowledge between the three modes are first analysed using an analysis of variance and then analysed through regression analysis which controls for the same variables as per the conceptual knowledge development analysis.

Table 4- 7 Overall transfer knowledge development per explanation mode

	Oral mode		Video mode		Written mode	
	Mean	Std. Dev	Mean	Std. Dev	Mean	Std. Dev
Transfer knowledge	24.35	17.23	28.64	19.06	25.81	18.95

Analysis of variance results indicates that the transfer knowledge scores between the three modes are not significantly different ($F = 1.361$, $p = 0.258$). Similar to the findings per Research Paper 2 (Chapter 3) of this thesis, differences in explanation mode do not appear to influence the transfer knowledge of students after completing the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis. This is however before controlling for prior performance, gender, language, and presenter status, which is controlled for in the regression analysis.

The regression results per Table 4-8 indicate that students who prepared oral explanations obtained significantly less ($t = -2.25$, $p = 0.03$) transfer knowledge, compared to students who prepared video explanations of course content. Similar to the conceptual knowledge regression analysis results, students' level of prior performance appears to be significantly associated with the transfer knowledge of the students after completing the student-led team-teaching tasks, which incorporate learning-by-explaining ($t = 3.41$, $p < 0.001$).

The significant coefficient for prior performance potentially indicates, as has been found in other team-based learning tasks (Mahoney & Harris-Reeves 2019; Koles et al. 2010; Giuliodori et al. 2008) and as was considered for the conceptual knowledge development section of Chapter 4, that the knowledge development benefits derived from the student-led team-teaching tasks, which incorporate learning-by-explaining, may vary for students from different prior performance levels. To further explore this and how it relates to the explanation mode, an exploration of transfer knowledge per the three levels of prior performance (as was done for conceptual knowledge development) is performed.

Table 4- 8 Regression results – Transfer knowledge

Regression results[51] *for the association between explanation mode and transfer knowledge (TK)*

Variables	Prediction	Unstandardized B	t-statistic	Sig.
(Constant)		16.97	3.58	< 0.001**
OralMode	±	-5.99	-2.25	0.03*
WrittenMode		-4.93	-1.65	0.10
PriorPerf	±	0.19	3.41	< 0.001**
Gender	±	-1.62	-0.76	0.49
Language	±	5.51	2.52	0.01*
Presenter	+	-0.49	-0.19	0.85
F-statistic = 3.76 (p = 0.001)		Significance:		
Adjusted R^2 = .052		**p < .01		
n = 305		* p < .05		

Table 4-9 provides an overview of students' transfer knowledge per mode and per prior performance level. Analysis of variance results suggests no significant difference in the transfer knowledge of the low performers (F = 1.037, p = 0.359), the moderate performers (F = 0.635, p = 0.532), or the top performers (F = 0.530, p = 0.590) across the three explanation modes. This indicates that although the oral explanation mode in its entirety (as per Table 4-8) appears to result in significantly less transfer knowledge, compared to the video explanation mode, this difference no longer exists when the two modes are compared per students' prior performance level. Consequently, the modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, do not seem to provide differential benefits across any of the prior performance categories, in terms of transfer knowledge when taking students' prior performance into consideration[52].

[51] The regression results do not change if the presenter status is not controlled for.

[52] Untabulated regression analysis which runs the same regression as per Table 4-8 for all three levels of prior performance found no significant difference in the transfer knowledge of students from the oral and written explanation mode compared to the video explanation mode. This supports the findings from the analysis of variance for transfer knowledge for the three prior performance levels as reported in Table 4- 9.

Table 4- 9 Transfer per prior performance category and explanation mode

	Oral mode Low (n = 24) Moderate (n = 30) Top (n = 36)		Video mode Low (n = 41) Moderate (n = 28) Top (n = 34)		Written mode Low (n = 26) Moderate (n = 39) Top (n = 47)	
	Transfer knowledge		Transfer knowledge		Transfer knowledge	
Prior performance categories:	Mean %	Std. Dev	Mean %	Std. Dev	Mean %	Std. Dev
Low	19.44	17.32	26.22	19.68	23.08	17.21
Moderate	24.17	16.42	27.68	19.25	22.65	18.63
Top	27.78	17.48	32.35	18.09	29.96	19.71

4.1.1.5 Discussion of the overall transfer knowledge findings

The overall comparison of the transfer knowledge benefits from the three explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, indicate comparative transfer knowledge benefits from all three explanation modes for the low, moderate, and top-performing students. This finding indicates that the inclusion of collaboration in the form of student-led team-teaching tasks, which incorporate learning-by-explaining, into the preparation and delivery of student-prepared explanations of course content, does not appear to influence the null effect of explanation modality on transfer knowledge, as was found in individually prepared student explanation settings (Hoogerheide et al. 2016).

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 increasing levels of task complexity could reproduce the differential explanation modality effects which were seen in individual explanation settings that investigated explanation modality effects when increasing the level of task complexity (Lachner et al. 2018). Future research could also, as mentioned in the discussion of the findings for conceptual knowledge development, consider investigating the effects of the explanatory features[53] of different modes of explanations, and the effects of

[53] The findings from section 4.1.1.1 of this thesis, indicate that the three modes of explanations of this thesis do result in different explanatory features. Future research could consider if the identified differences in the explanatory features have an effect on the transfer knowledge development of top-performing students from the three different modes of explanations per this thesis as such analysis is beyond the scope of this thesis.

different means of creating team heterogeneity, on the transfer knowledge findings of this thesis.

4.2 PART 2 OF CHAPTER 4: OVERALL RESULTS FOR RQ4

Quantitative and qualitative data collected to determine students' experiences of student-led team-teaching tasks, which incorporate learning-by-explaining, in the three explanation modes of this thesis for teamwork, and communication skills development are compared in this section of Chapter 4.

The sample of respondent students for this part of Chapter 4 is the sample used to provide a comparison of students' experiences of the oral, video, and written explanation modes of the team-teaching tasks which incorporate learning-by-explaining (RQ4). The sample is created by combining the samples included in the two research papers of this thesis. The respondent students for this part of Chapter 4 include 340 respondent students, consisting of 113 respondent students from Research Paper 1 and 227 respondent students from Research Paper 2. This, therefore, includes 113 respondent students from the oral mode, 120 respondent students from the video mode, and 107 respondent students from the written mode. Three students from the oral explanation mode who participated in the survey, but did not participate in the pre-test, were excluded from the analysis in Table 4- 10, as they could not be classified into a prior performance category. The sample of 113 respondents from Research Paper 1 was, therefore, reduced by three, to end with a total sample of 110 respondents from the oral explanation mode.

Across all three explanation modes, students experience the student-led team-teaching tasks, which incorporate learning-by-explaining, to be more beneficial in creating opportunities for the development of teamwork skills than for communication skills (Table 4-10). The video explanation mode appears to be experienced as most beneficial for teamwork skills as 69% of the students from the video explanation mode noted teamwork skills opportunities compared to 63% from the oral mode and 59% from the written mode.

Communication skills were more consistent across the three modes with 31% of students from the oral mode, 28% of students from the video mode, and 27% of students from the

written mode indicating opportunities for communication skills development from the team-teaching tasks which incorporate learning-by-explaining. Overall, the findings from Table 4- 10 point to the students experiencing the student-led team-teaching tasks, which incorporate learning-by-explaining, as being more focused on teamwork skills than on communication skills.

Table 4- 10 Percentage of students who indicated that the team-teaching tasks, which incorporate learning-by-explaining, created opportunities for the assessment of their teamwork and communication skill development.

	Oral mode (n = 110)		Video mode (n = 120)		Written mode (n = 107)	
Prior-performance category	Teamwork Skills	Communication skills	Teamwork skills	Communication skills	Teamwork skills	Communication skills
Low	61%	18%	69%	23%	64%	14%
Moderate	54%	33%	63%	33%	67%	31%
Top	72%	37%	78%	30%	50%	33%
Total (All students per mode)	63%	31%	69%	28%	59%	27%

~~Communication skills were more consistent across the three modes with 31% of students from the oral mode, 28% of students from the video mode, and 27% of students from the written mode indicating opportunities for communication skills development from the team-teaching tasks which incorporate learning-by-explaining. Overall, the findings from Table 4-10 point to the students experiencing the student-led team-teaching tasks, which incorporate learning-by-explaining, as being more focused on teamwork skills than on communication skills.~~

4.2.1 Discussion of the overall results for accounting students' experiences related to RQ4

When considering the accounting students' experiences of the student-led team-teaching tasks, which incorporate learning-by-explaining, for the purposes of teamwork and communication skills development, more students indicated that they experienced the tasks as beneficial for teamwork skills compared to the number of students who had reported benefits in terms of communication skills. The grading instructions of the student-led team-teaching tasks, which incorporate learning-by-explaining, may have contributed to students having reported that the task was experienced as being more beneficial for teamwork skills development. This is because the grading instructions of the tasks specifically required an anonymous peer evaluation[54] of students' teamwork effectiveness as part of the overall grading of these tasks. This may have influenced students' experiences and may have contributed to them placing greater emphasis on teamwork skills development. Future research may consider investigating this further and this may also need to be considered by accounting educators who wish to incorporate such tasks in their curriculum. It may, for example, be beneficial for accounting educators to also include a grading element for communication skills in the overall grading design of such tasks.

When considering explanation modality, students participating in the video explanation mode seem to have experienced the most significant benefits in teamwork skills, while communication skills benefits appear more to be consistent across all three explanation

[54] Although the peer evaluation did incorporate elements that measured student communication (refer to category 2 of the tool which presented in sections 2.8 and 3.9 of this thesis) within their teams, the majority of the peer evaluation tool focused on a student's effectiveness as a team member.

modes. This finding has practical implications for accounting educators. For instance, if an accounting educator aims to promote teamwork skills development, they might consider implementing the video explanation mode in student-led team-teaching tasks, which incorporate learning-by-explaining.

Future research is encouraged to explore the effects of explanation modality on students' experience through the lens of various educational theories. Social interdependence theory, with its emphasis on group goals, cooperation, and the individual (Johnson & Johnson 2005), may for example provide insight into the increased focus on teamwork skills that arise from the team-teaching tasks of this thesis. The stronger emphasis on teamwork may stem from the need for positive interdependence[55], where students rely on each other's contributions to successfully complete the task. In the video mode, this reliance may be more pronounced, as creating a video typically requires students to divide responsibilities, such as writing scripts, recording, and editing. This could foster a stronger sense of teamwork compared to oral or written explanations, where collaboration may be less intensive. Future research is needed to determine if factors such as social interdependence, and varying levels of positive interdependence linked to the division of labour in different student-led team-teaching modes, contribute to the differential teamwork skills development benefits experienced by students across these modes.

[55] Positive interdependence occurs when the actions of individuals within a team promote the achievement of joint goals Johnson & Johnson 2005). Positive interdependence thus exists within a team when the individual team members believe that they are only able to achieve their goals if, and only if, the other individuals in their team also achieve their goals (Johnson & Johnson 2005).

4.3 REFERENCES

Coetzee, S.A. & Schmulian, A., 2013, 'The effect of IFRS adoption on financial reporting pedagogy in South Africa', *Issues in Accounting Education* 28(2), 243–251, doi.org/10.2308/iace-50386.

Coetzee, S.A., Schmulian, A. & Kotze, L., 2014, 'Communication apprehension of South African accounting students: The effect of culture and language', *Issues in Accounting Education* 29(4), 505–525, doi.org/10.2308/iace-50850.

Edmond, T. & Tiggeman, T., 2009, 'Accounting Experiences In Collaborative Learning', *American Journal of Business Education* 2(7), 97–100, doi.org/10.19030/ajbe.v2i7.4588.

Engel, A.M., 2018, 'Literature Review of Student Characteristics and Performance in an Accounting Course', *Community College Journal of Research and Practice* 42(10), 748–751, doi.org/10.1080/10668926.2017.1328320.

Gammie, E., Paver, B., Gammie, B. & Duncan, F., 2003, 'Gender differences in accounting education.pdf', *Accounting Education* 12(2), 177–196.

Giuliodori, M.J., Lujan, H.L. & DiCarlo, S.E., 2008, 'Collaborative group testing benefits high- and low-performing students', *Advances in Physiology Education* 32(4), 274–278, doi.org/10.1152/advan.00101.2007.

Hoogerheide, V., Deijkers, L., Loyens, S.M.M., Heijltjes, A. & van Gog, T., 2016, 'Gaining from explaining: Learning improves from explaining to fictitious others on video, not from writing to them', *Contemporary Educational Psychology* 44, 95–106, doi.org/10.1016/j.cedpsych.2016.02.005.

Johnson, D.W. & Johnson, R.T., 2005, 'New developments in social interdependence theory', *Genetic, Social, and General Psychology Monographs* 131(4), 285–358, doi.org/10.3200/MONO.131.4.285-358.

Juarros-Basterretxea, J., Aonso-Diego, G., Postigo, Á., Montes-Álvarez, P., Menéndez-Aller, Á. & García-Cueto, E., 2024, 'Post-hoc tests in one-way ANOVA: The case for normal distribution', *Methodology* 20(2), 84–99, doi.org/10.5964/meth.11721.

Koles, P.G., Stolfi, A., Borges, N.J., Nelson, S. & Parmelee, D.X., 2010, 'The impact of team-based learning on medical students' Academic Performance', *Academic Medicine* 85(11), 1739–1745, doi.org/10.1097/ACM.0b013e3181f52bed.

Lachner, A., Ly, K.T. & Nückles, M., 2018, 'Providing Written or Oral Explanations?

Differential Effects of the Modality of Explaining on Students' Conceptual Learning and Transfer', *Journal of Experimental Education* 86(3), 344–361, doi.org/10.1080/00220973.2017.1363691.

