3.1 INTRODUCTION

The previous chapter explored the various experiential methods as a possible way of addressing the challenges facing current auditing education. The potential benefits and challenges of each method were analysed and the possibility of computerisation of these methods, as a way of improving their effectiveness, was discussed. The challenges and possible benefits of computerisation were also analysed and it was concluded that computerised experiential methods might be successfully used to address the challenges facing current auditing education, provided that challenges are kept in mind and addressed pro-actively. This chapter provides an overview of the findings of previous research conducted on the use of experiential teaching methodologies.

A literature review was conducted in order to identify previous research on the use of experiential teaching methodologies. The aim of the study was to gain an understanding of what is possible by taking into regard what has been done and accomplished and what other researchers have proposed as future possibilities. In this way, the possible benefits of the use of experiential teaching methodologies can be more or less anticipated and possibly magnified by tailoring the design of the game. Similar possible challenges and constraints can be taken into account and possibly mitigated by designing and developing the game taking these factors into account.

This chapter addresses Specific objective 5: Through review of research done on the use of experiential teaching methods, identify best practice and restrictions to be taken into account when developing the prototype game (see Section 1.5.2 in Chapter 1).

The following paragraphs firstly focus on research conducted in tertiary education. Then the focus shifts to research conducted in accounting and auditing education and finally research involving computer-assisted methods is reviewed.
3.2  RESEARCH CONDUCTED IN TERTIARY EDUCATION IN GENERAL

Research on the use of experiential educational methods have been done across a wide spectrum of subjects, yet the fields of medical education and civil engineering were predominant during the literature search. This is because these two fields tend to lend themselves, due to their practical nature, to the successful implementation of active learning.

3.2.1  Medical education

The use of simulations in medical education has been vastly researched by authors such as Scalese, Obeso and Issenberg (2008) and Lippert, Dieckmann and Oestergaard (2009), who found that the use of simulations in medical education may hold many benefits, for example the possibility to make mistakes in a risk-free environment and the ability to assess competence in a wide variety of scenarios, which may not be possible in real-life situations. The benefits are evident in the fact that simulations are widely used by all universities offering medical education.

Another experiential method that is commonly used in the field of medical education is PBL. PBL originated in medical schools at the Case Western Reserve in Cleveland, Ohio, in the USA, and at McMaster University in Hamilton, Ontario, in Canada (Eräpuro-Piila and Kujala, 2013). McMaster developed its entire curriculum around PBL and numerous other medical schools have adopted its model (Hansen, 2006). This is because PBL connects the students to the ‘real world’ and can foster students to think critically, solve complex problems and find and use learning resources, as will be expected of them when entering the ‘real world’ of work.

3.2.2  Civil engineering

The project iVISiCE (Interactive Visualizations in Civil Engineering), which involved building a game-based learning module, was founded by Ebner and Holzinger (2002) to assist students of civil engineering during their learning process by using visualisations and animations. It was found that playing games leads to at least an equal learning result as that of the traditional lecture method, but that games, in contrast to the traditional method, where intentional learning dominates, highly motivated students, leading to them playing the games more than once and leading to incidental learning. Important factors
that were noted by them that should be taken into account in following research were that firstly, the ease of use of the game has to be a first priority, as difficult technology could affect motivation to play the game, and secondly, curiosity is the primary learning motivation, not goal seeking. The game therefore has to be designed to provoke students’ curiosity. Various authors reports that one of the ways in which students’ curiosity can be provoked is by providing environments that have an optimal level of informational complexity (Kibrick, 2013; Malone, 1980; Vieira, 2013).

3.3 RESEARCH CONDUCTED IN ACCOUNTING AND AUDITING EDUCATION

Although not as extensively researched as in the medical and engineering professions, some research has been done on the use of active learning methods in accounting and auditing education in general. The research seems to focus on the case study and simulation methods, although some other methods, such as gaming and annual report projects, have also been investigated by selective authors. The research conducted on the use of active learning in auditing education focuses mainly on the case study and simulation methods, but again some authors have explored the area of gaming and role play.

