

# **ACTIVE LEARNING BY IN-CLASS**

## **POWERPOINT QUIZZES**

Aantal woorden / Word count: 18 436

**Evelien Van Den Berghe**

Stamnummer / student number : 000140240778

Promotor / supervisor: Prof. Dr. Patricia Everaert

Masterproef voorgedragen tot het bekomen van de graad van:

Master's Dissertation submitted to obtain the degree of:

Master in Business Economics: Accountancy

Academiejaar / Academic year: 2018-2019



# Confidentiality Agreement

## PERMISSION

I declare that the content of this Master's Dissertation may be consulted and/or reproduced, provided that the source is referenced.

Name student: Evelien Van Den Berghe

Signature:

# Foreword

The subject of this thesis is 'Active Learning by In-class PowerPoint Quizzes'. The in-class PowerPoint quizzes refers to the fact that we will make quizzes in the format of PowerPoint and they will be tested in the classroom.

I choose this subject because it gave me the opportunity to be creative and do something different. It also seemed to be an interesting subject since it possibly reduces the work of teachers and will possibly be used again.

The writing itself went fluent once the general idea was certain and I would love to thank Patricia Everaert for the excellent guidance and the opportunities to test my PowerPoints. I also want to thank Jens Van Gompel for proofreading my master thesis and Myriam De Visscher and Eric Van Den Berghe to make it possible for me to study Business Economics. I want to thank all of them for the support while writing my master thesis. I also want to thank all of my respondents.

# Table of Contents

<b>Confidentiality Agreement</b> .....	III
<b>Foreword</b> .....	IV
<b>Table of Contents</b> .....	V
<b>List of Figures</b> .....	VIII
<b>List of Tables</b> .....	IX
<b>Active Learning by In-class PowerPoint Quizzes</b> .....	1
Abstract.....	1
1. Introduction.....	2
2. Literature Review.....	3
2.1 What Is Active Learning?.....	3
2.2 Active Learning Versus Passive Learning.....	4
2.3 Different Ways to Modify a Lecture Into More Active Learning.....	6
2.3.1 Pausing for Enhanced Retention and Comprehension.....	7
2.3.2 Demonstrations.....	7
2.3.3 Feedback Lecture.....	7
2.3.4 Guided Lecture.....	8
2.3.5 Writing in Class.....	8
2.3.6 Case Studies.....	9
2.3.7 Cooperative Learning.....	9
2.3.8 Debates.....	10
2.3.9 Drama.....	10
2.3.10 Peer Instruction.....	10
2.3.11 Questioning.....	11
2.3.12 Visual-based Instruction.....	14
2.4 Sizes of Lectures.....	16

2.5 Short In-class Quizzes .....	20
2.5.1 Jeopardy .....	20
2.5.2 Connect 4 .....	23
2.5.3 Bingo .....	24
3. Methodology .....	26
3.1 Research Design .....	26
3.2 Procedures Study 1: Students.....	27
3.3 Procedures Study 2: Teachers.....	28
3.4 Measurement Instrument: Study 1 .....	29
3.5 Measurement Instrument: Study 2 .....	31
4. Development of the Three PowerPoint-Based Quizzes .....	35
4.1 Development of Bingo Quiz.....	35
4.1.1 Short Description .....	35
4.1.2 Full Description in Dutch .....	35
4.1.3 Learning Objective .....	35
4.1.4 Implementation Guidance .....	35
4.2 Development of Jeopardy Quiz .....	36
4.2.1 Short Description .....	36
4.2.2 Full Description in Dutch .....	36
4.2.3 Learning Objective .....	36
4.2.4 Implementation Guidance .....	37
4.3 Development of Connect 4 Quiz .....	37
4.3.1 Short Description .....	37
4.3.2 Full Description in Dutch .....	38
4.3.3 Learning Objective .....	38
4.3.4 Implementation Guidance .....	38
5. Results.....	38
5.1 Study 1: Students.....	38

5.2 Study 2: Teachers .....	40
5.3 Research Question: Effectiveness .....	48
5.4 Research Question: Satisfaction .....	48
5.5 Research Question: Purposes .....	48
5.6 Open-Ended Questions.....	49
5.6.1 Study 1 .....	49
5.6.2 Study 2 .....	49
6. Conclusion .....	52
<b>Reference List</b> .....	<b>IX</b>
<b>Attachments</b> .....	<b>XIV</b>
Attachment 1 Bingo PowerPoint – Accounting B – Students .....	XIV
Attachment 2 Workshop PowerPoint – Teachers .....	XVII
Attachment 3 Bingo PowerPoint – Accounting A – Teachers .....	XXI
Attachment 4 Bingo Word – Example answer sheet.....	XXIV
Attachment 5 Jeopardy PowerPoint – Accounting A – Teachers .....	XXV
Attachment 6 Jeopardy Word – Answer sheet.....	XXVII
Attachment 7 Connect 4 PowerPoint – Accounting A – Teachers .....	XXVIII
Attachment 8 Bingo – Implementation guidance in Dutch.....	XXXII
Attachment 9 Jeopardy – Implementation guidance in Dutch .....	XXXIV
Attachment 10 Connect 4 – Implementation guidance in Dutch.....	XXXV
Attachment 11 Questionnaire Students .....	XXXVI
Attachment 12 Questionnaire Teachers .....	XXXVII
Attachment 13 Comments Question 12 – Bingo Students .....	XLI
Attachment 14 Comments Question 12 – Bingo Teachers .....	XLIV
Attachment 15 Comments Question 12 – Jeopardy Teachers.....	XLVI
Attachment 16 Comments Question 12 – Connect 4 Teachers .....	XLVII

# List of Figures

Figure 1 – Frequency Question 11 Bingo ..... 40  
Figure 2 – Frequency Question 11 Bingo ..... 42  
Figure 3 – Frequency Question 11 Jeopardy..... 42  
Figure 4 – Frequency Question 11 Connect 4 ..... 42



# List of Tables

Table 1 – Different Definitions of Active Learning .....	3
Table 2 – Overview Impact PowerPoint on Performance.....	15
Table 3 – Summary of Already Existing PowerPoint Games .....	26
Table 4 – Overview Studies.....	27
Table 5 – Schedule Study 1 .....	28
Table 6 – Schedule Study 2 .....	29
Table 7 – Questionnaire Students Accounting B .....	30
Table 8 – Cronbach Alfa Study 1 .....	31
Table 9 – General Questionnaire Teachers.....	32
Table 10 – Questionnaire Teachers Bingo / Jeopardy / Connect 4.....	32
Table 11 – Cronbach Alfa Study 2.....	34
Table 12 – Correlation with P-values (two-tailed).....	39
Table 13 – Descriptive Statistics Students and One-Sample T-Test with Test Value = 3.....	39
Table 14 – Descriptive Statistics Teachers and One-Sample T-Test with Test Value = 3.....	41
Table 15 – Results General Questionnaire Teachers .....	41
Table 16 – Bingo Correlation with P-values (two-tailed).....	43
Table 17 – Jeopardy Correlation with P-values (two-tailed) .....	44
Table 18 – Connect 4 Correlation with P-values (two-tailed).....	45
Table 19 – Descriptive Statistics Teachers and One-Sample T-Test with Test Value = 3.....	45
Table 20 – Comparison Different Games.....	47
Table 21 – Recommendations on the Games.....	50
Table 22 – Summary of Results .....	53

# Active Learning by In-class PowerPoint Quizzes

## Abstract

Flemish teachers seem to be open towards experimenting with games in the classroom, however they often lack to skills to do this. (Stinissen, 2010) That is why it was interesting to investigate active learning and to develop different PowerPoint games for the teachers that are easy to modify. The study was conducted at Ghent University. The goals of this paper are to discover the different purposes of PowerPoint quizzes, the perceived effectiveness and satisfaction of teachers and students. We would like to reduce the preparation time for the teachers by providing our self-made PowerPoint games online. In total three different games for an accounting class were made: Bingo, Jeopardy and Connect 4. Bingo was tested in a large accounting B classroom and in a workshop for teachers. Jeopardy and Connect 4 were only tested in the workshop for teachers. All three of the games were provided with a questionnaire for each group (teachers and students). Responses were made on a 5-point Likert scale ranging from 'totally disagree' to 'totally agree'. The student and teacher survey results show the support for the use of (different) PowerPoint game(s) in the classroom. The game(s) also led to satisfied students and teachers. However, the same could not be said about the perceived effectiveness.

**Keywords:** Active learning, in-class quizzes, PowerPoint, effectiveness, satisfaction, purposes, Bingo, Jeopardy, Connect 4

# 1. Introduction

According to Stinissen (2010) Flemish teachers are open to experiment with games in the classroom, however, they often do not have the skills for this. In this paper we will focus on developing a couple of games which will provide the teachers with the tools to implement active learning in their classes. We will make these tools available for use in the classroom environment. Introducing these games is relevant, because research has shown that 70% of the pupils have never experienced games at school. Note that each game will be provided with a short walkthrough, making them easily adaptable. But first we will take a look at the existing literature about active learning. This can appeal to different types of learners because not all students learn in the same way. (Claxton & Murrell, 1987)

In the paper of Everaert, Opdecam and Maussen (2017), there are two types of learning, deep learning and surface learning. According to Donald (1999, p. 27) higher-order learning “*includes problem solving, critical thinking, synthesis and evaluation, and oral and written expression.*” This definition includes different types of active learning, making the subject relevant in our literature review. Their paper proves that deep learning is superior to surface learning. Consequently, it is interesting to know how deep learning is obtained. Donald (1999, p. 28) found that it can be achieved when students have a high intrinsic motivation, which is defined as “*the desire to learn for the sake of understanding*”. Extrinsic motivation on the other hand is defined as “*a desire to attain an external goal*”. (Donald, 1999, p. 28) Extra motivation is exactly what a game could possibly create (Stinissen, 2010), making games a relevant topic for further investigation.

The main research question of this thesis is: is it possible and feasible to use in-class quizzes, as a method of active learning, in an accounting course? Furthermore, what is the effect of these quizzes on the perceived effectiveness and satisfaction of these courses by both teachers and students? Finally, what are the possible purposes for which these games can be used?

This paper will first start with defining active learning and comparing it with passive learning. This will be followed upon by the different ways to modify a lecture into more active learning. The different sizes of lectures and short in-class quizzes, namely Bingo, Jeopardy and Connect 4, will also be discussed. In the methodology, the procedures and the measurements will be explained for two studies. The perception of both parties that are involved in a class will be measured, meaning that we will test the perception of university students (study 1) and high school teachers (study 2). The next part will discuss the development of the three games. All of this will be followed upon by the results of the two different studies and the discussion.

## 2. Literature Review

### 2.1 What Is Active Learning?

There is no generally accepted definition of active learning, however, there are some characteristics that can be associated with the term, for example:

- (1) doing more than just listening;
- (2) the focus that lays on developing students' skills instead of transmitting as much as possible information through lecturing;
- (3) higher-order thinking activities (e.g. analysis, synthesis, evaluation);
- (4) engaging students in activities (e.g. reading, discussing, writing);
- (5) focus on exploration of students' own attitudes and values. (Bonwell & Eison, 1991, p. 19)

We compared these characteristics with existing definitions, to help us define our definition (Table 1).

**Table 1 – Different Definitions of Active Learning**

<b>Authors &amp; Definition Active Learning</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>
Murphy (2005, p. 2): <i>“involves situations where students fully participate in the educational process. Students interact with others and actively process information received, as opposed to passively listening to lectures.”</i>	x		x	x	
Bonwell and Eison (1991, p.5): <i>“students that actively engage in higher-order thinking tasks such as analysis, synthesis and evaluation.”</i> Focus lays on <i>“instructional activities that involve students doing things and thinking about what they are doing.”</i>	x	x	x	x	x
Faust and Paulson (1998, p. 4): <i>“any learning activity engaged by students in a classroom other than listening passively to an instructor’s lecture.”</i>	x		x	x	

Hermanson (1994, p. 1): “Active learning refers to situations in which students are full participants in the educational process. The students interact with others and actively process information as it is received.”	x		x	x	
Keyser (2000, p. 35): “Active learning is any teaching method that gets students actively involved.”	x				

In the end we decided to stick with Bonwell and Eison (1991, p. 19), they define it as anything that *“involves students in doing things and thinking about the things they are doing.”* Their definition is the most comprehensive, since it is the only one that includes all of the five characteristics.

Active learning is important since Chickering and Gamson (1987) found that one of their seven principles for good practice in undergraduate education is active learning. Their seven good practices need to be included if students and faculty members want to improve undergraduate education. It should also be noted that when all these practices are present their effects multiply.

In this paper the focus will lay on active learning techniques since these techniques allow students to make what they learn part of themselves. This can be achieved by talking, writing and by relating what they have learned to past experiences and applying this to their daily lives. Active learning can be encouraged in classes that use structured exercises, challenging discussions, team projects and peer critiques. Different techniques will be discussed in the section ‘2.3 Different Ways to Modify a Lecture Into More Active Learning’.

## 2.2 Active Learning Versus Passive Learning

Passive learning can be defined as *“a prevalent approach in traditional teaching taken by many professors in business schools. These professors deliver lectures for the majority of time and there is little opportunity for student input through discussion or experiential exercises”*. (Cui, 2013, p. 39) Whereas in active learning there are several models of instruction that hold learners responsible for their own learning. As the definition of Bonwell and Eison (1991, p. 19) states this can be done by letting students do instructional activities, for example *“by doing things and thinking about what they are doing”*.

Note that both methods have their own advantages and disadvantages. Some advantages for passive learning, according to Bonwell and Eison (1991), can be found in the ability for an enthusiastic lecturer to present the interest of the subject matter differently. It also provides the opportunity to present current developments that are not yet published or available in traditional textbooks. It also allows for reorganizing the material in a way that will better meet the particular needs of a certain audience. Another advantage can be found in the opportunity to apply a scholarly model that allows student to compete, however, this is arguable since Johnson and Johnson (1987) found that cooperative efforts are more likely to result in a more positive outcome compared to competitive efforts, if cooperation is implemented in the right way. Cooperative learning is another learning method that is not quite the same as active learning. Cooperative learning and the difference with active learning will be further explained under '2.3 Different Ways to Modify a Lecture Into More Active Learning'. However, it should be noted that active learning will be the focus of this paper.

Even though passive learning has many advantages, research shows that lecturing is an ineffective way for increasing conceptual understanding. (Knight & Wood, 2005) In fact, students who are being taught by the lecture method tend to adopt lower-level learning of factual information. (Rao & DiCarlo, 2000; Cuseo, 2007; Dal Bello-Haas, Bazyk, Ekelman, & Milidonis, 1999) The most important problem with lectures is the fact that most listeners can only focus for about 10 to 20 minutes, after that distractions start to kick in. (Bonwell & Eison, 1991) Another problem is that they are more beneficial to auditory learners. (Rao & Dicarlo, 2000) This is a problem given the fact that not all students learn in the same way. (Claxton & Murrell, 1987) Students are showing us their discontent with lectures, through the many note-taking services (instead of attending class, they buy their lecture notes) and the low attendance rates of only 30 to 40 percent at the end of the semester. (Cooper & Robinson, 2000) In fact, the research of Rao and Dicarlo (2000) has shown that students prefer active learning strategies.

Active learning can solve the problems that come with or are related to passive learning. For instance, it increases the attendancy rate, more attention is being paid during lectures and students score better on their exams. (Cooper & Robinson, 2000) Another consequence is that the teaching evaluations are more positive. Note that a small incorporation of active learning can already lead to significant benefits to student learning. (Knight & Wood, 2005) For example, giving students more time to answer a question, will result in an improvement in their discourse. (Rowe, 1997)

Although active learning has its many advantages, there are still some limitations in the application. Faust and Paulson (1998) came up with a few possible causes that can prohibit the application of active learning. First, there is the problem of coverage of the subject material because the instructor cannot cover as much material as with the lecture method. Some proposed solutions are: letting students cover some of the material on their own or try to introduce active learning techniques that do not take long (e.g. pause procedure). A second problem is the large amount of preparation time needed for an active-learning course. However, once the course is on point, it can be used each time the course is taught. It is also possible to pick out some techniques that will require little to no added preparation time (e.g. exercises for individual students, questions and answers). A third problem is the fear of 'losing control' on behalf of the instructor. This fear of losing control originates from the instructors habit of lecturing and its inherent power to control the flow of the lecture. It might be a good idea to start with low-risk methods and evolve towards higher-risk activities. This will allow students and instructors to get used to the active learning classes. Other obstacles are: a lack of participation by the students; the instructors lack of the necessary skills; a lack of the needed resources; large classes prevent the application of active learning. (Bonwell & Eison, 1991)

However, even with these limitations the concept of active learning was proclaimed as superior to passive learning in the 1980s. (Murphy, 2005) It is also safe to say that the standard 'lecture-then-test' format is failing, especially when lectures are delivered to huge numbers of students simultaneously. (Powell, 2003) This was proven by previously done research, for example in an introductory physics course the test results showed that the use of interactive-engagement methods enhanced the problem solving ability of students than the use of traditional methods. (Hake, 1998) In a developmental biology course, Knight and Wood (2005) found that a more interactive course had significantly higher learning gains and that there was a better conceptual understanding, compared to the traditional method. Also in an accounting setting Hermanson (1994) found the active learning method more effective to recall material (simple and complex).

## **2.3 Different Ways to Modify a Lecture Into More Active Learning**

We will shortly discuss some active learning techniques. Note that we broadly used the structure of Bonwell and Eison (1991) but with some alterations.

### ***2.3.1 Pausing for Enhanced Retention and Comprehension***

This method, also called the “pause procedure”, consists of lecturing for short periods of 10 to 18 minutes with breaks of 2 minutes between each lecture. During the pauses of 2 minutes students consolidate and compare their notes with each other. (Bonwell, 1997; Rowe, 1972; Bachel & Thaman, 2014) In the last 5 minutes of the lecture, students’ unresolved questions should be answered. In short, the pause procedure is an active learning method where students are given time to review their notes and to reflect and discuss on them afterwards. (Bachel & Thaman, 2014) As a consequence, it leads to better notes compared to individual notes.

This method allows for little time loss and a significant increase in student learning while incorporating active engagement into a lecture. It also leads to better performance (on more complex test items), better quality of students’ questions, increased level of understanding, longer retention of information and a more positive outlook on the subject. (Rowe, 1972; Rao & Dicarlo, 2000) This method constitutes a low-risk approach for increasing students’ involvement. (Bonwell, 1997) It is also possible to give clarification pauses, this will increase the likelihood that students ask questions. (Faust & Paulson, 1998) Bonwell and Eison (1991) found that a discussion, for example during a small pause, better helps to develop the students’ ability to solve problems than a normal lecture. Students’ also approved the course more.

### ***2.3.2 Demonstrations***

The purpose of demonstrations is enhancing the understanding of conceptual material and processes and the observation skills. (Shakhashiri, 1984) They can be used during a lecture to stimulate students curiosity. They can also be used as a substitute for laboratory experiments, if they are too complex or too expensive. Crouch, Fagen, Callan and Mazur (2004) found that students who predict the demonstration outcome in advance show significantly better understanding than those who did not.

### ***2.3.3 Feedback Lecture***

This format usually consists of two minilectures, with a duration of 20 minutes each. (Bonwell & Eison, 1991) These two lectures are separated by a small-group study session of 6 to 8 minutes, in which students for example discuss a question that was provided by the instructor and that is related to the lecture material. Note that in this session students work in pairs because it is not pleasant to get left out of a pair. (Kohn, 1987) and free-riding becomes nearly impossible. This method can be seen as an alternative format for a lecture as it increases the students’ level of



engagement. Furthermore, before the lecture students are given a comprehensive study guide for the lecture. (Dal Bello-Haas, Bazyk, Ekelman, & Milidonis, 1999) After the lecture, students are given a summary and evaluation of student learning and attitudes.

This method is appropriate for large classes. (Dal Bello-Haas, Bazyk, Ekelman, & Milidonis, 1999) In their research, the feedback method was as effective in terms of performance as the traditional method. However, in terms of teaching quality, the feedback method was viewed as more favorable. This kind of lecture allows students to learn by their own strengths and at the same time allows them to develop their related strengths in other areas. (Odgen, 2003)

### ***2.3.4 Guided Lecture***

In a guided lecture the first thing that the instructor does is explain the objectives of the lecture to the students. After this explanation, students need to listen carefully to the instructor during one half of the class period without taking notes. (25 to 30 minutes; Bonwell & Eison, 1991) During this lecture students need to determine the major concepts that are presented and need to remember as much supporting data as possible. At the end of the lecture, students are instructed to spend five minutes writing down everything they can recall. The next step consists of students reconstructing the lecture conceptually with supporting data in small discussion groups. If needed, questions can be asked to the instructor, allowing students to complete their notes. Later that same day, students are encouraged to reflect on the lecture and to write in narrative form, the major concepts and most pertinent information presented.

This method has the advantage that the collective experience provides the students with notes that are superior to those produced individually. This method can also be seen as an alternative format for a lecture and it will also increase the students' level of engagement.

### ***2.3.5 Writing in Class***

This can include writing a journal, thoughts on a certain topic, summarizing a lecture or assigned reading, essay on solving a problem that was presented in class. (Bonwell & Eison, 1991) This will lead to improvement in writing if there is explicit instruction in these writing classes. Explicit instruction means that instructors give students opportunities to practice and provide them with feedback afterwards and coaching if needed.

