


Choice-based learning: lecture-based or team learning?

Evelien Opdecam & Patricia Everaert


To cite this article: Evelien Opdecam & Patricia Everaert (2019) Choice-based learning: lecture-based or team learning?, *Accounting Education*, 28:3, 239-273, DOI: [10.1080/09639284.2019.1570857](https://doi.org/10.1080/09639284.2019.1570857)


To link to this article: <https://doi.org/10.1080/09639284.2019.1570857>

 [View supplementary material](#) 

 Published online: 30 Jan 2019.

 [Submit your article to this journal](#) 

 Article views: 155

 [View related articles](#) 

 [View Crossmark data](#) 



Choice-based learning: lecture-based or team learning?

Evelien Opdecam and Patricia Everaert

Faculty of Economics and Business Administration, Department of Accounting, Corporate Finance and Taxation, Ghent University Ghent, Belgium

ABSTRACT

This study investigates choice-based learning as a choice between lecture-based or team learning in a large class at a large university in a European country. The study was designed as a between-subjects quasi-experiment where students were allocated their preferred learning approach. Data were collected for eight consecutive years (2008–2016). Based on quantitative and qualitative data, this study investigates the effect of choice-based learning on choice satisfaction, student selection and on student learning outcomes. The results show that team learning has a positive effect on learning outcomes. If students are faced with the choice, the majority select lecture-based learning. Additionally, both student groups are satisfied with their selected learning paths but selected them for specific reasons. Finally, choice-based learning provides job satisfaction for the instructors of both learning paths. These results can re-energize the ongoing discussion on why and how to engage students in learning activities.

ARTICLE HISTORY

Received 7 March 2017
Revised 30 December 2017;
5 December 2018
Accepted 14 January 2019

KEYWORDS


Self-determination theory (SDT); Quasi-experiment; Choice-based learning; Cooperative learning; Lectures

Introduction

Future employers encourage universities to implement cooperative learning in their curricula. The ability of employees to work together has been recognized as an important competency of future accountants (e.g. Montano, Donoso, Hassall, & Joyce, 2001). Professional bodies have also emphasized teamwork skills as necessary for successful careers within this profession (AECC, 1990; AICPA, 2005). However, students in higher education do not always enjoy working together and some hate working in groups, especially if grades are involved. Scholars have mentioned that students sometimes have negative feelings about group work (Brooks & Ammons, 2003; Julie Yazici, 2005; Opdecam & Everaert, 2018) that can lead to dissatisfaction with the course. Furthermore, whether cooperative learning will be successful for each student is questionable if some of the team members do not like to cooperate or are not willing to put forth their best effort.

Consequently in this study, students are offered a *choice* in learning paths (i.e. *choice-based learning*) as an alternative to the ‘one-size-fits-all’ approach, in which all students have to attend the same types of classes. Choice-based learning is consistent with the

CONTACT Evelien Opdecam  Evelien.Opdecam@UGent.be

 Supplemental data for this article can be accessed at <https://doi.org/10.1080/09639284.2019.1570857>

© 2019 Informa UK Limited, trading as Taylor & Francis Group

movement towards greater autonomy in the workplace (Lewis & Hayward, 2003). Students are only rarely given the opportunity to choose between learning activities in higher education (Frymier & Shulman, 1996) but are faced with multiple choices when they enter the work field. Increasingly, graduate students enter organizations where empowerment, self-determination, and self-management are indispensable (Lewis & Hayward, 2003). Similarly, in the psychology literature, self-determination theory (SDT) has been described as a promising theory to study the motivation of people at work (Ryan & Deci, 2000). Recently, the principles of SDT have been brought into the field of education to study the motivation of learners (Aelterman, Vansteenkiste, & Haerens, 2018; Liu, Fang, Wan, & Zhou, 2016). In SDT, the concept of autonomy has been determined as one of the three basic psychological needs that can be fulfilled by providing a real choice to individuals. Studies on the potential negative (and positive) feelings of students toward cooperative learning in accounting have not involved feelings of autonomy, that is, they involved situations in which the instructor decided that the students should either conduct group work or attend lectures. In the current study, the students are given the opportunity to choose between team learning (group work) and lectures for the tutorials of one specific course. Therefore, the *first* RQ investigates whether students are happy with the selected learning path after they go through the tutorials in the format they have chosen.

By providing students a choice between lecture-based and team learning, only students who want to cooperate will subscribe to the team learning setting. Students who want to learn autonomously, at their own pace, and who might not be a fan of working in groups will select the lecture-based learning. But how many students will choose team learning and how many will choose lecture-based learning? In previous studies on cooperative learning in accounting, students were rarely allocated the real education context of their choice. Hence, the *second* research question (RQ) of this paper is to investigate how many students will opt for team learning and how many will select lecture-based learning in a context in which they can choose one of the two.

Finally, previous studies in accounting education have addressed the learning outcomes of students, comparing team learning with other types of instruction formats (e.g. Clinton & Kohlmeyer, 2005; Gabbin & Wood, 2008; Lancaster & Strand, 2001). Some studies found a positive effect (e.g. Hite, 1996), while others found no effect on learning outcomes (e.g. Ravenscroft, 1997). However, not many studies have addressed (as far as we know) the differences in learning outcomes when students were provided a choice and were allocated their choice for the whole semester. Moreover this setting is quite unique, because there are no credits involved with homeworks or team projects. There is no product that has to be delivered by the teams and there is no team assessment among peers. Also in the lecture-based format there are no credits involved throughout the semester. Hence, the *third* RQ is whether there is a difference in learning outcomes between team learning and lecture-based learning when each individual student makes a choice at the beginning of the semester, knowing that the tutorials are not graded.

To answer the research questions, this study investigates choice-based learning as a choice between two learning paths in an on-campus teaching setting for a large class at a large university (600 students) in a European country during eight years (2008–2016). The choice between *lecture-based learning* and *team learning* was provided for

the tutorial sessions of an advanced financial accounting course in the first year of the undergraduate programme in (business) economics and business engineering. The choice was introduced at the beginning of the semester and students subscribed to one of the two, remaining in the same learning path for the nine weeks of the semester. *Team learning* is a specific type of cooperative learning that requires an acceptable investment of time and energy from the instructor while inducing active learning by the students. The core issue in team learning is that students learn not only from their own experiences but also especially from those of their colleagues (Ickes & Conzales, 1994). *Lecture-based learning* is the dominant pedagogy in higher education (Lambert, 2012; Lee, 2009) and is considered favourable for transferring knowledge from instructor to student (Kirschner, Sweller, & Clark, 2006; Sfard, 1998). In addition, it is a cost-effective knowledge acquisition method, which explains why it is the most popular teaching format in this setting (with low tuition fees and in publicly financed universities). This study implements lecture-based learning as an interactive lecture style for the tutorials. The instructor invites the students to participate actively by posing questions but also explains the material step by step and elaborates on how new topics fit into previously acquired knowledge.

The need to know more about choice-based learning in general and about providing a choice between team learning and lecture-based learning in particular responds to the international call for promoting student engagement in learning. Answering the RQs will shed light on students' behaviour and perceptions on (1) why they select group work or lectures, especially when the individual student's autonomy is respected, and (2) whether they would remain with the same choice after experiencing the group work (which was new to them) or lectures (which was familiar). The results could re-energize the ongoing discussion on why and how to engage students in learning activities.

Contribution

The contributions of this paper are as follows. *First*, the paper contributes to the literature in higher education with its unique research design. In contrast with other studies, the students in this study made a real-life choice for the entire semester between lecture-based and team learning for the tutorials. Many previous studies used random assignment to treatment or compare different cohorts of students, where the learning approach is decided by the teacher, where one group is taught by lectures while an equivalent group is taught by team learning (e.g. Gabbin & Wood, 2008; Ravenscroft, Buckless, McCombs, & Zuckerman, 1995).

Second, this paper describes in detail the characteristics of both the lecture-based and team learning interventions for the tutorials of an advanced financial accounting class in a large graduation cohort (more than 500 students). Given that lectures are considered the primary method of instruction at many Central European universities (even for tutorials), this paper provides a clear description of the implementation process and cost effects when offering a choice. In addition, the results show evidence of head counts when setting up the choice between a cooperative type of activity and a more individually oriented type of activity.

Third, this study uses qualitative and quantitative data before and after (i.e. pre and post, respectively) real-life intervention. Hence, the considerations of students were

captured when they made their choices at the beginning of the semester (pre-intervention), as well as at the end of the semester, after they experienced their preferred way of learning (post). The *qualitative* data provide insights into why some students selected the lecture-based approach and others the team learning approach (pre) and why they would make the same selection again (post). The *quantitative* part of this study shows how many students preferred team learning versus lecture-based learning (pre) in the first year of university (at 19 years old), given that the team learning approach was new to them and they were already familiar with the lecture-based setting for the tutorials from the previous semester. In addition, this study provides empirical evidence of the effects of both learning paths on the learning outcomes (post), using eight consecutive years of data. Analyses are run on the learning outcomes, comparing the course scores in the lecture-based and team learning settings. Since students selected themselves for one of the two approaches, different pre-test data are included as control variables (using two proxies for ability, the academic year and gender), leading to the same conclusions and showing that the results are robust. In addition, analyses are run on the students' choice satisfaction data collected at the end of the semester (post) to investigate whether students would again make the same choice.

Fourth, we add to the literature on choice-based learning, since there is almost no prior literature in (accounting) education on this topic. Moreover, this study answers the call for more research on choice- and autonomy-supporting techniques in higher education, as recently expressed by researchers in the field of the SDT (see e.g. Liu et al., 2016).

Fifth, this paper also describes the perspective of instructors, whereas prior literature has focused mainly on the students' perspective (e.g. Clinton & Kohlmeyer, 2005; Dyball, Reid, Ross, & Schoch, 2007). The differences in instructor roles and preparation methods for both tutorial settings are discussed.

Finally, this study has a unique setting, since students only earn marks by the final exam. The tutorials are not graded, and no deliverable needed to be handed in by the team (team learning) or by the individual student (lecture-based learning). A well-known quote among students is: 'No more group assignments – at least not until you figure out how to fairly grade each student's individual contributions' (Glenn, 2009, p. 1). That is one of the reasons why we opted for not-graded assignments. This study relies completely on the intrinsic motivation of the students to learn. However, participation in the tutorials (team and lecture-based) is seen as good preparation for the exam, therefore students attend. This setting makes it interesting to investigate the effect of team learning on student learning outcomes, in a unique situation where the credit for the course is only based on the score of the exam.

The paper is organized as follows. The following section reviews the literature and develops the hypotheses and the research question. The methodology is then described. We give an overview of the educational context, the research design, and the measurement of the variables. Next, we report on the specific characteristics of each learning path and the implementation process. The section on empirical results investigates the effects of choice-based learning on choice selection process, learning outcomes and choice satisfaction. Qualitative results are used to analyse why students embraced their choice and why they would or would not select the same learning path again. The paper ends with a discussion on offering a choice in learning paths, followed by limitations and avenues for future research.

Literature review

Choice

The *motivation* to provide a choice is underpinned by the following three considerations. First, choice-based learning is consistent with the movement toward *greater autonomy in the workplace* (Lewis & Hayward, 2003). Increasingly, graduate students enter organizations where empowerment, self-determination, and self-management are indispensable (Lewis & Hayward, 2003).