3.3.1 Case studies

In the previous chapter, the various potential benefits and challenges of the use of case studies for tertiary educational purposes were discussed. The paragraphs below discuss and highlight how the case study method has been used in accounting and auditing education and which benefits and challenges, as discussed above, have been noted in these specific fields.

3.3.1.1 Accounting education

According to Waddel and McChelry (2009), case studies can be used effectively at two levels in the learning process. Firstly, it can be used as a stimulus for knowledge development and secondly, it can be used at a developed stage of students’ learning experience in order for students to learn to apply knowledge. The aim of the case study should therefore be pre-determined and the difficulty of the material set accordingly.
Dittenhofer (1992) noted that in order for case studies for teaching auditing-related topics to be effective, the following best practice principles must be applied:

- The case study must be realistic.
- It must be related to the material being covered in the course.
- It must be presented in such a way that the student is drawn into the situation as a participant.
- The situation must be resolvable.
- The case study must be credible to the degree that the student views it as an actual occurrence or a situation that in all probability will occur.

### 3.3.1.2 Auditing education

Drake (2011) noted that the case study method has in a number of instances been successfully transferred from the accounting to the auditing field.

(Drake, 1999) reports on the use of a case study, which by presenting a variety of audit risks, hence audit implications, demonstrates the holistic approach to auditing required in order to avoid an inappropriate audit opinion. The author reports that the case provides an efficient and original vehicle for instruction in auditing and can be used to complement other teaching aids.

Henry and Crawford (1998) computerised a case study that was traditionally a role-play case study. This was in response to students’ suggestion that changes could be made to the way in which the case study was run and in an effort to address the time-consuming nature of the role-play case study. While they noted that the character of the case study recreated on the computer inevitably changed, the aims remained the same. One of the major disadvantages of computerisation, as noted by Henry and Crawford (1998), is the lack of flexibility in interaction. Computers are not living, thinking creatures like humans and therefore every single interaction required of them has to be anticipated and pre-programmed. Students did, however, find the computerised case study more comfortable to work with, because of the same reason.

Drake (2011) developed an innovative variation on the traditional case study method by advocating that there is a lot to be learnt from corporate failures in the context of auditing. The living case was developed to make auditing more interesting and relevant to students who perceive the subject as boring and not as important as the discipline of which it is a subfield (accountancy) by linking classroom theory to incidences in the real world. As
mode of delivery, the virtual learning environment was developed, making it highly accessible as a gateway to link to the real world and a variety of media, including newspapers, newswires, professional body internet sites and multi-media platforms such as YouTube. This kind of case aims to add to the educational value through the “extent to which it challenges the student not only to apply but also to question the audit approaches available” (Maltby, 2001, p. 424).

3.3.2 Simulations

3.3.2.1 Accounting education

Wolmarans (2005) focused his research on a financial and project management business simulation and concluded that business simulations play an important role, as students are able to link theory to practice. Participants in this study obtained a better understanding of the big picture of theory and their financial knowledge improved.

Silva et al. (2011) describe how a value-added tax (VAT) simulator was used in order to help bachelor accounting students of the Coimbra Institute of Accounting and Administration learn to work with an application that mimics the Portuguese official VAT form application. This is in response to employers complaining that graduates have vast theoretical knowledge regarding VAT, but are unable to perform the simple task of completing and submitting VAT returns.

3.3.2.2 Auditing education

In the auditing subject specifically, research concerning experiential teaching methodologies has been mainly focused on audit simulations in order to counteract the problematic effects of the lack of exposure to the real-life auditing world of chartered accounting students. May (1992) used a video simulation to help students visualise the auditing environment. Rudman and Terblanche (2011) completed a similar study by using photos (among other role-play activities) of access controls in an auditing lecture to help students visualise the control environment. The students gained from these activities by moving away from memorising facts to understanding the mechanics of the subject matter and the concepts (Rudman & Terblanche, 2011).