### 2.3.6 Case Studies

A case which can be based on reality or can be fictitious, is given and the goal for students is to solve it. Case studies can help to close the bridge between theory and practice since case studies are often based on real-life situations. (Bonwell & Eison, 1991) They also stimulate students and let students develop critical-thinking skills. (Herreid & Schiller, 2013) There are however some disadvantages to them: students might have some problems with the new teaching method; higher preparation time; and the instructor can fear that they will not be able to cover everything. These disadvantages can be solved by turning the class into a flipped classroom. In a flipped classroom, students participate in activities in class that would normally be considered as homework (e.g. problem solving, essay writing, ...) and at home they do the activities that they would normally do in class (e.g. listening to a lecture, watching videos, ...).

### 2.3.7 Cooperative Learning

The definition of cooperative learning that Faust and Paulson (1998, p. 4) use is “*cooperative learning covers the subset of active-learning activities that students do in groups of three or more, rather than alone or in pairs.*” Another definition can be given by Smith, Sheppard, Johnson and Johnson (2005, p. 88): “*cooperative learning is the instructional use of small groups so that students work together to maximize their own and each other’s’ learning.*” It should be noted that cooperative learning is always active learning, however, not all active learning is cooperative. (Keyser, 2000)

In order for cooperative learning to work, the following two conditions need to be met: positive interdependence and individual and group accountability. Positive interdependence means that you have to work together, in order to succeed, this will create a situation where learning can be maximized. (Johnson & Johnson, 1987) Individual and group accountability means that “*each member is individually as well as all members are collectively accountable for the work of the group*”. (Smith, Sheppard, Johnson, & Johnson, 2005, p. 88) Some examples of cooperative learning techniques are: multiple-step exercises, research projects or presentation. It should also be noted that cooperative learning is not the same as collaborative learning, which refers simply to “*any situation in which groups work together*”. (Faust & Paulson, 1998, p. 4) Thus, cooperative learning requires individual accountability, while collaborative does not.

In this method, small groups work together in a structured process to solve an academic task. This allows students to enhance their learning and to develop their social skills. (e.g. decision making, conflict management and communication; Bonwell & Eison, 1991) The problem of free

riders can be solved by letting students submit a written answer to three to five questions, which were distributed before the session. Each session there is a new recorder and leader. At the end of the session, they need to make a written report which contains major discussed ideas, points of disagreement with the group, and a brief summary of those points on which the group reached consensus. Each group gets 45 to 50 minutes to complete the report and afterwards the different findings are discussed. Grades are assigned to the submitted report. (Bonwell & Eison, 1991)

### **2.3.8 Debates**

Formats can range from formal presentation of opposing sides to less formal situations where the presentation of arguments for both sides serves as the basis for discussion in class. (Bonwell & Eison, 1991) For this method, we will specifically discuss debates in large lecture classes. Frederick (1986) came up with several ideas that make it possible for the instructor to use this method without losing too much control and that leads to increased student participation and engagement. One of them is to split the students into two teams and to let each team defend a point of view on the issue or to let the students prepare their point of view, so that they can choose on which side they are. The instructor then lets both sides explain for example five statements, possibly followed by some disproof. Afterwards the whole process can be repeated before an actual summary is reached. This summary can be obtained by choosing some volunteers who will summarize the statements that were made on each side. If students do not want to choose between two sides, it is possible to create a middle ground and also ask them to defend it.

### **2.3.9 Drama**

This methods uses written scripts to perform a play during a lecture, which will be followed by a discussion about the topic. This creates enthusiasm for the content and increases students' learning. (Bonwell & Eison, 1991)

### **2.3.10 Peer Instruction**

According to Sumangala and DiCarlo (2000, p. 51) peer instruction can be described as “a *cooperative-learning technique that promotes critical thinking, problem solving, and decision-making skills.*” They found that when peer instruction was used, students' level of understanding and their ability to summarize and integrate material increased.

### ***2.3.11 Questioning***

We will focus on this active learning method but we will first discuss the different types of questions and the requirements that need to be met in order for it to be effective. This will be followed by two different questioning techniques that can be used in a classroom environment. The last thing that will be discussed are the conditions that are ideal in the classroom environment.

#### ***2.3.11.1 Types of Questions***

Questions can be divided into four categories: cognitive memory questions; convergent thinking questions; divergent thinking questions and evaluative questions. (Bonwell & Eison, 1991) There are two known problems with these questions. Firstly, teachers often ask questions that are related to recall information instead of higher-order thinking. Secondly, it is not certain that students will answer on the same cognitive level as the question that was posed. In order to avoid these problems, Andrews (1980) discovered the three most productive types of questions. They are structured variations of divergent questions. From least to most effective: focal questions; brainstorm questions; and playground questions. With the focal question, there are a limited number of alternatives. Students need to choose one and defend it during the discussion. The brainstorm question requires students to think about all possible solutions for a specific question or problem. With a playground question, the instructor creates a specific intellectual sphere for discussion. Students are given the most freedom to approach the question.

#### ***2.3.11.2 Effective Techniques of Questioning***

We will discuss some of the question practices that were reviewed by Wilen and Clegg (1986). These practices make higher achievement possible. First, questions should be phrased clearly, since this will decrease the possibility of confusion or frustration and it also prevents waste of time. This technique will increase the number of precise and accurate responses. Questions should be primarily academic and should include different levels, from respectively low cognitive level questions to high cognitive level questions. Low cognitive level questions will increase the memorization of factual information, while high cognitive level questions will push students to organize and understand material and to apply the learned material. Another technique suggests to wait 3 to 5 seconds after asking a question before asking for a response, the same conclusion has already been reached by Rowe (1997). It is also important to stimulate students in answering questions. Some options are: probing to encourage students to clarify any vague answers or asking the unanswered question to another student. Probing can also be used for clarifying students' answers, their support for a point of view or to encourage their thinking. This helps

students to think at higher cognitive levels, to process knowledge or to enlarge their initial responses. If the instructor wants (to force) everybody to pay more attention and be more involved in class, selecting non-volunteering and volunteering students to answer a question might be a good idea. The non-volunteering students should especially be stimulated to answer when there is a high chance that they know the answer. Another technique includes encouraging as many as possible correct responses from students. If they are wrong, the instructor can lead them toward the correct answer by letting them know which part of their answer was correct and by reformulating the question.

### **2.3.11.3 Different Types of Questioning Techniques**

One example of a questioning technique is tests and quizzes. These include an immediate mastery test on the subject material that was covered, which will increase students' learning. (Menges, 1988) This allows students to retain almost twice as much information, both factual and conceptual, after eight weeks. (Menges, 1988) The whole idea of Kahoot is based on this technique.

Another category of questioning techniques are student-generated questions. Each week there is one class period that is devoted to answering open-ended, student-generated questions on any aspect of the course. (Bonwell & Eison, 1991) Each question requires a brief explanation why they consider the question important. Then the class arranges the questions in terms of general interest. Afterwards the instructor lectures on as many topics as the time allows. The drawback of this method is the lack of control that the instructor has and the risk that they may lack expertise in the topics that students want to discuss or a lack of student participation. A way to avoid this is to try to have a more structured approach. For example, students could submit written questions before the next class period. (Gleason, 1986)

### **2.3.11.4 Obtaining Ideal Classroom Conditions**

Wilén and Clegg (1986) found that it is a good idea to give extra feedback on questions because it could result in a discussion, which is preferred above a normal lecture. (Bonwell & Eison, 1991) In order to have an effective discussion, certain conditions need to be met: "*careful planning, thoughtful implementation, a supportive classroom environment, instructor's knowledge of techniques of questioning and strategies and styles for involving discussion*". (Bonwell & Eison, 1991, p. 36) It should be noted that discussion is preferable in the following cases: when the objective for the course is to retain information after the end of it; to be able to apply knowledge

to new situations; to change students' attitudes; to motivate students toward further learning in the subject area; develop students' problem-solving or thinking skills. (McKeachie, 1987)

#### **2.3.11.4.1 A Supportive Classroom Environment**

In order to create a supportive classroom environment, it is necessary for the instructor to create an environment where students feel safe to take risks. (Bonwell & Eison, 1991) This can be achieved by showing respect and support for individual student expression, encouraging students to take risks, to develop a personal connection with each student (is called 'student-centered approach', e.g. learn their names, ... ), encouraging them to ask questions, being open, predictable, showing interest in students. (Cole, Sugioka, & Yamagata-Lynch, 1999; Bonwell & Eison, 1991) However, it should be noted that this student-centered approach is more difficult to obtain in large classes.

A supportive classroom environment can also be achieved if individuals feel that their presence is recognized and validated, even in large courses. (Gleason, 1986) This can simply be obtained by trying to learn some of the students' their names, this will make the large class seem more personal. Other ways are: commend students if they asked an excellent question, adding some personal comments to some randomly selected exams or personally congratulating students who received the maximum score. These strategies will diminish defensiveness and increase participation and involvement in the course.

#### **2.3.11.4.2 Discussion Material**

In order to lead a good discussion: the discussed subjects should be relevant to both the students and instructor; the issues or problems that are being discussed should allow for different points of views; and the subjects need to be autonomous and brief so that they can be presented in class time. (Bonwell & Eison, 1991) There are different formats for delivering the material that is used: essays, speeches, poems, specific data, tables, figures, surveys of students, ...

#### **2.3.11.4.3 General Guidance and Discussion Rules**

In order to have a good discussion, it is necessary that the expectation for student involvement is clearly mentioned. The first task should be easy enough, in order to be understood and successfully solved. At the start, it is advised to let students work individually on an answer. After that, they can compare their solutions. As more and more discussions pass, students can work in larger groups with little of supervision. Note the importance for the instructor to not dominate the discussion. (Bonwell & Eison, 1991) In order to have a successful discussion, the objectives

of the class period should be clearly stated, appropriate questions for the material should be structured and the instructor should use techniques that include students as much as possible while maintaining a supportive environment.

### ***2.3.12 Visual-based Instruction***

This technique includes the use of slides, filmstrips, film, multimedia presentations, television, video or overhead transparencies. (Bonwell & Eison, 1991) It is safe to say that this technique is widely used nowadays: each year trillions of slides are being made just by using PowerPoint. (Doumont, 2005) There are also other programs that can be used, for example Kahoot and Prezi. Kahoot and the use PowerPoint in large lecture courses will be further discussed. Visual-based instruction leads to higher performance. (Cohen, Ebeling, & Kulik, 1981)

#### **2.3.12.1 Kahoot**

Kahoot is an online tool, in which quizzes can be created. Several students can participate and compete against each other in these quizzes. There has already been a lot of research on Kahoot, even for large lecture accounting classes. (Nkhoma, Nkhoma, Thomas, Tue & Le, 2018) Kahoot has its many advantages: it gives instant feedback to the students and the instructor can expand this feedback; it communicates where the problem areas of the students are; it gives the lecturer the opportunity to reflect on what works and what not; and students find it an enjoyable (learning) tool.

#### **2.3.12.2 Use of PowerPoint**

If we look at the effect that PowerPoint has on the performance of students, the results are mixed (see Table 2). The Table 2 contains an overview of the impact that PowerPoint has on the performance of the students. For accounting education, there are some studies that came up with a negative result, meaning that when PowerPoint is used, students perform worse. (Can, Karaca, Akyel, & Demirici, 2012; Burke, James, & Ahmadi, 2009) In terms of student perception, Can, Karaca, Akyel and Demirici (2012) found that there is no difference in student perception between PowerPoint and the traditional method. In the study of Burke, James and Ahmadi (2009) students perceived the use of PowerPoint as more effective in the case of management, marketing, business and economics. They also found that the students performed better in the previously mentioned courses. Szabo and Hastings (2000) found a positive attitude of students towards the use of PowerPoint, however this result was not reflected in a better performance of the students.

**Table 2 – Overview Impact PowerPoint on Performance**

<b>Author(s)</b>	<b>Positive (+) / Neutral (+/-) / Negative (-) effect on performance</b>
Lowry (1999). Electronic presentation of lectures--effect upon student performance. <i>The journal of the tertiary education group of the royal society of chemistry</i> .	+
ChanLin, L. J. (2000). Attributes of animation for learning scientific knowledge. <i>Journal of Instructional Psychology</i> , 27(4), 228.	+
Erwin, T. D., & Rieppi, R. (1999). Comparing multimedia and traditional approaches in undergraduate psychology classes. <i>Teaching of Psychology</i> , 26(1), 58-61.	+
Amare, N. (2006). To slideware or not to slideware: Students' experiences with PowerPoint vs. lecture. <i>Journal of technical writing and communication</i> , 36(3), 297-308.	-
Szabo, A., & Hastings, N. (2000). Using IT in the undergraduate classroom: should we replace the blackboard with PowerPoint?. <i>Computers &amp; education</i> , 35(3), 175-187.	+/-
Apperson, J. M., Laws, E. L., & Scepanisky, J. A. (2006). The impact of presentation graphics on students' experience in the classroom. <i>Computers &amp; Education</i> , 47(1), 116-126.	+/-

However, according to Doumont (2002, p. 293 - 294) it is possible to have effective slides if the three following guidelines are taken into account: “*adapt to your audience, maximize the signal-to-noise ratio, and use effective redundancy.*” These guidelines are called the ‘laws of communication’. Slides should focus on getting the main message across and not the details. Unnecessary information and unnecessary construction should be avoided in order to have a high signal-to-noise ratio. Also anything that can distract the audience should be avoided. He also suggests that slides should have as little text as possible in order to avoid that the spoken text would compete with the written text on the slides. (Doumont, 2005) The slides and spoken text should stand on their own. This means that the students should be able to understand the message by only reading the slides or by only listening to the lecturer, this will make it possible for students to still follow the lecture even though they missed something, we call this an effective redundancy.



Using PowerPoint brings many advantages, some of them are: PowerPoint makes it possible to accommodate visual learners with illustrations and images; more time for students to listen and engage in class; and the possibility to use websites for instruction purposes. (Gier & Kreiner, 2009) It also improves learning (Lowry, 1999); organization and clarity; entertainment and interest; professor likability and his behavior towards the students (Apperson, Laws, & Screpansky, 2006), even though the final grades were not improved. It is also advantageous to use PowerPoint in large lectures because Hove and Corcoran (2008) found that students who followed the slide-show-supplemented lecture performed better than students in the traditional lecture. The research of Hove and Corcoran (2008) is consistent with the research of Cornelius and Owen-DeSchryver (2008) and Chickering and Gamson (1987).

Cornelius and Owen-DeSchryver (2008) found that students who have partial notes performed better compared to students that got full notes. According to Chickering and Gamson (1987), if students want to master their material, it is necessary for them to do more than just listen to the lecture by for example taking notes. Using PowerPoint creates the opportunity to also give students partial notes which will give the students an incentive to go the lecture and to supplement the partial notes which were provided by the teacher. The combination of these two researches confirms one of the results of Hove and Corcoran (2008) that the slide-show-supplemented lecture created an active learning environment.

However, there are also some disadvantages when PowerPoint is used, for example: the risk that students feel like they only need to study the slides in order to succeed for the examination (Gier & Kreiner, 2009); it often reduces the presentations analytical quality (Stein, 2006), meaning that the standard templates weaken the verbal and dimensional reasoning.

As previously discussed, when using PowerPoint it is possible to incorporate active learning, for example by including content-based questions. Gier and Kreiner (2009) found that when content-based questions were used students performed better. Another way of introducing active learning in large lectures is by problem-based learning by using slides which show the case material. (Klegeris & Hurren, 2011)

## **2.4 Sizes of Lectures**

In this paper we will focus on large and small classes because large classes will be mostly used in graduate education (study 1) and small classes will be used in high-school (study 2). These

two groups will be the focus point in our research. The definition of a large class size according to Mateo and Fernandez (1996, p. 773) is a number of students between 60 and 149 students or even more. They divided the class sizes into five categories: “*very small - between 3 and 9; small - between 10 and 29; medium - between 30 and 59; large - between 60 and 149; and very large - classes of more than students.*” Mateo and Fernandez (1996) their definition is consistent with the one that Din (1998) uses. He considered a class of 50 or more students as large and a small class was one with less than 30 students.

Note that large classes are frequently referred to as ‘large lecture’ or ‘large lecture sections’ because the instructors usually choose to teach by the lecture method. (Cooper & Robinson, 2000) Previous research suggests that 73 to 83 percent of the instructors taught their classes using the lecture method. (Gardiner, 1994) This is also one of the arguments against large lectures put forward by Cuseo (2007), which will be further discussed in the next paragraph. Even though large lecture classes have their disadvantages, they can still be used if the classes are structured with clear (behavior) objectives and with a focus on specific problems which students have to face with writing for example business letters. (Lewis and Woodward, 1988) This makes sense because they found that it is not the size of the class but the used instruction method that is the most important ingredient of learning. In their analysis it was clear that one large business communication class, which involved less lecturing (called ‘environmental’ mode), had more participation than the smaller classes. Their results were consistent with Hillocks (1984) meta-analysis. They also found that active learning is effective considering students who participated in the more structured class scored higher on the post-test. A disadvantage of a more structured class with a focus on specific problems is that it increases the workload for the instructors of those large classes. However, it is worth the effort, given the results.

Cuseo (2007) identified eight possible harmful effects that are associated with large-sized classes:

- (1) it makes the faculty rely more on the lecture method
- (2) it makes students less actively involved in the learning process
- (3) there is less interaction between instructor and students, the same goes for feedback (also explained by Carbone and Greenberg (1998))
- (4) there is reduced depth of student thinking in the classroom
- (5) reduced breadth and depth of course objectives, assignments and learning strategies
- (6) lower academic achievement and performance, respectively in learning and grades
- (7) a decrease in the general course satisfaction

(8) lower student evaluations of the course / for the instructor.

Harmful effect (2) can be solved by introducing more active learning techniques during a lecture. (4) has already been mentioned in '2.2 Active Learning Versus Passive Learning'.

Even though large classes are frequently used, Carbone and Greenberg (1998, p. 315) found that there is a global dissatisfaction with the quality of large class learning experiences. According to them students seem to be bothered by the following things: *“lack of interaction with faculty; lack of structure in lecture; lack of/poor discussion sections; inadequate contact with teaching assistants; inadequacy of classroom facilities and environment; lack of frequent testing/graded assignments.”* The opinions on whether class size has an impact on the performance are split. Hill (1998) found that students in large introductory accounting course performed better than students in small classes, but at the same time students and instructors felt that the class size was too large for the course. Kokkelenberg, Dillon and Christy (2008) on the other hand found that there was a negative relationship between class size and grades. To make things more complicated, Becker and Powers (2001) found that class size does not matter in college level economics. It should be mentioned that their research was not consistent with previous research. Although there are many negative aspects that are correlated with large classes, they are still relevant since the number of students will not drop any time soon, so it might be interesting to make a course more directed towards students. (Powell, 2003)

In accounting the lecture method and routine problem solving are still dominant, but there is a movement towards more active teaching techniques, as for example discussions and questions. (Beegle & Coffee, 1991) The same thing can be said about economics, where lecture method is dominant in combination with more active techniques, such as discussion, questions and group activities. (Benzing & Christ, 1997) This trend can solve the lack of student and instructor interaction that is often experienced in large lecture classes.

Frederick (1986) gives some advice that ranges from the traditional advice to recommendations on how to attain interactive student participation in large lecture classes. Traditional advice would include things like content mastery; clearly stating objectives and a clear overview of the main topics that should be covered; limit the major points covered in one class too two to three, followed by examples to illustrate each point; by giving students specific assignments that allow them to practice these points; by adopting to the audience; to vary with the instructional strategy for the different classes and periods/days.

Frederick (1986) came up with some techniques that allow the introduction of active learning in large lecture classes. We will shortly mention two of his methods that have not been previously mentioned in this paper. The first technique is called the 'participatory lecture'. This lecture includes a brainstorm session with the students on for example everything they already know on a certain subject. The most important thing for the instructor is that he needs to make sure that everybody's ideas are recognized, for example by writing them down. The ideas can be divided into categories afterwards by the students or in advance by the instructor. Students can also judge the importance and accuracy of the ideas. This method is appropriate for visual learners and will allow them to learn better. It also requires more thinking and more interaction.

The second method is 'textual exegesis: modelling analytical skills'. In this lecture the instructor makes time to read and analyse a text out loud and afterwards he gives students the time to practice on analysing a text on their own and give them feedback. It is also possible to apply the mini-discussion in groups of 3 to 5 students, especially for the paragraphs that are ambiguous. This will foster the learning process. This method can also be used to teach students how to read graphs, charts, and tables.

Frederick (1986) was not the only one who developed techniques that allow to include active learning in a large class environment, Allen and Tanner (2005) also found different ways. We will only mention their methods that have no overlap with the methods that were previously mentioned by Frederick (1986) and that are relevant in an accounting course. Allen and Tanner (2005) found that is a good idea to introduce questions into the lecture that go beyond the simple yes-no questions. This will increase student participation while maintaining the lecture method. When applying it in a 50-minute lecture, it would result in the following schedule: 3-4 minute discussions are evenly spread between blocks of lectures of 10-12 minutes, with a 5-minute period at the end of the class that allows for summary. The advantage of this method is that not it does not take up much time and it is easy to introduce.

If the instructor wants to have 'on-the-spot-feedback', he or she can achieve this by using a student response (clicker) system, as Knight and Wood (2006) have previously done in a large-enrolment developmental biology course. This will lead to immediate feedback and discussion. However, it should be noted that multiple-choice questions are hard to let students participate in higher-order thinking.

Some other methods are: dedicating the entire class time to student presentations and projects; learning-cycle approaches (e.g. five-phased “5E” instructional model); peer-led team learning (where students, who have already done the course, try to guide the current students); modelling inquiry approaches; problem based learning and case studies (by using problems and cases that have natural pauses after 15-20 minutes that will allow the instructor to guide). The five-phased steps in ‘5E’ are engagement, exploration, explanation, elaboration and evaluation of student understanding.