Second, a focus on students' choices can be helpful in light of the massification of higher education (Tynjälä, Välimaa, & Sarja, 2003). Massification, or the ever-increasing numbers of students attending university, has also resulted in an expansion of the student population. There is also a growing diversity of the students in university classes (Schoenecker, Martell, & Michlitsch, 1997; Trow, 1999). Hu and McCormick (2012), in a study of undergraduate students, found that students have different patterns of engagement that are linked to different patterns of learning and development in the first year and different rates of persistence in the second year. In a traditional classroom, students are all given the same assignments, told the best way to learn the material, and are provided no opportunities to give input on how they will be assessed (Lewis & Hayward, 2003). Moreover, all students enrolled in a particular course must study the same way, using the same material. This is an unfortunate trend, given that students do have different learning styles and backgrounds and, consequently, find learning methods to be differentially interesting, engaging, and useful in their learning (Lewis & Hayward, 2003). According to Santangelo and Tomlinson (2009), students are more diverse than at any other point in history. One aspect of diversity is their different *preference for more or less active learning* (Hu & McCormick, 2012). The choice of instruction method gives a voice to different student learning strategies and various student needs. Students who may need more support and guidance benefit from a team learning method, while other students enjoy their freedom and do not want to feel 'coddled' by choosing the traditional lecture-based method. Therefore, this study focuses on providing students a choice in instruction methods.

Third, including a choice between learning activities in education is in line with the principles of *SDT*, a macro theory for the study of human motivation and personality (Ryan & Deci, 2000). According to Ryan and Deci (2000), three psychological needs motivate the 'self' to initiate behaviour: the need for competence ('I feel competent'), the need for relatedness ('I belong to a group'), and the need for autonomy ('I can decide'). Generally, factors that enhance the satisfaction of psychological needs will have positive motivational consequences, whereas factors that thwart one or more of these needs have negative consequences on autonomous motivation. *SDT* researchers have found that the three basic psychological needs are universal and that their fulfilment is essential for the psychological health and well-being of individuals (Ryan & Deci, 2000). The recent review book *Building Autonomous Learners* applies the principles of *SDT* to the educational context, addressing the motivation of learners (Liu et al., 2016). Deci and Ryan (2016, p. 20) state,

Perhaps the most important message from the research reviewed thus far is that when students' motivation is autonomous, they display more positive educational outcomes than

when their motivation is controlled and that the students are more autonomously motivated when the teachers create classroom climates that support the students' basic psychological needs for competence, autonomy, and relatedness.

In particular, offering choices and providing positive feedback are among the factors that autonomy-supportive teachers are implementing in their classrooms (Liu et al., 2016). Furthermore, Patall, Cooper, and Robinson (2008) found that providing students the opportunity to make choices either independently or as a group can help them feel more autonomous and competent and thus more engaged in the learning activities. Providing choices does not mean that students can decide on all aspects of their learning, since they need to fulfil certain requirements, but 'there is often room for the students to make choices about what, when, and how to engage in learning activities' (Deci & Ryan, 2016, p. 21).

As far as we know, not many studies have focused on providing a choice between team learning and lecture-based learning. This paper specifically addresses providing a choice in instruction method for tutorials, that is, a choice between lecture-based learning and team learning. We expect that the fact that students can choose between the two will also lead to satisfaction with the selected learning path after attending the learning activities of their choice.

Hypothesis 1: When offering a choice in tutorials, we expect high choice satisfaction (significantly different from the neutral value) afterwards for all students in both learning paths.

Lecture-based learning

The dominant pedagogy in European universities remains the traditional passive lecture approach (Lambert, 2012; Lee, 2009). University lectures are widely accepted as being much more than a way of neutrally conveying information; they are value discourses in which the lecturers certainly aim to inform but also to evaluate and critique the source materials brought to the students' attention (Lee, 2009). The dominance of lecturing in accounting education is also apparent in the huge number of papers discussing the effect of capturing lectures (e.g. Aldamen, Al-Esmail, & Hollindale, 2015; Choo & Tan, 2013; Holtzblatt & Tschakert, 2011). The focus on lecturing is partly due to the increasing size of many courses (Lewis & Hayward, 2003), the lack of resources to conduct active learning (Milne & McConnell, 2001), a reluctance to modify traditional teaching methods (Adler & Milne, 1997), and perceived student resistance (Libby, 1991). As Riley and Ward (2015) note, student resistance may be particularly acute in accounting, since research suggests that these students are more likely to prefer the structured, logical, and systematic focus offered in passive learning environments (Booth & Winzar, 1993; Byrne, Flood, & Willis, 2004).

The students in this study were familiar with the lecture-based tutorials from a similar accounting course in the first semester, but they also had experience with all sorts of cooperative learning approaches in their high school education. As far as we know, there are no prior studies on choice-based learning in accounting education. We therefore formulate the following RQ:

Research Question 2: When offered a choice in tutorials, what will be the distribution of the students selecting team learning and lecture-based learning?

Cooperative learning: Team learning

In the accounting education literature, we found some research on the effects of cooperative learning on student learning outcomes, with mixed results. Hite (1996), for example, reported significantly higher final exam scores for the experimental group. In addition, Ciccotello and D'Amico (1997) and Hwang, Lui, and Tong (2005) confirmed that cooperative learning can be more effective in enhancing students' learning in comparison to traditional learning environments. On the contrary, Ravenscroft (1997) found little or no improvement in student performance when students worked in a group versus when they worked individually. Comparably, Lancaster and Strand (2001), Gabbin and Wood (2008), and Kunkel and Shafer (1997) found no significant results. Hosal-Akman and Simga-Mugan (2010) explored the effects of teaching methods on the academic performance of accounting students by comparing the performances of students enrolled in group- versus lecture-based learning. Similar to previous research, they found no significant differences in academic performance between the treatment and control groups.

Because previous studies in accounting have provided mixed results, we searched for underlying theories to underpin hypotheses on the effect of providing choice between team learning and lecture-based learning.

In general, research on cooperative learning has been conducted from at least four major perspectives – (1) motivationalist, (2) social cohesion, (3) cognitive development and (4) cognitive elaboration (Slavin, Hurley, & Chamberlain, 2003) – which can be grouped into motivational and cognitive perspectives. The motivational theories of cooperative learning are the most studied. They emphasize the fact that rewarding groups based on the individual achievements of group members creates peer norms that encourage students to help each other. On the contrary, the cognitive perspective says that student learning can be enhanced through task-focused interaction, which creates cognitive conflicts and exposes students to a higher quality of thinking and reasoning (Slavin, 1987). In what follows, the four supporting theories are discussed separately. The *motivationalist perspective* creates a situation in which group members must work together and make the group successful to reach their own personal goals (Johnson & Johnson, 1989). This perspective relies on Kurt Lewin's field theory and Morton Deutsch's theory of interdependence (Ravenscroft, Buckless, & Hassall, 1999). These two theories together state that an individual's actions are driven by extrinsic motivation, which can be directed by means of rewards and goals. By rewarding groups based on group performance (or the sum of individual performances), an interpersonal reward structure and positive interdependence are created (Robert E Slavin, 1983). However, it is questionable whether this theory will provide a basis for the current study. In the current student, there are no group rewards nor are there individual rewards involved. The setting builds on the intrinsic motivation of students since students do not have to hand in a team product (or individual product) and there is also no group assessment. Consequently, students engage completely voluntary. The only assessment is done at the end of the semester, where both learning paths receive the same final exam.

The second perspective, *social cohesion perspective*, is somewhat related to the motivational perspective because it emphasizes mainly motivational rather than cognitive explanations for cooperative learning. However, the social cohesion perspective is based on the idea that students help their groupmates because they care for them and want to see

them succeed and not because of self-interest. This theory might predict a positive effect of team learning on student learning outcomes. In the current study, students prefer to work in team and make a deliberate choice for team work. So students want to put effort into the team and all students have a positive attitude towards teamwork. Moreover, the fact that the assignments are not graded (in combination with students choosing for working in teams) might have an effect on students' behaviour, with less social loafing and free riding. Consequently, this can lead to a strong cohesion between the team-mates. And if there is a strong cohesion between the team-mates, students might come more prepared to the team learning sessions and share and discuss information with each other.

In the *cognitive development perspective*, groups of students work together on course material in a well-structured manner. The main idea is that, through their interactions around appropriate tasks, the students will learn from each other. When discussing the task or material, cognitive conflicts will arise, inadequate reasoning will be questioned, critical thinking will be enhanced, and a higher quality of understanding will be developed (Vygotsky, 1978). This perspective might also predict a positive effect of team learning on student learning outcomes. Students work together in a well-structured way. Students are stimulated to come prepared to class. There is official class time allocated to the team process, students fill out a team card and there is a structured process of working in teams. The students are the primary source of information, so they discuss the prepared material. For example, when students have different solutions for the same journal entry, they have to discuss and explain their train of thoughts.

The (4) *cognitive elaboration perspective* is quite different from the cognitive development perspective in that it holds that students should engage in some sort of cognitive restructuring (elaboration) of new material to improve their learning and retention of it (American Educational Research Association, 1986). This perspective sees group work as a way to rehearse the material covered and is most appropriate when there is a great focus on memorization and less focus on analytical thinking (Ravenscroft et al., 1999). In the team learning process students have to explain things to each other. The students are the primary source of information and the instructor only intervenes if the students have a question. Basic knowledge of the material is present, since all students have studied basic accounting in the previous semester. By explaining the material to each other in the small teams and referring to the previously acquired knowledge, elaboration might happen more than when attending tutorials in a lecture-based setting.

These four perspectives can be seen as complementary and not as exclusive alternatives (Slavin et al., 2003). However, in relation to the unique setting of the current study, three of the four underlying theories predict a positive effect of team learning on learning outcomes. Therefore the following hypothesis was formulated:

Hypothesis 3: When offered a choice in tutorials, students' learning outcomes will be better when taught in the team learning setting than in the lecture-based setting.

Method

Context of the study

In the country of this study, higher education is fully publicly financed, with a very low tuition fee that is the same for all universities (860 EUR per year in 2016–2017). Access

to higher education is open and there are no entrance exams or admission tests, since a degree from secondary education (independent of major) is sufficient to enter university (Duchesne & Nonneman, 1998). University teaching is organized in two semesters (each with 12 weeks of classes, four weeks for study, and four weeks of exams). During the summer break (August to September), a resit is organized for all courses of the first and second semesters. This is a ‘second chance’ exam, organized for each course the student failed in the first exam period. A high percentage of students fail in the first year (more than 50%) because they do not have the appropriate skills for the programme in which they enrolled (due to an inappropriate major in high school) or lack the motivation or effort persistence to study such large amounts of material. Hence, the student population in the first year of the undergraduate programme is heterogeneous in terms of intellectual capabilities.

The choice between the two learning paths was organized in the first undergraduate year of the economics, business economics, and business engineering programmes. These are programmes with a common first year, with a total of 600–650 hours. The programme consists of 14 courses, for a total of 60 ECTS hours, which is the norm for a full-time day programme. All classes are on campus, where the professors teach all the students in one lecture hall (so-called theory) and the teaching assistants teach the tutorials (so-called exercises) in smaller groups. There is no habit of capturing classes in this programme. In addition to the theoretical sessions, tutorials are a specific type of teaching activity in which a teaching assistant explains the solutions of the exercises in a lecture-type setting. Tutorials are common for ‘application’ types of courses, such as mathematics, statistics, and accounting, as well as for ‘skills’ types of courses, such as the business French and business English languages courses.

All the students in the first year of the programmes in question are local students and the teaching language is Dutch, resulting in a homogeneous cultural sample of local students. In contrast, the master’s programme is taught in English, attracting international students; however, this is outside the scope of this study.