Davis (1997) designed an action learning method in which third-year business degree students had to participate in various real sampling exercises during class time. He
describes his concern that he was afraid students might find the exercise too simplistic, but his study proved that the students, who have previously only dealt with the theory of sampling, found the exercise helpful. In addition, the same students who previously evaluated the auditing course as boring and difficult described their experience of this exercise as entertaining. Davis is of the opinion that although this exercise was designed to demonstrate the application of sampling theory in practice, similar demonstrations could be applied to the entire audit process – from the initial planning phase to final reporting. A similar action learning activity was later designed and implemented by Tate and Grein (2009). The focus was also on teaching sampling theory by having students plan, perform and evaluate a sampling procedure to provide independent assurance to a fictive bakery about the amount of chocolate chips in their cookies. Feedback from the students again consistently rated the activity as worthwhile and effective.

A video simulation of an audit was prepared as part of the ‘Excellence in Audit Education’ programme sponsored by the Coopers & Lybrand Foundation (today part of PwC) (Siegel et al., 1997). The videotape exposed the students to some of the fundamental steps in an audit, including proposal and client acceptance issues, preliminary planning, engagement planning and evaluation, and audit completion. The pedagogical foundation of the video simulations was Kolb’s model (Siegel et al., 1997). The authors were of the opinion that more effective teaching can be accomplished by taking students through this entire learning cycle (concrete experience, reflective observation, abstract conceptualisation and active experimentation). In this way, different learning styles would also be accommodated. Therefore, the video simulation was designed to help students move through various stages of the learning cycle, as applied to an auditing environment. Controlled field experiments were conducted to determine the effectiveness of the video in improving student performance. In all cases, the experimental group was found to have significantly higher performance scores. It appears that the introduction of the videotapes was instrumental in improving class performance (Siegel et al., 1997).

Another method is the case study that provides real documents for students to inspect and on which to perform various audit procedures. Miller and Savage (2009) provided a set of source documents relating to the sales of a fictitious computer company, which students use to practise performing various audit procedures on a number of sales transactions. Dee and Durtschi (2010) provided students with a chance to practise looking for fraud in an extensive set of accounting records and supporting documents of a fictitious minor league baseball team and Clikeman (2012) contributed to the auditing education literature by providing a comprehensive set of accounting records and supporting documents relating to the inventory balance of a fictitious wholesale company.
that students can inspect and test substantially. In this way, students become acquainted with accounting records and supporting documents that they will have to examine as first-year trainee auditors and they are given an opportunity to link theoretical procedures to what it would be like when performed in the real world, thereby cultivating understanding. One disadvantage of this method, however, is that it is a time-consuming process for students who have most likely never before even seen these documents, much less audited them, which might leave students frustrated and demotivated. Another disadvantage is the intense investment of human capital required to guide students in this project and to subsequently mark and give feedback on the project.

One study conducted by Gelinas, Levy and Thibodeau (2001) might indicate that information technology is an effective way of addressing the challenge relating to the time-consuming nature of experiential teaching methods. This study developed and tested an audit simulation using audit command language focusing on risk assessment. Students felt positive about the integration of information technology and did not perceive that the time invested in the simulation had been an impediment (Gelinas et al., 2001).

Another study done in the 1980s also utilised information technology (Felix et al., 1985), however in this study, more than 50% of the participants felt that too much time was required to complete the simulation. This might be, however, because the study covered a whole transaction cycle. The fact that information technology was relatively undeveloped and not widely distributed at the time of the study also had an impact.

McDuffie and Smith (2006) took into account the fact that the use of technology has been identified as an important skill for entry-level accountants and the fact that presenting audit-reporting concepts to students during traditional lectures is difficult, and as a result constructed and used an expert system entitled AUDPORT that is, in essence, an audit-reporting system that can be used as a teaching aid in auditing education.