As previously mentioned small classes are used in high-school education. This offers some advantages: larger participation; more engagement from students; more interaction between teacher and students; more feedback. (Deutsch, 2003) The results of Richie (1999) for math and science classes indicated that there was more discussion in the class when there were less students in one classroom. To conclude, the larger the class is the lower the chance is that teachers will use active learning methods. It should however be noted that the extent of the effect tended to be small if the class was larger than 20 students. By delivering our PowerPoints to our respondents, we hope that this will make it more likely that they use active learning.

## **2.5 Short In-class Quizzes**

Firstly, we will discuss three existing games and afterwards we will work out three different in-class quizzes that will be applied in a first year accounting class and in a workshop (see ‘3. Methodology’). As research has shown that active learning methods increase the recall of simple and complex accounting material. (Hermanson, 1994)

For the existing games, we will discuss the basic concept of each original game and an already existing class game. Next, some advantages and disadvantages of that game will be discussed. This will be followed by a discussion on the effectiveness and satisfaction of the existing game.

### **2.5.1 Jeopardy**

#### **2.5.1.1 What Is Jeopardy?**

Jeopardy is a quiz game in which three contestants take part in three different rounds called: Jeopardy!, Double Jeopardy! and Final Jeopardy!. (Jeopardy!, s.d.) The material that is covered includes a wide variety of topics. The first two rounds both consist of six categories and each category consists of five different clues that are each valued by their difficulty. The Jeopardy! round starts with the selection of a position on the board by the returning champion, the winner

of the previous game. The contestant who rings the button first, is handed the opportunity to answer the clue that is presented. Note that the contestant needs to answer with a correct question instead of the answer, that fits in with the answer that is first shown. So the answer needs to be phrased in the form of a question instead of an answer. For example if the answer was *“a big gaming story of 2018 is “fortnite”: this genre of game where the winner is last shooter or last team standing”*. The correct question would be: *“what is battle royal?”* (Trebek, 2018) . If the contestants’ answer was correct, he or she earns the value that correlates with that question. The correct answer also gives them the right to select another clue. If their answer was incorrect or if their answer was not given within the time limit of five seconds, the value will be deducted from their score and this will give other contestants the opportunity to ring the button and give an answer. If nobody rings in or gives the right answer, the host gives the correct response and the last correct questioner can choose the next clue.

In the second round, there are six new categories of clues. The values of the clues are doubled in this round. The first clue is chosen by the contestant that had the least amount of money in the previous Jeopardy! round. In both rounds there is a ‘daily double’ hidden: one in Jeopardy! and two in Double Jeopardy!. Only the contestant that has discovered the daily double can solve it. Before the reveal of the clue, the player needs to do a wager ranging between five and their entire score. If the answer is correct, the amount of the wager is added to their score, while in the case of an incorrect answer, the amount will be deducted from their score. After this, the player can choose the next clue.

If there are contestants that have an end value of zero dollar or a negative score at the end of the Double Jeopardy!, they will be excluded from the game and they will get the third place prize.

During the last round, Final Jeopardy!, there is only one clue. The contestants first need to make a wager between zero and their own score. After that the host reads out the clue, giving the contestants 30 seconds to write down the answer. If their answer is correct, the amount of the contestants’ wager is added to their score. However, if the answer is incorrect or not given in time or if the answer is not phrased as a question, then there is a deduction from their score. The player with the highest score at the end of this round wins the game. Note that in the 2 previous rounds answering without formulating the answer in the form of a question is not punished, while this is the case in the last round.

### **2.5.1.2 Existing Jeopardy Game**

There has already been some research on including Jeopardy! in the classroom, even in the accounting field. One example is the game that Murphy (2005) made for a governmental accounting class. His game is a computer-based, active-learning and self-assessment tool and if the content is developed by students themselves, it creates the opportunity to learn how to work effectively in a team. He used spreadsheet software (Excel and Word) instead of PowerPoint.

The content of the game was made by students using Word and it was afterwards edited by the instructor. There were also some other boards that were made by a faculty member and they were made available online to the students. In his game, he made use of the same board as in the original game and the higher dollar values on the board correspond with higher level learning questions. In the Word version they made use of hyperlinks that referenced to other MS Word files with the answer and question in it. Note that in the Word-based game the original sound files were included.

Murphy (2005) made use of a survey for his research on the Word-based game. The survey existed out of 77 students. He made use of a five-point Likert scale and open-ended questions to make the answers of the students more clear.

The results of his survey showed that there were some technical issues with the Word-version of the game, which lead to the development of an Excel-based game. The Excel-based game made it easier for the students to be aware of their performance. It also had the advantage that there only needed to be one version in order to play the game through the computer or just manually. The results of his research will be discussed in section '2.5.1.2.2 Effectiveness and Satisfaction.'

#### **2.5.1.2.1 Advantages and Disadvantages**

The use of tools like Excel and Word has the advantage of them not being too complicated to use and being widely available. (Murphy, 2005) The excel version had the advantage that it was easier to keep up with the scores. The assessment part of the game made it possible for the instructor to see where additional attention was needed in the material. The advantage for the students is being able to determine where they are at with their knowledge of the material prior to an exam. Another advantage is that there is only one version of the game needed, which can save preparation time for the instructor. The Excel version is also easier to alter during the class.

#### **2.5.1.2.2 Effectiveness and Satisfaction**

The results of the survey showed that Jeopardy! is an effective pedagogic method. Students also found the game helpful for their learning process and it made them think more critical. The game made the learning process more entertaining and fun and the game serves as an beneficial assessment-tool. It also had an increased impact on student participation both during and after the game.

### **2.5.2 Connect 4**

#### **2.5.2.1 What Is Connect 4?**

Connect Four is a widely known game and is also known as 'Four in Row'. It was first sold by Milton Bradley in 1974. The game is designed for two players, where both players first need to choose a color. The players alternate between each other by putting a disk in the grid. It has the objective of achieving four discs in a row as the first, the four discs can either be a horizontal, vertical or in a diagonal line. The box in where the discs are placed, are usually in the form of a seven-column, six-row vertically grid. Note that the pieces fall straight down.

#### **2.5.2.2 Existing Connect 4 Game**

There have already been developed multiple games that are based on Connect 4. We will discuss the AIS Transaction Cycles Game instead of the game that Haywood and Wygal (2009) made, because our game will be based upon the PowerPoint that was made by Moncada and Moncada (2014). Their game can be found on <http://serc.carleton.edu/sp/library/games/examples/61908.html>. Note that they made use of a 7 by 7 grid, instead of a 7 by 6 grid as in the original game. This allows them to pose 49 multiple choice questions with five different responses each.

The game serves its purpose for drill practicing and reviewing the five typical transaction cycles: revenue, expenditure, production, human resources/payroll, and financing/investing. Each cell is correlated to a transaction cycle element and a matching question. In order to start the game, the class was divided into two groups of 13 students (red or yellow team). If a team chooses a cell and gives the correct transaction cycle to the question, the chip gets dropped in the game board. If the answer is incorrect, the cell remains unclaimed and the other team can get the opportunity to capture the cell, this encourages students to think logical instead of guessing. In both teams, different students get to play and choose a cell. Each student has the possibility to consult with their team members. Note that at the start of the game, only the beginning rows can be selected.



The game can be played in two versions, the first one being that the team which is the first to have five markers in a row wins (this can either be vertical, horizontal or diagonal). In the second version, the team that has the most cells selected wins after all the questions are answered. The second version was preferred by the students.

If the game is played in large classes, there is the option to play the game in pairs by letting the students download the PowerPoint to their laptops. Their participation can then be proved by submitting a screenshot of the ending game board.

#### **2.5.2.2.1 Advantages and Disadvantages**

The game can motivate students (Moncada & Moncada, 2014), because Haywood and Wygal (2009) found that games, like Connect Four, can foster student interest. They also found that the game can be used across multiple courses and promotes reflective thinking, meaning that students can solve a problem that has many solutions instead of just one. It also makes students think more critical in terms of being 'ethical' and 'professional'. A disadvantage of this method is that the number of participants should be limited in order to let them all participate. In large classes, this can be solved by playing the same game in different groups at the same time.

#### **2.5.2.2.2 Effectiveness and Satisfaction**

Moncada and Moncada (2014) found that the Connect 4 game increased the understanding of the material by the students. Students also thought that the game was enjoyable and made them increase their learning. Haywood and Wygal (2009) found that their game was effective for student learning and their game was viewed as an interesting learning activity.

### **2.5.3 Bingo**

#### **2.5.3.1 What Is Bingo?**

Most people have already heard of Bingo or have even played the game. The game usually starts by one person who spins a sphere filled with numbered balls. This will cause a ball, that has a certain number on it, to drop out of the sphere. The goal is to complete a record sheet that each participant has received, by crossing off those numbers as the corresponding ball falls out of the wheel. When the whole (or row) record sheet is crossed off, the participant needs to shout "bingo" and wins. The game can continue a number of times, each time using another record sheet (with different numbers).

### **2.5.3.2 Existing Bingo Game**

Coco, Woodward, Shaw, Cody, Lupton and Peake (2001) worked out a Bingo game called “The Body Show” which they used for the topic “sociological approaches to the study of the body.” Their game was introduced in a first year sociology class that had approximately 260 students.

In this game, a number of sub-games are included. Each sub-game is related to an issue within the theme ‘sociology of the body’ (e.g. adornment, body image, notions of pain and pleasure, ...). In their game there is no sphere with balls in it, instead yes-or-no questions are asked to the students that are related to a sub-game in which they belong. These questions can later on be divided into two categories, which will allow students to see into which (two) categories they belong. The record sheets are divided into a set of matrices, comparable to a matrix of a crossword puzzle. One point is given for each ‘yes’ that the student has and this continues until all eight blank squares of the matrix are filled. Each matrix is related to an particular sub-game. A sub-game is finished when all blank squares are filled in and the player shouts the name of the game. After this, the player is handed a card that is related to the category on which they predominantly have answered yes. The game stops when all the sub-games have been completed.

#### **2.5.3.2.1 Advantages and Disadvantages**

The game that Coco et al. (2001) designed makes it possible to include active learning in a structured lecture environment. The game also allows each student to participate in an equal way. Other advantages are: it facilitates the understanding of the students their material; can be used in large classes; the opportunity to follow-up discussions afterwards; stimulates students to think on their own cultural choices; the game can be used for different topics in the same subject and in various ways; can be used for a wide range of group sizes (groups of 100-350 students or smaller groups of 15-100 students).

The downside of this method is the potential lack of control that an instructor could face because of the variance in the potential issues that students might raise. The disadvantages of the potential discussion afterwards can situate itself in the form of non-response, selective response, anonymity or truth telling.

### 2.5.3.2.2 Effectiveness and Satisfaction

The game of Coco et al. (2001) was evaluated by the students after the session through two open-ended questions and a questionnaire. In the questionnaire they made use of a five-point Likert scale going from strongly disagree to strongly agree. They got a total response of 123 students out of 167 students that were present. The results showed that the game was perceived as satisfactory or even more than that by over 92 percent of the students. It was perceived as fun and the issues that were covered, were perceived as relevant. It also helped them understand the sociological material and stimulated their engagement. The game created more interaction between students and the instructor. This is one of the major advantages of active learning. No research was done in terms of effectiveness.

**Table 3 – Summary of Already Existing PowerPoint Games**

<b>Name of the game</b>	<b>Authors</b>	<b>Suited for ...</b>	<b>Effective?</b>	<b>Were students satisfied?</b>
Jeopardy	Murphy (2005)	Different types of courses	Yes	Yes
Connect Four - AIS Transaction Cycles Game	Moncada & Moncada (2014)	Different types of courses	Yes	Yes
Bingo - The Body Show	Coco et al. (2001)	Different types of courses	Further research needed	Yes

## 3. Methodology

### 3.1 Research Design

We made use of PowerPoint because this can tool is easy to use and can limit the time needed to make an interactive instructional game. (Moncada & Moncada, 2014, p. 18) As Moncada and Moncada (2014) already stated: these PowerPoint games “*can offer instructors a viable, stealthy, teaching and learning strategy that capitalizes on collaborative play to engage students.*”

We developed three different PowerPoint-based quizzes that are based on the previously discussed games. Our goal is to investigate the feasibility of these three games in an accounting

course. The development of these three games is discussed in '4. Development of the Three PowerPoint-Based Quizzes'. For the research itself, we focused on measuring the perception of first-year university students (study 1) and high-school teachers (study 2) on the feasibility of these games. However, it should be noted that not all of the games were tested for these two groups, Table 4 gives a clear overview which games were tested in each study.

**Table 4 – Overview Studies**

	<b>Bingo</b>	<b>Jeopardy</b>	<b>Connect 4</b>
<b>Study 1: Students</b>	X		
<b>Study 2: Teachers</b>	X	X	X

The perception on the feasibility of the games was measured by providing both groups with a questionnaire. The questionnaire for both groups was focused on their perception of the effectiveness these games could have on learning; the effect on the satisfaction; and for which purpose these games are most likely to be used.

### **3.2 Procedures Study 1: Students**

The study took place on the 2<sup>nd</sup> of April 2019 (between 10AM to 11.30AM) during the Accounting B class in the first-year economic students at Ghent University in Belgium. Table 5 gives an overview of the schedule of the course on the 2<sup>nd</sup> of April and when exactly and for how long Bingo was played. It should be noted that the first-year economic students at Ghent University only need to make a decision between Economics, Business Economics and Business Engineer after their first year. The Accounting B course is the sequel to the first semester Accounting A course. Note that the topic of the PowerPoints for the students was Accounting B. The Accounting B course is thought by slides, a textbook and exercises.

The game was introduced by Patricia Everaert, a professor with a lot of experience in teaching and is familiar with the Accounting B course since she teaches the course. The Bingo included multiple-choice and open-ended questions.

**Table 5 – Schedule Study 1**

Timing	Schedule
8:30 – 9:45	Class on debts
9:45 – 10:00	Break
10:00 – 10:28	Class on debts
10:28 – 10:46	Bingo game
10:46 – 11:15	Class on intangible assets + Questionnaire

Note that the PowerPoint and questionnaire was formulated in Dutch, because this was the mother tongue of our participants.

The goals of the game were to increase the interactiveness in the classroom, the satisfaction of the students, the (perceived) effectiveness and to get to know the different purposes for which these games can be used. This seems realistic to obtain by active learning because Hermanson (1994) found that students performed better in an accounting setting when an active learning method was used. Also, Coco et al. found that their Bingo game ('The Body Show') left students satisfied.

### 3.3 Procedures Study 2: Teachers

On the 2<sup>nd</sup> of May 2019 there was a seminar for active learning in Accounting education for teachers that was held at the library *the Krook* in Ghent in Belgium, this is also where we introduced our three PowerPoint-based quizzes. That day, we gave 2 different workshops, Table 6 gives an overview of the schedule for these 2 workshops. The workshop had to goal to show teachers how they can best apply active learning, what its benefits are for accounting classes and how to differentiate between formats to make a quiz seem different each time. In order to achieve this, different formats were presented. We started from raising hands, to working with multiple choice cards (ABCD), to visual-based questions, to open-ended questions and to PowerPoint games (Bingo, Jeopardy and Connect 4). These different formats were followed up by a reflection moment and our questionnaire. The games that were used in the workshop, were made available on the online platform <https://www.accountingeducation.ugent.be/nl> and were only made accessible for the participants.

The first workshop had 21 participants and the second had 15 participants, making a total of 36 participants. However, we only received 34 questionnaires. These two workshops were given by

Patricia Everaert (professor) and Evelien Van Den Berghe. At the end of the workshop an explanation was given on how to modify the PowerPoints.

**Table 6 – Schedule Study 2**

Workshop 1		Workshop 2	
Timing	Schedule	Timing	Schedule
14:00 – 14:10	Different Quiz Formats (raising hands and cards with A,B,C,D etc.)	15:45 – 15:55	Different Quiz Formats (raising hands and cards with A,B,C,D etc.)
14:10 – 14:25	Bingo Game	15:55 – 16:10	Bingo Game
14:25 – 14:40	Jeopardy Game	16:10 – 16:25	Jeopardy Game
14:40 – 14:55	Connect 4 Game	16:25 – 16:40	Connect 4 Game
14:55 – 15:05	Reflection	16:40 – 16:50	Reflection
15:05 – 15:15	Questionnaire	16:50 – 17:00	Questionnaire
15:15 – 15:45	Break	17:00	End of Seminar

Note that the content of the PowerPoints for the workshops was about Accounting A, instead of Accounting B. The content was focused on two chapters of Verhoeve, Everaert and De Lembre (2013), namely chapter three ‘the balance method’ and chapter four ‘the accounting technique’. Also note that the PowerPoints and questionnaires were formulated in Dutch, because this was the mother tongue of our participants.

The goals of the questionnaires were to found out the perception of the teachers on the usability, the perceived effectiveness, the satisfaction and the possible purposes of these three games.

### **3.4 Measurement Instrument: Study 1**

As we have previously explained, we handed out questionnaires after the Bingo game for the first-year economic students. Our questionnaires aimed to measure the three following things: the purpose, the perceived effectiveness and the satisfaction of the games. The purpose of the games meant that we want to find out the possible purposes for which these games can be used. Note that the questionnaire was written in Dutch but it has been translated in English in Table 7 and gives a representation of what the different questions measure. In total, 385 questionnaires (on paper) were handed in after the lecture. The students needed to answer question 1 to 11 with a 5-point Likert scale (1-10: totally disagree, disagree, neutral, agree, totally agree & 11: totally not

successful, not successful, neutral, successful, totally successful). Question 12 was an open-ended question which allowed students to give recommendations or comments on the game. The use of an open-ended questions and the use of a 5-point Likert scale is consistent with Murphy (2005) his research on his governmental accounting Jeopardy game and with Coco et al. (2001) their Bingo game for beginners.

First, each answer that was given by the respondents was put into an Excel file. The questions that had a 5-point Likert Scale (1 to 11) were coded as the following for question 1 to 10: 1 = 'totally disagree'; 2 = 'disagree'; 3 = 'neutral'; 4 = 'agree' and 5 = 'totally agree'. Question 11 was coded as: 1 = 'totally not successful'; 2 = 'not successful'; 3 = 'neutral'; 4 = 'successful' and 5 = 'totally successful'. Afterwards, the data was analysed with SPSS. For question 12 the comments were divided into different categories, because it was an open-ended question.

**Table 7 – Questionnaire Students Accounting B**

Questions	Satisfaction	Effectiveness	Purposes
1. Bingo made the class <b>more interactive</b> .			X
2. Bingo was a <b>fun variation</b> .	X		
3. Bingo made the class <b>pleasant</b> .	X		
4. Bingo is a <b>good alternative to rehearse</b> the material.			X
5. Bingo has helped me to <b>approach the material</b> in a <b>different way</b> .			X
6. Bingo has helped me to <b>gain more insight</b> into the material.			X
7. Bingo is <b>as effective</b> as an regular class (in acquiring competencies).		X	
8. Bingo is <b>more effective</b> than a regular class (in acquiring competencies).		X	
9. Bingo has helped me to <b>pay attention</b> to the class.			X
10. The implementation of Bingo in class is something that <b>can be repeated</b> .	X		
11. What is your <b>general judgement</b> of Bingo?	X		
12. Do you have any <b>suggestions</b> (to enhance Bingo), if yes write them underneath!	X		

In order to be able to evaluate the satisfaction and effectiveness, two different constructs were made. Satisfaction was measured by four questions, while the effectiveness was measured by only one question (see Table 7). The Cronbach alfa for the effectiveness was too low if we measured the effectiveness by question 7 and 8. The Cronbach alfa for the satisfaction was high enough. One possible explanation could be that questions 7 and 8 were not filled in a consistent way by the students. The different purposes were measured on their own. Table 8 gives the Cronbach's alfa of each construct.

**Table 8 – Cronbach Alfa Study 1**

<b>Bingo</b>	<b>Cronbach Alfa</b>	<b>Cronbach Alfa if Item is Deleted</b>
Effectiveness	0,684	
- Question 7		-
- Question 8		-
Satisfaction	0,898	
- Question 2		0,857
- Question 3		0,866
- Question 10		0,866
- Question 11		0,859

### **3.5 Measurement Instrument: Study 2**

For the high-school teachers, we first introduced each one of our games and then played them. All three games were followed-up by a questionnaire. This was done on the occasion of a training session for quizzes. In regard to the measurement of satisfaction, the perceived effectiveness and the different purposes for which our games can be used, we made use of 4 different questionnaires: one with general questions and one for each tested game (Jeopardy!, Bingo and Connect 4). Table 9 and Table 10 provide a translation in English of these two types of questionnaires, because the high-school teachers main language is Dutch. Note that these questionnaires were also distributed on paper and were first put into an Excel file before the analysis with SPSS. We had a total response of 34 questionnaires.



**Table 9 – General Questionnaire Teachers**

<p><u>General questionnaire teachers:</u></p> <p>1. I am <b>familiar</b> with active learning. (5-point Likert scale: totally disagree, disagree, neutral, agree, totally agree)</p> <p>2. I try to make my class <b>more interactive</b> during teaching. (5-point Likert scale: totally disagree, disagree, neutral, agree, totally agree)</p> <p>3. If your answer on question 2 was 'agree' or 'totally agree', <b>how</b> do you try to accomplish this? (open-ended question)</p> <p>4. How many times do you make <b>use of quizzes</b> during one semester for one course? (open-ended question)</p> <p>5. Do you make <b>use of PowerPoint</b> in order to make your class more active? (No, Yes)</p> <p>6. Choose one particular subject. <b>How many times</b> do you make <b>use of PowerPoint</b> while you are teaching for this subject? (never, less than once per month, 1 to 3 times per month, weekly, each class)</p>
---

As you can clearly notice, the general questionnaire for the teachers had the purpose to find out more information on how familiar the high-school teachers were with active learning. And if they were familiar with it, how they applied this in their classes. The questionnaire also measured how familiar they were with PowerPoint and how many times they made use of it while they are teaching.