Course background

In the (business) economics and business engineering programmes, students take Financial Accounting A the first semester and Financial Accounting B the second semester, as shown at the top of [Figure 1](#). Both theoretical lectures and tutorials are organized for each course. A tutorial is a practice session, intended to provide practical exercises on the topics explained in the theoretical lecture. By going through the exercises in the tutorial session, students apply concepts in new situations and develop answering strategies to complete new assignments. Two sets of exercises are rotated every second year so that resit students obtain new second-year exercises. In addition, the exercises are updated every year (because of changes in local GAAP or fiscal rules) and renamed after each update such that the students do not know they have the same exercises as the cohort two years ago.

The choice in learning path is offered in the tutorials for Financial Accounting B, that is, the second-semester course. A weekly three-hour theoretical lecture is supplemented by a weekly 1.5-hour tutorial session. The course content covers more advanced transactions, such as issuing shareholder capital (initial public offerings and private equity), asset impairment, corporate income tax with deferred taxes, capital subsidies, leasing, and

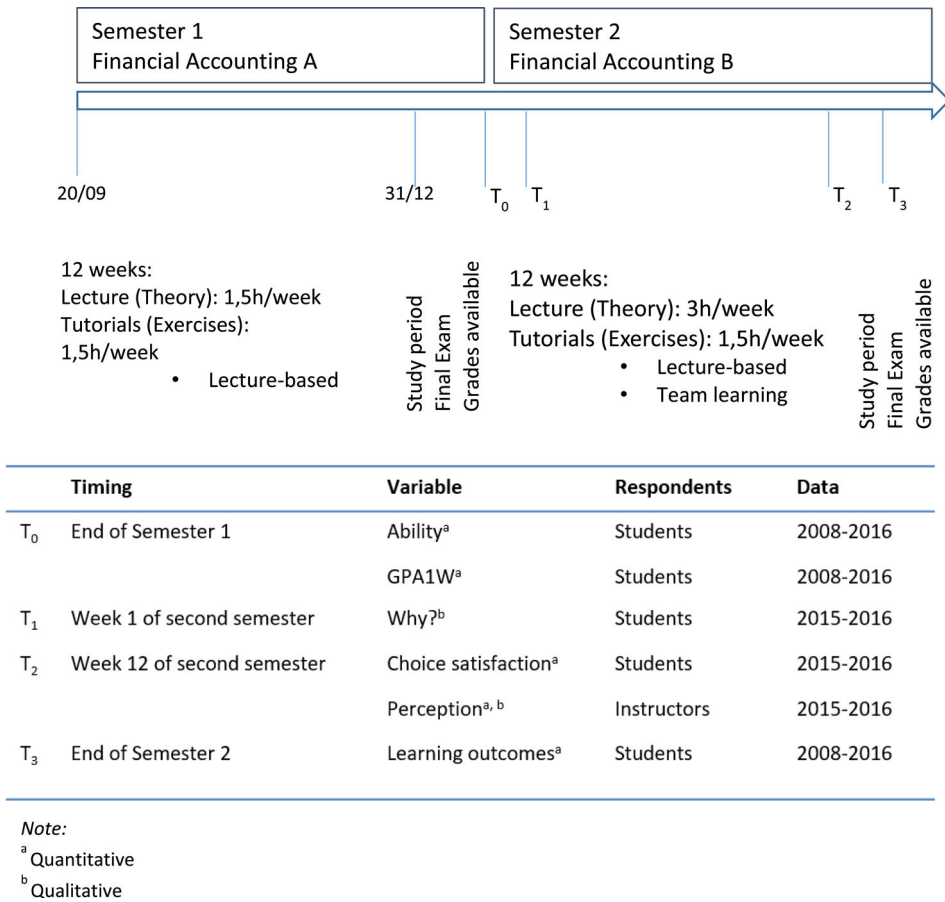


Figure 1. Overview of the setting and research design.

stock evaluation. The ultimate objective is to provide students insight into how company decisions impact a company’s balance sheet and profit and loss statement. The students consider the course difficult and constant practice is key to grasping the concepts. The final (written) exam is composed of four comprehensive exercises that involve filling out journal entries, T accounts, balance sheets, and income statements. These exam questions are similar in format to the exercises of the tutorial sessions. There are no homework assignments or mid-term exams for this course. The course material provided includes PowerPoint slides, a syllabus, and a Dutch textbook.

Choice between lecture-based and team learning

Students selected one of the two formats for the tutorials (lecture-based or team learning) at the beginning of the semester. All students were allocated the learning path of their choice for the whole semester. The lecture-based tutorials were organized in two groups of about 150–200 students, while the classes in the team learning tutorials had a maximum of 36 students. In total, there were four instructors (called teaching assistants),¹ all well trained in accounting, with comparable teaching skills, relying on the same amount

of teaching experience, and equally familiar with the content and what was required from the students at the final exam. Both learning paths used the same assignments and the same PowerPoint slides (as an introduction to the tutorial) and in both formats the solution key was provided on the blackboard system after the last class of the week. More details on the characteristics of each learning path are discussed in Sections 3.5 and 3.6. Details on the implementation process are provided in Section 3.7.

Research design

The study was designed as a between-subjects *quasi-experiment* (see [figure 1](#)) where students were allocated their preferred learning approach (lecture-based or team learning). Data were collected for eight consecutive years (2008–2016). The study follows an untreated control group design with a pre-test and a post-test (Cook & Campbell, 1979; Creswell, 2016). The pre-test collected ability data at the end of the first semester (t_0 in [Figure 1](#)). The post-test collected the learning outcome data at the end of the second semester (t_3 in [Figure 1](#)). The data will be used to test for differences in learning outcomes (H3).

The students' choices were registered over the period 2008–2016 and used to answer RQ2 to determine whether both learning paths were equally popular. To gain additional insight into why students selected a given learning path (RQ2), in the last academic year (2015/2016), we collected additional qualitative data with a pen and paper questionnaire at the *beginning* of the semester (i.e. week 3, t_1 in [Figure 1](#)).

To test Hypothesis 2 concerning students' choice satisfaction, a second (pen and paper) questionnaire was administered at the *end* of the semester (i.e. week 12, t_2 in [Figure 1](#)) in the same academic year, 2015/2016.

Finally, to obtain anecdotal evidence on the differences in the roles of the instructors between the two learning paths, we conducted a survey with open questions with three of the teaching assistants in 2015/2016, two of whom were used to teaching in both formats and all of whom had several years of teaching experience.² We asked the instructors to describe (1) how they prepared for the class, (2) their role as an instructor, and (3) what gave them joy as an instructor. The answers on the first two questions were used to describe the specific characteristics of each learning path. Data on the last question will be used in the results in Section 4, where we elaborate on the perceptions of the instructors.

Characteristics of lecture-based learning

[Table 1](#) summarizes the characteristics of the lecture-based format, as discussed in the next paragraphs.

Format = lecture. The tutorial was, as mentioned above, set up as a practice session where the instructor explained the solutions to the exercises step by step. Hence, the instructors are the most important source of information. The group attending the lecture-based tutorial was set for the whole semester. Individual students did not have to deliver a product and no grades (or credits) were involved with the exercises or attending the tutorials.

Preparation. In the lecture-based learning path, students were firmly recommended to prepare for the exercises at home, beforehand. The sequence of the exercises (assignments) strictly followed the sequence of the theoretical lectures, so that students were first

Table 1. Characteristics of the two learning paths: lecture-based versus team-based tutorial.

	Lecture-based tutorials	Team-based tutorials
		
Format	Lecture	Teams
Preparation	Preparation is voluntary.	Preparation is required.
Attendance	No requirement for attendance.	Commitment to attendance.
Active/passive	Teacher presents the solution. Students rather passive.	Students compare the solution. Students rather active
Asking questions	Asking questions is possible, however seldom happens in public during class.	Asking questions is promoted, while coach walks from one team to another.
Role of the instructor	Teacher	Coach
Preparation for instructor	Content, format, flow and timing	Content (in more depth)
Reflection of student	No reflection on learning process.	Reflection on learning process, operationalized by the team card.
Student-staff ratio	150–200 students for 1 instructor.	36 students for 1 instructor.
Duration one session	90 minutes.	90 minutes.
Material	Same 3 exercises, same PowerPoints of the intro, same PowerPoints with the solution of the exercises.	Same 3 exercises, same PowerPoints of the intro, same PowerPoints with the solution of the exercises.

introduced to the main concepts in the theoretical lecture, they then reviewed their notes at home, read the chapter in the textbook (one chapter per class), and then tried to do the exercises. However, the preparation for the exercises was not checked when students entered the tutorial classroom.

Attendance. In the lecture-based path, attendance is not mandatory. Generally, attendance in all classes is voluntary in this university setting. After class, the solution key to the exercises was put on the blackboard system. Hence, students who were willing to study on their own (and therefore did not attend) could find all the necessary material posted in the online learning environment after class.

Active/passive. The instructor first gave a short overview of the key concepts of the chapter. The three exercises were then addressed. Each time, the instructor rephrased the assignment and then presented the solution in a stepwise manner. When the solution was presented, the calculations were explained in detail, as well as the reasoning behind them. The instructor elaborated on the exercise, especially the difficult parts, and pointed out potential pitfalls. The flow of the explanations should have been just right for students who had reviewed the material beforehand. For others, the flow might be too fast to grasp all the details; however, the main concepts should be understood. In sum, in the lecture-based format, the instructor was the primary source of information.

Asking questions. During the tutorials, students could raise their hand to ask a question, but this happened only occasionally. The instructor tried to make the sessions as interactive as possible, for example, by asking the group questions. However, these questions were

seldom answered, since many students today like to keep a ‘low profile’. Students sometimes also asked the instructor a question at the end of the session, in an informal, face-to-face manner.

Role of the instructor = teacher. The lecture-based format places all the attention on the instructor. The instructor took on the role of teacher by explaining everything in a well thought out, stepwise manner, using various didactical techniques. Complex information or difficult concepts were unravelled and linked with previous knowledge. The flow of the steps and the reasoning behind them were elaborated upon in detail, as indicated in the following statements by the instructors (both in lecture-based settings):

Your role is to explain it as well and as structured as possible to the students. You use attractive slides and schemes here. You try to put as much variation as possible into your lessons. (teacher lecture-based)

As a teacher, you give background information on ‘why’ the exercises are solved that way. Students receive guidance on how an exercise has to be approached and solved. The recurring pattern in the journal entries is underlined and explained. (teacher lecture-based)

Preparation by the instructor. In terms of preparation, the instructor has to scrutinize precisely what concepts the students must learn and eliminate details that are not necessary or boring for the students. The presentation of the solution of the assignment must be well-structured, clear, and appealing in terms of graphics. The instructor must design a plan and a detailed timeframe for how the lesson will be organized, as well as provide real-life examples the students are familiar with and that might be suitable for introducing the topics in the assignment. During the lecture session, the instructor presents the solution, maintains order in the classroom, and makes sure everything goes according to plan. The students must also be kept alert and attentive, for example, by involving humour or asking questions. Concerning continuous improvement, the instructor must go over the sessions and re-evaluate the timeframe, based on class experience and possibly the students’ questions at the end of the session, to improve the lesson for future sessions. As one lecture-based teacher stated:

Based on questions/remarks received from students, I highlight some captions in my notes to take them into account for next year’s presentation.

Reflection by the students. The students were recommended to note their mistakes in their preparation and to check the solution key on the blackboard system afterwards. However, no reflection on the learning process was embedded in the lecture-based format itself. This was the responsibility of each individual student.