3.3.3 Educational games

3.3.3.1 Accounting education

Fowler (2006) compares the use of the traditional lecture format using debit/credit journaling to the use of an active learning format using case analysis and a simulation game. The study found that in all areas of Bloom’s taxonomy the active learning group outperformed the traditional group (although not to a significant degree in the upper-level
domains) with the exception of the application area, while the students taught by the traditional lecture method focused more on the application of the coding and formatting of the data than actually comprehending what information was being conveyed – and vice versa for the group taught through action learning. He concludes that a blend of different teaching models would yield the best overall results for learning in all areas of Bloom’s taxonomy.

Fouché (2006) developed an educational board game (Commercium™) to be used in introductory accounting and empirically proved this to be an effective teaching tool based on research on the requirements of the teaching-learning environment. He notes that some of the requirements of being an effective lecturer/facilitator are the ability to provide good-quality fair assignments and good-quality and frequent feedback. He also states that teaching instruments should take into account students’ previous skills and knowledge. When considering the milieu, he proposes that teaching instruments should assist the lecturer/facilitator in setting a milieu that would complement learning by involving students emotionally. According to him, the teaching instrument should focus on the competencies required of students and aim to enhance the retention and application of students. He summarises criticism against using games in teaching as follows:

- It may over-simplify real-life situations, building excessive confidence, making students act in superficial ways, which leads to games being valued less and having a short-term effect.
- It may require much preparation time from the lecturer.
- It may be financially expensive.

The board game Monopoly™, originally a manual board game, was used in the USA by Knechel (1989) and in the UK by Clayton (2001) with great success. Marriott (2004) reports that the game is available for use on personal computers and that this computerisation possibly enhances its potential use.

The Realgame (Lainema, 2004) business simulation game was used to study the problem-based gaming model, which stems from the methodology of problem-based learning as discussed in Chapter 2, Section 2.3.3. Realgame provides a realistic and complex model of business functions based on a fictitious company. Students compete in teams and are expected to make realistic time-dependent decisions. They then receive feedback on the consequences of their decisions. The game was effectively used to embed prior knowledge by effectively showing the students’ cause and effects
relationships in a realistic business setting. This is a very important finding, because traditional learning methods often failed to facilitate such an understanding (Kiili, 2007). It is important to note that students suggested that each student should have his/her own computer during gameplay. This will ensure participation and equal learning opportunities for all players, even if the game is still team-based. A chat function could be included to reap optimal benefits from intergroup communication.

3.3.3.2 Auditing education

One of the more interesting teaching methods used in auditing is the *Who Wants to Be a Millionaire* game (*WWTB*), which was incorporated in a senior-level auditing course required in an undergraduate BBA, on which McEacharn (2005) reports. The game is an almost exact replica of the popular television game show with the same name and some of the same features. It is functional on most computer systems and the manner in which the game can be played, the difficulty of the questions and the rules can be easily modified to the instructor’s discretion, dealing effectively with the challenge of extensive workload for the lecturer reported by most researchers of experiential methods. McEacharn (2005) reports that the *WWTB* game proved, through an analysis of examination scores, to be a viable educational tool that not only appeals to students visually and is intrinsically motivating because of the sense of competition attached to it, but also requires critical thinking of students in order to develop a strategy for handling the gameplay. When used in a class setting, it contributes to students’ ability to interact with team members.

3.3.4 Annual report project

3.3.4.1 Accounting education

The University of Natal uses an annual report project in the third year of the Financial Accounting course to develop the appropriate professional skills, such as personal, interpersonal, communication and intellectual skills, as called for by PAAB (2001) and SAICA (2000) in its students. The annual report project meets some of the educational objectives of SAICA and the Independent Regulatory Board for Auditors (IRBA) and the results of this analysis indicate that students benefited from the project and that it is a desirable component of the third-year course in Financial Accounting (Stainbank, 2003). The studies found that students valued the exposure to a practical approach to the
unknown business environment and felt that an important benefit was derived from the project, as it enabled them to visualise different theoretical business concepts (Stainbank, 2003, 2005).