**Table 10 – Questionnaire Teachers Bingo / Jeopardy / Connect 4**

Questions	Satisfaction	Effectiveness	Purposes
1. Bingo/Jeopardy/Connect 4 makes the class <b>more interactive</b> for the pupils.			X
2. Bingo/Jeopardy/Connect 4 is suitable for <b>repeating</b> the material.			X
3. Bingo/Jeopardy/Connect 4 is suitable for <b>introducing new material</b> .			X
4. Bingo/Jeopardy/Connect 4 is suitable for <b>afterschool activities</b> .			X
5. I would <b>consider using</b> Bingo/Jeopardy/Connect 4 in my own class.	X		
6. I find it <b>achievable to integrate</b> Bingo/Jeopardy/Connect 4 into my own class (given the fact that these PowerPoints will be made available).	X		
7. Bingo/Jeopardy/Connect 4 would help my students in <b>acquiring the necessary insights</b> in the material.			X
8. The use of Bingo/Jeopardy/Connect 4 would be <b>as effective</b> as teaching.		X	
9. The use of Bingo/Jeopardy/Connect 4 would be <b>more effective</b> than teaching.		X	
10. Bingo/Jeopardy/Connect 4 makes a class <b>more fun/pleasant</b> .	X		

11. What is your <b>general opinion</b> on Bingo/Jeopardy/Connect 4?	X		
12. If you have <b>some recommendations</b> or <b>ideas</b> to improve Bingo/Jeopardy/Connect 4, write them underneath.	X		

The questions about satisfaction and purpose were slightly based on the questionnaire of Simkim (2013, p. 206). The responses on his survey about his Jeopardy game were for example “*good study tool*”; “*excellent way to review*”; “*fun way to learn*”; ...

We also worked with the same 5-point Likert scale for each one of these statements, except for question 12 (1-10: totally disagree, disagree, neutral, agree, totally agree & 11: totally not successful, not successful, neutral, successful, totally successful). Questions 1 to 10 were coded as the following: 1 = ‘totally disagree’; 2 = ‘disagree’; 3 = ‘neutral’; 4 = ‘agree’ and 5 = ‘totally agree’. Question 11 was coded as: 1 = ‘totally not successful’; 2 = ‘not successful’; 3 = ‘neutral’; 4 = ‘successful’ and 5 = ‘totally successful’. Afterwards, the data was analysed with SPSS. The use of the 5-point Likert scale was in line with Murphy (2005). He developed a Jeopardy game for a governmental accounting course. Because teachers decide for themselves how they could use such a game, the questionnaire for the teachers had more questions about the possible purposes of each game. Question 12 was analysed by dividing the different comments into different categories.

Effectiveness was measured by 2 questions and satisfaction was measured by 4 questions (see Table 10). The Cronbach’s alfa were between 0,77 and 0,91 (see Table 11), which means that they are satisfactory. The different purposes were measured on their own. A comparison between the three games will also be made (see ‘5.2 Study 2: Teachers’).

**Table 11 – Cronbach Alfa Study 2**

<b>Bingo</b>	<b>Cronbach Alfa</b>	<b>Cronbach Alfa if Item is Deleted</b>
Effectiveness	0,856	
- Question 8		-
- Question 9		-
Satisfaction	0,917	
- Question 5		0,867
- Question 6		0,895
- Question 10		0,937
- Question 11		0,864
<b>Jeopardy</b>	<b>Cronbach Alfa</b>	<b>Cronbach Alfa if Item is Deleted</b>
Effectiveness	0,772	
- Question 8		-
- Question 9		-
Satisfaction	0,794	
- Question 5		0,731
- Question 6		0,688
- Question 10		0,820
- Question 11		0,723
<b>Connect 4</b>	<b>Cronbach Alfa</b>	<b>Cronbach Alfa if Item is Deleted</b>
Effectiveness	0,786	
- Question 8		-
- Question 9		-
Satisfaction	0,882	
- Question 5		0,822
- Question 6		0,809
- Question 10		0,922
- Question 11		0,818

## **4. Development of the Three PowerPoint-Based Quizzes**

### **4.1 Development of Bingo Quiz**

#### ***4.1.1 Short Description***

The Bingo game was tested in 2 different groups: the high-school teachers and first-year university students. In the last group, we did not make use of our self-made Bingo cards, instead we let the students develop their own Bingo cards on a piece of paper. At the same time, they also wrote their answers on the questions down. In both groups, we made use of the Bingo sphere. The game will be further explained in the 'Implementation Guidance', as well as in the 'Full Description'.

In the first-year university student group, the game was first explained and played after the explanation. After finishing the game, we handed out a questionnaire. The same thing was done for the high-school teachers.

#### ***4.1.2 Full Description in Dutch***

For the full description in Dutch we refer to the annex ('Attachment 8 Bingo – Implementation guidance in Dutch').

#### ***4.1.3 Learning Objective***

One of the purposes of our questionnaires was to find out for which purposes the Bingo game can be used. We included these questions in both questionnaires. The main intended purpose of the game is to enhance active learning and to increase the interaction in the classroom.

#### ***4.1.4 Implementation Guidance***

The game starts with a short explanation on the rules of the game, given by the instructor. We will shortly summarize them:

- Every student needs to have a bingo sheet. A bingo sheet contains a 3-by-4 matrix with random numbers, starting from 1 to 12. There are 24 different bingo-sheets in total. The first number in the upper-left corner of the sheet corresponds to their team number. The purpose of the team number is to prevent cheating. This way nobody in the same team has the same bingo-sheet so there is no incentive to cheat within the teams.
- The instructor needs to spin the sphere, this will lead to a drop of a ball with a certain number written on it. This number corresponds with a question in the PowerPoint. In order to go to the correct question, the instructor needs to click on that same number in the

gameboard. The right question will now be shown. Students will be given some time to write their answer down on a piece of paper. After this, the right answer will be shown on the PowerPoint. In case of an open-ended question, a simple mouse click will do the trick. However, if it is a multiple choice question, there first needs to be a pre-selection of the (most-wanted) answer. If the chosen answer was correct, a 'right' screen will be shown. If not, a 'wrong' screen will be shown.

- If the answer was correct, the student can color the question on their bingo-sheet. If it was wrong, nothing happens. The goal of working in teams is that each team member controls his or her partner. Also note that the instructor can give additional feedback, if needed. (Wilen & Clegg, 1986)
- The game continues until all the questions are answered. Note that returning to the game board can simply be obtained by selecting the home button.

The main purpose of the game is to be the first player who has a full row of correct answers fully colored in or to have a full card. It should be noted that having a full row or card is not enough to win the game, in order to win the game you also need to be the first player to shout 'bingo'.

## **4.2 Development of Jeopardy Quiz**

### ***4.2.1 Short Description***

The Jeopardy game was only tested in the workshop and was the second game that was played. The Jeopardy game is different in how the quiz is constructed, unlike normal quizzes it is the goal to give the correct question to an answer that is given. The answers are coupled with dollar values, it is possible to let the higher dollar values correspond with the more difficult questions. The dollar values can be earned if the question was correct.

### ***4.2.2 Full Description in Dutch***

For the full description in Dutch we refer to the attachment ('Attachment 9 Jeopardy – Implementation guidance in Dutch').

### ***4.2.3 Learning Objective***

As has been previously discussed in the literature review (section '2.5 Short In-class Quizzes' were different existing games were discussed), not much research has been done on investigating the different purposes that these games might have. Our questionnaire will focus on finding out these multiple purposes in terms of usage of the game. Although these purposes were not defined upon till now, the main goal of these games can be defined as engaging in active

learning and increase in interaction. Note that we will keep the scores on the blackboard because PowerPoint, unlike Excel, does not have the option to keep track of the scores.

#### ***4.2.4 Implementation Guidance***

First, the class needs to be divided in four different teams. A random team can first select a question, by for example guessing a number from 1 to 5. Each team can choose a question after the last one, rotating through the entire group clockwise. Each dollar value and each topic can be selected. The team will first get some time to consult with each other before giving a definitive answer. If the answer was right, the dollar value will be written down on the blackboard. At the end of the game, the sum for these dollar values for each time will be made. The team with the highest dollar value wins the game. If the answer was wrong, the team can choose a team that will get the change to answer the same question. If the other team can answer this question right, they will earn the dollar value of that question. If the other team their answer is wrong, they can decide for the last time on the team that will get the final chance to answer the question right. If after this, the question still remains unanswered, the teacher will provide the correct answer and will give an explanation. It is also necessary for each team to write down their answers, this will allow them to learn from their mistakes.

The PowerPoint of Jeopardy also works with a gameboard. On the gameboard there are nine dollar values in total, these dollar values are divided into three different categories (basis, terminology and technique). In order to go to the right question, the right dollar value should be selected. Note that the correct answer will be displayed by one simple mouse click on this slide. In order to go back to the gameboard, the 'home'-button needs to be selected.

### **4.3 Development of Connect 4 Quiz**

#### ***4.3.1 Short Description***

Connect 4 was also only tested in the workshop and it was the third game that was played. This game will probably take longer than the other two games, because the whole grid consists out of 20 cells that are linked to questions. The game will only end after one of the teams has 4 slices in a row (either horizontally, vertically or diagonally) or when all of the cells are filled with slices. It should be noted that all of these twenty questions are multiple choice.

### ***4.3.2 Full Description in Dutch***

For the full description in Dutch we refer to the attachment ('Attachment 10 Connect 4 – Implementation guidance in Dutch').

### ***4.3.3 Learning Objective***

The main aimed objective here also is to enhance active learning and to create more interaction. We also want to investigate the probable purposes for this game, because there has not been done much research.

### ***4.3.4 Implementation Guidance***

The class should be first divided into two groups, yellow and red. The red team will be the first team that can select a cell. Note that they can only select the cells in the bottom row. One student of the red team will select the cell by saying the name of the cell. The teacher will click on this cell in the gameboard, this will make the PowerPoint show the question that belongs to that cell. The red team will now get some time to consult with each other before giving a final answer. To make answering more easy, we provided each answer with a character (A,B,C,D, ...). If their final answer was correct, the teacher will select the red triangle in this cell, this will lead to a drop of a red coin. If the answer was wrong, nothing happens. In both situations, the turn will go the yellow team, where this whole process will be repeated. Note that if team yellow their answer was correct, the teacher should select the yellow rectangular in the cell. The game finishes when one of the teams obtains four in a row, this can either be horizontal, vertical or diagonal. If none of the teams obtain four in a row, but every question has been answered, the game also finishes.

Note that we based our PowerPoint on the AIS Transaction Cycles Game of Moncada and Moncada (2014), we decided to make the board shorter in order to save time.

## **5. Results**

### **5.1 Study 1: Students**

The correlations are shown in Table 12. The items are all significantly positively correlated, however they are not highly correlated. The correlations between the satisfaction and the different purposes are moderate. If the purposes are fulfilled this can lead to increased satisfaction. For the other items the correlations were on the weaker side.

**Table 12 – Correlation with P-values (two-tailed)**

	1.	2.	3.	4.	5.	6.	7.
1. Effectiveness	1						
2. Satisfaction	0.337** 0.000	1					
3. Purpose - Interactive (question 1)	0.122* 0.017	0.601** 0.000	1				
4. Purpose - Rehearse (question 4)	0.397** 0.000	0.616** 0.000	0.352** 0.000	1			
5. Purpose - Different Approach (question 5)	0.337** 0.000	0.464** 0.000	0.320** 0.000	0.562** 0.000	1		
6. Purpose - Gain Insight (question 6)	0.375** 0.000	0.504** 0.000	0.306** 0.000	0.556** 0.000	0.574** 0.000	1	
7. Purpose - Attention Paid (question 9)	0.295** 0.000	0.630** 0.000	0.398** 0.000	0.490** 0.000	0.393** 0.000	0.466** 0.000	1

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

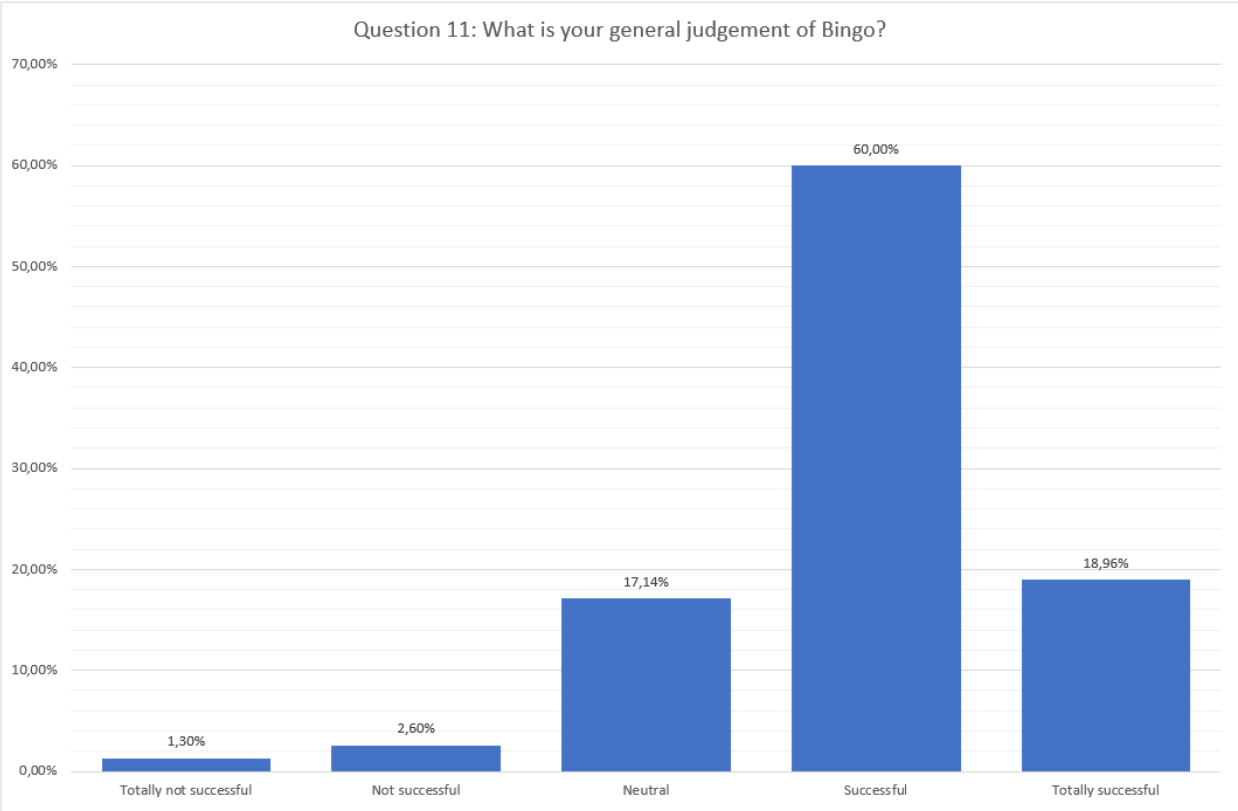
Table 13 contains the mean scores and standard deviations of the different questions in the questionnaire. The means range between 2,77 and 4,23 and the standard deviation ranges between 0,694 and 1,0056. Figure 1 gives an overview on the general judgement of Bingo, as you can see 78,96% of the respondents thought that Bingo was successful to totally successful.

**Table 13 – Descriptive Statistics Students and One-Sample T-Test with Test Value = 3**

Bingo	N	Mean	Maximu m	Minimu m	SD	T	p-value (one-sided)
Effectiveness	385	2,77	5	1	0,978	-4,533	0,000
Satisfaction	385	4,07	5	1	0,694	30,157	0,000
Purpose – Interactive	385	4,23	5	2	0,696	34,648	0,000
Purpose – Rehearse	383	3,77	5	1	0,919	16,285	0,000
Purpose – Different Approach	385	3,63	5	1	0,936	13,128	0,000
Purpose – Gain Insight	385	3,09	5	1	1,001	1,833	0,034
Purpose – Attention Paid	385	3,58	5	1	1,056	10,717	0,000



**Figure 1 – Frequency Question 11 Bingo**



After analysing all the data of the survey (see Table 13), we can conclude that the Bingo game was successful in satisfying the students. On the contrary students do not find Bingo effective but this does not mean that Bingo will not increase the actual performance of the students. Further research is necessary to study the effect on their performance.

In terms of different purposes for the Bingo game, it can be said that Bingo is well suited for rehearsing the material. It is also a good alternative to approach the material in a different way and it made the class more interactive. Bingo also helped the students to pay attention in class. For the purpose on gaining insight, the effect of the game was also significant. However, it should be noted that the p-value was higher (0,034) in comparison to the other purposes, which had a p-value of 0,000.

### **5.2 Study 2: Teachers**

We can conclude from the general questionnaire that teachers nowadays are familiar with active learning and that they try to make their class more interactive (Table 14). These two questions

are significantly positively correlated, with a moderate correlation of 0,592. A lot of different methods are being used when teachers incorporate active learning in their class. For example: visual based instruction (kahoot, quizlet, PowerPoint, ...), debates, different sorts of quizzes, groupwork, movies, .... Kahoot seemed to be a popular method, because it was mentioned 12 times, especially given the fact that there were only 34 participants. Quizzes were also frequently used, only 6 respondents answered that they never use quizzes. The usage rate of quizzes fluctuated between one and more than 5 times during one semester for one course. Table 15 shows that 91,18% of our respondents made use of PowerPoint to make their class more active. When we asked about how many times they made use of PowerPoint while they teach, 28,13% answered that they used PowerPoint weekly and 50,00% said they made use of PowerPoint during each class.

**Table 14 – Descriptive Statistics Teachers and One-Sample T-Test with Test Value = 3**

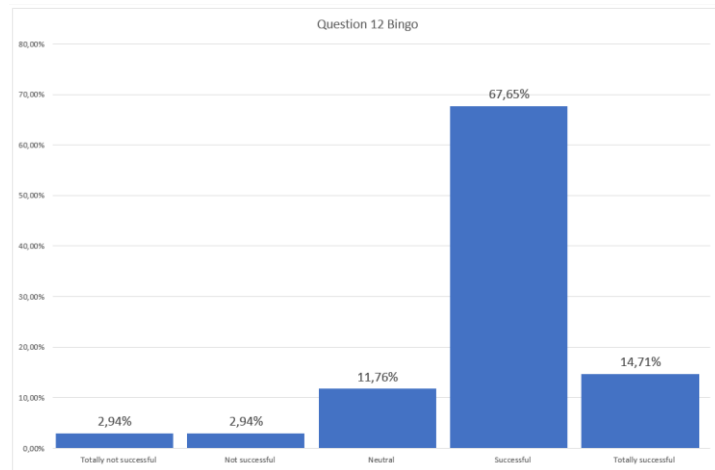
General questions	N	Mean	Maximum	Minimum	SD	T	p-value (one-sided)
Question 1	34	3,74	5	1	1,024	4,186	0,000
Question 2	34	3,85	5	1	0,784	6,347	0,000

**Table 15 – Results General Questionnaire Teachers**

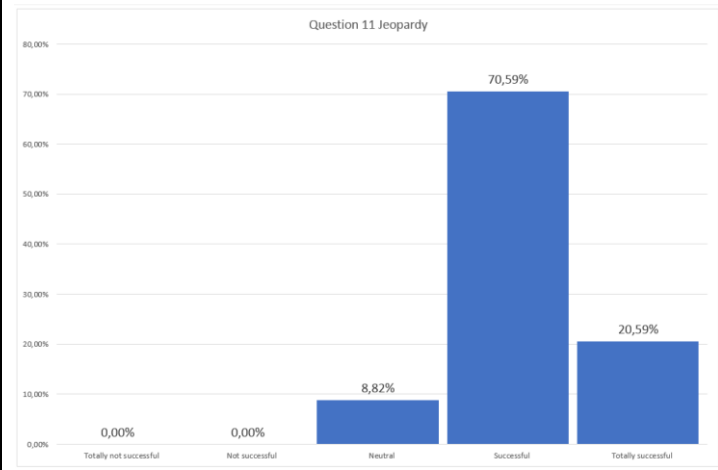
General questions	1 = Never	2 = Less than once per month	3 = 1 to 3 times per month	4 = Weekly	5 = Each class
6. Choose one particular subject. How many times do you make use of PowerPoint while teaching for this subject?	6,25%	9,38%	6,25%	28,13%	50,00%
General questions	1 = No		2 = Yes		
5. Do you make use of PowerPoint to make your class more active?	8,82%		91,18%		

Figure 2, Figure 3 and Figure 4 allow for a comparison on the general opinion on the three different games. Later on in this paper, a comparison of the three different games on each aspect will be made.