Mahoney, J.W. & Harris-Reeves, B., 2019, 'The effects of collaborative testing on higher order thinking: Do the bright get brighter?', *Active Learning in Higher Education* 20(1), 25–37, doi.org/10.1177/1469787417723243.

Schmulian, A. & Coetzee, S.A., 2019, 'Students' experience of team assessment with immediate feedback in a large accounting class', *Assessment and Evaluation in Higher Education* 44(4), 516–532, doi.org/10.1080/02602938.2018.1522295.

Schwartz, D.L., Bransford, J.D. & Sears, D., 2005, 'Efficiency in Innovation and Transfer', *Transfer of Learning from a Modern Multidisciplinary Perspective* 1–51.

Strand Norman, C., Rose, A.M. & Lehmann, C.M., 2004, 'Cooperative learning: Resources from the business disciplines', *Journal of Accounting Education* 22(1), 1–28, doi.org/10.1016/j.jaccedu.2004.01.001.

Van der Vleuten, C.P.M., 2015, 'Competency-based education is beneficial for professional development', *Perspectives on Medical Education* 4(6), 323–325, doi.org/10.1007/s40037-015-0232-6.

Wagner, R.M. & Huang, J.C., 2011, 'Relative Performance Of English Second Language Students In University Accounting Courses', *American Journal of Business Education* 4(5), 31–38, doi.org/10.19030/ajbe.v4i5.4222.

5. CHAPTER 5: CONCLUSION

5.1 INTRODUCTION

The changing business environment with its increased globalisation and technological advances has resulted in significant changes to the accounting profession (Cunha, Martins, Carvalho & Carmo 2022; Tan & Laswad 2018; Bunney, Sharplin & Howitt 2015) which, in turn, requires that professional accountants now need to be equipped with a broader set of competencies (Cunha et al. 2022; Zhao 2018; Chaplin 2017). Competency-based education has been suggested as a means to achieve broader competency development for accounting graduates (Schmulian 2018). Competency-based education requires students to engage in integrated tasks that provide them with opportunities to practice integrating the skills, knowledge, and attitudes they need to be able to perform tasks required by their profession (Van der Vleuten 2015).

Social constructivism plays a crucial role in competency-based accounting education (Schmulian & Coetzee 2019). Social constructivist learning opportunities, like team-based or collaborative learning, are suggested to promote more comprehensive competency-based learning environments compared to individual learning environments, as they broaden the competencies that can be developed (Wilson, Ho & Brookes 2018; Jang, Lasry, Miller & Mazur 2017). Social constructivism has thus been applied in competency-based accounting education contexts to support accounting students with the development of their required competencies (Janse van Rensburg, Coetzee & Schmulian 2022; Schmulian 2018). Although competency-based education has been advocated for by accounting scholars, its buy-in among accounting educators has been challenging (Schmulian 2018). Accounting educators need to be supported by research and training that will help them to implement competency-based education, and to develop integrated tasks that will give their students opportunities for broader competency development (Janse van Rensburg 2022; Schmulian 2018). Accounting educators would thus benefit from research, that provides evidence-based exemplars of integrated tasks, which incorporate social constructivism, in order to broaden competency development in accounting education.

This thesis responds to this need as it provides accounting education research that reports on the use of a social constructivist learning approach, as part of an integrated task, to broaden accounting students' competency development in a competency-based accounting education context. More specifically this thesis explores the use of an integrated task in the form of student-led team-teaching, which incorporates learning-by-explaining, to develop accounting students' knowledge, teamwork skills, and communication skills as part of the competencies that they need to develop (Lawson, Blocher, Brewer, Cokins, Sorensen, Stout, Sundem, Wolcott & Wouters 2014; Partnership for 21st Century Skills 2015; Plant, Barac & Sarens 2019; Dolce, Emanuel, Cisi & Ghisleril 2020).

In particular, this thesis, therefore:

1. Reported on the use of equal-status team-teaching to develop accounting students' knowledge, teamwork skills, and communication skills. An analysis of students' knowledge development and an analysis of students' experiences of the team-teaching task, for knowledge, teamwork skills, and communication skills development, was specifically documented (Chapter 2: Research Paper 1).

2. Reported on the use of varying modes (written and video) of a collaboratively prepared explanation task, as an assessment for learning, which required accounting students to team-teach an accounting topic for the purpose of knowledge, teamwork skills, and communication skills development. An analysis of students' conceptual and transfer knowledge development, together with an analysis of the explanatory features of the written and video explanations and an analysis of students' experiences of the assessment task, for the purpose of teamwork and communication skills development, was specifically documented (Chapter 3: Research Paper 2).

Provided a holistic combination and extension of the results from the two research papers contained in this thesis as they relate to research question 2 (RQ2) and research question 4 (RQ4) of this thesis. An analysis of students' conceptual and transfer knowledge development from the oral (Research Paper 1), written, and video (Research Paper 2) explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis, were compared, combined, and reported on in part 1 of Chapter 4

of this thesis. Finally, students' experiences of the three explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, for the purposes of teamwork and communication skills development, w reported on in part 2 of Chapter 4.

5.2 RESEARCH PAPER 1: ACCOUNTING STUDENTS IN THE ROLE OF EQUAL-STATUS TEAM-TEACHER FOR THE DEVELOPMENT OF KNOWLEDGE, TEAMWORK AND COMMUNICATION SKILLS COMPETENCIES

Competency-based education advocates for the use of integrated tasks which are considered to be tasks that allow students to practice integrating the knowledge, skills, and attitudes they need for the successful completion of a professional task (Van der Vleuten 2015). Team-teaching tasks provide student teachers, who are training to become professional teachers themselves, with opportunities to develop the knowledge, skills, and attitudes they would need to be successful professional teachers (Baeten & Simons 2014). This is because team-teaching tasks, in teacher education training, have been found to include teaching, collaboration, reflection, learning, self-confidence, and self-efficacy benefits for student teachers as part of their professional development as teachers (Howlett & Nguyen 2020; Baeten & Simons 2014; Wynn & Kromrey 2000).

Competency-based education, which use has also been advocated for in accounting education as a means to broaden accounting students' competency development, also requires accounting educators to identify and develop integrated tasks that can be used to broaden the competency development of their students (Janse van Rensburg 2022; Schmulian 2018; Van der Vleuten 2015). This research paper explored the use team-teaching, as an integrated task, in an accounting education context, to broaden accounting students' competency development by not only developing their accounting knowledge, but by also providing opportunities for the development of their teamwork, and communication skills.

Research into the benefits of the use of team-teaching for professional role development has mostly been restricted to teacher education settings. Its use has not been explored in the accounting domain. Given the overlap in the competency development benefits identified from team-teaching, in teacher education, and the knowledge, teamwork, and communication skills development needs of accounting students, this research paper

reported on the use of team-teaching in a competency-based accounting education context. Through this research paper, this thesis contributed to the team-teaching and accounting education literature by broadening the exploration into the benefits of team-teaching as it extends its scope of use to contexts outside of teacher education and provides evidence of its benefits for accounting students' professional development.

The team-teaching task of this research paper also incorporated the use of learning-by-explaining, which has proven to be beneficial for students' knowledge development. Much of the learning-by-explaining literature has focused on investigating the knowledge development benefits thereof in experimental settings which require students to individually engage in a teaching task (Ribosa & Duran 2022). Very little attention has been given to understanding the knowledge development benefits of learning-by-explaining in teams or by groups of students (Ribosa & Duran 2022). This research paper, of this thesis, contributes to the learning-by-explaining and accounting education literature, as it reports on the knowledge development benefits of learning-by-explaining, during a team-teaching task that requires student collaboration, within a competency-based accounting education context. Furthermore, this research paper, of this thesis, not only reports on the knowledge development benefits but also the broader competency development benefits, of learning-by-explaining during team-teaching, in a real classroom environment, within a competency-based accounting education context.

The team-teaching task of this research paper required the students to collaboratively prepare and present a team explanation of an accounting topic. The student teams were designed to incorporate an equal-status team-teaching model. In an equal-status team-teaching model, all the members of a teacher team actively contribute to the teaching process and share equal responsibility for the teaching task (Baeten, Simons, Schelfhout & Pinxten 2018). The equal responsibility of the equal-status team-teaching model engages the team teachers in more meaningful dialogue as they share their expertise and learn from each other. The explanation preparation phase of the team-teaching task necessitated close collaboration, as each team member was required to be present and contribute equally. The explanation delivery phase allowed for more flexibility to either allow all team members to be included in the delivery of the explanation or to only have some team members present for the delivery of the explanation. This allowed students to follow an interactive, participant-

observer, or rotational team-teaching style, in the delivery phase. Students wrote a pre-test before being engaged in the team-teaching task and upon completion of the task wrote a post-test that was used to measure the knowledge development benefits of the team-teaching task. Students also completed a survey that provided insight into their experiences of the team-teaching task and their experience of its ability to develop a broader set of competencies (including knowledge, teamwork skills, and communication skills)

From a knowledge development benefit perspective, the team-teaching task appeared beneficial for low and moderate-performing students. Although the top-performing students did not benefit from the team-teaching task, in terms of knowledge development, they appeared to experience slightly greater teamwork and communication benefits from the team-teaching task, compared to the low and moderate-performing students. All three categories of students (low, moderate, and top performers) noted both teamwork and communication skill benefits from the team-teaching task, but the results appeared to indicate that the students experienced more teamwork than communication skills development benefits from the team-teaching task.

Overall, the students were generally positive towards the team-teaching task and noted learning benefits from the social constructivist design of the team-teaching task. This is because many of the students noted that collaboration with their teammates significantly enhanced their learning. The most frequently reported benefits included collaborative learning benefits, as the accounting students consistently emphasised the knowledge construction benefits afforded by the collaborative nature of the team-teaching task and the benefits for the student's professional development. In terms of the professional development benefits, the accounting students noted that they experienced opportunities for the development of critical professional competencies, such as intellectual, interpersonal and communication skills, and organisational skills, aligning with the Revised International Education Standard (IES 3) (International Accounting Education Standards Board™ 2019), from the team-teaching task. Some additional benefits noted included increased dialogue and personal growth benefits. The most commonly identified disadvantages of the team-teaching task, as noted by the students, included peer compatibility issues and increased workload requirements. These disadvantages should be considered for future iterations of such tasks. Educators wishing to implement such tasks should, for example, consider

implementing interventions that proactively mitigate learning impediments caused by peer incompatibility. Educators should also consider providing organisational and time-management support, such as aligning the team-teaching tasks with less busy student academic periods and allocating sufficient time for team meetings.

This research paper contributed to both the team-teaching and the learning-by-explaining literature as it provided evidence to suggest that student-led team-teaching tasks, which incorporate learning-by-explaining, is a powerful instructional approach in higher education, that transcends disciplinary boundaries.

5.3 RESEARCH PAPER 2: DO TEAM-BASED WRITTEN OR VIDEO EXPLANATIONS OF COURSE CONTENT DEVELOP ACCOUNTING STUDENTS' KNOWLEDGE, TEAMWORK SKILLS, AND COMMUNICATION SKILLS?

Changes in the accounting profession require that accounting educators develop well-rounded accounting students who not only have the necessary accounting knowledge but also possess the professional skills they will need to be successful within their profession (Cunha et al. 2022; Jackson & Meek 2021; Zhao 2018). In investigating the potential benefits of using learning-by-explaining, as a potential mechanism to help accounting educators develop accounting students' knowledge and skills, this thesis extends on prior learning-by-explaining literature.

Learning-by-explaining literature has found that the mode of an explanation mediates the learning benefits that students experience (Lachner, Ly & Nückles 2018). These findings arose from settings in which students individually prepared explanations of course content. Individually prepared written explanations of course content, for example, appear to be more organised than video explanations of course content, and the increased level of organisation appeared to mediate the conceptual knowledge development that students gained when they individually prepared written explanations (Lachner et al. 2018). Although a mediating effect was found for the level of organisation of written explanations on conceptual knowledge development, no overall effect of explanation mode on conceptual knowledge was found from the mediation analysis (Lachner et al. 2018). Individually prepared video explanations of course content on the other hand appeared to be more elaborate and to

contain more person deictic references, than written explanations, and the higher level of elaborations in turn appeared to mediate the transfer knowledge development gains experienced by students from such explanations (Lachner et al. 2018). Whether the influence of explanation mode, as found in individual settings, remains intact when explanations are prepared by teaching teams, instead of being individually prepared, had not yet been explored. Given that recent experimental research has found that the learning benefits of collaboratively prepared explanations exceed the benefits obtained from individually prepared explanations (Kobayashi 2021), it may also be plausible that the inclusion of collaboration, in the explanation process, may eclipse the previously identified variations in the knowledge development benefits that students experience from varying modes of explanations. This research paper therefore explored the knowledge development benefits of video and written explanations that are prepared by teams of students. This research paper also investigated the teamwork and communication skills development benefits of such team-based explanations, as part of a competency-based accounting education context.

The team-based explanation assessment task of this research paper required the students to collaboratively prepare and present written and video explanations of an accounting topic. The student teams, comprising approximately six students per team, with varying academic strengths, were randomly allocated to either the written or the video explanation mode. Student teams in the written explanation mode were instructed to collaboratively write a 750-word explanation of the preparation of consolidated financial statements, while the student teams in the video explanation mode prepared a five-minute video explanation of the same topic. Pre-test and post-test scores were used to compare student's conceptual knowledge before and after the team-based explanation assessment task. The change in conceptual knowledge was compared between the two explanation modes. A section of the post-test also tested students' transfer knowledge and allowed for a comparison of students' transfer knowledge between the two explanation modes. A student survey also allowed for a comparison of students' experiences between the two modes of the team-based explanation assessment. The survey measured students' overall experience of the two explanation modes and their experience of the two explanation modes for teamwork and communication skills development.