Student-staff ratio. There was one instructor for about 150–200 students. Two sessions were organized back to back and the teacher was the same for both sessions. Students selected one of the two time slots at the beginning of the semester (see Section 3.7). Because of the high student–staff ratio, the lecture format is considered cost efficient in previous studies, since a low number of instructors is needed (e.g. Clinton & Kohlmeyer, 2005).

Characteristics of team learning

Edmondson (1999, p. 353) defined team learning as ‘an ongoing process of reflection and action, characterized by asking questions, seeking feedback, experimenting, reflecting on

results and discussing errors or unexpected outcomes of actions'. Decuyper, Dochy, and Bossche (2010) noted that studies use different labels for team learning and the definitions are not always clear. Therefore, in the next paragraphs, we provide a full description of the operationalization of team learning in our setting. Table 1 presents a summary.

Format = teams. Team learning is a student-centred learning technique in which students primarily learn from each other and from the instructor only as the next resort. The teams were long term and stable, that is, the team remained the same for the whole semester. Commitment to the team was required. The team did not have to deliver a product and no assessments (or grades) were involved in the teamwork. We experimented with fully self-selected teams of five to six students, as well as with self-selected mini-teams of two and three, which the instructor subsequently turned into teams of five or six students, based on the self-selected mini-teams. In any case, students had at least one or two of their friends on their team to ensure what we call a safe and warm learning environment. The teams had always five or six members.

Preparation. The assignments are the same as in the lecture-based setting but the preparation of the assignments at home is required in the team learning setting. Each student had to prepare the exercises at home, individually (not with the other team members). If the students did not prepare the exercises beforehand, the team learning session was of no value for the student and the students knew this beforehand (for further details on the implementation process, see Section 3.7). The exercises were challenging, so preparation was needed. The preparation was not checked by the instructor by entering the room, but this was one of the team leader's duties. Each week, one of the team members was assigned the role of team leader. Specifically, the team leader was responsible for completing the pre-printed team card, as shown in Figure 2. The team leader had to ask each member whether or not the three exercises had been prepared at home beforehand and then registered the reply on the team card.

Attendance. Students who selected the team learning approach made a commitment towards their team members (and the instructor) to be present each week for the tutorials. Attendance, therefore, was required. Students who could not attend a particular tutorial session (because of a doctor's visit, illness, or other reason) had to inform the instructor beforehand by e-mail. However, again, the team itself was responsible for checking attendance. The team leader registered the attendance of each team member on the team card. This was one of the advantages of the team card because it helped the instructors send a follow-up email (or arrange to talk) to the student about the student's absence.

Active/passive. The students sit around a table, with one table per team. The instructor first gives a very short overview of the key concepts of the chapter (using the same PowerPoint slides as in the lecture-based setting, but much more quickly). The students then start discussing the first exercise in their teams, as follows. The team leader lets the team members speak and offer solutions, which are compared by the team: one student reads the first part of the assignment and then provides a solution. The team members agree or disagree and the discussion continues to seek a proper solution. The instructor walks around the class, from one team to another, and answers questions that arise. For instance, a team might ask, 'Is the revaluation 320.000 EUR or 360.000 EUR for item 1?' which would require the instructor to quickly give the appropriate answer, 360.000 EUR, for example. The instructor does not have to give the whole explanation, because those students who answered 360.000 EUR in their preparation will do so for their

Team report: Tutorial 1

Name of the teamleader *Inge Devreese*.....

Name of the group: <i>Group 5</i>	Present in class? (Yes/No)	Prepared ? (Yes/No)	Time spent at home to the exercises? (minutes)	Time spent at home to the textbook and notes (minutes)
Names team members:				
1. Emilie Devooght	<i>Yes</i>	<i>Yes</i>	<i>90'</i>	<i>90'</i>
2. Fien De Clercq	<i>Yes</i>	<i>Yes</i>	<i>60'</i>	<i>90'</i>
3. Inge Devreese	<i>Yes</i>	<i>Yes</i>	<i>60'</i>	<i>30'</i>
4. Jan Demoor	<i>Yes</i>	<i>Yes</i>	<i>105'</i>	<i>30'</i>
5. Cedric Welvaert	<i>Yes</i>	<i>Yes</i>	<i>90'</i>	<i>120'</i>

	Problems?	Remarks?	Group Score out of 10
Exercise 1	<i>No problem, only for question B couldn't we come to a consensus.</i>	<i>This exercise was an easy one.</i>	<i>9.5</i>
Exercise 2	<i>We had a problem with 'right of preemption'.</i>	<i>/</i>	<i>9.5</i>
Exercise 3	<i>This was a very difficult exercise. We had problems with finding the solution for questions 4 en 5.</i>	<i>Our group experiences a lot of difficulties with this exercise.</i>	<i>6</i>

How do you rate the team in terms of collaboration process today?

7.5 / 10

Figure 2. Example of team card, used in the team learning tutorial.

team members. After 20 minutes on the first exercise, the instructor stops the discussion and quickly presents the solution, using the same PowerPoint slides as in the lecture-based setting. However, only the difficult parts of the exercise are explained, while also pointing out potential pitfalls. If the explanation is going too fast for a particular team, they can ask the instructor to explain a few more things to their team only afterwards, when the other teams start the second exercise. In sum, students are very active during the tutorial, with the students themselves as the primary source of information.

Role of the instructor = coach. During the team session, the instructor is the coach for the teams, trying to create a safe and warm learning climate for the teams and paying attention to each team member individually. The instructor walks around the classroom, going from one table to another, answering questions asked by a whole team or a particular student. The instructor also provides constructive feedback to the teams, as they seek the correct answers for the different items of the exercises. As mentioned, at the beginning of the session and at the end of each exercise, the role of the instructor briefly changes into a teacher's role when providing a quick overview of the solution of the assignment. However, the focus of the instructor is much more on the coaching role. The instructor must be very empathic and receptive to motivate students who might be struggling with the material, as noted in the following statements by two instructors in a team learning setting:

You are a coach. You explain the content but, besides that, you also have to have a lot of empathy, motivating people, acting decisively when students are not prepared or if they are absent without notification.

In the teams, I'm a coach. Most of the input has to come from the students themselves. They have to prepare the exercises and try to obtain the correct solution with their team members. My role is to step in when they are stuck and lead them to the correct solution by asking questions. The most important part for the teacher is to sense the hard topics and to elaborate more on them when going through the solution.

Preparation by the instructor. Concerning the preparation of the class content, the PowerPoint presentations are of marginal importance, so no effort should be spent on making them look appealing. Highly detailed knowledge about the assignment and knowing the specific calculations by heart are, however, essential for the team instructor. The instructor can thus immediately respond to a team's problem and promptly detect students' mistakes. During the preparation time, the instructor anticipates questions the students might encounter during the discussion and thinks about well-structured but short answers to these questions. The team instructor has to be an expert on the content because the students will have all kinds of questions. The team instructor must also be very flexible in order to tailor the sessions to the needs, prior knowledge, and pace of the students. During the lesson preparation, the instructor should foresee additional questions the students might have if they finish the assignment early. For the reflection process after the session, the instructor thinks about any problems the students wrote on the team report and analyses the report to monitor the preparation process of individual students. The instructor can thus motivate the students individually to prepare and put effort into learning the material during the subsequent team session.

The instructor of the team learning session also has additional administrative work, such as preparing the team cards (by merging Excel and Word files to print the session

number, the team number, and the names of all the students per team on each card). In addition, name tags (e.g. ‘Team 15’) are printed in a large font and placed on the dedicated team table. This helps to make sure that the teams sit down quickly at their assigned table upon entering the room, especially at the beginning of the semester. Finally, reviewing the team cards and recalling the specific questions of the teams helps enormously in improving the assignments and even the explanations in the textbook. As noted by one of the team learning instructors:

In team learning, I write down the mistakes students made that I did not think of. This can help me to better prepare my lesson next year.

Reflection by the students. Several points of reflection are built into the team learning sessions. During the team discussion, the team leader can write down a few words on the team card, pointing out problems or remarks. That is interesting for the instructor as well, especially if something was not clearly described in the assignment. Furthermore, after the instructor’s presentation of the solution, the team gives itself a performance score. This score represents how well the team did at completing the exercise, in a self-reported grade. Third, at the end of each team learning session, the team is required to give itself a team score for its collaboration process (‘How do you rate the team in terms of the collaboration process today?’). The team leader is responsible for writing down this score at the bottom of the team card (see [Figure 2](#), score of 7.5 out of 10).

Student–staff ratio. In the team learning session, 6 teams are present, with each time a maximum of 6 members per team, limiting the total class size to 36 students. Compared to the lecture-based setting, the student–staff ratio is much lower! But in the present study, the instructor in the lecture-based session is sponsored by a Big-4 Audit Company, so there is no extra cost at the university level for offering the team learning approach.

Implementation process

The following describes the different steps of the implementation process, representing the experimental procedures.

Short introduction. In the last tutorial of the preceding course, that is, Financial Accounting A in the first semester, students were told that, for the next accounting course, a choice would be offered for the tutorials: lecture-based (a format the students are familiar with) or team learning (a new format).

Orientation session. In the first class of the course (i.e. the second-semester course, Financial Accounting B), students were introduced to the choice-based model in an orientation session, during the official class time of the so-called theoretical lecture. Information on both learning paths was provided, using different formats: pictures of the class settings the previous year, PowerPoint slides explaining the characteristics of each learning path (stressing the expectations), and a student-made video. The video showed students from prior years sharing their experiences (advantages and disadvantages) of the learning path they chose (lecture-based or team learning). In the video, the students presented the characteristics of each learning path so that the instructor could not influence the students in their choices. The students in the videos for both the team learning and lecture-based

learning were selected to appear in the video based on the same criteria (e.g. performance, gender, engagement level).

Syllabus on the blackboard system. All the information on the differences between the two learning paths was also described in the syllabus, posted on the blackboard (see Appendix 1, Supplementary information). Absent students were thus also informed and everyone could go over the information again, if needed.

Enrolment. In week 2, on Monday, students were required to enrol in one of the two learning paths through an online reservation tool. Friday of week 2 required a second enrolment to select one of the time slots for the chosen learning path. By making the choice of learning path *independent* of the time slot selection, since academic year 2015–2016 we prevented students from enrolling in a particular learning path because of the schedule (as we have experienced in the past). From week 3 onwards, students attended the lecture-based or the team-based tutorials. Hence, all the students followed the learning path of their choice.

First tutorial session, lecture-based learning. For good class management, the instructor reiterated the class rules in the first lecture-based tutorial session (preparation, attendance, class behaviour). An overview of the different learning activities was also provided, explaining that the tutorial would always start with a short summary of the chapter before explaining the solution of each exercise step by step. In addition, the rules in terms of questions were agreed upon (i.e. raising one's hand if needing to ask a question or asking afterwards in a more individual way). See Table 2 for an overview.

First tutorial session, team learning. In the team learning as well, the instructor made all expectations very explicit in the first class (preparation, commitment to attendance). Additionally, the role of the team leader and the content (and function) of the team card were pointed out to the students. Finally, an overview of the different learning activities was provided, explaining that a team discussion will first be held before the instructor presents the solution. A summary of the different learning activities is shown in Table 2.