**Figure 2 – Frequency Question 11 Bingo**



**Figure 3 – Frequency Question 11 Jeopardy**



**Figure 4 – Frequency Question 11 Connect 4**

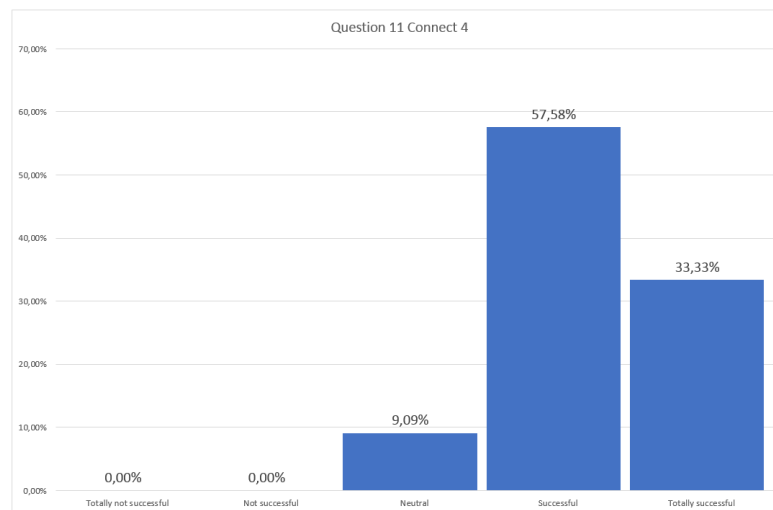


Table 16, Table 17 and Table 18 give an overview of the correlations for each game. For the Bingo game, there is a significant positive correlation between satisfaction and the purposes interactive and repeating. This relationship also holds for the correlation between the effectiveness and the purposes interactive and approach new material. The correlation between satisfaction and the purposes approach new material, afterschool activities and gain insight is low, with a correlation for approach to material of 0,003, which is almost not existent. For some items, there is even a negative correlation. This is the case for: effectiveness and afterschool activities ( $r = -0,039$ ); approach new material and repeating ( $r = -0,014$ ); afterschool activities and approach new material ( $r = -0,104$ ).

**Table 16 – Bingo Correlation with P-values (two-tailed)**

	1.	2.	3.	4.	5.	6.	7.
1. <i>Effectiveness</i> (question 8 & 9)	1						
2. <i>Satisfaction</i> (questions 5, 6, 10 & 11)	0.147 0.414	1					
3. <i>Purpose - Interactive</i> (question 1)	0.470** 0.006	0.564** 0.001	1				
4. <i>Purpose - Repeating</i> (question 2)	0.207 0.247	0.439** 0.009	0.470** 0.005	1			
5. <i>Purpose - Approach</i> <i>New Material</i> (question 3)	0.629** 0.000	0.003 0.986	0.293 0.093	-0.014 0.938	1		
6. <i>Purpose -Afterschool</i> <i>Activities</i> (question 4)	-0.039 0.829	0.241 0.169	0.216 0.220	0.472** 0.005	-0.104 0.557	1	
7. <i>Purpose - Gain Insight</i> (question 7)	0.130 0.472	0.259 0.139	0.259 0.139	0.262 0.135	0.123 0.487	0.380* 0.026	1

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

For the Jeopardy game, there were also some negative correlations between some items: between the effectiveness and satisfaction ( $r = -0,205$ ); the effectiveness and purpose repeating ( $r = -0,085$ ); the satisfaction and purpose approach new material ( $r = -0,043$ ); purpose approach new material and repeating ( $r = -0,085$ ). There were also some significantly positively correlated items, two of them were even highly correlated: the satisfaction and purpose repeating ( $r = 0,719$ ;  $p = 0,000$ ); the purposes repeating and interactive ( $r = 0,773$ ;  $p = 0,000$ ).

**Table 17 – Jeopardy Correlation with P-values (two-tailed)**

	1.	2.	3.	4.	5.	6.	7.
1. <i>Effectiveness</i>	1						
2. <i>Satisfaction</i>	-0.205 0.244	1					
3. <i>Purpose - Interactive</i>	0.092 0.603	0.636** 0.000	1				
4. <i>Purpose - Repeating</i>	-0.085 0.634	0.719** 0.000	0.773** 0.000	1			
5. <i>Purpose - Approach New Material</i>	0.413* 0.015	-0.043 0.808	0.026 0.883	-0.085 0.634	1		
6. <i>Purpose - Afterschool Activities</i>	0.140 0.428	0.486** 0.004	0.599** 0.000	0.507** 0.002	0.048 0.789	1	
7. <i>Purpose - Gain Insight</i>	0.165 0.352	0.096 0.590	0.347* 0.044	0.092 0.606	-0.045 0.800	0.314 0.070	1

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

For the Connect 4 game, there were not many significantly positively correlated items, except for the satisfaction and purposes interactive and repeating, the effectiveness and purpose approach new material, purposes gain insight and afterschool activities, and purposes repeating and interactive. There were also two negative (not significant) correlations between the effectiveness and purpose interactive and between purposes interactive and approach new material.

**Table 18 – Connect 4 Correlation with P-values (two-tailed)**

	1.	2.	3.	4.	5.	6.	7.
1. Effectiveness	1						
2. Satisfaction	0.029 0.875	1					
3. Purpose - Interactive	-0.152 0.390	0.690**	1				
4. Purpose - Repeating	0.143 0.419	0.616**	0.666**	1			
5. Purpose - Approach New Material	0.577** 0.000	0.078 0.671	-0.053 0.771	0.141 0.433	1		
6. Purpose - Afterschool Activities	0.068 0.703	0.262 0.141	0.311 0.073	0.326 0.060	0.249 0.162	1	
7. Purpose - Gain Insight	0.029 0.869	0.301 0.089	0.286 0.102	0.303 0.081	0.330 0.061	0.356* 0.039	1

\*\* Correlation is significant at the 0.01 level (2-tailed)

\* Correlation is significant at the 0.05 level (2-tailed)

The mean of the three games averages between 2,29 and 4,56. Table 19 gives an overview of the statistic descriptives. The standard deviation for the three games ranged between 0,472 and 0,962.

**Table 19 – Descriptive Statistics Teachers and One-Sample T-Test with Test Value = 3**

Bingo	N	Mean	Maximum	Minimum	SD	T	P-value (one-sided)
Effectiveness	33	2,39	5	1	0,836	-4,163	0,000
Satisfaction	34	4,02	5	1	0,796	7,485	0,000
Purpose – Interactive	34	4,18	5	2	0,716	9,574	0,000
Purpose – Repeating	34	4,38	5	3	0,604	13,350	0,000
Purpose - Approach New Material	34	2,56	5	1	0,960	-2,681	0,006

Purpose - Afterschool Activities	34	3,74	5	2	0,898	4,774	0,000
Purpose - Gain Insight	34	3,68	5	2	0,806	4,894	0,000
<b>Jeopardy</b>	<b>N</b>	<b>Mean</b>	<b>Maximum</b>	<b>Minimum</b>	<b>SD</b>	<b>T</b>	<b>P-value</b>
Effectiveness	34	2,51	5	1	0,773	-3,658	0,001
Satisfaction	34	4,20	5	3	0,472	14,811	0,000
Purpose – Interactive	34	4,21	5	2	0,592	34,648	0,000
Purpose – Repeating	34	4,38	5	3	0,551	16,285	0,000
Purpose - Approach New Material	34	2,65	4	1	0,917	13,128	0,016
Purpose - Afterschool Activities	34	3,85	5	2	0,857	1,833	0,000
Purpose - Gain Insight	34	3,74	5	2	0,864	10,717	0,000
<b>Connect 4</b>	<b>N</b>	<b>Mean</b>	<b>Maximum</b>	<b>Minimum</b>	<b>SD</b>	<b>T</b>	<b>P-value</b>
Effectiveness	34	2,46	5	1	0,829	-3,827	0,001
Satisfaction	33	4,32	5	3	0,560	13,523	0,000
Purpose – Interactive	34	4,44	5	3	0,561	14,982	0,000
Purpose – Repeating	34	4,47	5	3	0,563	15,223	0,000
Purpose - Approach New Material	33	2,64	5	1	0,962	-2,171	0,019
Purpose - Afterschool Activities	34	3,74	5	2	0,864	4,964	0,000
Purpose - Gain Insight	34	3,74	5	1	0,751	5,708	0,000

None of the games was perceived as effective, unlike the satisfaction which was fulfilled for all three games. The games succeeded in making the class more interactive. They are also well suited to repeat material, to gain more insight into the material and for afterschool activities. The only purpose that was not fulfilled for all three games was the 'approach new material', the teachers did not find the games suitable to approach new materials.

When we compare the different games in terms of satisfaction, Connect 4 is perceived as more satisfying compared to Bingo (see Table 20). The same conclusion can be reached for the purpose 'interactive'. Connect 4 is also better at making the class interactive than Jeopardy. Connect 4 is also more equipped to repeat the material than Jeopardy or Bingo, but Jeopardy is better for afterschool activities than Connect 4 is.

**Table 20 – Comparison Different Games**

<b>Comparison</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Correlation</b>	<b>T</b>	<b>P-value (one-sided)</b>
<b>Effectiveness</b>						
- Bingo & Jeopardy	33	-0,136	0,641	0,688	-1,223	0,115
- Bingo & Connect 4	33	-0,076	0,792	0,553	-0,550	0,293
- Jeopardy & Connect 4	34	0,059	0,613	0,710	0,560	0,290
<b>Satisfaction</b>						
- Bingo & Jeopardy	34	-0,177	0,724	0,442	-1,421	0,083
- Bingo & Connect 4	33	-0,303	0,775	0,404	-2,246	0,016
- Jeopardy & Connect 4	33	-0,121	0,489	0,567	-1,425	0,082
<b>Purposes</b>						
- Interactive:						
- Bingo & Jeopardy	34	-0,029	0,758	0,340	-0,226	0,411
- Bingo & Connect 4	34	-0,265	0,751	0,328	-2,055	0,024
- Jeopardy & Connect 4	34	-0,235	0,554	0,540	-2,478	0,010
- Repeating:						
- Bingo & Jeopardy	34	0,000	0,492	0,640	0,000	0,500
- Bingo & Connect 4	34	-0,294	0,799	0,238	-2,147	0,020
- Jeopardy & Connect 4	34	-0,235	0,554	0,540	-2,478	0,010
- Approach New Material:						
- Bingo & Jeopardy	34	-0,088	1,055	0,369	-0,488	0,315
- Bingo & Connect 4	33	-0,091	0,980	0,486	-0,533	0,299
- Jeopardy & Connect 4	33	0,030	1,104	0,316	0,158	0,438
- Afterschool Activities:						
- Bingo & Jeopardy	34	-0,118	0,591	0,774	-1,161	0,127
- Bingo & Connect 4	34	0,000	0,550	0,805	0,000	0,500
- Jeopardy & Connect 4	34	0,118	0,327	0,928	2,098	0,022
- Gain Insight:						
- Bingo & Jeopardy	34	-0,059	0,694	0,657	-0,494	0,312
- Bingo & Connect 4	34	-0,059	0,649	0,655	-0,529	0,300
- Jeopardy & Connect 4	34	0,000	0,651	0,683	0,000	0,500



### **5.3 Research Question: Effectiveness**

As we saw in Table 13 the effectiveness for the students was significantly lower than 3, which means that the students did not perceive Bingo as more effective than somebody who would have a neutral opinion on the effectiveness. Note that we only investigated the perceived effectiveness and not the performance of the students, for which further research would be needed.

For study 2, the same conclusion was reached for the perceived effectiveness for all three games. All three games were also perceived as equally (un)effective.

### **5.4 Research Question: Satisfaction**

After analysing all the data of the survey (see Table 13), we can conclude that the Bingo game was successful in satisfying the students.

The same conclusion was also reached for study 2. Out of the comparison came that the Connect 4 game left the teachers more satisfied in comparison to the Bingo game. This was the only difference that was found.

### **5.5 Research Question: Purposes**

In terms of possible purposes for the Bingo game, it can be concluded that Bingo is well suited for rehearsing the material. It is also a good alternative to approach the material in a different way and it made the class more interactive. Bingo also helped the students to pay attention in class. For the purpose on gaining insight, the effect of the game was also significant. However, it should be noted that the p-value was higher (0,034) in comparison to the other purposes, which had a p-value of 0,000.

In study 2, all three games are suitable for repeating material, afterschool activities, gaining insight in the material and making the class interactive. The three games were not suitable for approaching new material, which is in line with our expectations because the games were not designed for a full class period. They were only meant to test/refresh the knowledge of the students. In terms of the interactivity, the Connect 4 game is better at fulfilling this purpose than Bingo or Jeopardy. Connect 4 was also better to repeat the course material than Bingo and Jeopardy. There was one purpose for which Connect 4 was not better, this was for the afterschool activities in comparison with Jeopardy.



**Table 21 – Recommendations on the Games**

<b>Bingo</b>		<b>Jeopardy</b>		<b>Connect 4</b>	
<b>Comments</b>	<b># times mentioned</b>	<b>Comments</b>	<b># times mentioned</b>	<b>Comments</b>	<b># times mentioned</b>
Formulation of questions (only one answer should be possible in order to avoid any discussion with pupils)	4	Formulation of questions (only one answer should be possible in order to avoid any discussion with pupils)	3	Less applicable in large groups	5
Time pressure	5	More variation in the different kinds of questions	2	Preparation for an examination / temporary evaluation	2
Some pupils might lose their motivation in the second round	4	An equal amount of questions for each team	5	Time pressure	1
Pupils will shout the answers or cheat	2	Pupils have to think about posing the right question (perceived as more difficult, good exercise)	2		

In regards to Bingo, many teachers recommended to include an extra round of questions during the second round with the same numbers in order to avoid a lack of motivation for the students who were not able to answer every question right. Another solution for this problem was to let students shout 'bingo' after obtaining a full row instead of the whole card. We think that the teachers had a valid point and we would take the second solution into consideration. Timing also seemed to be an issue for some teachers: they found that the time was not used efficiently because it took a lot of time to spin the wheel. This problem might be solved by using a bowl with numbers in it or to call out random numbers. There was even a teacher that already used Bingo

in their class. Another teacher came up with the idea to include a score that would reflect the level of the individual pupils, this might be a good idea especially when the teacher wants to find out who is struggling and which parts of the material are perceived to be more difficult. One teacher found Bingo ideal for the last class before a recess and another one suggested to let pupils play the game at home.

In regard to the Jeopardy game, the teachers also pointed out the importance of the formulation of questions. It is important that there is only one possible answer in order to avoid any discussion with pupils. We on the other hand think that the different answers of the students show that they have gained insight in the material, which is exactly one of our purposes that were achieved for both studies. Furthermore, Bonwell and Eison (1991) found that discussion is preferred above a normal lecture. Two teachers had the impression that the Jeopardy game had a higher incentive to win than Bingo. They also suggested to vary more between different kinds of questions. One teachers suggested to expand the game board, because he found the game rather short. There was also a suggestion to reduce the difference between dollar values to make the game more 'fair'. Winning would otherwise be difficult. Another remark was that every group should get the chance to answer the same amount of questions. So in other words the groups should not be too large and the questions should be divided according to the number of groups in a fair way. This was not the case in the first workshop because there were 6 groups and there were only 9 different questions. One teacher found this game the most fun out of all the three games. The teachers liked the concept that the pupils needed to pose the right question, because this is not always obvious for pupils.

It should be noted that, unlike the other games, the teacher should never give the right answer in the Connect 4 game. One teacher perceived the game as very exciting because of the ability to block the other team and the game board made everything visually clear. Another teacher suggested to ideally make use of the whole grid just like in the original game, however this is something that we did not do because of time limitations of the courses. This concern was valid because another teacher also found the game too time consuming. One teacher found the game more effective than teaching if there would be a thorough explanation for every question. The game was perceived as a nice tool by another teacher however there is still a disadvantage to the game, namely the fact that it is hard to play the game for a large class. This was mentioned by several teachers. One possible solution for this problem would be to divide the class into smaller groups. Each group would then download the game on their own laptop and they would play the games separately. (Moncada & Moncada, 2014)

There were also some general suggestions that included the following: '*using these game formats in high school instead of education for adults*', '*using the games as variation instead of acquiring material in case of technical secondary education*', '*using these game formats as preparation for an intermediary evaluation or to get a broad idea on the foreknowledge of the students in higher education*', ... The second and third suggestions were confirmed by our analysis because the purpose repeating was fulfilled while approaching new material was not fulfilled. In table 13 a summary of the results is provided.

## 6. Conclusion

There are many ways to define active learning but the most comprehensive definition is the one of Bonwell and Eison (1991, p. 19): "*anything that involves students in doing things and thinking about the things they are doing.*" This is a very broad definition but we focused on two different active learning techniques, more specifically quizzes as a form of questioning and PowerPoint as a form of visual-based instruction.

In 1991 Beegle and Coffee found that there was a movement towards more active learning techniques in accounting. In recent years the use of visual-based instruction has become widely used through the PowerPoint format. (Dumont, 2005) Our research confirms these two findings but also identifies a few problems and limitations as stated by Faust and Paulson (1998).

To tackle these problems and limitations we developed three PowerPoint-based games, which can be used in (accounting) classes. By providing the PowerPoints to our respondents online, this will reduce the preparation time and also solves the lack of skill of the instructor to develop these games. (Faust & Paulson, 1998) The teacher only needs to prepare his questions for the quiz and modify the PowerPoint. PowerPoint-based games do not need a lot of resources, except for a projector and they can be used in a large class. They also made the class interactive and helped students to pay attention in class, so they should prevent a lack of participation by the students. Because these problems have been addressed by our games, the use of our PowerPoint-based games makes it possible to use in-class quizzes as an active learning method in (accounting) classes.

To evaluate the applicability of our games, we asked the participants of our studies (both students and teachers) to evaluate whether it is feasible to use these games in a (accounting) class. The

feasibility was measured through three concepts: the perceived effectiveness, satisfaction and possible purposes (Table 22).

**Table 22 – Summary of Results**

<b>Game</b>	<b>Satisfaction</b>	<b>Perceived effectiveness</b>	<b>Purpose</b>
Bingo – students	Yes	No	<ol style="list-style-type: none"> <li>1. Rehearsing material</li> <li>2. Use as a different approach</li> <li>3. Use as a tool to let students pay attention in class</li> <li>4. Interactive class</li> </ol>
Bingo – teachers	Yes	No	<ol style="list-style-type: none"> <li>1. Repeating material</li> <li>2. Afterschool activities</li> <li>3. Acquiring insight in the material</li> <li>4. Interactive class</li> </ol>
Jeopardy – teachers	Yes	No	<ol style="list-style-type: none"> <li>1. Repeating material</li> <li>2. Afterschool activities</li> <li>3. Acquiring insight in the material</li> <li>4. Interactive class</li> </ol>
Connect 4 – teachers	Yes	No	<ol style="list-style-type: none"> <li>1. Repeating material</li> <li>2. Afterschool activities</li> <li>3. Acquiring insight in the material</li> <li>4. Interactive class</li> </ol>

Both students and teachers did not find the games effective. However, we only investigated the perceived effectiveness, not the actual performance of the students. Just as Coco et al. (2001),

Murphy (2005) and Moncada and Moncada (2014) our games also succeeded to satisfy the students and the teachers.

According to the teachers all three games can be used to repeat material, for afterschool activities, to acquire new insights in the material and to make the class interactive. The questionnaires for the students were slightly different in terms of possible purposes as they find other things important in comparison to the teachers. For example, they liked the different approach that the game provided and it helped them to pay attention in class.

Even though the games were not perceived to be as effective as a normal lecture, it is still feasible to use these games because the games left the students and teachers satisfied and they can be used for a lot of different purposes.

It should be noted that it was only possible to question 34 teachers, which is not enough to come to a definitive conclusion. Further research on this topic is needed. Due to time limitations it was only possible to test one game in a large accounting class, in particular the Bingo game. Jeopardy and Connect 4 should also be tested in a large (accounting) class, preferably with a post-test and pre-test on the performance of the students. One last problem is one of coverage, teachers are afraid that they are not able to cover as much material as in a normal lecture. This could be solved by for example, introducing self-study or to let students play the games at home. Further research is needed to find out whether this is a viable solution to this coverage problem.

## Reference List

- Allen, D., & Tanner, K. (2005). Infusing active learning into the large-enrollment biology class: seven strategies, from the simple to complex. *Cell biology education*, 4(4), 262-268.
- Amare, N. (2006). To slideware or not to slideware: Students' experiences with PowerPoint vs. lecture. *Journal of technical writing and communication*, 36(3), 297-308.
- Andrews, J. D. (1980). The verbal structure of teacher questions: Its impact on class discussion.
- Apperson, J. M., Laws, E. L., & Scepansky, J. A. (2006). The impact of presentation graphics on students' experience in the classroom. *Computers & Education*, 47(1), 116-126.
- Bachhel, R., & Thaman, R. G. (2014). Effective use of pause procedure to enhance student engagement and learning. *Journal of clinical and diagnostic research: JCDR*, 8(8), XM01.
- Beegle, J., & Coffee, D. (1991). Accounting instructors' perceptions of how they teach versus how they were taught. *Journal of education for Business*, 67(2), 90-94.
- Benzing, C., & Christ, P. (1997). A survey of teaching methods among economics faculty. *The Journal of Economic Education*, 28(2), 182-188.
- Bonwell, C. C., & Eison, J. A. (1991). Active Learning: Creating Excitement in the Classroom. 1991 ASHE-ERIC Higher Education Reports. *ERIC Clearinghouse on Higher Education, The George Washington University, One Dupont Circle, Suite 630, Washington, DC 20036-1183*.
- Burke, L. A., James, K., & Ahmadi, M. (2009). Effectiveness of PowerPoint-based lectures across different business disciplines: An investigation and implications. *Journal of Education for Business*, 84(4), 246-251.
- Can, A. V., Karaca, N., Akyel, N., & Demirci, S. D. (2012). Evaluating the fitness of lecturing with Powerpoint presentations for accounting education-Research at Sakarya University. *Procedia-Social and Behavioral Sciences*, 55, 128-137.
- Carbone, E., & Greenberg, J. (1998). Teaching large classes: Unpacking the problem and responding creatively. *To improve the academy*, 17(1), 311-326.
- ChanLin, L. J. (2000). Attributes of animation for learning scientific knowledge. *Journal of Instructional Psychology*, 27(4), 228.
- Chickering, A. W., & Gamson, Z. F. (1987). Seven principles for good practice in undergraduate education. *AAHE bulletin*, 3, 7.
- Claxton, C. S., & Murrell, P. H. (1987). Learning Styles: Implications for Improving Educational Practices. *ASHE-ERIC Higher Education Report No. 4, 1987. Association for the Study of Higher Education*, 1 Dupont Circle, Suite 630, Washington, DC 20036.