The findings from this research paper indicated that either mode of explanation delivery provided comparable conceptual knowledge development benefits for low and moderate-performing students. The video explanation mode appears more beneficial for top-performing students compared to the written explanation mode. The written explanation mode also appeared to be detrimental to top-performing students' conceptual knowledge development. Taking all the findings from the conceptual knowledge development results into consideration, the video explanation mode appeared most beneficial, especially when aiming to achieve conceptual knowledge development for an entire classroom of students. The transfer knowledge development benefits of the two explanation modes were comparable, while the teamwork and communication skills development benefits between the two explanation modes were more reflective of the findings for conceptual knowledge development. As with the findings regarding the conceptual knowledge development benefits of the two explanation modes, the video explanation mode appeared more beneficial for teamwork skills development, when compared to the written explanation mode. The communication development opportunities afforded by the two explanation modes were, however, comparable.

Overall, the students had a positive experience with the team-based explanation assessment task, with the video explanation mode providing more holistic conceptual knowledge and teamwork skills development benefits.

5.4 COMBINED RESULTS FOR RQ2 AND RQ4 WHEN CONSIDERING THE DIFFERENT EXPLANATION MODES CONTAINED IN RESEARCH PAPER 1 AND RESEARCH PAPER 2

The combined results section (Chapter 4) of this thesis combined and extended the findings from Research Paper 1 and Research Paper 2 of this thesis as they relate to research question 2 (RQ2) and research question 4 (RQ4) of this thesis. The aim of this section was to provide more comprehensive answers to these research questions as it combines and compares the data from both research papers that are contained in this thesis. Although some research questions of this thesis could only be addressed at a research paper level (this would include, for example, the more detailed qualitative analysis of students' experiences of team-teaching tasks, as was presented in Research Paper 1), this section

aimed at combining similar research data (data that was measured and collected in the same manner) from the two research papers, in order to provide more comprehensive answers to the research questions 2 and 4 of this thesis.

More comprehensive findings to the following research questions were thus provided in the combined results (Chapter 4) section of this thesis:

RQ2: Do varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential conceptual and transfer knowledge benefits for accounting students, in a competency-based accounting education context?

RQ4: Do accounting students experience that varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential teamwork and communication skills development opportunities in a competency-based accounting education context?

In response to RQ2 of this thesis the first part of the combined results, per Chapter 4, found that similar conceptual knowledge development benefits are experienced by low and moderate-performing students from all three explanation modes (oral, video, and written) of the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis. The video explanation mode, however, appears to provide significantly more conceptual knowledge development benefits for top-performing students, when compared to the other two modes (which also appear detrimental to top-performing students' conceptual knowledge development). The findings from Chapter 4, as it relates to low and moderate-performing students' conceptual knowledge, coincide with similar findings in experimental settings, which required students to individually prepare explanations of their course content (Lachner, Ly & Nückles, 2018). Chapter 4 found that explanation modality does appear to affect the conceptual knowledge development of top-performing students when explanations are prepared by students in teams as they engage in a student-led team-teaching task, which incorporates learning-by-explaining. This is because only the video explanation mode of such tasks provided beneficial conceptual knowledge development benefits for top-performing students. Future research could consider investigating whether this difference also exists for top-performing students, when students individually prepare

explanations in different modes of such explanations, as this has not yet been considered in prior literature.

The first part of Chapter 4 as it relates to RQ2 of this thesis also found comparative transfer knowledge benefits from all three explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, for the low, moderate, and top-performing students in this thesis. This finding also indicates that the inclusion of collaboration in the form of student-led team-teaching tasks, which incorporate learning-by-explaining, into the preparation and delivery of student-prepared explanations of course content, does not appear to influence the null effect of explanation modality on transfer knowledge development, as was seen when students were required to individually prepare explanations of course content in experimental settings (Hoogerheide et al. 2016).

The second part of Chapter 4, relates to RQ4 of this thesis. The results from the second part of Chapter 4 found that students more often noted opportunities for teamwork skills development, than for communication skills development, from all three (oral, video, and written) explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining. The social constructivist design of the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis thus seems to have promoted opportunities for teamwork skills development. Students more often noted opportunities for the development of teamwork skills from the video explanation mode than from the other two (oral and written) explanation modes. Students, however, reported similar opportunities for communication skills development from all three explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, contained in this thesis. This may have been influenced by the grading instructions of the team-teaching tasks and future research should consider the effects of grading instructions on students' experiences of the opportunities created for the development of skills by such tasks.

Taking all the findings together, accounting educators wishing to adapt to the rapidly changing requirements of the accounting profession may consider implementing student-led team-teaching tasks, which incorporate learning-by-explaining, in a video explanation mode in their courses, if they wish to develop their students' knowledge and teamwork and communication skills. This is because student-led team-teaching tasks, which incorporate

learning-by-explaining, in a video explanation mode, appear to be beneficial and more beneficial than oral or written tasks, for ensuring that an entire classroom of accounting students experience knowledge and broader teamwork and communication skills development opportunities.

5.5 SUMMARY

This thesis extends the team-teaching, learning-by-explaining, and accounting education literature. It does so as it provides research support to accounting educators who are required to broaden the competency development opportunities of their courses (Plant et al. 2019; Schmulian & Coetzee 2019b; Zhao 2018) in response to the changing needs of the profession that have resulted due to the changing business environment (Cunha et al. 2022; Tan & Laswad 2018; Bunney et al. 2015). This thesis reports on the use of student-led team-teaching tasks, which incorporate learning-by-explaining, (as an exemplar of an integrated task) that can be employed by accounting educators in order to provide their students with accounting knowledge, teamwork skills, and communication skills development opportunities. In so doing, this thesis also promotes the use of social constructivism in the form of collaborative student-~~centered~~centred learning as a means to develop accounting students' competencies.

The team-based design of the student-led team-teaching tasks, which incorporate learning-by-explaining, contained in this thesis, is underpinned by the social constructivist approach to learning. Teamwork, as a form of collaboration, is a form of social constructivist learning. The teamwork requirement of the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis, promoted active learning in a social manner, which helped to foster students' knowledge and skills development. The collaborative preparation and delivery of an explanation of accounting content was experienced by students as beneficial for knowledge construction and for creating opportunities for the development of critical professional competencies. Social interactions during the completion of the student-led team-teaching tasks, which incorporate learning-by-explaining, for example, provided knowledge scaffolding and teamwork skill development opportunities while also providing opportunities for interpersonal, organisational and communication skill development. Opportunities for time management and leadership skill development were also reported by

students. Although there were many reported benefits from the team-based design of the student-led team-teaching tasks, which incorporate learning-by-explaining, some students also noted disadvantages because of issues like peer incompatibility and increased workload requirements. Educators who wish to implement similar student-led team-teaching tasks, which incorporate learning-by-explaining, in their own competency-based education environments, should thus be cognisant of both the benefits and disadvantages of team-based learning and should try to mitigate disadvantages as far as possible. Overall, the results from this thesis provide evidence of the relevance and benefits of social constructivism in the domain of accounting education.

Central to this thesis, is the use of integrated tasks and the mode of such integrated tasks, in order to broaden competency development. This thesis thus reported on the use of integrated tasks, which incorporate social constructivism and learning-by-explaining strategies, for the purpose of knowledge, teamwork skills, and communication skills development. The integrated tasks of this thesis, in the form of student-led team-teaching tasks, which incorporate learning-by-explaining, were found to play a beneficial role in providing accounting students with opportunities for broader competency development. Having the students explain their accounting content as part of a teacher-team helped the students gain knowledge of the topic they explained and also provided the students with opportunities to develop both teamwork and communication skills. The mode of the explanation played a role in the knowledge development benefits of the student-led team-teaching tasks, which incorporate learning-by-explaining, contained in this thesis. The video mode of an explanation was, for example, most beneficial for top-performing students' conceptual knowledge development. Although the mode of the explanation did not necessarily provide significantly different conceptual knowledge development benefits for low and moderate-performing students, it would still be best to use the video explanation mode, if the goal of such student-led team-teaching tasks, which incorporate learning-by-explaining, was to benefit all students' conceptual knowledge development. Either explanation mode (oral, video, or written) of student-led team-teaching tasks, which incorporate learning-by-explaining, are however, credible if the aim of such tasks is to provide remedial knowledge development benefits for weaker students, or if the focus is only on transfer knowledge. The mode of the student-led team-teaching tasks, which incorporate learning-by-explaining, also played a role in the development of accounting

students' broader competencies. The video explanation mode of student-led team-teaching tasks, which incorporate learning-by-explaining, was, for example, experienced as most beneficial for creating opportunities for teamwork skills development. This thesis thus provides evidence that adding integrated tasks such as student-led team-teaching tasks, which incorporate learning-by-explaining, can be beneficial in developing broader competencies for accounting students. It also provides evidence of the importance of considering the explanation mode of such a task and that it may be necessary to evaluate the overall classroom effectiveness of the explanation mode of such a task before implementing it. This is because the explanation mode of an integrated task in the form of student-led team-teaching tasks, which incorporate learning-by-explaining, may influence which students in a classroom benefit from such a task and may influence the choice to either use such a task for whole-class knowledge development or for the remedial development of weaker performing students. Table 5- 1 provides an overall summary of the findings of this thesis.

In conclusion, accounting educators who need to develop broader competencies in their accounting students, in line with the competency frameworks of the profession, may use the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis as an exemplar of an integrated task that they can implement, to achieve the needed broader competency development of their students.

Table 5- 1 Overall findings of the thesis

Research questions of this thesis	Overall findings of this thesis
RQ1: Do accounting students experience knowledge development benefits when they are engaged in a student-led team-teaching task, which incorporates learning-by-explaining, in a competency-based accounting education context?	The collaborative preparation and delivery of an explanation of accounting content in the form of student-led team-teaching tasks, which incorporate learning-by-explaining, was experienced by the accounting students of this thesis as beneficial for their knowledge construction. Social interactions during the completion of the student-led team-teaching tasks, which incorporate learning-by-explaining provided the students with knowledge scaffolding and collaborative learning opportunities. Although students reported knowledge development benefits from the team-based design of the student-led team-teaching tasks, which incorporate learning-by-explaining, some students also noted disadvantages because of issues like peer incompatibility and increased workload requirements.
RQ2: Do varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential conceptual and transfer knowledge benefits for accounting students, in a competency-based accounting education context?	Comparative conceptual knowledge development benefits were experienced by low and moderate-performing students from all three explanation modes (oral, video, and written) of the student-led team-teaching tasks, which incorporate learning-by-explaining, of this thesis. The video explanation mode, however, appears to provide significantly more conceptual knowledge development benefits for top-performing students, when compared to the other two modes (which also appear detrimental to top-performing students' conceptual knowledge development). This thesis found comparative transfer knowledge benefits from all three explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, for the low, moderate, and top-performing accounting students in this thesis.

Table 5- 1 Overall findings of the thesis (continued)

Research questions of this thesis	Overall findings of this thesis
RQ3: What are accounting students' experiences of a student-led team-teaching task, which incorporates learning-by-explaining, that is aimed at developing their knowledge and teamwork skills, and communication skills in a competency-based accounting education context?	The integrated tasks of this thesis, in the form of student-led team-teaching tasks, which incorporate learning-by-explaining, were found to play a beneficial role in providing accounting students with opportunities for competency development. The students of this thesis reported that the student-led team-teaching tasks, which incorporate learning-by-explaining of this thesis provided them with opportunities to develop both teamwork and communication skills. Students more often reported opportunities for the development of teamwork skills than for communication skills. The accounting students of this thesis also reported experiencing the following benefits from the student-led team-teaching tasks, which incorporate learning-by-explaining of this thesis: collaborative learning benefits, support for professional development, increased dialogue, and personal growth benefits. The accounting students of this thesis also reported experiencing the following challenges from the student-led team-teaching tasks, which incorporate learning-by-explaining of this thesis: peer compatibility issues and increased workload challenges.
RQ4: Do accounting students experience that varying modes of explanations of a student-led team-teaching task, which incorporates learning-by-explaining, have differential teamwork and communication skills development opportunities in a competency-based accounting education context?	The mode of the student-led team-teaching tasks, which incorporate learning-by-explaining played a role in the development of accounting students' competencies. The video explanation mode of student-led team-teaching tasks, which incorporate learning-by-explaining, was experienced as most beneficial for creating opportunities for teamwork skills development. Students, however, reported similar opportunities for communication skills development from all three explanation modes of the student-led team-teaching tasks, which incorporate learning-by-explaining, contained in this thesis.

5.6 CONTRIBUTION

There is little to no literature exploring:

- The use of team-teaching which shifts the focus from teacher-led team-teaching to student-led team-teaching, outside of teacher education;
- Student's experiences of entering into the role of team teacher as part of their professional development, outside of teacher education;
- The use of team-teaching by students for the purpose of broader competency development, outside of teacher education;
- The conceptual and transfer knowledge development benefits of different modes of learning-by-explaining (or learning-by-teaching as it is also commonly referred to) which incorporates social constructivist learning, in the form of team-teaching where students prepare and present explanations of course content in teams;
- The broader competency development benefits of learning-by-explaining (or learning-by-teaching as it is also commonly referred to) for the purpose of not only knowledge development but also for providing opportunities for teamwork and communication skills development;
- Students' experiences of learning-by-explaining (or learning-by-teaching as it is also commonly referred to) which incorporates social constructivist learning, in the form of team-teaching, where students prepare and present explanations of course content in teams;
- Students' experiences of different modes of learning-by-explaining (or learning-by-teaching as it is also commonly referred to) which incorporates social constructivist learning in the form of team-teaching, where students prepare and present explanations of course content in teams;
- The benefits of learning-by-explaining (or learning-by-teaching as it is also commonly referred to) beyond the confounds of experimental settings;
- The use of team-teaching and learning-by-explaining (or learning-by-teaching as it is also commonly referred to) in accounting education, and more specifically, in a competency-based accounting education context.