Learning material. Both learning paths use the same learning material for the tutorials, including the same assignments (exercises), the same PowerPoint slides, and the same solution keys (posted after each session on the blackboard). An example of an assignment (one exercise) is provided in Appendix 2 (Supplementary information). These assignments were initially designed for the lecture-based tutorial session (before 2008) but were repeatedly adapted to eliminate any misunderstanding of the facts and requirements of the exercise. The assignments cover the whole content of the course. In particular, the instructors listed the material to be covered, which was then divided into nine tutorial sessions. The most essential items were selected and the individual assignments (re)developed. To accommodate both learning paths, we made sure that every step in the assignments had a proper answer and that there was no doubt about the assessment requirements. Financial Accounting B is a very challenging class to teach because the technical complexity of the course material is quite high while the students' motivation is sometimes less so, especially if they do not understand what is required and how the assignment should be solved. Therefore, considerable efforts were made to provide a clear and transparent solution key for each exercise. An example of a solution key (as posted on the blackboard after the session) is shown in Appendix 3 (Supplementary information).

Table 2. Overview and timing of the learning activities in each learning path.

Panel A: Learning activity in the team learning path		Time (min)	Cumulative time (min)
0	Short summary of the chapter, presented by instructor	3	3
1	Team leader fills out team report.	2	5
2	Team members compare their solution of the first exercise and try to come to a consensus. Opportunity to call in the instructor.	15	20
3	Students listen to the short presentation of the solution of the first exercise by the instructor, while focusing on most difficult elements.	7	27
4	Team members reflect on the solution of the first exercise. Team can come back on difficult journal entries. Opportunity to call in the instructor.	5	32
5	Team members compare their solution of the second exercise and try to come to a consensus. Opportunity to call in the instructor.	15	47
6	Students listen to the short presentation of the solution of the second exercise by the instructor, while focusing on most difficult elements.	7	54
7	Team members reflect on the solution of the second exercise. Team can come back on difficult journal entries. Opportunity to call in the instructor.	5	59
8	Team members compare their solution of the third exercise and try to come to a consensus. Opportunity to call in the instructor.	15	74
9	Students listen to the short presentation of the solution of the third exercise by the instructor, while focusing on most difficult elements.	7	81
10	Team members reflect on the solution of the third exercise. Team can come back on difficult journal entries. Opportunity to call in the instructor.	5	86
11	Team reflects on the group process and the team leader writes down a group score.	4	90
Panel B: Learning activity in the lecture-based learning path		Time (min)	Cumulative time (min)
0	Short summary of the chapter, presented by instructor	15	15
1	Students listen to the presentation of the solution of the first exercise by the instructor, step-by-step, with full explanation on all elements.	20	35
2	Students listen to the presentation of the solution of the second exercise by the instructor, step-by-step, with full explanation on all elements.	20	55
3	Students listen to the presentation of the solution of the thirds exercise by the instructor, step-by-step, with full explanation on all elements.	20	75
4	During the break, students can ask the instructor some questions on an individual basis.	15	90

Variable measurement

The students' choices between the two learning paths (*lecture-based or team learning*) each year was obtained by the administration for eight subsequent years (2008–2016). Only freshman students were included in the sample and resit students were excluded. There are approximately 100 resit students every year. These data will be used to answer RQ2. To obtain further insight into *why* students selected a given learning path at the beginning of the semester, qualitative data were collected in week 3 of the semester by a questionnaire for academic year 2015/2016. The students were asked to indicate what they chose as their learning path and, in an open answer, why they selected that particular learning path.

To test for hypothesis 3, quantitative data were collected (from 2008 to 2016) on learning outcomes and control variables (gender and ability). The *learning outcomes* were measured by the scores obtained on the final exam (score Accounting B, grade on 40); *gender* was obtained from the administrative records (male = 1, female = 2). For *ability*, the grade-point average (GPA) is used as a first proxy, in line with Doran, Bouillon, and Smith (1991), but with two modifications: (1) only the GPA for the first semester (fall) courses are used, that is, to denote ability before the quasi-experiment, and (2) the score of the first-semester accounting course (score Accounting A) is excluded from the GPA. This procedure results in a measure for the first-semester GPA without Financial

Accounting A (GPA1W, grade on 440), a proxy for general ability. In addition, a second proxy is used to represent ability in accounting, using the final exam score for the Financial Accounting A course in the first semester (grade on 40).

To test whether students would make the same choice after having experienced the tutorials of their choice (i.e. to test hypothesis 1), *choice satisfaction* was measured in a questionnaire in week 12 of the semester in 2015/2016. Week 12 is the last week of classes, just before the study period and exams. We asked the students to rate the following statements on a five-point Likert scale (with 1 for strongly disagree and 5 for strongly agree): (1) 'I would make the same choice again for the tutorials', (2) 'the tutorials fulfilled my expectations', and (3) 'I learned a great deal during the tutorials'. Immediately after each statement, an open area was provided with the question 'Why?' In addition, students were asked to indicate their *attendance* at the tutorials and the theoretical lectures (with the anchors 1 for <25%, 2 for 25–49%, 3 for 50–74%, 4 for 75–89%, and 5 for 90–100% of the classes attended). These two variables were added to obtain more background information.

Results

Choice

Table 3 shows the numbers of students opting for the two learning paths in each of the years investigated. In the first year, 23% of the novice students enrolled for the new, team learning approach, gradually increasing over the years, for an average of 36%. We assume that this increase is due to word-of-mouth advertising to the freshmen. Over the eight years, in total, the students chose the lecture-based format more often than the team learning format ($\chi^2 = 362.167$, $p < .001$). For each academic year separately, from 2008 to 2014, the chi-squared test is significant (see Table 3). However, for 2015–2016, we found both settings were chosen equally ($\chi^2 = 0.008$; $p = .928$).

Analysing the argumentations of the students for academic year 2015/2016, we found that the students had very specific reasons for selecting one of the two learning paths. It is interesting that certain characteristics of the instruction method were considered by some students as an advantage, while others considered them a disadvantage (e.g. forced preparation, collaborating with peers, personal contact with the teacher, watching versus doing,

Table 3. Number of students, choosing for lecture-based and team learning.

Academic year	Lecture-based learning		Team learning		Total		Chi ² -test	p-value
	n	%	n	%	n	%		
2008–2009	443	77	130	23	573	100	170.976	.000
2009–2010	367	70	155	30	522	100	86.1	.000
2010–2011	390	71	156	29	546	100	100.286	.000
2011–2012	413	73	154	27	567	100	118.309	.000
2012–2013	342	62	206	38	548	100	33.752	.000
2013–2014	316	66	163	34	479	100	48.871	.000
2014–2015	178	41	256	59	434	100	14.018	.000
2015–2016	243	50	245	50	488	100	0.008	.928
Average	337	64	183	36	520	100		
Total	1955		801		2756		362.167	.000

Note: The resit students were left out of the sample. There are approximately 100 resit students every year.

the need to change learning methods). In the following, the qualitative data are further analysed and quotes are given as illustrations.

First, the students selected the lecture-based learning format because it does *not* force them to work in teams, which *provides a sense of freedom*. In addition, some students honestly stated that their own learning behaviours would not fit with the requirement of forced preparation in the teams, as noted in the following statements from the lecture-based learning students:

The lecture-based tutorial allows me to work at my own pace.

I want the freedom to decide for myself if I want to go to class and prepare the exercises.

I lack discipline/responsibility to master this myself.

I expect that I have enough self-discipline to prepare the exercises on my own plus I have a lot of secondary activities (20 hours a week); therefore, it's hard to always make time for obligatory classes.

I usually try to prepare the exercises, but I do not manage to prepare them weekly. So, I do not want to disappoint my team; therefore, the large group seems more appropriate for me.

I know that I will not always be present or prepared when I go to the exercises. Therefore, teams will not work for me.

I am worried about the fact that I will not always come prepared to class and therefore will disappoint my fellow students and the teacher, who have put a lot of effort into it. Therefore, I selected the lecture.

On the other hand, students selecting team learning were attracted by the prospect of *required preparation*. Again, the students reflected on their own ways of learning and then deliberately selected the team learning, as shown in the following:

Teams will force me to keep up with the material and to prepare the exercises.

The teams will force me to read through the chapter in the textbook and try to do the exercises so that I can test in time whether or not I understand.

The obligation to prepare the exercises will have a good influence on my knowledge of the course. If I prepare the exercises beforehand and try to solve them first by myself, I will better understand what the course is about.

Because last semester I did not always have the time to prepare my exercises and, in this way, I will now be more obligated to prepare my exercises and spend more time on them.

The obligation to prepare exercises will be more intense.

Second, offering the choice provided an opportunity to satisfy both the 'watchers' and the 'doers' among the students. So-called watchers like to have the whole explanation before trying a problem themselves – and hence select lecture-based learning (LBL) – versus doers, who like to figure out the exercises – and hence select the team learning (TL) – as shown in the following quotes:

I first need an explanation before I can do an exercise. (LBL)

It benefits me more if the exercise is first explained to me and afterwards I look at it at home, rather than when I try to do it beforehand. (LBL)

Being active during the exercise class and trying to find possible mistakes with my fellow students appeals to me. (TL)

I try to do the exercises every week to keep up with the material. It seems interesting to me to exchange ideas about an exercise with my fellow students. (TL)

Third, offering the choice allowed us to respect those students *who hate group work as a learning format*, as well as those *who like to cooperate* with others in terms of learning, as indicated in the following:

I'm a person who likes to work individually. (LBL)

To discuss exercises with other students does not provide any benefit for me. (LBL)

I don't like to work in a group. If I prepare the exercises myself and see the solution presented in class, I learn more from my mistakes. (LBL)

I prefer to work alone than in a group and I found the [lecture-based] setting of Accounting A very helpful in processing/understanding the exercises and theory. (LBL)

I prefer to work in a passive way during class. (LBL)

I selected the teams because it is more interactive, more pleasant to study, it will require discipline; it's more pleasant to do it together. (TL)

Cooperating with friends and investigating together how an exercise should be solved seemed worth trying. We can also learn from each other, besides the information the professor gives us. (TL)

This way, I will definitely do my exercises and I will be able to discuss the reasoning with others, which can help in studying this course. (TL)

I find it interesting to confer with others on the topics of this course. (TL)

Fourth, the choice was embraced by students *who like a large group with no personal contact* with the instructor or teammates (LBL), as well as by students *who prefer to attend classes in small groups* with more personal contact with the instructor and the teammates (TL), as shown in the following statements:

I do not like personal contact with the teacher and become very stressed if a stranger asks me questions. (LBL)

Because I do not want to talk with strangers. (LBL)

I selected the teams because of the better and more personal follow-up, which will result in me coming prepared to class. Also, because you can ask questions more easily in smaller groups. (TL)

In teams, I can ask questions to my fellow students on topics that I do not understand very well plus the teachers are easier to approach than in a large group. (TL)

Fifth, offering the choice made it possible for some students *to keep* the traditional way of attending tutorials (because it worked well for them) and for others *to alter* the learning

method (because the traditional way of attending tutorials did not work well for them the previous semester), as indicated in the following:

It worked well in the first semester. Everything was explained very clearly. For me, this is a better way for class, better than in the smaller groups. (LBL)

I had good experiences with the course Accounting A, so I want to keep the same study method. (LBL)

I had a bad exam in Financial Accounting A. I do not recall so much from the exercise classes in the group and I did not prepare my exercises because it didn't matter for the large group. In the teams, cooperating more actively and thinking are encouraged more. (TL)

Because my Financial Accounting A was not good and now I am preparing to change my study method for Financial Accounting B and try harder. I'm still hesitating and wondering if this will work. (TL)

I thought Financial Accounting A was very difficult and, apparently, that was just an introduction. In the large groups, the speed was too fast for me to follow. I also had no obligation to prepare my exercises, which I have now. If I have questions, I will be able to get answers here, I hope. (TL)

Finally, some students followed their friends in selecting one of the two learning methods, in line with the feeling of relatedness, an important driver of SDT, as mentioned in the literature review in Section 2:

My friends also did it. (LBL)

My friends wanted teams. I did not feel this was necessary because I prepare the exercises anyhow. (TL)

Choice satisfaction

The data on choice satisfaction for 2015/2016 are summarized in [Table 4](#). The results show high choice satisfaction, for both the lecture-based and team learning groups. The group means are all significantly higher than three for Panel A (the lecture-based setting), as well as for Panel B (the team learning setting). For each of the three measures, the t-test value was significantly higher than the neutral value of three, supporting H1. In particular, 72% of the students would certainly make the same choice again for the lecture-based setting ($38 + 50 = 88/123$) and 83% would for the teams ($46 + 87 = 133/161$). Hence, the students in both groups were satisfied with the choices they made after having attended the path of their choice.