- Coco, A., Woodward, I., Shaw, K., Cody, A., Lupton, G., & Peake, A. (2001). Bingo for beginners: A game strategy for facilitating active learning. *Teaching sociology*, 29(4), 492-503.
- Cohen, P. A., Ebeling, B. J., & Kulik, J. A. (1981). A meta-analysis of outcome studies of visual-based instruction. *ECTJ*, 29(1), 26-36.
- Cole, D. G., Sugioka, H. L., & YAMAGATA-LYNCH, L. C. (1999). Supportive classroom environments for creativity in higher education. *The journal of creative behavior*, 33(4), 277-293.
- Cooper, J. L., & Robinson, P. (2000). The argument for making large classes seem small. *New directions for teaching and learning*, 2000(81), 5-16.
- Cornelius, T. L., & Owen-DeSchryver, J. (2008). Differential effects of full and partial notes on learning outcomes and attendance. *Teaching of Psychology*, 35(1), 6-12.
- Crouch, C., Fagen, A. P., Callan, J. P., & Mazur, E. (2004). Classroom demonstrations: Learning tools or entertainment?. *American journal of physics*, 72(6), 835-838.
- Cui, Y. (2013). An empirical study of learning outcomes based on active versus passive teaching styles. *International Journal of Education and Management Engineering*, 3(1), 39.
- Cuseo, J. (2007). The empirical case against large class size: Adverse effects on the teaching, learning, and retention of first-year students. *The Journal of Faculty Development*, 21(1), 5-21.
- Dal Bello-Haas, V., Bazyk, S., Ekelman, B., & Milidonis, M. (1999). A study comparing the effectiveness of the feedback lecture method with the traditional lecture method. *Journal of Physical Therapy Education*, 13(2), 36.
- Deutsch, F. M. (2003). How small classes benefit high school students. *NASSP Bulletin*, 87(635), 35-44.
- Din, F. S. (1998). The Functions of Class Size Perceived by Chinese Rural School Teachers.
- Donald, J. G. (1999). Motivation for higher-order learning. *New directions for teaching and learning*, 1999(78), 27-35.
- Doumont, J. L. (2002). The three laws of professional communication. *IEEE transactions on professional communication*, 45(4), 291-296.
- Doumont, J. L. (2005). Slides are not all evil. *Technical communication*, 52, 64-70.
- Erwin, T. D., & Rieppi, R. (1999). Comparing multimedia and traditional approaches in undergraduate psychology classes. *Teaching of Psychology*, 26(1), 58-61.
- Everaert, P., Opdecam, E., & Maussen, S. (2017). The relationship between motivation, learning approaches, academic performance and time spent. *Accounting Education*, 26(1), 78-107.
- Faust, J. L., & Paulson, D. R. (1998). Active learning in the college classroom. *Journal on excellence in college teaching*, 9(2), 3-24.
- Frederick, P. J. (1986). The lively lecture—8 variations. *College teaching*, 34(2), 43-50.

- Gardiner, L. F. (1994). Redesigning Higher Education: Producing Dramatic Gains in Student Learning. *ASHE-ERIC Higher Education Report No. 7*. ERIC Clearinghouse on Higher Education, One Dupont Circle, NW, Suite 630, Washington, DC 20036-1183.
- Gier, V. S., & Kreiner, D. S. (2009). Incorporating active learning with PowerPoint-based lectures using content-based questions. *Teaching of Psychology, 36*(2), 134-139.
- Gleason, M. (1986). Better communication in large courses. *College Teaching, 34*(1), 20-24.
- Hake, R. R. (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American journal of Physics, 66*(1), 64-74.
- Haywood, M. E., & Wygal, D. E. (2009). Ethics and professionalism: Bringing the topic to life in the classroom. *Journal of Accounting Education, 27*(2), 71-84.
- Hermanson, D. R. (1994). The effect of self-generated elaboration on students' recall of tax and accounting material: Further evidence. *Issues in Accounting Education, 9*(2), 301.
- Herreid, C. F., & Schiller, N. A. (2013). Case studies and the flipped classroom. *Journal of College Science Teaching, 42*(5), 62-66.
- Hill, M. C. (1998). Class size and student performance in introductory accounting courses: Further evidence. *Issues in Accounting Education, 13*(1), 47.
- Hove, M. C., & Corcoran, K. J. (2008). Educational technologies: Impact on learning and frustration. *Teaching of Psychology, 35*(2), 121-125.
- Jeopardy!. (s.d.). In Wikipedia. Retrieved February 7, 2018, from <https://en.wikipedia.org/wiki/Jeopardy!>
- Johnson, D. W., & Johnson, R. T. (1987). *Learning together and alone: Cooperative, competitive, and individualistic learning*. Prentice-Hall, Inc.
- Keyser, M. W. (2000). Active learning and cooperative learning: understanding the difference and using both styles effectively. *Research strategies, 17*(1), 35-44.
- Klegeris, A., & Hurren, H. (2011). Impact of problem-based learning in a large classroom setting: student perception and problem-solving skills. *Advances in physiology education, 35*(4), 408-415.
- Knight, J. K., & Wood, W. B. (2005). Teaching more by lecturing less. *Cell biology education, 4*(4), 298-310.
- Kohn, A. (1987). It's hard to get left out of a pair (profile of David and Roger Johnson, researchers on cooperative learning). *Psychology Today 21* (Oct.), 52(6).
- Kokkelenberg, E. C., Dillon, M., & Christy, S. M. (2008). The effects of class size on student grades at a public university. *Economics of Education Review, 27*(2), 221-233.
- Becker, W. E., & Powers, J. R. (2001). Student performance, attrition, and class size given missing student data. *Economics of Education Review, 20*(4), 377-388.

- Lewis, K. G., Woodward, P., & Bell, J. (1988). Teaching business communication skills in large classes. *The Journal of Business Communication* (1973), 25(1), 65-86.
- Lowry, R. B. (1999). Electronic presentation of lectures--effect upon student performance. *The journal of the tertiary education group of the royal society of chemistry*.
- Mateo, M. A., & Fernandez, J. (1996). Incidence of class size on the evaluation of university teaching quality. *Educational and Psychological Measurement*, 56(5), 771-778.
- McKeachie, W. J. (1987). Teaching and Learning in the College Classroom. A Review of the Research Literature (1986) and November 1987 Supplement.
- Menges, R. J. (1988). Research on teaching and learning: The relevant and the redundant. *The Review of Higher Education*, 11(3), 259-268.
- Moncada, S. M., & Moncada, T. P. (2014). Gamification of learning in accounting education. *Journal of Higher Education Theory and Practice*, 14(3), 9.
- Murphy, E. A. (2005). Enhancing student learning with governmental accounting jeopardy!. *Journal of Public Budgeting, Accounting & Financial Management*, 17(2), 223-248.
- Nkhoma, C., Nkhoma, M., Thomas, S., Tu, L. K., & Le, N. Q. (2018, November). Gamifying a flipped first year accounting classroom using kahoot!. In *International Journal of Information System and Engineering*.
- Ogden, W. R. (2003). Reaching all the students: The feedback lecture. *Journal of Instructional Psychology*, 30(1), 22.
- Powell, K. (2003). Science education: spare me the lecture.
- Rao, S. P., & DiCarlo, S. E. (2000). Peer instruction improves performance on quizzes. *Advances in Physiology Education*, 24(1), 51-55.
- Rice, J. K. (1999). The impact of class size on instructional strategies and the use of time in high school mathematics and science courses. *Educational Evaluation and Policy Analysis*, 21(2), 215-229.
- Rowe, M. B. (1986). Wait time: slowing down may be a way of speeding up!. *Journal of teacher education*, 37(1), 43-50.
- Shakhashiri, B. Z. (1984). Lecture demonstrations. *Journal of Chemical Education*, 61(11), 1010.
- Simkin, M. G. (2013). Playing jeopardy in the classroom: An empirical study. *Journal of information systems education*, 24(3), 203.
- Smith, K. A., Sheppard, S. D., Johnson, D. W., & Johnson, R. T. (2005). Pedagogies of engagement: Classroom-based practices. *Journal of engineering education*, 94(1), 87-101.
- Stein, K. (2006). The dos and don'ts of PowerPoint presentations. *Journal of the Academy of Nutrition and Dietetics*, 106(11), 1745-1748.
- Stinissen, L. (2010). *Gaming in de klas*. Retrieved from <http://www.standaard.be/cnt/bk30o61d>

Szabo, A., & Hastings, N. (2000). Using IT in the undergraduate classroom: should we replace the blackboard with PowerPoint?. *Computers & education*, 35(3), 175-187.

Trebek, A. (2018). *Video games Jeopardy!*. Retrieved from [https://www.youtube.com/watch?v=B5NbCOCGQ\\_Q](https://www.youtube.com/watch?v=B5NbCOCGQ_Q)

Verhoeve, J., Everaert, P., & De Lembre, E. (2013). *Dubbel boekhouden* (3e ed.). Antwerpen, Cambridge: Intersentia.

Wilén, W. W., & Clegg Jr, A. A. (1986). Effective questions and questioning: A research review. *Theory & Research in Social Education*, 14(2), 153-161.

---

# Attachments

## Attachment 1 Bingo PowerPoint – Accounting B – Students



# BINGO



Accounting B – Patricia Everaert  
Evelien Van Den Bergh

### SPELBORD

1	2	3	4
5	6	7	8
9	10	11	12

### INSTRUCTIES SPELBORD

- Om naar de juiste vraag te gaan: klik op het juiste nummer in het spelbord.
- Om het antwoord op de vraag te laten verschijnen klik een keer.
- Om terug te gaan naar het spelbord klik op: 

• Merk op: indien er een multiple choice vraag wordt gesteld, dan klikt u eerst op het antwoord dat u wil selecteren om vervolgens ook op  te drukken

1	2	3	4
5	6	7	8
9	10	11	12

### OEPS!!! HET ANTWOORD IS FOUT!!!



### PROFICIAT, HET ANTWOORD IS JUUST!!!



### Vraag 1: Wanneer is winst uitkeerbaar?

Schrijf het antwoord op!

Gecorrigeerd NA > onbeschikbaar EV  
NA – OO OK > KUHWOK  
ofwel  
Gecorrigeerde BOB > o



### Vraag 2: Maken oprichtingskosten deel uit van de vaste activa?

JA

Neen



Vraag 3: Wanneer kan een onderneming de rubriek oprichtingskosten gebruiken? Geef 2 voorbeelden.

• Noteer kort!

- Bij oprichting van onderneming
- Bij kapitaalverhoging
- Bij inbreng in nature
- Bij uitgifte van lening
- Bij herstructurering



Vraag 4: Waarom staan de oprichtingskosten als "eerste" rubriek op het actief?

Minst liquide



Vraag 5: Hoe boeken we kosten bij uitgifte van lening?

• Zoek in MAR: Geef 2 mogelijke rekeningnummers

- 20100: Kosten bij uitgifte van leningen
- 65000 Rente, commissies en kosten



Vraag 6: Voor welk % schrijven we oprichtingskosten elk jaar af?

• Kosten van leningen: NIET beschouwen

Maximaal  
20%

Minimaal  
20%



Vraag 7: Als de onderneming in moeilijkheden zit, schrijven we oprichtingskosten voor 100% af. Welk boekhoudprincipe?

Overeenstemming

Going concern

Volledigheid



Vraag 8: Afschrijvingskosten op oprichtingskosten: Welk soort kost is dat?



Bedrijfs

Niet-recurrente bedrijfs

Financiële

65000 Afschrijvingen op oprichtingskosten

65000 Niet-recurrente afschrijvingen op OK

65000 Niet-recurrente afschrijvingen op OK

Vraag 9: Mogen we oprichtingskosten herwaarderen?

Ja

Neen



Vraag 10: Wat is het verschil tussen:



1. Als herstructureringskosten geactiveerde bedrijfskosten (-)

2. Herstructureringskosten

1.  $200 = \text{Kosten terugnemen (via 65.000)}$

2.  $\text{Balans} = \text{Netto boekwaarde} = \text{A.W.} - \text{geboekte afschrijvingen}$

Vraag 11: Tot welke klasse van het MAR behoren de oprichtingskosten?

Klasse 2



Vraag 12: Zondag was het de wielervedstrijd Gent- .... ?

Wevelgem



# Attachment 2 Workshop PowerPoint – Teachers

Studiedag Accounting Education 2019: Actief leren  
2 mei 2019

 UNIVERSITEIT  
GENT

 FACULTEIT ECONOMIE  
EN BEDRIJFSKUNDE


Quizen in de lessen boekhouden  
Prof. dr. Patricia Everaert en Evelien Van Den Berghe

 UNIVERSITEIT  
GENT

**Inhoud**

- Quizjes
- Bingo
- Waagstuk
- 4 op een rij
- Reflectie

**Quizjes:  
Waarom, hoe, formaat?**


 GHEENT  
UNIVERSITY

3

**VRAAG 1**

Waar bevindt zich de school, waar u momenteel werkt?


- a) Oost-Vlaanderen
- b) West-Vlaanderen
- c) Vlaams-Brabant
- d) Antwerpen

 GHEENT  
UNIVERSITY

**VRAAG 2**

Hoeveel jaar ervaring heb je als leerkracht in het onderwijs?

- a) < 10 jaar
- b) > 10 jaar

 GHEENT  
UNIVERSITY

**VRAAG 3**

Wie is voorstander van een harde Brexit?

- a) Voorstander
- b) Tegenstander

 GHEENT  
UNIVERSITY

**VRAAG 4**

Is dit terugstuurbare of verloren verpakking?

- a) terugstuurbare
- b) verloren

**a) terugstuurbare**




 GHEENT  
UNIVERSITY

**VRAAG 5**

Schelpdieren, levende dieren, voedsel voor dieren, water, boeken, fietsherstelling, kunstwerken: Welk btw%?

- a) 0%
- b) 6%
- c) 12%
- d) 21%

**b) 6%**

 GHEENT  
UNIVERSITY





**VRAAG 6**

Wie won gisteren de bekerfinale?

- A. AA Gent
- B. KV Mechelen
- B. KV Mechelen**



**VRAAG 7**

- Verkoopprijs goederen = €100,00
- Handelskorting = 10%
- Terugstuurbare verpakking = €20,00
- Btw = 21%
- Maatstaf van heffing =
  - A. 110 = 100 - 10 + 20
  - B. 108 = 100 + 20 - 12
  - C. 100 = 100
  - D. 90 = 100 - 10



**D. 90**

**VRAAG 8**

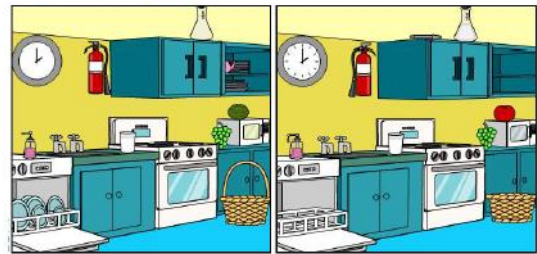
Wat past niet in deze rij?  
**Leasingnemer**

Actief staat bij MVA	Actief afschrijven	Leasing schulden	Juridische eigenaar
A	B	C	<del>D</del>

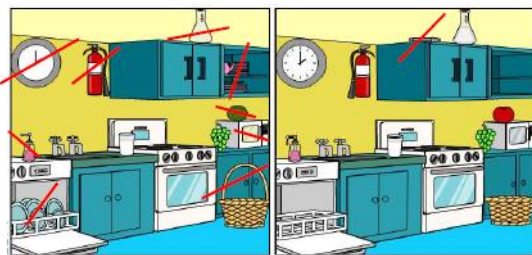


**VRAAG 9**

Zoek de verschillen. Hoeveel?



Zoek de verschillen. Hoeveel? **10**



**VRAAG 10**

Zoek de verschillen tussen:

**Aandeel**

- Eigen vermogen
- Dividend: onzeker
- Permanent
- ....

**Obligatie**

- Vreemd vermogen
- Intrest: afgesproken
- Looptijd
- ....



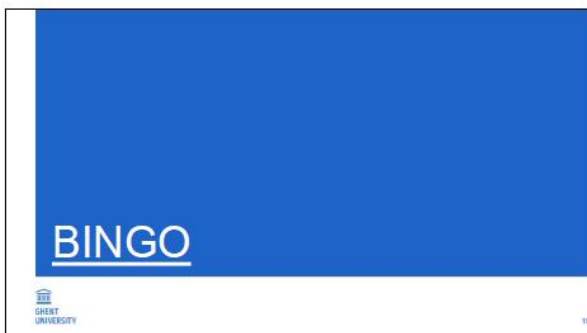


## REFLECTIE

- Handopsteking versus kaartjes
- Formaat van de vraagstelling
- Opbouw
- Doel
- Individueel versus in team
- Score al of niet bijhouden
  
- Formaat van de quiz: Wees creatief!
- Bingo, Waagkans, Vier op een rij, ...



18



19



## BINGO: REFLECTIE

- Winnaars?
- Reflectie:
  - Open en gesloten vragen
  - Toeval en competitie
  - Random volgorde van vragen
  - Elke student moet antwoord bedenken
  - PowerPoint aanpasbaar
  - Tip: werk via "Insert action" om naar specifieke slide te gaan



21

## JEOPARDY OF WAAGSTUK

eenje uit de oude doos



22



## JEOPARDY (WAAGSTUK): REFLECTIE

- Winnaars?
- Reflectie:
  - Strategie, toeval en competitie
  - Random volgorde van vragen
  - Leerlingen moeten nadenken over vraagstelling
  - PowerPoint aanpasbaar
  - Tip: werk via "Insert action" om naar specifieke slide te gaan



24



# Attachment 3 Bingo PowerPoint – Accounting A – Teachers



## BINGO



Studiedag Accounting Education 2019: Actief leren (2/5/2019)  
Quiz in de lessen boekhouden  
Evelien Van Den Berghen en Prof. dr. Patricia Everaert

### Benodigheden

- Deze PowerPoint.
- Elke leerling krijgt een Bingoblad.
- Elke leerling speelt individueel, maar controle binnen het team.
- Verdeel de klas in groepjes van 2, zodat 1 team telkens 2 leerlingen omvat.

1	6	7	12
2	5	8	11
3	4	9	10

### Spelregels Bingo

- Een leerling draait aan het rad, het "nummer" stemt overeen met de vraag (aanklikbaar op het spelbord).
- De vraag die wordt getrokken wordt opgelost door alle leerlingen.
- Als het antwoord juist is, dan kleurt de leerling het nummer van de vraag op zijn/haar antwoordblad.
- Als het antwoord fout is, dan mag de leerling niets inkleuren.
- Scheidrechter = andere teamlid
- De leerling met een volledige rij gekleurde bolletjes, die het eerst 'bingo' roept, is de eerste winnaar.
- Het spel eindigt als alle vragen aan bod zijn gekomen.
  - Winnaar 1 ("bolletjes trui"): eerste die bingo roept
  - Winnaar 2 ("gele trui"): wie het meeste aantal vakjes heeft ingekleurd.

### Spelbord

1	2	3	4
5	6	7	8
9	10	11	12

### Instructies spelbord

- Om naar de juiste vraag te gaan: klik op het juiste nummer in het spelbord.
- Om het antwoord op de vraag te laten verschijnen klik één keer.
- Om terug te gaan naar het spelbord klik op: 

1	2	3	4
5	6	7	8
9	10	11	12

Vraag 1: Een inbreng van een vrachtwagen in een onderneming is een voorbeeld van ...

Antwoord: Inbreng in natura

Vraag 2: Tot welke klasse van het MAR behoren de voorraden?

Antwoord: Klasse 3 in het MAR

### Vraag 3: Hoeveel bedraagt het resultaat?

- Aankopen handelsgoederen (HG): 2.500 euro
- Verkopen handelsgoederen (HG): 3.000 euro
- Beginvoorraad HG = 0 euro
- Eindvoorraad HG = 500 euro

Antwoord: Winst = 1.000  
 $= 3.000 - 2.500 + 500$   
 $= 3.000 - 2.000$



Studeer bij Accounting Education 2019



### Vraag 4: Wanneer een productie onderneming een auto aankoopt, dan komt deze auto onder welke rubriek in de balans?

Antwoord: Materiële vaste activa:  
Meubilair en rollend materieel



Studeer bij Accounting Education 2019



### Vraag 5: Geef het juiste woord ...

- Een lijst van alle rekeningen waarbij per rekening het debet- of creditsaldo werd bepaald.