This thesis, therefore, makes an independent and original contribution to the literature with respect to the broader competency development benefits of different explanation modes (oral, video, and written) of student-led team-teaching tasks, which incorporate learning-by-explaining, for accounting students' knowledge, teamwork skills, and communication skills development. In particular, this thesis provides insights into:

- Accounting students' experiences of entering the role of team teacher as they engage in learning-by-explaining (or learning-by-teaching as it is also commonly referred to). More specifically, this thesis provides in-depth insights into accounting students' experienced benefits and disadvantages of a team-teaching task that required them to prepare and present an oral (podcast) explanation of accounting coursework;
- Accounting students' experiences of student-led team-teaching tasks, which incorporate learning-by-explaining in either oral, video, or written explanation mode, for knowledge, teamwork skills, and communication skills development;
- Accounting students' conceptual knowledge development benefits from student-led team-teaching tasks, which incorporate learning-by-explaining, in either oral, video, or written explanation mode;
- Accounting students' transfer knowledge benefits from student-led team-teaching tasks, which incorporate learning-by-explaining, in either oral, video, or written explanation mode.

In addition, this thesis makes the following specific contributions to the practice of social constructivist teaching:

- Informs stakeholders' (university administrators' and educators') decisions in respect of adopting and supporting the implementation of student-led team-teaching tasks, which incorporate learning-by-explaining, as a social constructivist learning task, which engages students in collaborative learning, for the purpose of knowledge and skills development, in a competency-based accounting education context.
- Provides an exemplar of an integrated task that can be employed by accounting educators who need to adapt to the rapidly changing requirements of the accounting profession by implementing integrated learning tasks that engage students in active learning as they socially construct knowledge alongside the development of broader

competencies (like teamwork and communication skills) as needed by the accounting profession.

Overall, this thesis contributes to existing accounting, higher education, team-teaching, and learning-by-explaining literature, by providing evidence that student-led team-teaching tasks, which incorporate learning-by-explaining, can provide integrated learning opportunities as they promote knowledge and skills development opportunities for accounting students, in a competency-based higher education environment.

5.7 REFERENCES

Baeten, M. & Simons, M., 2014, 'Student teachers' team teaching: Models, effects, and conditions for implementation', *Teaching and Teacher Education* 41, 92–110, doi.org/10.1016/j.tate.2014.03.010.

Baeten, M., Simons, M., Schelfhout, W. & Pinxten, R., 2018, 'Team teaching during field experiences in teacher education: Exploring the assistant teaching model', *European Journal of Teacher Education* 41(3), 377–397, doi.org/10.1080/02619768.2018.1448780.

Bunney, D., Sharplin, E. & Howitt, C., 2015, 'Generic skills for graduate accountants: the bigger picture, a social and economic imperative in the new knowledge economy', *Higher Education Research and Development* 34(2), 256–269, doi.org/10.1080/07294360.2014.956700.

Chaplin, S., 2017, 'Accounting Education and the Prerequisite Skills of Accounting Graduates: Are Accounting Firms' Moving the Boundaries?', *Australian Accounting Review* 27(1), 61–70, doi.org/10.1111/auar.12146.

Cunha, T., Martins, H., Carvalho, A. & Carmo, C., 2022, 'Not Practicing What You Preach: How Is Accounting Higher Education Preparing the Future of Accounting', *Education Sciences* 12(7), doi.org/10.3390/educsci12070432.

Dolce, V., Emanuel, F., Cisi, M. & Ghislieri, C., 2020, 'The soft skills of accounting graduates: perceptions versus expectations', *Accounting Education* 29(1), 57–76, doi.org/10.1080/09639284.2019.1697937.

Hoogerheide, V., Deijkers, L., Loyens, S.M.M., Heijltjes, A. & van Gog, T., 2016, 'Gaining from explaining: Learning improves from explaining to fictitious others on video, not from writing to them', *Contemporary Educational Psychology* 44, 95–106, doi.org/10.1016/j.cedpsych.2016.02.005.

Howlett, K.M. & Nguyen, H.L., 2020, 'Autoethnographic reflections of an international graduate teaching assistant's co-teaching experiences', *Journal of International Students* 10(2), 401–419, doi.org/10.32674/jis.v10i2.774.

International Accounting Education Standards Board™, 2019, *International Education Standard 3, Initial Professional Development – Professional Skills (Revised)*, NY: IFAC, New York.

Jackson, D. & Meek, S., 2021, 'Embedding work-integrated learning into accounting

education: the state of play and pathways to future implementation', *Accounting Education* 30(1), 63–85, doi.org/10.1080/09639284.2020.1794917.

Jang, H., Lasry, N., Miller, K. & Mazur, E., 2017, 'Collaborative exams: Cheating? Or learning?', *American Journal of Physics* 85(3), 223–227, doi.org/10.1119/1.4974744.

Janse van Rensburg, C., 2022, Approaches to Digital Learning and Authentic Assessment in Accounting Education, University of Pretoria.

Janse van Rensburg, C., Coetzee, S.A. & Schmulian, A., 2022, 'Talking during a test?! Embracing mobile instant messaging during assessment', *Assessment & Evaluation in Higher Education* 0(0), 1–13, doi.org/10.1080/02602938.2022.2041545.

Kobayashi, K., 2021, 'Effects of collaborative versus individual preparation on learning by teaching', *Instructional Science* 49(6), 811–829, doi.org/10.1007/s11251-021-09561-6.

Lachner, A., Ly, K.T. & Nückles, M., 2018, 'Providing Written or Oral Explanations? Differential Effects of the Modality of Explaining on Students' Conceptual Learning and Transfer', *Journal of Experimental Education* 86(3), 344–361, doi.org/10.1080/00220973.2017.1363691.

Lawson, R.A., Blocher, E.J., Brewer, P.C., Cokins, G., Sorensen, J.E., Stout, D.E., Sundem, G.L., Wolcott, S.K., et al., 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.org/10.2308/iace-50673.

Partnership for 21 st Century Skills, 2015, 'Partnership for 21St Century Skills-Core Content Integration', *Ohio Department of Education* 1–70, from www.P21.org.

Plant, K., Barac, K. & Sarens, G., 2019, 'Preparing work-ready graduates – skills development lessons learnt from internal audit practice', *Journal of Accounting Education* 48, 33–47, doi.org/10.1016/j.jaccedu.2019.06.001.

Ribosa, J. & Duran, D., 2022, 'Do students learn what they teach when generating teaching materials for others? A meta-analysis through the lens of learning by teaching', *Educational Research Review* 37(July), 100475, doi.org/10.1016/j.edurev.2022.100475.

Schmulian, A., 2018, Approaches To Social Constructivist Accounting Education, University of Pretoria.

Schmulian, A. & Coetzee, S.A., 2019a, 'Students' experience of team assessment with immediate feedback in a large accounting class', *Assessment and Evaluation in Higher*

Education 44(4), 516–532, doi.org/10.1080/02602938.2018.1522295.

Schmulian, A. & Coetzee, S.A., 2019b, 'To Team or Not to Team: an Exploration of Undergraduate Students' Perspectives of Two Teachers Simultaneously in Class', *Innovative Higher Education* 44(4), 317–328, doi.org/10.1007/s10755-019-9466-2.

Tan, L.M. & Laswad, F., 2018, 'Professional skills required of accountants: what do job advertisements tell us?', *Accounting Education* 27(4), 403–432, doi.org/10.1080/09639284.2018.1490189.

Van der Vleuten, C.P.M., 2015, 'Competency-based education is beneficial for professional development', *Perspectives on Medical Education* 4(6), 323–325, doi.org/10.1007/s40037-015-0232-6.

Wilson, L., Ho, S. & Brookes, R.H., 2018, 'Student perceptions of teamwork within assessment tasks in undergraduate science degrees', *Assessment and Evaluation in Higher Education* 43(5), 786–799, doi.org/10.1080/02602938.2017.1409334.

Wynn, M. & Kromrey, J., 2000, 'Paired Peer Placement with Peer Coaching to Enhance Prospective Teachers' Professional Growth in Early Field Experience', *Action in Teacher Education* 22(sup2), 73–83, doi.org/10.1080/01626620.2000.10463041.

Zhao, Q., 2018, 'Study on Integrated Competency-based Accounting Education', 205(Iccese), 890–893, doi.org/10.2991/iccese-18.2018.203.

6 COMBINED REFERENCES

Abbasi, N., 2014, 'Competency approach to accounting education: A global view', *Journal of Finance and Accountancy* 13(1), 1–18.

Adams, P., 2006, 'Exploring social constructivism: theories and practicalities', *Education* 34(3), 243–257.

Al-Hassan, O., A. Al-Barakat, & Y. Al-Hassan. 2012, 'Pre-service Teachers' Reflections During Field Experience', *Journal of Education for Teaching* 38 (4): 419–434. doi:10.1080/02607476.2012.707918.

Al-Saaideh, M. 2010, 'A rationale to adopt team teaching in prevocational education in Jordan', *Journal of Instructional Psychology*, 37(4), 269–285.

Amineh, J.R. & Asl, H.D., 2015, 'Journal of Social Sciences, Literature and Languages Review of Constructivism and Social Constructivism', *Journal of Social Sciences, Literature and Languages* 1(1), 9–16.

Anderson, N. A., & Radencich, M. C. 2001, 'The value of feedback in an early field experience: peer, teacher, and supervisor coaching', *Action in Teacher Education* 23,66–74. http://dx.doi.org/10.1080/01626620.2001.10463076.

Anderson, N. A., Barksdale, M. A., & Hite, C. E. 2005, 'Pre-service teachers' observations of cooperating teachers and peers while participating in an early field experience', *Teacher Education Quarterly* 32(4), 97–117.

Atir, S., & Risen, J. L. 2025, 'The paradox of explaining: When feeling unknowledgeable prevents learners from engaging in effective learning strategies', *Journal of Experimental Psychology: General 154*(1), 228–248. https://doi.org/10.1037/xge0001679

Austin, V. 2001, 'Teachers' beliefs about co-teaching', *Remedial and Special Education* 22(4), 245–255. http://dx.doi.org/10.1177/074193250102200408.

Badiali, B., & Titus, N. 2010, 'Co-teaching: enhancing students learning through mentor-intern partnerships', *School University Partnerships* 4(2), 74–80.

Baeten, M. & Simons, M., 2014, 'Student teachers' team teaching: Models, effects, and conditions for implementation', *Teaching and Teacher Education* 41, 92–110, doi.org/10.1016/j.tate.2014.03.010.

Baeten, M. & Simons, M., 2016, 'Student teachers' team teaching: how do learners in the

classroom experience team-taught lessons by student teachers?', *Journal of Education for Teaching* 42(1), 93–105, doi.org/10.1080/02607476.2015.1135226.

Baeten, M., & Simons, M. 2016a, 'Innovative field experiences in teacher education: Student-teachers and mentors as partners in teaching', *International Journal of Teaching and Learning in Higher Education*, 28, 38–51. https://api.semanticscholar.org/CorpusID:55045663

Baeten, M. & Simons, M., 2016b, 'Student teachers' team teaching: how do learners in the classroom experience team-taught lessons by student teachers?', *Journal of Education for Teaching* 42(1), 93–105, doi.org/10.1080/02607476.2015.1135226.

Baeten, M., Simons, M., Schelfhout, W. & Pinxten, R., 2018, 'Team teaching during field experiences in teacher education: Exploring the assistant teaching model', *European Journal of Teacher Education* 41(3), 377–397, doi.org/10.1080/02619768.2018.1448780.

Baldvinsdottir, G., Burns, J., Nørreklit, H. & Scapens, R.W., 2009, 'The image of accountants: From bean counters to extreme accountants', *Accounting, Auditing and Accountability Journal* 22(6), 858–882, doi.org/10.1108/09513570910980445.

Bangert-drowns, R.L., Hurley, M.M. & Wilkinson, B., 2004, 'The Effects of School-Based Writing-to-Learn Interventions on Academic Achievement : A Meta-Analysis', *Review of Educational Research* 74(1), 29–58.

Barahona, M., 2017, 'Exploring models of team teaching in initial foreign/second language teacher education: A study in situated collaboration', *Australian Journal of Teacher Education* 42(12), 144–161, doi.org/10.14221/ajte.2017v42n12.9.

Bashan, B., & Holsblat, R. 2012, 'Co-teaching through modeling processes: professional development of students and instructors in a teacher training program', *Mentoring & Tutoring: Partnership in Learning* 20(2), 207–226. http://dx.doi.org/10.1080/13611267.2012.678972.

Bayerlein, L., 2015, 'Curriculum innovation in undergraduate accounting degree programmes through "virtual internships"', *Education and Training* 57(6), 673–684, doi.org/10.1108/ET-09-2014-0110.

Bayne, L., Birt, J., Hancock, P., Schonfeldt, N. & Agrawal, P., 2022, 'Best practices for group assessment tasks', *Journal of Accounting Education* 59, 100770, doi.org/10.1016/j.jaccedu.2022.100770.

Benjamin, J. 2000, 'The scholarship of teaching in teams: What does it look like in practice?',

Higher Education Research & Development 19(2):191-204.

Biggs, J., 1999, 'What the student does: Teaching for enhanced learning', *International Journal of Phytoremediation* 21(1), 57–75, doi.org/10.1080/0729436990180105.

Bilgrami, A. (2002). *Realism and Relativism*. In Source: Philosophical Issues (Vol. 12).