When analysing the open question in the dataset of 2015/2016 on *why* students would make the same choice again, the following ideas were most frequently mentioned in the lecture-based setting:

It was totally in line with my own rhythm in the large group.

It was as expected.

I prefer to follow the steps of the teacher and to take notes rather than to participate in an active way.

I think it was better explained in the large group.

Table 4. Choice satisfaction.

Measure	Frequency table					N	Min	Max	Mean	Std Dev	t*	p-value
	1	2	3	4	5							
Panel A: Lecture-based learning												
I would make the same choice again for the tutorials**	9	14	12	38	50	123	1	5	3.86	1.27	7.5281	.000
the tutorials fulfilled my expectations**	3	11	29	55	21	119	1	5	3.67	0.958	7.6578	.000
I learned a great deal during the tutorials**	7	24	26	60	4	121	1	5	3.25	1.002	2.7209	.007
I was present during the tutorials***	23	15	18	15	53	124	1	5	3.48	1.575		
I was present during the theory***	1	2	7	13	101	124	1	5	4.7	0.721		
Panel B: Team learning												
I would make the same choice again for the tutorials**	5	9	14	46	87	161	1	5	4.25	1.037	15.276	.000
the tutorials fulfilled my expectations**	1	8	32	79	40	160	1	5	3.93	0.84	14.020	.000
I learned a great deal during the tutorials**	1	7	28	90	37	163	1	5	3.95	0.792	15.330	.000
I was present during the tutorials***	2	2	8	20	131	163	1	5	4.69	0.731		
I was present during the theory***	3	4	3	21	132	163	1	5	4.69	0.79		

Notes: Panel A – *Test value = 3 (2-tailed), Panel B – *Test value = 3.
 **measured by a 5-point Likert Scale with 1 totally not agree, 3 neutral and 5 totally agree.
 ***measured by a 5-point Likert Scale with the following anchors: 1 = <25%, 2 = 25–49%, 3 = 50–74%, 4 = 75–89%, 5 = 90–100%.

It provided me with more insight into the theory.

When not satisfied with the lecture-based choice, the following explanation was given:

I did not do enough exercises during the semester.

The team learning students would make that choice again for the following reasons:

I expected to have a nice discussion within the team and that was totally the case.

My team members were highly motivated and I was studying this course intensively.

Because of the tutorials, I feel well prepared for the final exam.

Perfect way to understand all the material of this course.

I would make this choice again, but I underestimated the preparation time at home.

I thought I would hate it, but it was really interesting and fun.

Learning outcomes

As formulated in Hypothesis 3, we expected team learning to have a positive effect on academic learning outcomes, which is supported by the data. The t-test results for the Financial Accounting B scores show a significantly higher mean ($p = .032$) for the students in the team learning setting (mean = 19.05) than in the lecture-based setting (mean = 18.26; see Table 5, Panel A).³ This difference was not found for the Financial Accounting A score ($p = .223$).

Table 5. Effect on learning outcomes.Panel A: *t*-test on learning outcomes and ability measures

	Lecture-based learning		Team learning		<i>t</i> -test	
	<i>n</i>	Mean	<i>n</i>	Mean	<i>t</i> -test	<i>p</i> -value
Score for Financial Accounting B (score on 40)	2029	18.26	1256	19.05	-2.145	.032
Ability, measured as GPA1W (score on 500)	2029	274.55	1256	265.90	3.113	.002
Ability, measured as score for Financial Accounting A (score on 40)	2029	22.89	1256	22.50	1.219	.223

Panel B: ANCOVAs on learning outcomes (covariates Ability, Gender, Year)

	Lecture-based learning EM*	Team learning EM*	ANCOVA	
			<i>F</i> -test	<i>p</i> -value
Score for Financial Accounting B (covariates: GPA1W; year; gender)	18.07	19.36	24.236	.000
Score for Financial Accounting B (covariates: Financial Accounting A; year; gender)	18.06	19.38	30.334	.000

Note: *EM = estimated marginal means, i.e. the mean for each group, adjusted for all control variables in the model.

Panel C: *t*-tests and ANCOVAs on choice satisfaction

	Mean LBL	Mean TL	<i>t</i> -test	<i>p</i> -value	Covariate: GPA1W, gender				Covariate: AccA, gender			
					EM* LBL	EM* TL	<i>F</i> -test	<i>p</i> -value	EM* LBL	EM* TL	<i>F</i> -test	<i>p</i> -value
I would make the same choice again for the tutorials**	3.86	4.25	-2.824	0.005	3.84	4.26	8.621	0.004	3.84	4.25	8.438	0.004
the tutorials fulfilled my expectations***	3.67	3.93	-2.398	0.017	3.67	3.95	5.899	0.016	3.66	3.95	6.511	0.011
I learned a great deal during the tutorials**	3.25	3.95	-6.6	0.000	3.24	3.97	42.721	0.000	3.23	3.97	44.79	0.000
I was present during the tutorials	3.48	4.69	-8.658	0.000	3.5	4.73	74.125	0.000	3.49	4.73	76.49	0.000
I was present during the theory	4.7	4.69	0.16	0.873	4.72	4.68	0.244	0.622	4.73	4.67	0.31	0.578

Notes: *EM = estimated marginal mean, i.e. the mean for each group, adjusted for all control variables in the model.

LBL = lecture-based learning, TL = team learning

**Measured by a 5-point Likert Scale with 1 totally not agree, 3 neutral and 5 totally agree.

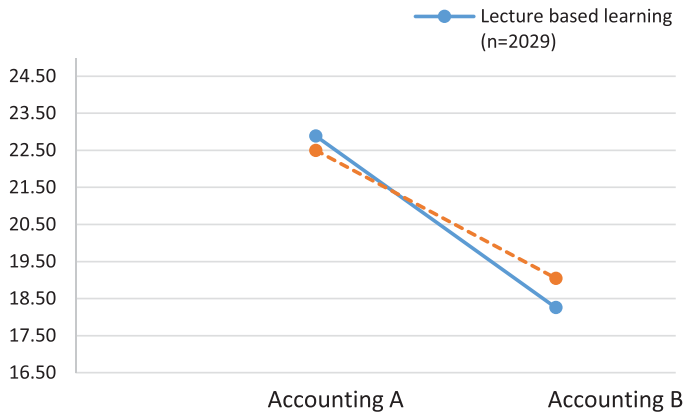


Figure 3. The effect of learning path on Learning Outcomes.

In addition, the research design made it possible to compare pre-tests (ability) with post-tests (learning outcomes) without influencing the subjects with interim test scores (e.g. mid-term exams). The team learners scored significantly lower for GPA1W than the lecture-based learners did (t -test = 3.113, $p = .002$). However, the results in Table 5, Panel B, show that the team learning students improved more compared to the lecture-based learners in this course. The analysis of covariance (ANCOVA) of the learning path on the Financial Accounting B score, with the covariates GPA1W, gender, and academic year, indeed shows a significant difference in learning paths ($F = 24.236$, $p < .001$), with team learners scoring higher (estimated marginal mean = 19.36) than the lecture-based learners (estimated marginal mean = 18.07). Similar results were found for the second operationalization of the ability measure: the significant difference in learning outcomes is still supported if we control for gender, academic year, and ability, measured as the score on the Financial Accounting A exam (estimated marginal mean = 18.06 for LBL and 19.38 for TL; $F = 30.334$; $p < .001$).

Figure 3 shows what happens when students are taught in their selected way of instruction (LBL $n = 2.029$; TL $n = 1.256$). Both groups have similar Financial Accounting A scores; however, students taught by team learning ended up with higher scores for Financial Accounting B than students taught via lecture-based learning. We can therefore conclude that team learning is an effective way to study accounting if the students select team learning as their learning path.

Additional analysis on choice satisfaction

Table 4 shows that both groups were satisfied with their choice. To investigate whether one of the two groups was more satisfied, we perform t -tests and ANCOVA's on choice satisfaction in additional analyses (see Table 5, Panel C). The team learning group agreed significantly more with the following statements: 'I would select this learning path again' (t -test = -2.824 , $p = .005$); 'it fulfilled my expectations' (t -test = -2.398 , $p = .017$); 'I learned a great deal during the tutorials' (t -test = -6.600 , $p < .001$). In addition, we found a significant difference in self-reported attendance for the tutorials (t -test = -8.658 , $p < .001$) but no significant difference in self-reported attendance for the theoretical sessions (t -test = 0.016, $p = .873$). Similar results were found when we performed an ANCOVA and

controlled for gender and both ability measures. To conclude, both groups were satisfied with their selection of learning path, but students who selected team learning reported higher choice satisfaction after having been taught in the selected format than students who chose lecture-based learning.

Additional qualitative data on instructors' perceptions

The students were satisfied with the choices they made, but what about the instructors? How do they enjoy working in each of the two settings? The happiness of the teachers in the lecture-based setting comes from the fact that they gain recognition as a *good teacher* by making *good explanations* and making sure the students learn a great deal in an efficient manner, as stated by two lecture-based learning instructors:

I feel good in my class when students are following with interest. I like it when students laugh at my humour and when I feel that they like me as a teacher.

The high attendance rate and positive feedback gives me satisfaction.

The instructors in the team sessions called the sessions *intellectually challenging* because of the difficult questions the students have. It keeps them on their toes and nurtures their need for competence, since a teacher inherently desires feeling effective in interacting with students. A teacher who taught in both learning settings noted the following:

In the lecture-based group, you know exactly what you are going to say, which makes you, as a teacher, more at ease. In the teams, however, more questions are asked on the spot. Personally, as an inexperienced teacher, I found it more comfortable to be in front of the big group [lecture based]. You are challenged with the teams, since the students ask specific questions and you do not always expect these difficult issues.

In addition, the relationships between the teachers and the students are different. The instructors in the teams reported high job satisfaction, because they had a great deal of *personal contact* with the students and built a *personal relationship* with them, something that is very unusual in a lecture-based setting with many hundreds of students.