Antwoord: Saldibalans



Studeer bij Accounting Education 2019



### Vraag 6: Een inbreng van "cash" wordt op het actief genoteerd bij de rubriek ...

Antwoord: Liquide middelen



Studeer bij Accounting Education 2019



### Vraag 7: Goederen die worden aangekocht en verkocht, noemen we ...

Antwoord: Handelsgoederen



Studeer bij Accounting Education 2019



### Vraag 8: Het saldo van de zichtrekening van de onderneming: Op welke rubriek staat dit op de balans?

Antwoord: Liquide middelen



Studeer bij Accounting Education 2019



### Vraag 9: Een gebouw staat in de balans onder de rubriek ...

Antwoord: Materiële vaste activa



Studeer bij Accounting Education 2019



### Vraag 10: Wie won dit jaar Parijs-Roubaix?

Philippe  
Gilbert

Peter  
Sahan

Zdenek  
Stybar



Studeer bij Accounting Education 2019



Vraag 11: De onderneming moet nog €2.000 aan het personeel betalen. Dit staat op de eindbalans onder de rubriek ...

Antwoord: Schulden op ten hoogste een jaar



[StudiegidsAccountingEducatie.nl](http://StudiegidsAccountingEducatie.nl)



Vraag 12: Een ander woord voor de uitkering van de winst aan de aandeelhouders is een ....

Antwoord: Dividend



[StudiegidsAccountingEducatie.nl](http://StudiegidsAccountingEducatie.nl)



PROFICIAT, HET ANTWOORD IS JUIST!!!



[StudiegidsAccountingEducatie.nl](http://StudiegidsAccountingEducatie.nl)



OEPS!!! HET ANTWOORD IS FOUT!!!



[StudiegidsAccountingEducatie.nl](http://StudiegidsAccountingEducatie.nl)



## Attachment 4 Bingo Word - Example answer sheet

1	6	7	12
2	5	8	11
3	4	9	10

1	5	7	11
2	4	9	12
3	8	10	6

# Attachment 5 Jeopardy PowerPoint – Accounting A – Teachers



### BENODIGDHEDEN

- ✓ Antwoordsblad per team
- ✓ PowerPoint-game
- ✓ Bord om scores per team te noteren

Antwoordsbladen

Team	100	200	300	400	500
Team 1					
Team 2					
Team 3					
Team 4					

UNIVERSITEIT GENT

### SPELREGELS

- Verdeel de zaal in 4 groepen.
- Werkwijze: een groepslid kiest een dollar waarde op het spelbord, waarna een antwoord verschijnt. Het doel is om nu een juiste vraag te formuleren.
  - Als de vraag juist werd geformuleerd, dan verdient die groep de dollar waarde. De scores worden bijgehouden op het bord.
  - Als een foute vraag werd geformuleerd, dan gaat de beurt naar een andere groep, die wordt aangeduid door het team dat fout was.
- Elke groep houdt zijn antwoorden bij op hun antwoordsblad.
- Het doel is om zoveel mogelijk "geld" te verzamelen.
- Het spel stopt wanneer alle vragen zijn beantwoord.
- Aan het eind van het spel worden de dollar waarden opgeteld per groep.
- De groep met het meeste dollars aan het eind van het spel wint.


UNIVERSITEIT GENT

### SPELBORD

Basis	Terminologie	Techniek
\$ 100	\$ 100	\$ 100
\$ 200	\$ 200	\$ 200
\$ 300	\$ 300	\$ 300
\$ 400	\$ 400	\$ 400
\$ 500	\$ 500	\$ 500

UNIVERSITEIT GENT

### INSTRUCTIES SPELBORD

- Start: klik op het spelbord op één van de dollar waarden
- Het team geeft antwoord.
- Om juiste antwoord te zien, klikt één keer verder.
- Om terug te gaan naar het spelbord klik op: 

UNIVERSITEIT GENT

Basis	Terminologie	Techniek
\$ 100	\$ 100	\$ 100
\$ 200	\$ 200	\$ 200
\$ 300	\$ 300	\$ 300
\$ 400	\$ 400	\$ 400
\$ 500	\$ 500	\$ 500

UNIVERSITEIT GENT

Basis \$ 200 **BRONNEN VAN VERMOGEN**

Correcte vraag: Wat zijn passiva?

UNIVERSITEIT GENT

Basis \$ 600 **TEGOED OP KLANTEN**

Correcte vraag: Wat is een vordering?

UNIVERSITEIT GENT



Basis  
\$ 1200 BANKSCHULD

Correcte vraag: Hoe noemt men een lening aangeaan bij de bank?

UNIVERSITET  
LEIEN

Stufelag Accounting Education 2019

Terminologie  
\$ 200 KAPITAAL

Correcte vraag: Hoe noemt men de inbreng van de aandeelhouders?

UNIVERSITET  
LEIEN

Stufelag Accounting Education 2019

Terminologie  
\$ 600 WAARDEDALING DOOR SLUITAGE VAN EEN  
ACTIEF (MET BEPERKTE LEVENSDUUR)

Correcte vraag: Wat is een afschrijving?

UNIVERSITET  
LEIEN

Stufelag Accounting Education 2019

Terminologie  
\$ 1200 VERGOEDING, TE BETALEN AAN DE BANK  
OP DE NOG UITSTAANDE SCHULD

Correcte vraag: Wat is interest?

UNIVERSITET  
LEIEN

Stufelag Accounting Education 2019

Techniek  
\$ 200

Aankoop Handelsgoederen  
@ Leveranciers

Correcte vraag: Wat is de journalpost voor een aankoopfactuur (zonder btw)?

UNIVERSITET  
LEIEN

Stufelag Accounting Education 2019

Techniek  
\$ 600

Handelsdebiteuren  
@ Verkopen

Correcte vraag: Wat is de journalpost voor een verkoopfactuur (zonder btw)?

UNIVERSITET  
LEIEN

Stufelag Accounting Education 2019

Techniek  
\$ 1200

Kredietinstellingen: Rekening Courant  
@ Handelsdebiteuren

Correcte vraag: Wat is de journalpost als de klant de verkoopfactuur betaalt via de bank?

UNIVERSITET  
LEIEN

Stufelag Accounting Education 2019

# Attachment 6 Jeopardy Word – Answer sheet

## Antwoordblad Jeopardy

Naam groep: \_\_\_\_\_

<b>Basis</b>	<b>Terminologie</b>	<b>Techniek</b>
<b>\$200</b> Antwoord:	<b>\$200</b> Antwoord:	<b>\$200</b> Antwoord:
<b>\$600</b> Antwoord:	<b>\$600</b> Antwoord:	<b>\$600</b> Antwoord:
<b>\$1200</b> Antwoord:	<b>\$1200</b> Antwoord:	<b>\$1200</b> Antwoord:

Eindscore groep: \_\_\_\_\_

Naam groep: \_\_\_\_\_

<b>Basis</b>	<b>Terminologie</b>	<b>Techniek</b>
<b>\$200</b> Antwoord:	<b>\$200</b> Antwoord:	<b>\$200</b> Antwoord:
<b>\$600</b> Antwoord:	<b>\$600</b> Antwoord:	<b>\$600</b> Antwoord:
<b>\$1200</b> Antwoord:	<b>\$1200</b> Antwoord:	<b>\$1200</b> Antwoord:

Eindscore groep: \_\_\_\_\_

# Attachment 7 Connect 4 PowerPoint – Accounting A – Teachers

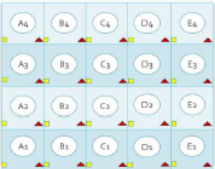

**Vier Op Een Rij**  
 Studiedag Accounting Education 2019: Actief leren  
 2 mei 2019  
 Quizen in de lessen boekhouden  
 Evellen Van Den Berghe en Prof. dr. Patricia Everaert



### Spelregels

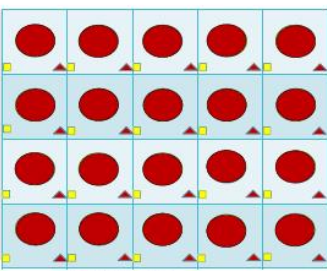
- Doel: 4 schijfjes op een rij, dit mag horizontaal, verticaal of diagonaal zijn. Verdeel de klas in 2 groepen (rood en geel).
- Een student in de (rode of gele) groep selecteert een van de (onderste) cellen. Hieraan is een vraag gekoppeld.
- Er zijn 20 multiple choice vragen in totaal.
- Als het antwoord correct is, wint de groep de cel en komt er een schijfje in de geselecteerde cel (van zijn of haar kleur).
- Als het antwoord fout is, gaat de beurt over naar de andere groep. Die eventueel dezelfde cel kan kiezen.
- De groepen spelen elk om beurt, tot wanneer een groep vier op een rij heeft (dit mag horizontaal, verticaal of diagonaal zijn).

### Spelbord




### Instructies voor het spelbord



- Klik alleen op de voorziene vormen op het spelbord.
- Klik op de witte cirkel om een vraag weer te geven.
- Klik op een mogelijk antwoord op de vraag.
- Klik op de feedback slide actie knop (Home )
- Klik op de gele rechthoek  om een geel schijfje te laten vallen in de juiste cel.
- Klik op de rode gelijkbenige driehoek  om een rood schijfje te laten vallen in de juiste cel.
- Merk op: de cursor van de muis moet veranderen naar een hand  vooraleer je klikt op een actieknop.




Hoera!




Het antwoord is juist!

Helaas!



Het antwoord is fout!



### Welke standaard modellen zijn er voor de jaarrekening?

A	B	C	D
VKT en VOL	VKT, MIC en VOL	VKT, NIC en VOL	MIC en VOL

Onder de klasse 4 in het MAR behoren:

**A**

Vorderingen op **max. 1** jaar & overlopende rekeningen

**B**

Vorderingen en schulden op **meer** dan 1 jaar & overlopende rekeningen

**C**

Vorderingen en schulden op **max. 1** jaar & overlopende rekeningen

UNIVERSITEIT GENT Studielog Accounting Education 2019

Stelling: Een rekening nummer telt 6 cijfers (boek prof. De Lembre, Everaert & Verhoeve)

**A**

Stelling is **juist**

**B**

Stelling is **fout**

UNIVERSITEIT GENT Studielog Accounting Education 2019

Volgens welk schema is deze jaarrekening opgesteld?

RESULTATENREKENING		Totaal	Controle
Bedrijfsopbrengsten			2075A
Omzet	6.10	70	
Voorraad goederen in bewerking en gereed product en bezittingen in uitvoering (aanname juli 2019) — (175.3)		71	
Opproducerende vaste activa	6.10	74	
Andere bedrijfsopbrengsten	6.12	75A	
Nettoresultaat bedrijfsopbrengsten			

**A**

**VOL**

**B**

**VKT**

**C**

**MIC**

UNIVERSITEIT GENT Studielog Accounting Education 2019

Firma ADL leverde aan ons handelsgoederen. We betalen nu voor de goederen van ADL via de bank. Wat moeten we nu in journaal boeken?

**A**

Handelsdebiteuren: Credit

**B**

Leveranciers: Debet

**C**

Leveranciers: Credit

**D**

Handelsdebiteuren: Debet

UNIVERSITEIT GENT Studielog Accounting Education 2019

Hoeveel bedraagt de rubriek kapitaal?

Indien de volgende gebeurtenissen plaatsvinden:

- Inbreng in natura: nl. een auto voor 20.000 euro
- Inbreng van cash ingebracht voor een bedrag van 6.000 euro

**A**

€ 26 000

**B**

€ 6 000

**C**

€ 20 000

UNIVERSITEIT GENT Studielog Accounting Education 2019

Stelling: VOL en VKT hebben hetzelfde wettelijke formaat van Balans.

**A**

Stelling is **juist**

**B**

Stelling is **fout**

UNIVERSITEIT GENT Studielog Accounting Education 2019

De vaste activa worden ingedeeld in vaste en ... activa.

**A**

Vlottende

**B**

Materiële

**C**

Variabele

UNIVERSITEIT GENT Studielog Accounting Education 2019

Welke definitie past bij een saldibalans?

**A**

Een lijst van alle rekeningen waarbij per rekening het debiet- of creditstaal gemaakt werd.

**B**

Een lijst van alle rekeningen waarbij per rekening het debiet- of creditstaal werd bepaald.

**C**

Een lijst van alle rekeningen waarbij per rekening zowel een totaal als saldo werd gemaakt.

UNIVERSITEIT GENT Studielog Accounting Education 2019

Hoeveel bedragen de materiële vaste activa op de balans?  
Gegeven volgende saldi:

Oprichtingskosten	1.000 (Debet)	
Terreinen	25.000 (Debet)	
Meubilair	5.000 (Debet)	
Geboekte afschrijvingen op meubilair		2.500 (Credit)

5.000      28.500      27.500

A                      B                      C

UNIVERSITEIT  
STUDIEG      Studieg Accounting Education 2019

Stelling: een rekeningstelsel telt 5 klassen.

A                      B

Stelling is juist      Stelling is fout

UNIVERSITEIT  
STUDIEG      Studieg Accounting Education 2019

Stelling: VOL en VKT hebben hetzelfde formaat wat betreft de resultatenrekening.

A                      B

Stelling is fout      Stelling is juist

UNIVERSITEIT  
STUDIEG      Studieg Accounting Education 2019

Hoe noemt men de verplichte jaarlijkse bijeenkomst van aandeelhouders?

A                      B                      C                      D

Algemene vergadering      Nieuwjaarsreceptie      Winstbespreking      Oprichtingsakte

UNIVERSITEIT  
STUDIEG      Studieg Accounting Education 2019

Hoe noemt men het terugbetalen van een lening?

A                      B                      C                      D

Interest      Aflossing      Kapitaal      Vordering

UNIVERSITEIT  
STUDIEG      Studieg Accounting Education 2019

De winstbestemming voor de aandeelhouder wordt getoond in de ...

A                      B                      C

Balans      Resultaatverwerking      Resultatenrekening

UNIVERSITEIT  
STUDIEG      Studieg Accounting Education 2019

Op 01/01/N<sub>0</sub> werd er vrachtwagen aangekocht met een aanschaffingswaarde van 100.000 euro. Hoeveel bedragen de Materiële Vaste Activa op 31/12/N<sub>2</sub>, indien n = 10jaar?

A                      B                      C

100.000 euro      70.000 euro      80.000 euro

UNIVERSITEIT  
STUDIEG      Studieg Accounting Education 2019

Hoeveel bedragen de vorderingen op minder dan 1 jaar op eindbalans? Gegeven volgende proefbalans:

Handelsdebiteuren	1.000	600
Dubieuze Debiteuren	100	


A                      B                      C                      D

1.000      500      600      400

UNIVERSITEIT  
STUDIEG      Studieg Accounting Education 2019

De inventarisdatum wordt ook aangeduid als ...

A	B	C
het einde van het boekjaar	de sluitdatum	de aanvangsdatum

 Studielog Accountig Education 2019


Goederen die geproduceerd zijn en klaar zijn voor de verkoop noemt men ook ...

A	B	C
grondstoffen	gereed product	verwerkte producten

 Studielog Accountig Education 2019

Het opeisbaar vermogen wordt ook wel ... genoemd.

A	B	C
het eigen vermogen	de schulden	het vreemd vermogen

 Studielog Accountig Education 2019

## Attachment 8 Bingo – Implementation guidance in Dutch

### **Doel van het spel:**

Het doel van het spel is om op je bingokaart een volledige rij of kaart in te kleuren en als eerste bingo te kunnen roepen. Degene die het eerst een volledige rij of kaart heeft ingekleurd en bingo roept, is de winnaar. Het inkleuren van een vakje is pas mogelijk indien een juist antwoord op de vraag werd gegeven.

### **Praktische uitvoering:**

Zoals eerder vermeld, werd Bingo op twee verschillende groepen getest, namelijk op die van leerkrachten en studenten. Daarvoor was er een verschil in praktische uitvoering en inhoud voor het Bingo spel. We zullen de aanpak voor beide groepen achtereenvolgens overlopen.

#### **Aanpak voor studenten:**

Voor het Bingo spel met de Accounting B studenten, hebben we ervoor gekozen om het spel individueel te spelen. Vooraleer het spel kan beginnen, moet de prof eerst de spelregels en werkwijze uitleggen. Deze staan in de volgende paragraaf uitgelegd. Na de uitleg kan het spel beginnen en kan de prof voor de eerste keer aan het rad draaien. Uit het rad zal een bolletje komen met een nummer van 1 tot en met 12. Dit nummer is gekoppeld aan een vraag op het spelbord. Om naar de juiste vraag te gaan, dient men op de slide van het spelbord op het juiste nummer te klikken. Wanneer de vraag verschijnt, wordt aan de studenten ongeveer 30 seconden de tijd gegeven om de vraag te beantwoorden en hun antwoord op een blad neer te schrijven. Vervolgens overloopt de prof het juiste antwoord en geeft hij eventueel wat extra uitleg bij de vraag. De prof heeft ook de optie om aan de studenten te vragen hun arm in de lucht te steken voor het antwoord waarvan de studenten denken dat dit het juiste antwoord is. Dit laat de prof toe om een beter inzicht te krijgen in de moeilijkheid van de vraag en kan hij hierop dan ook verder inspelen bij de volgende lessen. Indien de student het antwoord juist heeft, mag hij het vakje inkleuren op zijn of haar antwoordblad. Bij een fout antwoord is dit niet het geval. Merk op dat we bij de Accounting B studenten, niet hebben gewerkt met vaste Bingo-bladen. De studenten hebben zelf hun Bingo-blad gemaakt door op een Sudoku één kolom bij te tekenen en hierin willekeurige nummers te plaatsen van 1 tot en met 12.

Hierna dient men terug te gaan naar het spelbord, dit kan door op de 'home'-knop te drukken. Deze uitleg staat ook vermeld in de PowerPoint zelf. Voor de Accounting B PowerPoint werd er zowel gebruik gemaakt van open vragen als van meerkeuzevragen. Het enige verschil bij meerkeuzevragen is de manier waarop men terug naar het spelbord dient te geraken. Om naar het spelbord terug te gaan, dient men hier eerst op één van de mogelijke antwoorden te klikken

waarbij men zal worden doorverwezen naar een 'juist' of 'fout' slide waarbij er telkens ook een 'home'-knop wordt weergegeven. De 'juist' of 'fout' slide geeft weer of het aangeduide antwoord juist of fout is. Eenmaal men weer op het spelbord is terecht gekomen, dient men hetzelfde proces te herhalen tot wanneer alle vragen zijn overlopen. Aan het einde van het spel zijn er 2 mogelijke winnaars, aangezien er 2 manieren zijn om te winnen, namelijk door een volledige rij of blad juist te antwoorden/in te kleuren en als eerste telkens bingo te roepen. De game met 12 vragen zal rond de 15 à 20 minuten in beslag nemen.

### **Aanpak voor leerkrachten:**

Voor de leerkrachten werd Bingo voorgesteld tijdens een workshop en werd er eerst ook een korte uitleg gegeven, vooraleer Bingo werd gespeeld. De werkwijze bij de leerkrachten was grotendeels dezelfde. Alleen bestonden de vragen bij hen grotendeels uit open vragen die over Accounting A gingen ('Hoofdstuk 3: De Balansmethode' en 'Hoofdstuk 4: De Boekhoudtechniek') en werd er nu wel gebruik gemaakt van de Bingo-bladen. We zullen hierbij kort de werking van deze bladen uitleggen.

In totaal zijn er 24 verschillende Bingo-bladen, die willekeurig worden uitgedeeld aan de studenten. Het eerste nummer in de linkerbovenhoek staat voor het teamnummer waartoe de student behoort. Het is de bedoeling dat de teams samen werken, in de zin van elkaar te controleren in hun gegeven antwoorden, zodat er geen stimulans is om vals te spelen. De stimulans om vals te spelen in team onderling wordt verholpen door het feit dat de Bingo-bladen per team verschillen (andere volgorde van de nummers), wat de onderlinge controle moet vergroten/bevorderen. Een ander voordeel van de Bingo-bladen is het feit dat de leerkracht een willekeurig team kan aanduiden om het antwoord te geven op de vraag.

### **Spelregels:**

De spelregels zijn heel erg simpel, iedere speler dient over een Bingo-blad te beschikken. Een Bingo-blad bestaat uit een 3x4 rooster, met nummers van 1 tot en met 12, die op een willekeurige manier zijn ingedeeld in het rooster. De regel is dat een nummer pas kan worden ingekleurd indien deze vraag is aanbod gekomen en indien de speler hierop juist heeft geantwoord. De eerste speler die een volledige rij heeft ingekleurd en als eerste 'bingo' roept, wint. Men kan ook winnen indien men de eerste is die een volledig rooster heeft ingekleurd en als eerste 'bingo' roept. Men dient ook per vraag het antwoord te noteren alvorens het juiste antwoord op de slides wordt getoond. De nummers van de vragen dienen getrokken te worden door de professor of



leerkracht, dit kan via een rad met bolletjes of door gebruikt te maken van een bokaal met briefjes, waarop de nummers van de vragen telkens worden vermeld.

## Attachment 9 Jeopardy – Implementation guidance in Dutch

### **Doel van het spel:**

Het uiteindelijke doel van het spel is om zoveel mogelijk dollars te verzamelen. Dit bereikt men door zoveel mogelijk de juiste vragen te stellen bij de getoonde antwoorden. Wanneer alle vragen op het spelbord zijn gesteld, wint de groep met de meeste dollars. Hoe moeilijker de vraag, hoe hoger de dollarwaarde. De verschillende vragen zijn ook gegroepeerd per thema, namelijk '*basis*', '*terminologie*' en '*techniek*'.