Birrell, J.R. & Bullough, R. V., 2005, 'Teaching with a Peer: A Follow-Up Study of the 1st Year of Teaching', *Action in Teacher Education* 27(1), 72–81, doi.org/10.1080/01626620.2005.10463375.

Bisra, K., Liu, Q., Nesbit, J. C., Salimi, F., & Winne, P. H. 2018. 'Inducing Self-Explanation: a Meta-Analysis'. *Educational Psychology Review 30*(3), 703–725. https://doi.org/10.1007/s10648-018-9434-x

Bloom, R. & Debessay, A., 1984, 'Educating Professional Accountants for the Twenty-First Centurv : A Point of View', *The Journal of Business Education* 4(59), 159–162, doi.org/10.1080/00219444.1984.10534117.

Bolam, R., Mcmahon, A., Stoll, L., Thomas, S., Wallace, M., Greenwood, A., Hawkey, K., Ingram, M., Atkinson, A., & Smith, M. 2005, 'Creating and Sustaining Effective Professional Learning Communities', *Universitiy of Bristol*. www.dfes.go.uk/research

Bolt-Lee, C. & Foster, S., 2003, 'The core competency framework: A new element in the continuing call for accounting education change in the United States', *Accounting Education* 12(1), 33–47, doi.org/10.1080/0963928031000074486.

Boritz, J.E. & Carnaghan, C.A., 2003, 'Competency-based education and assessment for the accounting profession: A critical review', *Canadian Accounting Perspectives* 2(1), 7–42, doi.org/10.1506/5K7C-YT1H-0G32-90K0.

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

Bowman, C. L., & McCormick, S. 2000, 'Comparison of peer coaching versus traditional supervision effects', *The Journal of Educational Research* 93(4), 256–261.

Brojčin, B., Bankovič, S., Glumbič, N., & Weiss, S. 2012, 'Effects of cooperative teaching in inclusive education', *Didactica Slovenica - Pedagoska Obzorja* 27(5), 66–79.

Bryman, A., 2006, 'Integrating quantitative and qualitative research: How is it done?', *Qualitative Research* 6(1), 97–113, doi.org/10.1177/1468794106058877.

Bullough, R., J. Young, J. Birrell, D. Clark, M. Egan, L. Erickson, M. Frankovich, J. Brunetti, and M. Welling 2003, 'Teaching with a Peer: A Comparison of Two Models of Student Teaching', *Teaching and Teacher Education* 19, 57–73.

Bunney, D., Sharplin, E. & Howitt, C., 2015, 'Generic skills for graduate accountants: the bigger picture, a social and economic imperative in the new knowledge economy', *Higher Education Research and Development* 34(2), 256–269, doi.org/10.1080/07294360.2014.956700.

Carberry. A.R. 2008, *Learning-by-teaching as a pedagogical approach and its implications on engineering education*. Ph. D. Dissertation. Tufts University.

Carpenter, D.M., Crawford, L. & Walden, R., 2007, 'Testing the efficacy of team teaching', *Learning Environments Research* 10(1), 53–65, doi.org/10.1007/s10984-007-9019-y.

Carpenter, S.K., Cepeda, N.J., Rohrer, D., Kang, S.H.K. & Pashler, H., 2012, 'Using Spacing to Enhance Diverse Forms of Learning: Review of Recent Research and Implications for Instruction', *Educational Psychology Review* 24(3), 369–378, doi.org/10.1007/s10648-012-9205-z.

Chan, D., 2015, 'The Effect of Cooperative Learning on Students' Attitude in First-Year Principles of Accounting Course', *Business Education Innovation Journal* 7(2), 107–116, doi.org/10.1016/0748-5751(95)00032-1.

Chaplin, S., 2017, 'Accounting Education and the Prerequisite Skills of Accounting Graduates: Are Accounting Firms' Moving the Boundaries?', *Australian Accounting Review* 27(1), 61–70, doi.org/10.1111/auar.12146.

Chebbihi, H., Varpio, L., St-Onge, C. & Chamberland, M., 2019, 'Self-explanation to support knowledge development for clinical reasoning: Perspectives from third year medical clerks', *MedEdPublish* 8(3), 1–11, doi.org/10.15694/mep.2019.000225.1.

Chhinzer, N. & Russo, A.M., 2018, 'An exploration of employer perceptions of graduate student employability', *Education and Training* 60(1), 104–120, doi.org/10.1108/ET-06-2016-0111.

Chi, M., & Wylie, R. 2014, 'The ICAP framework: linking cognitive engagement to active learning outcomes', *Educational Psychologist* 49(4), 219–243.

Cho, Y. H., & Jonassen, D. H. 2012, 'Learning by self-explaining causal diagrams in high-school biology', *Asia Pacific Education Review* 13(1), 171–184.

Coetzee, S.A. & Schmulian, A., 2012, 'A critical analysis of the pedagogical approach employed in an introductory course to IFRS', *Issues in Accounting Education* 27(1), 83–100, doi.org/10.2308/iace-10220.

Coetzee, S.A. & Schmulian, A., 2013, 'The effect of IFRS adoption on financial reporting pedagogy in South Africa', *Issues in Accounting Education* 28(2), 243–251,

doi.org/10.2308/iace-50386.

Coetzee, S.A., Schmulian, A. & Kotze, L., 2014, 'Communication apprehension of South African accounting students: The effect of culture and language', *Issues in Accounting Education* 29(4), 505–525, doi.org/10.2308/iace-50850.

Coetzee, S.A., Leith, K. & Schmulian, A., 2019, 'Accounting students access to social media related resources and the risk of tacit social exclusion', *Accounting Education* 28(5), 465–483, doi.org/10.1080/09639284.2019.1641116.

Colburn, M., Sullivan, D. & Fox, D.E. 2012, 'An examination of the impact of team teaching on student learning outcomes and student satisfaction in undergraduate business capstone courses', *American Journal of Business Education (Online),* 5(2):149-157.

Coleman, E. B., Brown, A. L., & Rivkin, I. D. 1997, 'The Effect of Instructional Explanations on Learning from Scientific Texts', *Journal of the Learning Sciences 6*(4), 347–365. https://doi.org/10.1207/s15327809jls0604_1

Cooper, S., 2017, 'A collaborative assessment of students' placement learning', *Assessment and Evaluation in Higher Education* 42(1), 61–76, doi.org/10.1080/02602938.2015.1083093.

Cook, L., & Friend, M. 1995, 'Co-teaching: guidelines for creating effective practices', *Focus on Exceptional Children* 28(3), 1–16.

Connolly, P., Keenan, C. & Urbanska, K., 2018, 'The trials of evidence-based practice in education: a systematic review of randomised controlled trials in education research 1980–2016', *Educational Research* 60(3), 276–291, doi.org/10.1080/00131881.2018.1493353.

Creemers, B., & Kyriakides, L. 2007, *The dynamics of educational effectiveness: A contribution to policy, practice and theory in contemporary schools*, Routledge.

Creswell, J. W. 2014. *Qualitative enquiry and research design: choosing among five approaches*. Thousand Oaks: Sage.

Cunha, T., Martins, H., Carvalho, A. & Carmo, C., 2022, 'Not Practicing What You Preach: How Is Accounting Higher Education Preparing the Future of Accounting', *Education Sciences* 12(7), doi.org/10.3390/educsci12070432.

Daniels, H., 2001, *Vygotsky and pedagogy*, Routledge Falmer, London.

Darnon, C., Dompnier, B. & Poortvliet, M.., 2012, 'Achievement goals in educational contexts. A social psychology perspective.', *Social and Personality Psychology Compass* 6(10), 760–771.

Dawadi, S., Shrestha, S. & Giri, R.A., 2021, 'Mixed-Methods Research: A Discussion on its Types, Challenges, and Criticisms', *Journal of Practical Studies in Education* 2(2), 25–36, doi.org/10.46809/jpse.v2i2.20.

Debbané, A., Lee, K. J., Tse, J., & Law, E. 2023, 'Learning by Teaching: Key Challenges and Design Implications', *Proceedings of the ACM on Human-Computer Interaction 7*(CSCW1). https://doi.org/10.1145/3579501

Dee, A. 2012, 'Collaborative Clinical Practice: An Alternate Field Experience', *Issues in Teacher Education* 21 (2): 147–163.

Denicolo, P., 2016, *Constructivist Approaches and Research Methods: A Practical Guide to Exploring Personal Meanings*, SAGE, doi.org/https://doi.org/10.4135/9781526402660.

Dehnad, A., Jalali, M., Shahabi, S., Mojgani, P., & Bigdeli, S. 2021, 'Students' view on supportive co-teaching in medical sciences: A systematic review', *BMC Medical Education* 21(1), 522. https://doi.org/10.1186/s12909-021-02958-4

Denzin, N. K., & Licoln, Y. S. (1994). *Handbook of Qualitative Research*. Sage.

Dietrichson, J., Filges, T., Klokker, R. H., Viinholt, B. C. A., Bøg, M., & Jensen, U. H. 2020, 'Targeted school-based interventions for improving reading and mathematics for students with, or at risk of, academic difficulties in Grades 7–12: A systematic review', *Campbell Systematic Reviews* 16(2), e1081. https://doi.org/10.1002/cl2.1081

Do, M.L. & Hascher, T., 2023, 'Peer cooperation during teaching in paired field placements: Forms and challenges', *Frontline Learning Research* 11(1), 94–122, doi.org/10.14786/flr.v11i1.1305.

Dolce, V., Emanuel, F., Cisi, M. & Ghislieri, C., 2020, 'The soft skills of accounting graduates: perceptions versus expectations', *Accounting Education* 29(1), 57–76, doi.org/10.1080/09639284.2019.1697937.

Donnison, S., Edwards, D., Itter, D., Martin, D. & Yager, Z., 2009, 'Reflecting on improving our practice: Using collaboration as an approach to enhance first year transition in higher education', *Australian Journal of Teacher Education* 34(3), 18–29, doi.org/10.14221/ajte.2009v34n3.2.

Dunlosky, J., Rawson, K., Marsh, E., Nathan, M., & Willingham, D. 2013, 'Improving students' learning with effective learning techniques', *Psychological Science in the Public Interest* 14(1), 4–58.

Duran, D., 2017, 'Learning-by-teaching. Evidence and implications as a pedagogical mechanism', *Innovations in Education and Teaching International* 54(5), 476–484,

doi.org/10.1080/14703297.2016.1156011.

Duran, D. & Topping, K.J., 2017, *Evidence-based strategies to enhance learning in the classroom*, Routledge, London.

de Koning, B. B., Tabbers, H. K., Rikers, R. M. J. P., & Paas, F. 2010, 'Learning by generating vs. receiving instructional explanations: two approaches to enhance attention cueing in animations', *Computers & Education* 55(2), 681–691.

de Lange, P., O'Connell, B. T., Tharapos, M., Beatson, N., & Oosthuizen, H. 2023, 'Accounting graduate employability: employer perspectives on skills and attributes of international graduates', *Accounting Education 32*(3), 249–277. https://doi.org/10.1080/09639284.2022.2059383

de Weerdt, D., Simons, M., Struyf, E., & Tack, H. 2024. 'Studying the Effectiveness of Team Teaching: A Systematic Review on the Conceptual and Methodological Credibility of Experimental Studies', *Review of Educational Research*. https://doi.org/10.3102/00346543241262807

Edmond, T. & Tiggeman, T., 2009, 'Accounting Experiences In Collaborative Learning', *American Journal of Business Education* 2(7), 97–100, doi.org/10.19030/ajbe.v2i7.4588.

Engel, A.M., 2018, 'Literature Review of Student Characteristics and Performance in an Accounting Course', *Community College Journal of Research and Practice* 42(10), 748–751, doi.org/10.1080/10668926.2017.1328320.

Esterhazy, R., de Lange, T., Bastiansen, S., & Wittek, A. L. 2021, 'Moving beyond peer review of teaching: A conceptual framework for collegial faculty development', *Review of Educational Research* 91(2), 237–271. https://doi.org/10.3102/0034654321990721.

Falkner, K. & Falkner, N.J.G., 2012, 'Supporting and structuring "contributing student pedagogy" in Computer Science curricula', *Computer Science Education* 22(4), 413–443, doi.org/10.1080/08993408.2012.727713.

Feldstein, S., Dohm, F.A. & Crown, C.L., 2001, 'Gender and speech rate in the perception of competence and social attractiveness', *Journal of Social Psychology* 141(6), 785–806, doi.org/10.1080/00224540109600588.

Fiorella, L. & Mayer, R.E., 2013, 'The relative benefits of learning by teaching and teaching expectancy', *Contemporary Educational Psychology* 38, 281–288, doi.org/10.1016/j.cedpsych.2013.06.001.

Fiorella, L. & Mayer, R.E., 2014, 'Role of expectations and explanations in learning by

teaching', *Contemporary Educational Psychology* 39(2), 75–85, doi.org/10.1016/j.cedpsych.2014.01.001.

Fiorella, L., Mayer, R.E., 2016, 'Eight Ways to Promote Generative Learning', *Educational Psychology Review* 28, 717–741, https://doi.org/10.1007/s10648-015-9348-9.

Fiorella, L., 2021, 'Fostering knowledge building in learning by teaching: A test of the drawing-facilitates-explaining hypothesis', *Applied Cognitive Psychology* 35(2), 548–558, doi.org/10.1002/acp.3774.

Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. 2019, *How to design and evaluate research in education* (10th ed.). McGraw-Hill.

Frank, J.R., Snell, L.S., Cate, O. Ten, Holmboe, E.S., Carraccio, C., Swing, S.R., Harris, P., Glasgow, N.J., et al., 2010, 'Competency-based medical education: Theory to practice', *Medical Teacher* 32(8), 638–645, doi.org/10.3109/0142159X.2010.501190.