Also, the feeling that you know your students personally – because in the teams you get to know them all by name – is really satisfying for me. (TL teacher)

Students know you by name as well. Along the way, they experience that you, as a teacher, are hoping the best for them and surely want them to succeed. (TL teacher)

I prefer team based because it gives me the opportunity to get to know my students better. I can help them with their own mistakes and there is more personal interaction vis-à-vis lecture based learning. It gives me more satisfaction because, at the end of the lesson, I know that my students comprehend the subject matter. In lecture-based lessons, you simply do not know if they understand it or not. (LBL and TL teacher)

Additionally, the fact that teachers *learn from the students* provides job satisfaction. As mentioned, the questions and feedback students provide results in the continuous improvement of the assignments, learning material, and teaching in general:

In the teams, students ask challenging questions all the time. By asking questions, students challenge you to go back to the learning material. And, that way, you learn things you never thought of before. So, it is inspiring to do. (LBL and TL teacher)

Discussion and reflections

A quasi-experiment with a pre-test and a post-test was carried out with first-year undergraduate students. The students were provided a choice between team learning and lecture-based learning for their tutorial sessions. Choice-based learning is more expensive than a one size fits all learning. However, if instructors are creative and open-minded there might be several alternatives. By providing students such an option, a market-based solution is created where only students who believe in the added value of team learning are attracted to this labour-intensive instruction method. We will now elaborate on the cost efficiency of our model if no additional funding is earned.

First, on average, there are 650 first year undergraduate students (including resit students). Given the huge number of students and scarce resources, the university code prescribes groups of approximately 80 students for tutorials. This would mean eight hours of teaching for the teaching assistant. In the lecture-based learning, we allocate 150–200 students to each lecture-based learning session, knowing that 10–20% of the students do not show up. We believe that teaching a group of approximately 80–100 students or a group of approximately 150 students is more or less the same for the students and the instructor. Because both lecture-based groups (80 versus 150) are too large to create real interaction, to pose specific questions or to have personal contact with the instructor.

In the traditional group, therefore, where no choice is provided, we need eight teaching hours per week. If a choice between lecture- and team-based learning is provided, with two lecture-based sessions (e.g. 2*200 students) and a maximum of eight team sessions (e.g. 8*36 students), this sums up to 10 tutorial sessions. Consequently compared to the traditional model, two additional hours of teaching are needed (i.e. 10 versus eight). Without private funding, this will cost the university 25% more in teaching hours for the tutorials. There is also an additional time cost for organizing the selection process and for organizing the logistics (location and schedule). However, we still believe that choice-approach is an efficient way to improve learning. Because, if the students were offered a choice between team learning and lecture-based learning, 30–50% chose team learning, while 70–50% selected the lecture-based approach. The investment must also be seen in the light of the effect of the learning path on student learning outcomes. Team learning has a positive effect on learning outcomes, so fewer students have to take the course again.

Second, we found that team learning students outperform lecture-based learning students, supporting H3. Given that team learning had a positive outcome in our setting, one might ask whether team learning should be provided for all students. We believe that providing students the choice between team learning and lecture-based learning is a good way to start. We are not sure that the effect of team learning on learning outcomes would be the same if students were forced into the cooperative learning format. Some students prefer smaller groups with personal contact with the teacher and like to cooperate with peers (team learners), while others prefer working in an autonomous, free manner and like to attend class passively, in a large group with no personal contact (lecture-based learners). With two learning paths offered, students can stipulate their own learning styles and learn the way they like, which leads to a high choice satisfaction. Indeed, both groups of students experienced high levels of choice satisfaction and reported that they would make the same choice again, supporting H1.

Third, it was surprising that more than 50% of the students (on average) preferred lecture-based learning. The students were not eager to change learning methods, probably because they became used to lecture-based tutorials at the university in the first semester. Moreover, some students were perhaps unwilling to give up their sense of freedom and commit themselves to prepare the exercises before class. Again, surprisingly, compared to the lecture-based learners, team learning students expressed a higher level of choice satisfaction afterwards. This confirms prior literature that stated that cooperative learning could lead to higher student satisfaction (Norman, Rose, & Lehmann, 2004).

Fourth, this research adds to the motivational perspective (Slavin et al., 2003) on cooperative learning. Scholars of this view have stated that cooperative learning will only work under the assumption that there are group rewards. However, *no* group rewards were involved in our study. The only reward for participation in the team learning sessions was the promise of proficient preparation for the final exam. The results show that cooperative learning has a positive effect on academic learning outcomes without formal group rewards. The team process in this study is entirely voluntary. Students opted for this learning method even though no bonus grade for participation was earned. Attendance and preparation before class were expected and encouraged but were still completely voluntary.

Fifth, the motivation of participants has been mentioned as one of the most serious problems in group work, that is, students being reluctant to fulfil assessment tasks and uncommitted to the aims of the group (Davies, 2009). A free rider benefits from cooperative learning with little or no effort expended. A free rider makes the choice not to contribute while sharing in the rewards of cooperative learning. The term *social loafing* is used as a synonym and sometimes to mean ‘the tendency to exert less effort when working with others than when working alone’ (Wagner, 1995). Social loafing happens when each team member thinks that the other team members will fulfil a given part of the teamwork. Social loafing can lead to free riding. When capable students experience the free riding of others, they reduce their input and effort in the project in reaction (the so-called sucker effect). If the students consider free riding to be unjustifiable, they will try to avoid being a sucker by reducing their own input to the task (Kerr, 1983). One can question whether this reaction is embedded in human behaviour or cultivated by the grading of the team product. Students have been known to say, ‘No more group assignments – at least not until you figure out how to fairly grade each student’s individual contributions’ (Glenn, 2009, p. 1). This is one of the reasons why the current study did not grade the learning product, so there was nothing to gain for free riders.

Sixth, the group assignments (see Appendixes 1–3, Supplementary information) were designed to develop critical thinking, promote discussion, and develop a deeper understanding of the course content. There were two or three assignments every week. Each weekly assignment was developed so that there was a clear solution, indicating exact (quantitative) answers to the questions posed. However, the assignments were not graded and no deliverables were required of the team or the individual students. This naturally had implications for the interactions and group discussions. Theoretically, the amount of interactions can be more critical and more diverse when a solution is poorly structured (Cohen, 1994) or when students have to submit a report. However, based on the fact that the students in the study were freshmen and that participation was entirely voluntary, a well-structured assignment with a clear-cut solution key was opted for.

Finally, the approach described in this study did not require extensive preparation time from the instructors, because the same exercises were used as those in the lecture-based approach, which made it less risky to experiment with team learning in the first place. In the end, the effort of team learning pays itself back, because the instructors reflect on their own teaching and teaching material. As mentioned in Section 3.7, the types of preparation for the classes differed. For the lecture, the focus was on logical flow and the step-wise explanation of the key issues in a smoothly run PowerPoint presentation, providing additional schemes and calculations on the blackboard. For the team learning, the emphasis during preparation was more on the content of the exercise, trying to determine its pitfalls and alternative answers. During the tutorial, the teaching activities differ as well. The teachers in the team sessions should accept that they do not have full control of the classroom. Experience has shown that going from one table to the next is enough to keep the teams progressing in the right direction. It is not a good idea to sit down with a team, because the instructor then loses the general overview and complicates the explanations. The main aim is for the students to explain things to each other, but when hesitation between, for example, two numbers (or journal entries) arises, the teacher only needs to indicate the correct one. Hence, the focus is more on a coaching and motivating role than on a teaching role. In addition, when explaining the solution, the instructor should understand that she or he cannot address every detail.

What is the most comfortable setting for new teachers? Certainly, the lecture-based setting, since the instructor can prepare almost everything beforehand, following a certain logic. In the team setting, students ask all sorts of different questions on the content and expect the instructor to know the answers on all these issues. Furthermore, the instructors should be able to easily switch between the different roles within a session.

Limitations and future research

It is important to note that the current study has limitations. *First*, the study implemented only two learning paths, lecture-based and team learning. It would be interesting and challenging to compare the selection and choice satisfaction of students if more learning paths were offered in a similar context. It would also be very interesting to investigate the differences in satisfaction/learning outcomes between random assignment to treatment experiment and choice-based learning. We wonder whether our results are transferrable to a setting in which all students must participate in the team learning process or where the instructor allocates the students one of the two conditions. Moreover, we also wonder whether comparing team learning with lecture-based groups of 80 and lecture-based groups of 150 students would yield the same results. We invite colleagues to study this with us.

Second, this study was limited to first-year undergraduate students at a single institution where we experimented for several years with team learning in a large class. To enhance insights into potential cultural differences, it would be interesting to investigate similar learning path choices at other universities and in different settings. In our setting, 99% of the students were Dutch-speaking local students, resulting in a homogeneous sample in terms of cultural differences. Although no rewards (or credits) were involved with the teamwork, we wonder how the system would cope with students from different cultural backgrounds in which cheating is perhaps more socially accepted. It would also be

interesting to investigate the effect of the learning path on learning outcomes for a more culturally diverse cohort of students. Therefore, we invite colleagues to offer team learning at their institutions as an alternative to lecture-based learning, to replicate and extend our findings on student learning outcomes and choice satisfaction.

*Third,*⁴ the assignments had a clear solution key. The solution key was inherent to the context of the study. We were working with first-year undergraduate students in an accounting principles course. In the first year, students have to gather technical information to gain insight into the local accounting rules. Based on the fact that these were first-year undergraduate students and that participation was completely voluntary, a well-structured assignment with a clear-cut solution key was opted for. This can have implications for the interactions and group discussions. In a master's programme course, such as in an audit course, there is no need for a clear solution key. We question whether our results are generalizable to other populations and courses that do not use a clear solution key. Further research on this topic is needed. Moreover, there was no mid-term or formative assessment involved in the current setting. The learning outcomes were only measured at the end of the semester. This makes the lecture-based group and the team group comparable because they have for example the same preparation time, instructor time and learning material. However, one might wonder if a mid-term exam or a graded assignment could bring about the improved learning outcomes similar to team learning in the current setting of lecture-based learning. This may be considered as a future avenue for research.

*Fourth,*⁵ one might wonder whether choice-based learning has a differential effect on interpersonal skills. In this study, the focus is on the implementation process of the two learning paths and the effect on learning outcomes and choice satisfaction. No differences in interpersonal skills were investigated. The measurement of interpersonal skills, as a self-reported measure, in a large sample is perhaps challenging. Perhaps observation in a small sample is a better technique for investigating how students in a team learning (or lecture-based) setting develop interpersonal skills. In sum, offering a choice of the instruction method provides challenging avenues for future research.

Fifth, to enrich the results of team learning on the learning outcomes, we believe that this is the first study that adds information on choice satisfaction and perception of the instructors. Unfortunately, these variables are only measured for one particular year: namely 2015–2016 (we refer to [Figure 1](#)). One might wonder if the data of 2015–2016 can be generalized to other choices in different academic years. Future research concerning choice satisfaction and perception of the instructors over the years would be interesting.

Conclusion

This paper was intended to investigate a choice-based approach in university teaching that has been successfully utilized over the last eight years at our university. In particular, we described the choice-based learning approach for one course where students can *choose between tutorials* in either a lecture or a team setting. By providing students a choice, worthwhile benefits can be realized for both students and instructors. This is especially crucial in light of promoting student engagement in learning activities. The characteristics of both learning paths are provided, as well as a detailed description of the implementation process, to encourage and inspire other instructors to consider introducing this method

into their own learning context. We found team learning to have a positive effect on academic learning outcomes, but only for those students who selected team learning as their preferred method. We also found that, if students are faced with the choice, the majority selects lecture-based learning. Additionally, we determined that both student groups were satisfied with their selected learning paths but selected them for specific reasons. Finally, we found that choice-based learning provides job satisfaction for the instructors of both learning paths.