### **Spelregels en praktische uitvoering:**

Om met het spel te kunnen starten, moet de klas eerst worden opgedeeld in vier verschillende groepjes. Het eerste team dat een vraag mag kiezen, zal willekeurig worden gekozen. Dit kan bijvoorbeeld op basis van een getal van 1 tot en met 5 waarbij het team dat het nummer raadt als eerste mag beginnen. Het eerste team dat een vraag mag kiezen, kan zelf het thema en de dollarwaarde waarvoor ze willen spelen vrij kiezen. Indien het team een juist antwoord geeft, wordt de bijpassende dollarwaarde op het bord mee genoteerd. In geval van een fout antwoord gaat de beurt naar een ander team, waarbij het foute team mag kiezen naar welk team de volgende beurt gaat. Indien het nieuwe team juist antwoordt, wordt de dollarwaarde bij hun team op het bord genoteerd. Indien het antwoord fout is, gaat de beurt voor de laatste keer door naar een ander team, dat ook weer wordt geselecteerd door het team dat nu een fout antwoord heeft gegeven. Indien het team juist antwoordt, wordt de dollarwaarde op het bord genoteerd. Indien het antwoord fout is, wordt het juiste antwoord door de leerkracht bekend gemaakt en verder uitgelegd. Deze cyclus zal zich steeds herhalen in wijzerzin.

De PowerPoint werkt ook weer via een spelbord dat telkens verwijst naar de juiste vraag. Door te klikken op de juiste vraag in het spelbord, springt de PowerPoint naar de juiste vraag. Merk op dat bij een klik op deze slide het juiste antwoord zal worden getoond. Om terug te gaan naar het spelbord dient men ook weer op de 'home'-knop te drukken.

Het is de bedoeling om tijdens het spel per team de antwoorden op te schrijven op een bijpassend antwoordblad, zodat er wordt geleerd uit de gemaakte fouten. Merk ook op dat indien het

antwoord juist is van het eerste team de beurt gaat naar de eerstvolgende groep waarbij er wordt gewerkt in wijzerzin. Het is ook de bedoeling dat de teams eerst overleggen vooraleer er een definitief antwoord wordt gegeven, er zal hiervoor telkens tijd worden gegeven.

## **Attachment 10 Connect 4 – Implementation guidance in Dutch**

### **Doel van het spel:**

Het doel van het spel is om als eerste 4 op een rij te krijgen, dit kan horizontaal, verticaal of diagonaal zijn op het spelbord. Er kan pas een schijf worden geplaatst indien de vraag (die gekoppeld is aan de cel) juist wordt beantwoord.

### **Spelregels en praktische uitvoering:**

Om te kunnen beginnen met het spel, dient de klas eerst in twee grote groepen te worden gesplitst. Er dient ook eerst afgesproken te worden wie welke kleur voor zijn rekening neemt. Je kan kiezen tussen rood of geel. Het rode team mag als eerste een cel kiezen. Merk hierbij wel op dat in het begin alleen maar de onderste cellen kunnen worden geselecteerd. Het kiezen van de cel zal gebeuren door een willekeurig teamlid, die de naam van de cel zal opnoemen. Door het klikken op die cel in het spelbord in de PowerPoint, zal de hieraan gekoppelde vraag verschijnen. Merk op dat vier op een rij alleen maar bestaat uit meerkeuzevragen. Eerst krijgt de groep wat tijd om te overleggen om daarna met een definitief antwoord te komen. Om het antwoorden vlotter te laten verlopen is er boven elke antwoordoptie een letter voorzien (A,B,C,D, ...). Op de PowerPoint dient het definitief antwoord te worden aangeklikt. Vervolgens zal er een slide tevoorschijn komen waarop er juist of fout zal staan. Indien het antwoord juist is, wordt er een schijfje gedropt, dit kan door op het rode driehoekje of gele rechthoekje te klikken in de cel (hier nu rood). Indien het antwoord fout is, gebeurt er niks op het spelbord. Vervolgens gaat in beide gevallen de beurt naar het andere team. Deze mag dan ook een willekeurige cel aanduiden en overleggen over het definitieve antwoord. Deze cyclus zal zich herhalen tot wanneer er een team vier op een rij heeft of wanneer alle cellen zijn volzet. Zoals al eerder werd vermeld, wint het team die het eerst vier op een rij scoort.

# Attachment 11 Questionnaire Students

## Vragenlijst

Thesis - Evelien Van Den Berghe

Duid het meest passende antwoord aan voor de volgende stellingen.

<b>Stellingen</b>	<b>Helemaal niet akkoord</b>	<b>Niet akkoord</b>	<b>Neutraal</b>	<b>Akkoord</b>	<b>Helemaal akkoord</b>
1. Bingo maakte de les interactiever.					
2. Bingo was een leuke afwisseling.					
3. Bingo maakte de les plezierig.					
4. Bingo is goede manier om de leerstof te herhalen.					
5. Bingo heeft geholpen om het hoofdstuk op een andere manier te benaderen.					
6. Bingo heeft mij geholpen om meer inzicht te verwerven in dit hoofdstuk.					
7. Bingo is even effectief als een gewone les (in het verwerven van competenties).					
8. Bingo is effectiever dan een gewone les (in het verwerven van competenties).					
9. Bingo heeft mij geholpen om de aandacht bij de les te houden.					
10. Het toepassen van Bingo in de les is voor herhaling vatbaar.					
<b>Stelling</b>	<b>Helemaal niet geslaagd</b>	<b>Niet geslaagd</b>	<b>Neutraal</b>	<b>Geslaagd</b>	<b>Erg geslaagd</b>
11. Wat is je algemeen oordeel over Bingo?					

12. Heeft u enkele suggesties (om Bingo te verbeteren), noteer ze hieronder!

## Attachment 12 Questionnaire Teachers

### Algemene vragenlijst leerkrachten:

Vragen	Helemaal niet akkoord	Niet akkoord	Neutraal	Akkoord	Helemaal akkoord
1. Ik ben vertrouwd met actief leren.					
2. Tijdens het lesgeven probeer ik mijn les interactiever te maken.					
3. Indien u bij vraag 2 'akkoord' of 'helemaal akkoord' hebt geantwoord, hoe probeert u dit dan te verwezenlijken?					
4. Hoeveel keer maakt u gebruik van quizzes in één semester, per vak?					
5. Maakt u gebruik van PowerPoint voor het meer actief maken van uw lessen? Omcirkel. NEE JA					
6. Kies één bepaald vak. Hoeveel keer maakt u gebruik van powerpoint in dit vak?	Nooit	Minder dan 1 keer per maand	1 à 3 keer per maand	Wekelijks	Elke les

### Vragenlijst leerkrachten: **Bingo**

Duid het meest passende antwoord aan en verklaar u nader indien gevraagd.

Stellingen	Helemaal niet akkoord	Niet akkoord	Neutraal	Akkoord	Helemaal akkoord

1. Bingo maakt de les interactiever voor leerlingen.					
2. Bingo is geschikt om leerstof mee te herhalen.					
3. Bingo is geschikt om nieuwe leerstof mee aan te brengen.					
4. Bingo is geschikt voor gebruik in een naschoolse activiteit.					
5. Ik zou overwegen om Bingo toe te passen in mijn eigen les.					
6. Ik vind het haalbaar om Bingo te integreren in mijn les (gegeven het feit dat deze PowerPoint ter beschikking wordt gesteld).					
7. Bingo zou mijn leerlingen helpen, in het verwerven van het nodige inzicht in de cursus.					
8. Het gebruik van Bingo zou even effectief zijn dan het geven van les.					
9. Het gebruik van Bingo zou effectiever zijn dan het geven van les.					
10. Bingo maakt een les plezieriger/bezit een fun factor om een normale les te doorbreken.					
<b>Stelling</b>	<b>Helemaal niet geslaagd</b>	<b>Niet geslaagd</b>	<b>Neutraal</b>	<b>Geslaagd</b>	<b>Helemaal geslaagd</b>
11. Wat is uw algemene oordeel over Bingo?					
12. Indien u enkele bemerkingen of ideeën heeft om Bingo te verbeteren, noteer deze dan hieronder.					

## Vragenlijst leerkrachten: Jeopardy

Duid het meest passende antwoord aan en verklaar u nader indien gevraagd.

Stellingen	Helemaal niet akkoord	Niet akkoord	Neutraal	Akkoord	Helemaal akkoord
1. Jeopardy maakt de les interactiever voor leerlingen.					
2. Jeopardy is geschikt om leerstof mee te herhalen.					
3. Jeopardy is geschikt om nieuwe leerstof mee aan te brengen.					
4. Jeopardy is geschikt voor gebruik in een naschoolse activiteit.					
5. Ik zou overwegen om Jeopardy toe te passen in mijn eigen les.					
6. Ik vind het haalbaar om Jeopardy te integreren in mijn les (gegeven het feit dat deze PowerPoint ter beschikking wordt gesteld).					
7. Jeopardy zou mijn leerlingen helpen, in het verwerven van het nodige inzicht in de cursus.					
8. Het gebruik van Jeopardy zou even effectief zijn dan het geven van les.					
9. Het gebruik van Jeopardy zou effectiever zijn dan het geven van les.					
10. Jeopardy maakt een les plezier/aangenamer.					
Stelling	Helemaal niet geslaagd	Niet geslaagd	Neutraal	Geslaagd	Helemaal geslaagd
11. Wat is uw algemene oordeel over Jeopardy?					
12. Indien u enkele bemerkingsen of ideeën heeft om Jeopardy te verbeteren, noteer deze dan hieronder.					

--

**Vragenlijst leerkrachten: Vier op een rij**

Duid het meest passende antwoord aan en verklaar u nader indien gevraagd.

Stellingen	Helemaal niet akkoord	Niet akkoord	Neutraal	Akkoord	Helemaal akkoord
1. Vier op een rij maakt de les interactiever voor leerlingen.					
2. Vier op een rij is geschikt om leerstof mee te herhalen.					
3. Vier op een rij is geschikt om nieuwe leerstof mee aan te brengen.					
4. Vier op een rij is geschikt voor gebruik in een naschoolse activiteit.					
5. Ik zou overwegen om Vier op een rij toe te passen in mijn eigen les.					
6. Ik vind het haalbaar om Vier op een rij te integreren in mijn les (gegeven het feit dat deze PowerPoint ter beschikking wordt gesteld).					
7. Vier op een rij zou mijn leerlingen helpen, in het verwerven van het nodige inzicht in de cursus.					
8. Het gebruik van Vier op een rij zou even effectief zijn dan het geven van les.					
9. Het gebruik van Vier op een rij zou effectiever zijn dan het geven van les.					
10. Vier op een rij maakt een les plezieriger/bezit een fun factor om een					

normale les te doorbreken.					
<b>Stelling</b>	<b>Helemaal niet geslaagd</b>	<b>Niet geslaagd</b>	<b>Neutraal</b>	<b>Geslaagd</b>	<b>Helemaal geslaagd</b>
11. Wat is uw algemene oordeel over Vier op een rij?					
12. Indien u enkele bemerkingen of ideeën heeft om Vier op een rij te verbeteren, noteer deze dan hieronder.					

## Attachment 13 Comments Question 12 – Bingo Students

<b>Comments</b>	<b>Category</b>
Winnaar naar voor laten komen	Reward for the winners
Prijs voor de winnaar	Reward for the winners
NEE!	-
DASS KANN DOCH NICHT	-
JA, STOERE GAST	-
Meer sportvragen	-
Cadeau voor winnaar	Reward for the winners
Meer sportvragen	-
Een geschenk voor de winnaar	Reward for the winners
Tijd geven voor de vragen op te schrijven	To less time to solve the questions
Zeer interactief, joepie! Cool! #dailystudymoments	Positive reactions towards the game
Felicitatiezoenen van Patricia	-
Niet meer doen	-



Prijzen aan koppelen en voordien aankondigen en antwoorden controleren	Reward for the winners
Een kleine prijs voor de winnaar	Reward for the winners
Meer.	More of those games
Met prijzen!!!	Reward for the winners
Was zeer leuk!	Positive reactions towards the game
Alle vragen meerkeuze maken	-
S/O Patricia	-
Meer vragen over de koers!	-
Zelfgemaakte kaartjes en nummers herhalen	-
Prijzen & extra punt op examen winnen	Reward for the winners
Bier zorgt voor sfeer	-
Meer van dat!!	More of those games
Leuk, maar kan niet de hele les	Positive reactions towards the game
Vraag 7: voor even	-
Geef een prijs aan Robbe Seys & luzolste wint	Reward for the winners
Het ging redelijk snel: ik had geen tijd om echt over de vragen na te denken omdat ik nog aan het schrijven was.	To less time to solve the questions
Trager overlopen	To less time to solve the questions
Cadeautje voor de winnaar Misschien iets met de gsm doen	Reward for the winners Incorporate the smartphone
Cadeautje voor de winnaar Echt een tof idee!	Reward for the winners Positive reactions towards the game
Doe zo verder! Met de smartphone bingoën	Positive reactions towards the game Incorporate the smartphone
Met smartphone	Incorporate the smartphone
Geef Robbe Seys altijd een prijs ook al verliest hij! Robbe Seys wil doctoreren	Reward for the winners -

Robbe loves Patricia	-
Dik in orde	Positive reactions towards the game
Meer tijd om te antwoorden	To less time to solve the questions
Via kahoot	Incorporate the smartphone
Ook proberen met andere spelletjes; anders zou men dit nog beu kunnen worden.	-
Iets om te winnen	Reward for the winners
Een prijs winnen	Reward for the winners
Prijs voor de winnaar	Reward for the winners
Een prijs zou fijner geweest zijn!	Reward for the winners
Prijs uitreiken	Reward for the winners
Prijsuitreiking! Maar voor de rest helemaal oke	Reward for the winners
Prijs voor de winnaar	Reward for the winners
Perfect Evelien! Top!	Positive reactions towards the game
exclusieve prijs (auto, jacht, ...)	Reward for the winners
Hartjes getekend	-
Hartjes getekend	-
Niet bruikbaar voor les te geven, wel voor les te herhalen	-
Leuk	Positive reactions towards the game
Prijzen uitdelen	Reward for the winners
Op een internet platform	Incorporate the smartphone
Prijzen voor winnaar	Reward for the winners
Prijzen	Reward for the winners
Examenpunten voor winnaar	Reward for the winners
Goed idee, goed samenvatten les, belangrijke zaken uit hoofdstuk halen. Hoeft geen bingo te zijn vragen voldoen	Positive reactions towards the game
Nee	-
Kleine attentie voor de winnaar	Reward for the winners
Mensen naar voor laten komen en trakteren	Reward for the winners

Toffe ppt!	Positive reactions towards the game
ppt =)	Positive reactions towards the game
Langer stilstaan bij de antwoorden	To less time to solve the questions
Prijs!	Reward for the winners
Prijzen voor de winnaars!	Reward for the winners
NEEN	-
MAG NOG IETS LANGER ZIJN	-
Uno, ...	-
UNO	-
UNO	-
Prijzen voor bingo	Reward for the winners
De vragen waren goed maar het hele spel er rond is tijdrovend	-
Beloning? Kahoot versie?	Reward for the winners Incorporate the smartphone
Jow geniet ervan!	Positive reactions towards the game

## Attachment 14 Comments Question 12 – Bingo Teachers

Comments	Category
Tijdens gewone les	-
Probleem van tijdsdruk	Time pressure
Zeker interessant voor laatste les voor vakantieperiode	-
Je zou er zelfs een score kunnen aan toevoegen: zo weet de student wat zijn/haar niveau is	-
Leerlingen roepen antwoorden: effect gaat verloren Mag niet te lang duren: verveling slaat vlug toe	Pupils will shout the answers or cheat Time pressure
Vraagstelling zeer belangrijk	Formulation of questions

Timing is vaak een probleem als je een volledig leerplan moet zien. Tip: als je geen bingo ballen hebt met een random lijst met nummers maken	Time pressure
Bij vraag 2: verankering Een extra vragenreeks, zodat leerlingen die bij het begin al fouten hadden gemaakt nog de kans hebben om het vakje aan te vinken. Op die manier blijven ze gemotiveerd om mee te doen. Dus de gebruikte bolletjes opnieuw in het toestel steken.	- Some pupils might lose their motivation in the second round
Bij vraag 7: zelf spelen thuis. Leerlingen roepen de antwoorden, zijn niet altijd eerlijk in het spel waardoor de sfeer het doel voorbijgaat. Het spel duurt te lang.	- Pupils will shout the answers or cheat Time pressure
Bij vraag 2: er gaat veel tijd naar het draaien van het rad, weinig feedback, ... Bij vraag 8: weinig terugkoppeling Het is ok maar zoals eerder vermeld, wordt de beschikbare tijd niet optimaal gebruikt	Time pressure -
Beter ook werken met A,B,C,D Enkel bingo bij volle rij, niet volledige rooster (te veel IIn zullen opgeven)	Some pupils might lose their motivation in the second round
Zeker vraagstelling aanpassen. Op sommige vragen kunnen er meerder antwoorden gegeven worden.	Formulation of questions
Kan niet winnen als iets fout geantwoord	Some pupils might lose their motivation in the second round
Mss zijn IIn niet meer zo gemotiveerd om de 2e ronde nog mee te spelen als ze reeds in de 1e ronde een fout hadden omdat ze dan toch nooit meer de hele kaart kunnen inkleuren.	Some pupils might lose their motivation in the second round
Proficiat! Knap!	-
Juiste vraagstelling is heel belangrijk om discussies met de IIn te vermijden	Formulation of questions
Bij vraag 5: past bingo al toe Vraagstelling! -> waterdichte vragen stellen bv MVA of ROM moet, natura kan ook MVA zijn -> geeft discussies in de klas!	Formulation of questions

## Attachment 15 Comments Question 12 - Jeopardy Teachers

Comments	Category
De vraagstelling moet zo veel mogelijk eenduidige antwoorden geven: anders kan er in een competitief ingestelde klas onenigheid ontstaan: het antwoord was wel/niet juist	Formulation of questions
Prima, geen opmerkingen	-
Vraagstelling zeer belangrijk	Formulation of questions
Meer effectief dan bingo Aanvullend om te toetsen of om leerstof te begrijpen	-
Bij vraag 4: IIn kunnen zelf herhalen Hoge spelfactor, winnaarsgehalte, meer dan bij het bingospel. Moeilijkheidsgraad is hoog genoeg omdat de IIn zelf vragen moeten bedenken i.p.v. het antwoorden te formuleren. Voor IIn geen voor de hand liggende oefening.	- Pupils have to think about posing the right question
Goed principe om de leerling de vraag te laten formuleren	Pupils have to think about posing the right question
Zorg ervoor dat er evenveel vakken zijn als antwoordmogelijkheden voor IIn (bv elke groep krijgt 2 vragen)	Equal amount of questions for each team
Ook hier letten op de uitwerking. Sommige vragen die bij het antwoord stonden zijn onvolledig. Bv IC verwerving of IC levering ipv aankoop of verkoop zonder btw.	Formulation of questions
Heel leuk! Bedragen minder ver van elkaar -> moeilijk om te winnen, rekening houden met aantal groepen in je klas (iedereen moet evenveel vragen krijgen)	Equal amount of questions for each team
Zorgen dat iedere IIn evenveel vragen kan beantwoorden.	Equal amount of questions for each team
Mooie spelvorm maar neemt wel veel tijd in beslag.	Time pressure
Belangrijk dat elk team evenveel vragen kan beantwoorden zodat ze evenveel kansen hebben.	Equal amount of questions for each team
Flipquiz (=online tool) vind ik aantrekkelijker dan de gemaakte Jeopardy en het is hetzelfde principe.	-

Hou er rekening mee dat meerdere vragen oké zijn	-
Voldoende vragen voorzien	Equal amount of questions for each team
Vraagstelling meer variëren -> de lln niet enkel vragen laten bedenken maar ook antwoorden of korte doe-opdrachtjes bv korte factuur berekening op bord.	More variation in the different kinds of questions
Meer variatie in de vraagstelling i.p.v. wat is de vraag op ...	More variation in the different kinds of questions

## Attachment 16 Comments Question 12 - Connect 4 Teachers

Comments	Category
Ik zou de spelvormen eerder in het secundair onderwijs gebruiken dan in het volwassenenonderwijs.	-
Ideaal is dat het rooster het echte spel weerspiegelt maar dat vergt natuurlijk enorm veel vragen.	-
Geen verbetering: zeer spannend omdat je ander partij kan blokkeren. Visueel stand van zaken goed zichtbaar.	-
Ik zie de spellen meer als afwisseling i.p.v. het echt vervangen van het verwerven van leerstof. Vaak wordt ervaren dat de leerlingen er toch te weinig uit halen, verbanden leggen als een aantal zaken eerst niet uitgelegd worden (TSO)	-
Bij vraag 3: LLN eerst de leerstof zelfstandig laten leren	-
Bij vraag 5: per 4 Moeilijk om met een hele klas te spelen.	Less applicable in large groups
Bij vraag 2: overleg	-
Jammer dat het enkel realiseerbaar is in een kleine klas	Less applicable in large groups
TOP!	-
Kan niet gemakkelijk winnen	-
Mooie spelvorm maar neemt veel tijd in beslag	Time pressure
Ideaal als herhalingsles voor het examen.	Preparation for an examination / temporary evaluation

In grote klas minder toepasbaar aangezien je maar 2 teams hebt die dan te groot worden.	Less applicable in large groups
Mooie tool!	-
Groepen mogen niet te groot zijn	Less applicable in large groups
Al deze spelvorm zou ik eerder gebruiken als voorbereiding voor een tussentijdse evaluatie. Kan eventueel ook gebruikt worden om te weten hoever de voorkennis van studenten reikt (ik geef les in hoger onderwijs)	Preparation for an examination / temporary evaluation
Leukste van de 3	-
Ik zou het toepassen in een kleine groep. Bij grote groep lln zal een deel stoppen met nadenken.	Less applicable in large groups
Effectiever dan het geven v.e. les mits de nodige bespreking per vraag	-