Friend, M., Cook, L., Hurley-Chamberlain, D., & Shamberger, C. 2010, 'Co-teaching: An illustration of the complexity of collaboration in special education', *Journal of Educational and Psychological Consultation* 20(1), 9–27. https://doi.org/10.1080/10474410903535380

Fukaya, T. 2013, 'Explanation generation, not explanation expectancy, improves metacomprehension accuracy', *Metacognition and Learning 8*(1), 1–18. https://doi.org/10.1007/s11409-012-9093-0

Fuller, R.G. & Bail, J., 2011, 'Team teaching in the online graduate: Collaborative Instruction', *International Journal of Information and Communication Technology Education* 7(4), 72–83.

Gall, M. D., Gall, J. P., & Borg, W. R. 2003, *Educational research: An introduction* (7th ed.). Boston, MA: Pearson.

Gammie, E., Paver, B., Gammie, B. & Duncan, F., 2003, 'Gender differences in accounting education.pdf', *Accounting Education* 12(2), 177–196.

Gardiner, W., and K. Robinson. 2009, 'Paired Field Placements: A Means for Collaboration', *The New Educator* 5, 81–94.

Gardiner, W. 2010, 'Mentoring Two Student Teachers: Mentors' Perceptions of Peer Placements', *Teaching Education* 21 (3), 233–246. doi:10.1080/10476210903342102.

Gardiner, W., & Robinson, K. 2011, 'Peer field placements with preservice teachers: negotiating the challenges of professional collaboration', *The Professional Educator* 35(2).

Gartner, A. 1971, *Children teach children: Learning by teaching*. Harper & Row, Manhattan, NY 10022, USA.

Gast, I., Schildkamp, K., & Van Der Veen, J. T. 2017, 'Team-based professional development interventions in higher education: A systematic review', *Review of Educational Research* 87(4), 736–767.

Gaytan, J. 2010, 'Instructional strategies to accommodate a team-teaching approach', *Business Communication Quarterly* 73, 82-87. http://dx.doi.org/10.1177/1080569909358097

Ghani, E.K. & Muhammad, K., 2019, 'Industry 4.0: Employers' expectations of accounting graduates and its implications on teaching and learning practices', *International Journal of Education and Practice* 7(1), 19–29, doi.org/10.18488/journal.61.2019.71.19.29.

Giuliodori, M.J., Lujan, H.L. & DiCarlo, S.E., 2008, 'Collaborative group testing benefits high- and low-performing students', *Advances in Physiology Education* 32(4), 274–278, doi.org/10.1152/advan.00101.2007.

Goddard, R., Goddard, Y., Sook Kim, E., & Miller, R. 2015, 'A theoretical and empirical analysis of the roles of instructional leadership, teacher collaboration, and collective efficacy beliefs in support of student learning', *American Journal of Education* 121(4), 501–530. https://doi.org/10.1086/681925

Goker, S. 2006, 'Impact of peer coaching on self-efficacy and instructional skills in TEFL teacher education', *System* 34, 239–254. http://dx.doi.org/10.1016/j.system.2005.12.002.

Goodnough, K., Osmond, P., Dibbon, D., Glassman, M. & Stevens, K., 2009, 'Exploring a triad model of student teaching: Pre-service teacher and cooperating teacher perceptions', *Teaching and Teacher Education* 25(2), 285–296, doi.org/10.1016/j.tate.2008.10.003.

Graziano, K., & Navarette, L. 2012, 'Co-teaching in a teacher education classroom: collaboration, comprise, and creativity', *Issues in Teacher Education* 21(1), 109–126.

Greene, J.C., Caracelli, V.J. & Graham, W.F., 1989, 'Toward a Conceptual Framework for Mixed-Method Evaluation Designs', *Educational Evaluation and Policy Analysis* 11(3), 255–274, from https://www.jstor.org/stable/1163620.

Griffin, P. and Robertson, P., 2014, 'Professional learning teams and decision-making.', *Assessment for teaching* 1, 13–25.

Grix, J. 2004, *The Foundations of Research*. New York, NY: Palgrave Macmillan

Gunawardena, C.N., 1995, 'Social Presence Theory and Implications for Interaction and Collaborative Learning in Computer Conferences', *International Journal of Educational Telecommunications* 1(2), 147–166.

Gurgur, H., & Uzuner, Y. 2011, 'Examining the implementation of two co-teaching models: Team teaching and station teaching', *International Journal of Inclusive Education* 15(6), 589–610. https://doi.org/10.1080/13603110903265032

Hanusch, F., Obijiofor, L. & Volcic, Z., 2009, 'Theoretical and Practical Issues in Team-Teaching a Large Undergraduate Class', *International Journal of Teaching and Learning in Higher Education* 21(1), 66–74, from http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ896243&site=ehost-live.

Hargreaves, E., 2007, 'The validity of collaborative assessment for learning', *Assessment in Education: Principles, Policy and Practice* 14(2), 185–199, doi.org/10.1080/09695940701478594.

Harris, P., Bhanji, F., Topps, M., Ross, S., Lieberman, S., Frank, J.R., Snell, L. & Sherbino, J., 2017, 'Evolving concepts of assessment in a competency-based world', *Medical Teacher* 39(6), 603–608, doi.org/10.1080/0142159X.2017.1315071.

Hefter, M.H. & Berthold, K., 2020, 'Preparing learners to self-explain video examples: Text or video introduction?', *Computers in Human Behavior* (110), 106404, doi.org/10.1016/j.chb.2020.106404.

Heisler, L. A., & Thousand, J. S. 2021, 'A guide to co-teaching for the SLP: A tutorial', *Communication Disorders Quarterly* 42(2), 122–127. https://doi.org/10.1177/1525740119886310

Hellier, S., & Davidson, L. 2018, 'Team teaching in nursing education', *Journal of continuing Education in Nursing 49*(4), 186–192. https://doi.org/10.3928/00220124-20180320-09

Helms, M., Alvis, J., &Willis, M. 2005, 'Planning and implementing shared teaching: an MBA team-teaching case study', *Journal of Education for Business* 8,29–34.

Honigsfeld, A., & Dove, M. G. 2019, Preparing teachers for co-teaching and collaboration. In L. C. de Oliveira (Ed.), *The handbook of TESOL in K-12* (pp. 405–421). Wiley. https://doi.org/10.1002/9781119421702.ch26

Hoogerheide, V., Loyens, S. M., & van Gog, T. 2014, 'Effects of creating video-based modeling examples on learning and transfer', *Learning and Instruction* 33, 108–119. doi:10.1016/j.learninstruc.2014.04.005

Hoogerheide, V., Deijkers, L., Loyens, S.M.M., Heijltjes, A. & van Gog, T., 2016, 'Gaining from explaining: Learning improves from explaining to fictitious others on video, not from writing to them', *Contemporary Educational Psychology* 44, 95–106, doi.org/10.1016/j.cedpsych.2016.02.005.

Hoogerheide, V., Renkl, A., Fiorella, L., Paas, F. & van Gog, T., 2019, 'Enhancing Example-Based Learning: Teaching on Video Increases Arousal and Improves Problem-Solving Performance', *Journal of Educational Psychology* 111(1), 45–56, doi.org/10.1037/edu0000272.

Howlett, K.M. & Nguyen, H.L., 2020, 'Autoethnographic reflections of an international graduate teaching assistant's co-teaching experiences', *Journal of International Students* 10(2), 401–419, doi.org/10.32674/jis.v10i2.774.

Huguet, P. & Kuyper, H., 2017, 'Applying Social Psychology to the Media', in *Applied Social Psychology: Understanding and Addressing Social and Practical Problems*, L. Steg, K. Keizer, A.. Buunk, & T. Rothengatter, Eds., Cambridge University Press, pp. 172–192, doi.org/10.4135/9781071800591.n7.

ICAEW, 2017, 'Understanding the Impact of Technology in Audit and Finance', *Understanding the impact of technology in audit and finance* 14, from https://www.icaew.com/-/media/corporate/files/middle-east-hub/understanding-the-impact-of-technology-in-audit-and-finance.ashx.

International Accounting Education Standards Board (IAESB), 2014, 'IES 4: Initial Professional Development – Professional Values, Ethics, and Attitudes', *International Federation of Accountants* (January), 1–15.

International Accounting Education Standards Board™, 2019, *International Education Standard 3, Initial Professional Development – Professional Skills (Revised)*, NY: IFAC, New York.

Irby, D.M., 1994, ' What clinical teachers in medicine need to know', *Academic Medicine* 65 (9), 333–342, doi.org/10.1097/00001888-199405000-00003.

Jackson, D. & Meek, S., 2021, 'Embedding work-integrated learning into accounting education: the state of play and pathways to future implementation', *Accounting Education* 30(1), 63–85, doi.org/10.1080/09639284.2020.1794917.

Jackson, D., Michelson, G. & Munir, R., 2023, 'Developing accountants for the future: new technology, skills, and the role of stakeholders', *Accounting Education* 32(2), 150–177, doi.org/10.1080/09639284.2022.2057195.

Jacob, L., Lachner, A. & Scheiter, K., 2020, 'Learning by explaining orally or in written form ? Text complexity matters', *Learning and Instruction* 68, 101344, doi.org/10.1016/j.learninstruc.2020.101344.

Jamieson, S., 2004, 'Likert scales: How to (ab)use them', *Medical Education* 38(12), 1217–1218, doi.org/10.1111/j.1365-2929.2004.02012.x.

Jang, S. 2008, 'Innovations in science teacher education: effects of integrating technology and team-teaching strategies', *Computers & Education* 51, 646–659. http://dx.doi.org/10.1016/j.compedu.2007.07.001.

Jang, H., Lasry, N., Miller, K. & Mazur, E., 2017, 'Collaborative exams: Cheating? Or learning?', *American Journal of Physics* 85(3), 223–227, doi.org/10.1119/1.4974744.

Janse van Rensburg, C., 2022, Approaches to Digital Learning and Authentic Assessment in Accounting Education, University of Pretoria.

Janse van Rensburg, C., Coetzee, S.A. & Schmulian, A., 2022, 'Talking during a test?! Embracing mobile instant messaging during assessment', *Assessment & Evaluation in Higher Education* 0(0), 1–13, doi.org/10.1080/02602938.2022.2041545.

Jenkins, J., & Veal, M. 2002, 'Preservice teachers' PCK development during peer coaching', *Journal of Teaching in Physical Education* 22,49–68.

Jick, T.D., 1979, 'Mixing Qualitative and Quantitative Methods : Triangulation in Action', *Administrative Science Quarterly* 24(4), 602–611.

John-Steiner, V. & Mahn, H., 1996, 'Sociocultural Contexts for Teaching and Learning', *Educationaly Psychologist* 31 (3/4), 191–206, doi.org/10.1002/0471264385.wei0707.

Johnson, D.W. & Johnson, R.T., 2005, 'New developments in social interdependence theory', *Genetic, Social, and General Psychology Monographs* 131(4), 285–358, doi.org/10.3200/MONO.131.4.285-358.

Jon A. Krosnick, L.R.F., 1997, 'Designing Rating Scales for Effective Measurement in Surveys', in *Survey Measurement and Process Quality*, M.C. L. Lyberg, P. Biemer, Ed., Wiley-Interscience, New York, pp. 141–164, doi.org/https://doi.org/10.1002/9781118490013.ch6.

Jonassen, D., Davidson, M., Collins, M., Campbell, J. & Haag, B.B., 1995, 'Constructivism and Computer-Mediated Communication in Distance Education', *American Journal of Distance Education* 9(2), 7–26, doi.org/10.1080/08923649509526885.

Juarros-Basterretxea, J., Aonso-Diego, G., Postigo, Á., Montes-Álvarez, P., Menéndez-Aller, Á. & García-Cueto, E., 2024, 'Post-hoc tests in one-way ANOVA: The case for

normal distribution', *Methodology* 20(2), 84–99, doi.org/10.5964/meth.11721.

Kamens, M. 2007. 'Learning about Co-teaching: A Collaborative Student Teaching Experience for Preservice Teachers.' *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children* 30 (3), 155–166. doi:10.1177/088840640703000304.

Kay, D. & Kibble, J., 2016, 'Learning theories 101: Application to everyday teaching and scholarship', *Advances in Physiology Education* 40(1), 17–25, doi.org/10.1152/advan.00132.2015.

Keevy, M., Tharapos, M., O'Connell, B. T., Verhoef, G., de Lange, P., & Beatson, N. J. 2023, 'Using an extended professional project to develop professional skills among rural South African accounting students' *Accounting Education*. https://doi.org/10.1080/09639284.2023.2283441

Kelchtermans, G., 2006, 'Teacher collaboration and collegiality as workplace conditions. A review', *Zeitschrift fur Padagogik* 52(2), 220–237, doi.org/10.25656/01.

Kerin, M. & Murphy, C. 2015. 'Exploring the impact of coteaching on pre-service music teachers', *Asia-Pacific Journal of Teacher Education* 43(4), 309–323.

King, S., 2006, 'Promoting paired placements in initial teacher education . The use of paired placements in England', *International Research in Geographical and Environmental Education* 15(4), 370–386.

Kivunja, C., & Kuyini, A. B. 2017, 'Understanding and Applying Research Paradigms in Educational Contexts', *International Journal of Higher Education 6*(5), 26. https://doi.org/10.5430/ijhe.v6n5p26

Kobayashi, K., 2019, 'Learning by Preparing-to-Teach and Teaching: A Meta-Analysis', *Japanese Psychological Research* 61(3), 192–203, doi.org/10.1111/jpr.12221.

Kobayashi, K., 2021, 'Effects of collaborative versus individual preparation on learning by teaching', *Instructional Science* 49(6), 811–829, doi.org/10.1007/s11251-021-09561-6.