Notes

1. In Belgium, teaching assistants are part of the university faculty and must have at least a master's degree (called a postgraduate degree in Australia) in business economics or a similar program. They must excel in the subject area they are teaching and have fixed contracts.
2. The interviewed instructors did not intervene with this research paper and the authors were not interviewed as an instructor.
3. The number of observations in Table 5 drops compared to Table 3 because not all students participated in the final exam of Financial Accounting B and/or Financial Accounting A.
4. We thank the two anonymous reviewers for suggesting this idea.
5. We thank the two anonymous reviewers for suggesting this idea.

Acknowledgements

We thank our colleagues from the Accounting team, who provided insights and expertise that greatly assisted the development of the two learning paths. We thank Elke Minnaert en Hanne Mortier, teachers in the tutorials (lecture-based and teams), for their for their valuable input. We also thank Thierry Van Loocke, teacher in the lecture-based setting, for his valuable input. We thank Bruno Vandebussche, for assistance with the survey data and Fanny Buyschaert for sharing her ideas about problem-based learning. We would like to thank Kim Watty (Deakin University) and Alan Sangster (University of Sussex) for comments on an earlier version.

Disclosure statement

No potential conflict of interest was reported by the authors.

References

- Adler, R. W., & Milne, M. J. (1997). Improving the quality of accounting students' learning through action-oriented learning tasks. *Accounting Education*, 6(3), 191–215.
- AECC. (1990). Objectives of education for accountants. Position Statement. *Issues in Accounting Education*, 5(2), 307.
- Aelterman, N., Vansteenkiste, M., & Haerens, L. (2018). Correlates of students' internalization and defiance of classroom rules: A self-determination theory perspective. *British Journal of Educational Psychology*. Advance online publication. doi:10.1111/bjep.12213
- AICPA. (2005). Core competency framework & educational competency assessment website. Retrieved from Available at: <http://www.aicpa.org/interestareas/accountingeducation/resources/pages/corecompetency.aspx>
- Aldamen, H., Al-Esmail, R., & Hollindale, J. (2015). Does lecture capturing impact student performance and attendance in an introductory accounting course? *Accounting Education*, 24(4), 291–317.

- Association, A. E. R. (1986). *Handbook of research on teaching: A project of the American Educational Research Association*. Macmillan: Collier-Macmillan.
- Booth, P., & Winzar, H. (1993). Personality biases of accounting students: Some implications for learning style preferences. *Accounting & Finance*, 33(2), 109–120.
- Brooks, C. M., & Ammons, J. L. (2003). Free riding in group projects and the effects of timing, frequency, and specificity of criteria in peer assessments. *Journal of Education for Business*, 78(5), 268–272.
- Byrne, M., Flood, B., & Willis, P. (2004). Using the student learning framework to explore the variation in academic performance of European business students. *Journal of Further and Higher Education*, 28(1), 67–78.
- Choo, F., & Tan, K. B. (2013). Effect of Audio Clips of heavily accented lecture on teacher evaluations. *Issues in Accounting Education*, 28(3), 487–501.
- Ciccotello, C., & D'Amico, R. (1997). An empirical examination of cooperative learning and student performance in managerial accounting. *Accounting Education: A Journal of Theory, Practice and Research*, 2(1), 1–8.
- Clinton, B. D., & Kohlmeyer, J. M. (2005). The effects of group quizzes on performance and motivation to learn: Two experiments in cooperative learning. *Journal of Accounting Education*, 23(2), 96–116.
- Cohen, E. G. (1994). Restructuring the classroom: Conditions for productive small groups. *Review of Educational Research*, 64(1), 1–35.
- Cook, T., & Campbell, D. (1979). *Quasi-experimentation: Design & analysis issues for field settings*. Boston, MA: Houghton Mifflin.
- Creswell, J. W. (2016). *Research design: Qualitative, quantitative and mixed method approaches*. Lincoln: University Of Nebraska-Lincoln.
- Davies, W. M. (2009). Groupwork as a form of assessment: Common problems and recommended solutions. *Higher Education*, 58(4), 563–584.
- Deci, E. L., & Ryan, R. M. (2016). Optimizing students' motivation in the era of testing and pressure: A self-determination theory perspective. In *Building autonomous learners* (pp. 9–29). Singapore: Springer.
- Decuyper, S., Dochy, F., & Bossche, V. d. (2010). Grasping the dynamic complexity of team learning: An integrative model for effective team learning in organisations. *Educational Research Review*, 5(2), 111–133.
- Doran, B. M., Bouillon, M. L., & Smith, C. G. (1991). Determinants of student performance in accounting principles I and II. *Issues in Accounting Education*, 6(1), 74–84.
- Duchesne, I., & Nonneman, W. (1998). The demand for higher education in Belgium. *Economics of Education Review*, 17(2), 211–218.
- Dyball, M., Reid, A., Ross, P., & Schoch, H. (2007). Evaluating assessed group-work in a second-year management accounting subject. *Accounting Education*, 16(2), 145–162. doi:10.1080/09639280701234385
- Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, 44(2), 350–383.
- Frymier, A. B., & Shulman, G. M. (1996). The development of a learner empowerment measure. *Communication Education*, 45(3), 181.
- Gabbin, A., & Wood, L. (2008). An experimental study of accounting majors' academic achievement using cooperative learning groups. *Issues in Accounting Education*, 23(3), 391–404.
- Glenn, D. (2009, June 08). Students give group assignments a failing grade. *The Chronicle of Higher Education*.
- Hite, P. A. (1996). An experimental study of the effectiveness of group exams in an individual income tax class. *Issues in Accounting Education*, 11(1), 61.
- Holtzblatt, M., & Tschakert, N. (2011). Expanding your accounting classroom with digital video technology. *Journal of Accounting Education*, 29(2), 100–121.
- Hosal-Akman, N., & Simga-Mugan, C. (2010). An assessment of the effects of teaching methods on academic performance of students in accounting courses. *Innovations in Education and Teaching International*, 47(3), 251–260.

- Hu, S., & McCormick, A. C. (2012). An engagement-based student typology and its relationship to college outcomes. *Research in Higher Education*, 53(7), 738–754. doi:10.1007/s11162-012-9254-7
- Hwang, N. C. R., Lui, G., & Tong, M. Y. J. W. (2005). An empirical test of cooperative learning in a passive learning environment. *Issues in Accounting Education*, 20(2), 151–165.
- Ickes, W., & Conzales, R. (1994). 'Social' Cognition and social Cognition: From the Subjective to the Intersubjective. *Small Group Research*, 25(2), 294–315.
- Johnson, D., & Johnson, R. (1989). *Cooperation and competition: Theory and research*. Edina, MN: Interaction Book Company.
- Julie Yazici, H. (2005). A study of collaborative learning style and team learning performance. *Education + Training*, 47(3), 216–229. doi:10.1108/00400910510592257
- Kerr, N. L. (1983). Motivation losses in small groups: A social dilemma analysis. *Journal of Personality and Social Psychology*, 45(4), 819.
- Kirschner, P. A., Sweller, J., & Clark, R. E. (2006). Why minimal guidance during instruction does not work: An analysis of the failure of constructivist, discovery, problem-based, experiential, and inquiry-based teaching. *Educational Psychologist*, 41(2), 75–86.
- Kunkel, J. G., & Shafer, W. E. (1997). Effects of student team learning in undergraduate Auditing courses. *Journal of Education for Business*, 72(4), 197–181.
- Lambert, C. (2012). Twilight of the lecture. *Harvard Magazine*, 114(4), 23–27.
- Lancaster, K., & Strand, C. (2001). Using the team-learning model in a managerial accounting class: An experiment in cooperative learning. *Issues in Accounting Education*, 16(4), 549–567.
- Lee, J. J. (2009). Size matters: An exploratory comparison of small-and large-class university lecture introductions. *English for Specific Purposes*, 28(1), 42–57.
- Lewis, L. K., & Hayward, P. A. (2003). Choice-based learning: Student reactions in an undergraduate organizational communication course. *Communication Education*, 52(2), 148–156.
- Libby, P. A. (1991). Barriers to using cases in accounting education. *Issues in Accounting Education*, 6(2), 193–213.
- Liu, Q.-X., Fang, X.-Y., Wan, J.-J., & Zhou, Z.-K. (2016). Need satisfaction and adolescent pathological internet use: Comparison of satisfaction perceived online and offline. *Computers in Human Behavior*, 55, 695–700.
- Milne, M. J., & McConnell, P. J. (2001). Problem-based learning: A pedagogy for using case material in accounting education. *Accounting Education*, 10(1), 61–82.
- Montano, J. L. A., Donoso, J. A., Hassall, T., & Joyce, J. (2001). Vocational skills in the accounting professional profile: The Chartered Institute of Management Accountants (CIMA) employers' opinion. *Accounting Education*, 10(3), 299–313.
- Norman, C. S., Rose, A. M., & Lehmann, C. M. (2004). Cooperative learning: Resources from the business disciplines. *Journal of Accounting Education*, 22(1), 1–28.
- Opdecam, E., & Everaert, P. (2018). Seven disagreements about cooperative learning. *Accounting Education*, 27(3), 223–233.
- Patall, E. A., Cooper, H., & Robinson, J. C. (2008). The effects of choice on intrinsic motivation and related outcomes: A meta-analysis of research findings. *Psychological Bulletin*, 134(2), 270–300.
- Ravenscroft, S. P. (1997). In support of cooperative learning. *Issues in Accounting Education*, 12(1), 187.
- Ravenscroft, S. P., Buckless, F. A., & Hassall, T. (1999). Cooperative learning – a literature guide. *Accounting Education*, 8(2), 163–176.
- Ravenscroft, S. P., Buckless, F. A., McCombs, G. B., & Zuckerman, G. J. (1995). Incentives in student team learning: An experiment in cooperative group learning. *Issues in Accounting Education*, 10(1), 97.
- Riley, J., & Ward, K. (2015). Active learning, cooperative active learning, and passive learning methods in an Accounting Information Systems course. *Issues in Accounting Education*, 32(2), 1–16.
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54–67. doi:10.1006/ceps.1999.1020
- Santangelo, T., & Tomlinson, C. A. (2009). The application of differentiated instruction in postsecondary environments: Benefits, challenges, and future directions. *International Journal of Teaching and Learning in Higher Education*, 20(3), 307–323.

- Schoenecker, T. S., Martell, K. D., & Michlitsch, J. F. (1997). Diversity, performance, and satisfaction in student group projects: An empirical study. *Research in Higher Education*, 38(4), 479–495.
- Sfard, A. (1998). On two metaphors for learning and the dangers of choosing just one. *Educational Researcher*, 27(2), 4–13.
- Slavin, R. E. (1983). When does cooperative learning increase student achievement? *Psychological Bulletin*, 94(3), 429.
- Slavin, R. E. (1987). Developmental and motivational perspectives on cooperative learning: A Reconciliation. *Child Development*, 58(5), 1161–1167. doi:10.2307/1130612
- Slavin, R., Hurley, E., & Chamberlain, A. (2003). Cooperative learning and achievement: Theory and research. In W. M. Reynolds & G. E. Miller (Eds.), *Handbook of psychology* (Vol. 7, Pp. 177–198). Hoboken, NJ: John Wiley & Sons, Inc.
- Trow, M. (1999). From mass higher education to universal access: The American advantage. *Minerva*, 37(4), 303–328.
- Tynjälä, P., Välimaa, J., & Sarja, A. (2003). Pedagogical perspectives on the relationships between higher education and working life. *Higher Education*, 46(2), 147–166.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher mental process*. Cambridge, MA: Harvard University Press.
- Wagner, J. A. (1995). Studies of individualism-collectivism: Effects on cooperation in groups. *Academy of Management Journal*, 38(1), 152–173.