Koles, P.G., Stolfi, A., Borges, N.J., Nelson, S. & Parmelee, D.X., 2010, 'The impact of team-based learning on medical students' Academic Performance', *Academic Medicine* 85(11), 1739–1745, doi.org/10.1097/ACM.0b013e3181f52bed.

Krosnick, J.A., 1999, 'Survey Research', *Annual Review of Psychology* 50, 537–567, doi.org/10.1097/ALN.0000000000002436.

Kurtts, S. A., & Levin, B. B. 2000, 'Using peer coaching with preservice teachers to develop reflective practice and collegial support', *Teaching Education* 11(3), 297–310.

http://dx.doi.org/10.1080/713698980.

Kyndt, E., V. Donche, D. Gijbels, and P. Van Petegem. 2014, 'Workplace Learning within Teacher Education: The Role of Job Characteristics and Goal Orientation', *Educational Studies*, 40 (5), 515–532. doi:10.1080/03055698.2014.936829.

Kyndt, E., Gijbels, D., Grosemans, I., & Donche, V. 2016, 'Teachers' everyday professional development: Mapping informal learning activities, antecedents, and learning outcomes', *Review of Educational Research* 86(4), 1111–1150. https://doi.org/10.3102/0034654315627864

Lachner, A., Ly, K.T. & Nückles, M., 2018, 'Providing Written or Oral Explanations? Differential Effects of the Modality of Explaining on Students' Conceptual Learning and Transfer', *Journal of Experimental Education* 86(3), 344–361, doi.org/10.1080/00220973.2017.1363691.

Lachner, A., Backfisch, I., Hoogerheide, V., van Gog, T. & Renkl, A., 2020, 'Timing Matters! Explaining Between Study Phases Enhances Students' Learning', *Journal of Educational Psychology* 112(4), 841–853, doi.org/10.1037/edu0000396.

Lachner, A., Hoogerheide, V., van Gog, T. & Renkl, A., 2021, 'Learning-by-Teaching Without Audience Presence or Interaction: When and Why Does it Work?', *Educational Psychology Review*, doi.org/10.1007/s10648-021-09643-4.

Lachner, A., Jacob, L., & Hoogerheide, V. 2021, 'Learning by writing explanations: Is explaining to a fictitious student more effective than self-explaining?' *Learning and Instruction*, *74* 101438. https://doi.org/10.1016/j.learninstruc.2020.101438

Laughlin, K., Nelson, P., & Donaldson, S. 2011, 'Successfully applying team teaching with adult learners', *Journal of Adult Education* 40,11-17.

Lawson, R.A., Blocher, E.J., Brewer, P.C., Cokins, G., Sorensen, J.E., Stout, D.E., Sundem, G.L., Wolcott, S.K., et al., 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.org/10.2308/iace-50673.

Lee, S.H.S. 2013, 'An evaluation on a team teaching by university students and lecturers in Australia', *Journal of Language Teaching & Research* 4(5), 914–923.

Lee, K. J., Chauhan, A., Goh, J., Nilsen, E., & Law, E. 2021, 'Curiosity Notebook: The Design of a Research Platform for Learning by Teaching', *Proceedings of the ACM on Human-Computer Interaction*, *5*(CSCW2). https://doi.org/10.1145/3479538

Leikin, R. 2006, *Learning by teaching: The case of Sieve of Eratosthenes and one elementary school teacher*. Routledge, Oxfordshire, England, UK, 115–140

Lerchenfeldt, S., Mi, M. & Eng, M., 2019, 'The utilization of peer feedback during collaborative learning in undergraduate medical education: A systematic review', *BMC Medical Education* 19(1), 1–10, doi.org/10.1186/s12909-019-1755-z.

Letterman, M.R. & Dugan, K.B., 2004, 'Team Teaching a Cross-Disciplinary Honors Course: Preparation and Development', *College Teaching* 52(2), 76–79.

Levant, Y., Coulmont, M. & Sandu, R., 2016, 'Business simulation as an active learning activity for developing soft skills', *Accounting Education* 25(4), 368–395, doi.org/10.1080/09639284.2016.1191272.

Lin, L., & Atkinson, R. K. 2013, 'Enhancing learning from different visualizations by self-explanation prompts', *Journal of Educational Computing Research* 49(1), 83–110.

Lopez-Fernandez, O. & Molina-Azorin, J.F., 2011, 'The use of mixed methods research in the field of behavioural sciences', *Quality and Quantity* 45(6), 1459–1472, doi.org/10.1007/s11135-011-9543-9.

Loughry, M.L., Ohland, M.W. & Moore, D.D., 2007, 'Development of a Theory-Based Member Effectiveness', *Educational and Psychological Measurement* 67(3), 505–524, doi.org/10.1177/0013164406292085.

Loureiro, M. & Silva, R., 2019, 'Differences in communication skills between business, economics and management university students', *Proceedings of the European Conference on Knowledge Management, ECKM* 2(2), 700–707, doi.org/10.34190/KM.19.167.

Mahoney, J.W. & Harris-Reeves, B., 2019, 'The effects of collaborative testing on higher order thinking: Do the bright get brighter?', *Active Learning in Higher Education* 20(1), 25–37, doi.org/10.1177/1469787417723243.

Mapuya, M., 2021, 'First-year accounting student teachers' constructivist learning experiences, the lecturer's role and implications for curriculum implementation', *International Journal of Learning, Teaching and Educational Research* 20(1), 103–119, doi.org/ 10.26803/ijlter.20.1.6.

Mayer, R.E., 2014, 'Cognitive theory of multimedia learning.', in *The Cambridge Handbook of Multimedia Learning*, 2nd ed, Cambridge University Press, New York, pp. 31–48, from https://doi.org/10.1017/CBO9780511816819.004.

McKenzie, J.F., Wood, M.L., Kotecki, J.E. & Clark, J.K., 1999, 'Establishing content validity:

using qualitative and quantitative steps', *American Journal of Health Behaviour* 4(23), 311–318.

Mehrabi Boshrabadi, A. & Hosseini, M.R., 2021, 'Designing collaborative problem solving assessment tasks in engineering: an evaluative judgement perspective', *Assessment and Evaluation in Higher Education* 46(6), 913–927, doi.org/10.1080/02602938.2020.1836122.

Memon, M. A., Ting, H., Cheah, J.-H., Thurasamy, R., Chuah, F., & Cham, T. H. 2020, 'Sample size for survey research: Review and recommendations', *Journal of Applied Structural Equation Modeling*, 4(2), i–xx. https://doi.org/10.47263/JASEM.4(2)01

Morgan, D.L., 1998, 'Practical strategies for combining qualitative and quantitative methods: Applications to health research', *Qualitative Health Research* 8(3), 362–376, doi.org/10.1177/104973239800800307.

Morse, J.M., 1991, 'Approaches to qualitative-quantitative methodological triangulation', *Nursing Research* 40(2), 120–123, doi.org/10.1097/00006199-199103000-00014.

Murata, R., 2002, 'What does team teaching mean? a case study of interdisciplinary teaming', *Journal of Educational Research* 96(2), 67–77, doi.org/10.1080/00220670209598794.

Murphy, C. & Scantlebury, K. (Eds.). 2010, *Co-teaching in international contexts*. London: Springer.

Nevin, A., Thousand, J., & Villa, R. 2009, 'Collaborative teaching for teacher educators—What does the research say?', *Teaching and Teacher Education* 25(4), 569–574. https://doi.org/10.1016/j.tate.2009.02.009

Nguyen, H., & Baldauf, R. 2010, 'Effective peer mentoring for EFL pre-service teachers' instructional practicum practice', *The Asian EFL Journal Quarterly* 12(3), 40–61.

Nimon, K. F. 2012, 'Statistical assumptions of substantive analyses across the general linear model: A mini-review'. In *Frontiers in Psychology* (Vol. 3, Issue AUG). https://doi.org/10.3389/fpsyg.2012.00322

Nokes, J.D., Bullough, R. V., Egan, W.M., Birrell, J.R. & Merrell Hansen, J., 2008, 'The paired-placement of student teachers: An alternative to traditional placements in secondary schools', *Teaching and Teacher Education* 24(8), 2168–2177, doi.org/10.1016/j.tate.2008.05.001.

OECD. (2020). TALIS 2018 results: Vol. II. *Teachers and school leaders as valued professionals*. OECD Publishing. https://doi.org/10.1787/23129638

Okita, S.Y. & Schwartz, D.L., 2013, 'Learning by Teaching Human Pupils and Teachable Agents: The Importance of Recursive Feedback', *Journal of the Learning Sciences* 22(3), 375–412, doi.org/10.1080/10508406.2013.807263.

Onwuegbuzie, A.J., Johnson, R.B. & Collins, K.M.T., 2009, 'Assessing legitimation in mixed research: A new framework', *Quality and Quantity* 45(6), 1253–1271, doi.org/10.1007/s11135-009-9289-9.

Ostovar-Nameghi, S. A., & Sheikhahmadi, M. 2016, 'From Teacher Isolation to Teacher Collaboration: Theoretical Perspectives and Empirical Findings', *English Language Teaching 9*(5), 197. https://doi.org/10.5539/elt.v9n5p197

Palincsar, A.S., 1998, 'Social Constructivist Perspectives on Teaching and Learning', *Annual Review of Psychology* 49(1), 345–375, doi.org/10.1146/annurev.psych.49.1.345.

Paris, S.G. & Paris, A.H., 2001, 'Classroom applications of research on self-regulated learning', *Educational Psychologist* 36(2), 89–101, doi.org/10.1207/S15326985EP3602_4.

Parker, L.D. & Warren, S., 2017, 'The presentation of the self and professional identity: countering the accountant's stereotype', *Accounting, Auditing and Accountability Journal* 30(8), 1895–1924, doi.org/10.1108/AAAJ-09-2016-2720.

Partnership for 21 st Century Skills, 2015, 'Partnership for 21St Century Skills-Core Content Integration', *Ohio Department of Education* 1–70, from www.P21.org.

Pathways Commission, 2015, *In Pursuit of Accounting's Curricula of the Future*, from http://commons.aaahq.org/posts/c0a7037eea.

Pearl, C., Dieker, L. A., & Kirkpatrick, R. M. 2012, 'A five-year retrospective on the Arkansas department of education co-teaching project', *Professional Development in Education* 38(4), 571–587. https://doi.org/10.1080/19415257.2012.668858

Pena-Shaff, J.B. & Nicholls, C., 2004, 'Analyzing student interactions and meaning construction in computer bulletin board discussions', *Computers and Education* 42(3), 243–265, doi.org/10.1016/j.compedu.2003.08.003.

Pereira, L. & Sithole, B., 2019, 'Towards Constructivist Learning and Teaching in Accounting Education', *Journal of Emerging Trends in Educational Research and Policy Studies* 10(1), 1–9.

Phillips, A.W., Reddy, S. & Durning, S.J., 2016, 'Improving response rates and evaluating nonresponse bias in surveys: AMEE Guide No. 102', *Medical Teacher* 38(3), 217–228,

doi.org/10.3109/0142159X.2015.1105945.

Plant, K., Barac, K. & Sarens, G., 2019, 'Preparing work-ready graduates – skills development lessons learnt from internal audit practice', *Journal of Accounting Education* 48, 33–47, doi.org/10.1016/j.jaccedu.2019.06.001.

Pratt, S. 2014, 'Achieving symbiosis: Working through challenges found in co-teaching to achieve effective co-teaching relationships', *Teaching and Teacher Education* 41, 1–12. https://doi.org/10.1016/j.tate.2014.02.006

Pratt, S. M., Imbody, S. M., Wolf, L. D., & Patterson, A. L. 2017, 'Co-planning in co-teaching', *Intervention in School and Clinic* 52(4), 243–249. https://doi.org/10.1177/1053451216659474

Quiñones-Ramírez, F., Duran, D. & Viladot, L., 2023, 'Co-Teaching with High School Students for Music Teaching', *Education Sciences* 13(10), 1–17, doi.org/https://doi.org/10.3390/educsci13100972.

Rehman, A. A., & Alharthi, K. 2016, 'An Introduction to Research Paradigms', *International Journal of Educational Investigations, 3*(8), 51–59.

Reynolds, D., Sammons, P., De Fraine, B., Van Damme, J., Townsend, T., Teddlie, C., & Stringfield, S. 201, 'Educational effectiveness research (EER): A state-of-the art review', *School Effectiveness and School Improvement* 25(2), 197–230. https://doi.org/10.1080/09243453.2014.885450

Ribosa, J. & Duran, D., 2022, 'Do students learn what they teach when generating teaching materials for others? A meta-analysis through the lens of learning by teaching', *Educational Research Review* 37(July), 100475, doi.org/10.1016/j.edurev.2022.100475.

Richards, K., 2003. *Qualitative inquiry in TESOL*. New York, NY: Palgrave Macmillan.

Rittle-Johnson, B., Loehr, A.M. & Durkin, K., 2017, 'Promoting self-explanation to improve mathematics learning: A meta-analysis and instructional design principles', *ZDM - Mathematics Education* 49(4), 599–611, doi.org/10.1007/s11858-017-0834-z.

Robb, M. & Gerwick, M. 2013, 'Team teaching: a resource guide for nurse educators', *Teaching and Learning in Nursing,* 8(3):78–82.

Rodgers, W., Simon, J. & Gabrielsson, J., 2017, 'Combining experiential and conceptual learning in accounting education: A review with implications', *Management Learning* 48(2), 187–205, doi.org/10.1177/1350507616669479.

Roscoe, R. D., Michelene, A. E., & Chi, T. H. 2008, 'Tutor learning: the role of explaining

and responding to questions', *Instructional Science* *36*(4), 321–350. https://doi.org/10.1007/s11251-007-9034-5

Roth, W.M. & Tobin, K. 2002, *At the elbow of one another: learning to teach by co-teaching*. New York, NY: Peter Lang.

Sandholtz, J., 2000, 'Interdisciplinary Team Teaching as a Form of Professional Development', *Teacher Education Quarterly* 27(3), 39–54.

Schmulian, A., 2018, Approaches To Social Constructivist Accounting Education, University of Pretoria.

Schmulian, A. & Coetzee, S.A., 2019a, 'To Team or Not to Team: an Exploration of Undergraduate Students' Perspectives of Two Teachers Simultaneously in Class', *Innovative Higher Education* 44(4), 317–328, doi.org/10.1007/s10755-019-9466-2.

Schmulian, A. & Coetzee, S.A., 2019, 'Students' experience of team assessment with immediate feedback in a large accounting class', *Assessment and Evaluation in Higher Education* 44(4), 516–532, doi.org/10.1080/02602938.2018.1522295.

Schmulian, A. & Coetzee, S.A., 2019, 'To Team or Not to Team: an Exploration of Undergraduate Students' Perspectives of Two Teachers Simultaneously in Class', *Innovative Higher Education* 44(4), 317–328, doi.org/10.1007/s10755-019-9466-2.

Schuwirth, L.W. & Van der Vleuten, C.P., 2020, 'A History of Assessment in Medical Education', *Advances in Health Sciences Education* 25(5), 1045–1056.

Schwartz, D.L., 1999, 'The productive agency that drives collaborative learning', *Collaborative learning: Cognitive and computational approaches* 197–218, doi.org/10.1016/j.cbpra.2007.04.002.Preventing.

Schwartz, D.L. & Okita, S., 2004, *The Productive Agency in Learning by Teaching Unpublished manuscript.*

Schwartz, D.L., Bransford, J.D. & Sears, D., 2005, 'Efficiency in Innovation and Transfer', *Transfer of Learning from a Modern Multidisciplinary Perspective* 1–51.

Scruggs, T. E., Mastropieri, M. A., & McDuffie, K. A. 2007, 'Co-teaching in inclusive classrooms: A metasynthesis of qualitative research', *Exceptional Children* 73(4), 392–416. https://doi.org/10.1177/001440290707300401

Shadish, W. R., Cook, T. D., & Campbell, D. T. 2002. *Experimental and quasi-experimental designs for generalized causal inference.* Houghton, Mifflin and Company.

Shibley, I.A., 2006, 'Interdisciplinary Team Teaching: Negotiating Pedagogical Differences', *College Teaching* 54(3), 271–274, doi.org/10.3200/CTCH.54.3.271-274.

Shin, E., Wilkins, E., & Ainsworth, J. 2007, 'The nature and effectiveness of peer feedback during an early clinical experience in an elementary education program', *Action in Teacher Education* 28(4), 40–52. http://dx.doi.org/10.1080/01626620.2007.10463428.

Shortridge, R.T. & Smith, P.A., 2009, 'Understanding the changes in accounting thought', *Research in Accounting Regulation* 21(1), 11–18, doi.org/10.1016/j.racreg.2008.11.010.

Silva, I., 2018, 'How learning theories can be applied in accounting education', *Millenium* 2(7), 13–20, doi.org/10.29352/mill0207.01.00181.

Simonds, B.K., Meyer, K.R., Quinlan, M.M. & Hunt, S.K., 2006, 'Effects of Instructor Speech Rate on Student Affective Learning, Recall, and Perceptions of Nonverbal Immediacy, Credibility, and Clarity', *Communication Research Reports* 23(3), 187–197, doi.org/10.1080/08824090600796401.

Simons, M., Baeten, M. & Vanhees, C., 2020, 'Team Teaching During Field Experiences in Teacher Education: Investigating Student Teachers' Experiences With Parallel and Sequential Teaching', *Journal of Teacher Education* 71(1), 24–40, doi.org/10.1177/0022487118789064.

Sistermans, I.J., 2020, 'Integrating competency-based education with a case-based or problem-based learning approach in online health sciences', *Asia Pacific Education Review* 21(4), 683–696, doi.org/10.1007/s12564-020-09658-6.

Smith, M. & Briggs, S., 1999, 'From bean-counter to action hero: Changing the image of the accountant', *Management Accounting* 77, 28–30, from http://proquest.umi.com/pqdweb?did=38205206&Fmt=7&clientId=14273&RQT=309&VName=PQD.

Smith, J. 2002, 'The Development of Tandem Teaching Placements', *Mentoring & Tutoring: Partnership in Learning* 10 (3), 253–274. doi:10.1080/1361126022000022507.

Smith, J.D.N., 2004, 'Developing paired teaching placements', *Educational Action Research* 12(1), 99–126, doi.org/10.1080/09650790400200241.

Solis, M., Vaughn, S., Swanson, E., & McCulley, L. 2012, 'Collaborative models of instruction: The empirical foundations of inclusion and co-teaching', *Psychology in the Schools* 49(5), 498–510. https://doi.org/10.1002/pits.21606

Sorensen, P. 2004, 'Learning To Teach Collaboratively: The Use of Subject Pairs in the School Practicum', *Canadian Journal of Educational Administration and Policy, 32.*

Sorensen, P., 2014, 'Collaboration, dialogue and expansive learning: The use of paired and

multiple placements in the school practicum', *Teaching and Teacher Education* 44, 128–137, doi.org/10.1016/j.tate.2014.08.010.

Soslau, E., Gallo-Fox, J. & Scantlebury, K., 2019, 'The Promises and Realities of Implementing a Coteaching Model of Student Teaching', *Journal of Teacher Education* 70(3), 265–279, doi.org/10.1177/0022487117750126.

Sotola, L.K. & Crede, M., 2021, 'Regarding Class Quizzes: a Meta-analytic Synthesis of Studies on the Relationship Between Frequent Low-Stakes Testing and Class Performance', *Educational Psychology Review* 33(2), 407–426, doi.org/10.1007/s10648-020-09563-9.

Stairs, A.J., Corrieri, C., Fryer, L., Genovese, E., Panaro, R. & Sohn, C., 2009, 'Inquiry Into Partnered Student Teaching in an Urban School – University Partnership', *School-University Partnerships* 3(1), 75–89.

Steeger, C. M., Buckley, P. R., Pampel, F. C., Gust, C. J., & Hill, K. G. 2021, 'Common methodological problems in randomized controlled trials of preventive interventions', *Prevention Science* 22(8), 1159–1172. https://doi.org/10.1007/s11121-021-01263-2

Strand Norman, C., Rose, A.M. & Lehmann, C.M., 2004, 'Cooperative learning: Resources from the business disciplines', *Journal of Accounting Education* 22(1), 1–28, doi.org/10.1016/j.jaccedu.2004.01.001.

Subban, P., 2006, 'Differentiated instruction: A research basis', *International Education Journal* 7(7), 935–947.

Sullivan, G.M. & Artino, A.R., 2013, 'Analyzing and Interpreting Data From Likert-Type Scales', *Journal of Graduate Medical Education* 5(4), 541–542, doi.org/10.4300/jgme-5-4-18.

Sung, Y. T., Lee, H. Y., Yang, J. M., & Chang, K. E. 2019, 'The quality of experimental designs in mobile learning research: A systemic review and self-improvement tool', In *Educational Research Review* (28). https://doi.org/10.1016/j.edurev.2019.05.001

Svinicki, M.D., 2004, *Learning and motivation in the postsecondary classroom.*, Anker Publishing Co.

Sweigart, C. A., & Landrum, T. J. 2015, 'The impact of number of adults on instruction: Implications for co-teaching', *Preventing School Failure: Alternative Education for Children and Youth*, 59(1), 22–29. https://doi.org/10.1080/1045988X.2014.919139

Szumski, G., Smogorzewska, J., & Karwowski, M. 2017, 'Academic achievement of students without special educational needs in inclusive classrooms: A meta-analysis',

Educational Research Review, 21, 33–54. https://doi.org/10.1016/j.edurev.2017.02.004

Tan, L.M. & Laswad, F., 2018, 'Professional skills required of accountants: what do job advertisements tell us?', *Accounting Education* 27(4), 403–432, doi.org/10.1080/09639284.2018.1490189.

Tharapos, M. 2022, 'Opportunity in an uncertain future: reconceptualising accounting education for the post-COVID-19 world', *Accounting Education 31*(6), 640–651. https://doi.org/10.1080/09639284.2021.2007409

Thousand, J.S., Villa, R.A. & Nevin, A.I., 2006, 'The many faces of collaborative planning and teaching', *Theory into Practice* 45(3), 239–248, doi.org/10.1207/s15430421tip4503_6.

Tobin, K., Roth, W.-M. & Zimmermann, A., 2001, 'Learning to Teach Science in Urban Schools', *Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching* 38(8), 941–964, doi.org/10.1111/ssm.12441.

Tourangeau, R., Couper, M.. & Conrad, F., 2004, 'Spacing , Position , and Order : Interpretive Heuristics for Visual Features of Survey Questions', *The Public Opinion Quarterly* 68(3), 368–393.

Tsiligiris, V. & Bowyer, D., 2021, 'Exploring the impact of 4IR on skills and personal qualities for future accountants: a proposed conceptual framework for university accounting education', *Accounting Education* 30(6), 621–649, doi.org/10.1080/09639284.2021.1938616.

Vacilotto, S., & Cummings, R. 2007, 'Peer coaching in TEFL/TESL programmes', *ELT Journal*, 61(2) 153–160. http://dx.doi.org/10.1093/elt/ccm008.

Vangrieken, K., Dochy, F., Raes, E., & Kyndt, E. 2015, 'Teacher collaboration: A systematic review', *Educational Research Review* 15, 17–40. https://doi.org/10.1016/j.edurev.2015.04.002

Vembye, M. H., Weiss, F., & Hamilton Bhat, B. 2024, 'The Effects of Co-Teaching and Related Collaborative Models of Instruction on Student Achievement: A Systematic Review and Meta-Analysis', In *Review of Educational Research* 94 (3), 376–422. https://doi.org/10.3102/00346543231186588

Venter, E.R. & de Villiers, C., 2013, 'The accounting profession's influence on academe: South African evidence', *Accounting, Auditing and Accountability Journal* 26(8), 1246–

1278, doi.org/10.1108/AAAJ-06-2012-01027.

Villarroel, V., Boud, D., Bloxham, S., Bruna, D. & Bruna, C., 2020, 'Using principles of authentic assessment to redesign written examinations and tests', *Innovations in Education and Teaching International* 57(1), 38–49, doi.org/10.1080/14703297.2018.1564882.

Vogler, K.E., & Long, E. 2003, 'Team teaching two sections of the same undergraduate course', *College Teaching* 51, 123-126.

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

Van der Vleuten, C.P.M., 2015, 'Competency-based education is beneficial for professional development', *Perspectives on Medical Education* 4(6), 323–325, doi.org/10.1007/s40037-015-0232-6.

Van Garderen, D., Stormont, M., & Goel, N. 2012, 'Collaboration between general and special educators and student outcomes: A need for more research', *Psychology in the Schools*, 49(5), 483–497. https://doi.org/10.1002/pits.21610

van Laar, E., van Deursen, A.J.A.M., van Dijk, J.A.G.M. & de Haan, J., 2017, 'The relation between 21st-century skills and digital skills: A systematic literature review', *Computers in Human Behavior* 72, 577–588, doi.org/10.1016/j.chb.2017.03.010.

Wagner, R.M. & Huang, J.C., 2011, 'Relative Performance Of English Second Language Students In University Accounting Courses', *American Journal of Business Education* 4(5), 31–38, doi.org/10.19030/ajbe.v4i5.4222.

Weinberg, A. E., Sebald, A., Stevenson, C. A., & Wakefield, W. 2020, 'Toward conceptual clarity: A scoping review of coteaching in teacher education', *The Teacher Educator*, 55(2), 190–213. https://doi.org/10.1080/08878730.2019.1657214

Wenger, E., 1999, *Communities of practice: Learning, meaning, and identity*, Cambridge University Press.

White, C.S., Henley, J.A. & Brabston, M.E., 1998, 'To Team Teach or Not to Team Teach—That Is the Question: A Faculty Perspective', *Marketing Education Review* 8(3), 13–23, doi.org/10.1080/10528008.1998.11488640.

Wilson, R.M.S., 2011, 'Alignment in accounting education and training', *Accounting Education* 20(1), 3–16, doi.org/10.1080/09639284.2011.555940.

Wilson, L., Ho, S. & Brookes, R.H., 2018, 'Student perceptions of teamwork within

assessment tasks in undergraduate science degrees', *Assessment and Evaluation in Higher Education* 43(5), 786–799, doi.org/10.1080/02602938.2017.1409334.

Wittwer, J. & Renkl, A., 2008, 'Why instructional explanations often do not work: A framework for understanding the effectiveness of instructional explanations', *Educational Psychologist* 43(1), 49–64, doi.org/10.1080/00461520701756420.

Woo, Y. & Reeves, T.C., 2007, 'Meaningful interaction in web-based learning: A social constructivist interpretation', *Internet and Higher Education* 10(1), 15–25, doi.org/10.1016/j.iheduc.2006.10.005.

Wynn, M. & Kromrey, J., 2000, 'Paired Peer Placement with Peer Coaching to Enhance Prospective Teachers' Professional Growth in Early Field Experience', *Action in Teacher Education* 22(sup2), 73–83, doi.org/10.1080/01626620.2000.10463041.

Zhao, Q., 2018, 'Study on Integrated Competency-based Accounting Education', 205(Iccese), 890–893, doi.org/10.2991/iccese-18.2018.203.

Zhu, W., Wang, F., Mayer, R. E., & Liu, T. 2024, 'Effects of explaining a science lesson to others or to oneself: A cognitive neuroscience approach'. *Learning and Instruction 91*. https://doi.org/10.1016/j.learninstruc.2024.101897