### 3.3.5 Problem-based learning

#### 3.3.5.1 Accounting education

PBL (see Section 2.3.3) is still a relatively new approach in accounting education, but some studies, such as that of Hansen (2006), have focused on using PBL in accounting education. Milne and McConnell (2001) state that, because PBL is intended to motivate students to acquire new knowledge, it is important that the problem requires a higher level of knowledge to solve than the students have prior to being confronted by the problem. This promotes the acquisition of new knowledge.

One of the biggest challenges in PBL is the writing of good problems (Hansen, 2006). The problem needs to be exactly balanced in order to engage, motivate and challenge students without frustrating and demotivating them, and it has to be taken into account that the problem could have more than one acceptable answer, based on assumptions made by the students.

Hansen (2006) also notes that the effectiveness of the PBL method is enhanced if assignments are graded with comments, questions and suggestions for improvement and in a timeous manner.

Duch (2001) lists some characteristics of good PBL problems as follows:

- An effective problem must engage students’ interest and motivate them to probe for deeper understanding of the concepts being introduced.
- Good problems require students to make decisions or judgements based on facts, information, logic or rationalisation.
- Co-operation from all members of the team should be necessary to effectively work through a problem.
- The initial questions in the problem should have one or more of the following characteristics so that all students in the groups are initially drawn into a discussion of the topic:
They should be open-ended, not limited to one correct answer.

- They should be connected to prior knowledge.
- They should incorporate controversial issues that will elicit diverse opinions.

- The content objectives of the course should be incorporated into the problems and the questions should challenge students to develop higher-order thinking skills such as analysis, synthesis and evaluation.

### 3.4 CONSIDERATIONS FOR THE DESIGN OF AN EXPERIENTIAL TEACHING AID

During the literature review, considerations, advice, tips, and so forth were noted, specifically on the design principles that have to be taken into account when designing an experiential teaching aid. These considerations are summarised below and served as a foundation from which to plan the development of the educational computer game as an experiential teaching aid.
<table>
<thead>
<tr>
<th>EXPERIENTIAL METHOD</th>
<th>RESEARCH</th>
<th>CONSIDERATIONS ADVOCATED BY THE RESEARCHER</th>
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<tbody>
<tr>
<td>SIMULATIONS</td>
<td>Clikeman (2012)</td>
<td>• One of the strengths of simulations is that they provide students with the opportunity to make mistakes in a risk-free environment.</td>
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<td></td>
<td>Davis (1997)</td>
<td>• Simulations may be used when it is evident that graduates have vast theoretical knowledge regarding a subject, but are unable to do what employers wish them to do.</td>
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<td></td>
<td>Felix et al. (1985)</td>
<td>• Students may gain from simulation activities by moving away from memorising facts to understanding the mechanics of the subject matter and the concepts and thereby gaining insight.</td>
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<td></td>
<td>Gelinas et al. (2001)</td>
<td>• Even simplistic exercises may be found helpful by students who have not had any previous practical experience.</td>
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<td></td>
<td>Lammers et al. (2008)</td>
<td>• Simulations may be used in such a way that students get acquainted with accounting records and supporting documents that they will have to examine as first-year trainee auditors.</td>
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<td></td>
<td>Lippert et al. (2009)</td>
<td>• The simulation process could be a time-consuming process, adding weight to an already substantial course load.</td>
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<td></td>
<td>Rudman and Terblanche (2011)</td>
<td>• Integration of information technology might be an effective way of addressing the time problem.</td>
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<td></td>
<td>Scalese et al. (2008)</td>
<td>• Another way of addressing the time problem could be not covering a whole transaction cycle, but rather focusing on selective topics from the course.</td>
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<td></td>
<td></td>
<td>• If the gap between the theory taught in lectures and the underlying principles of the simulation is too wide, students may feel frustrated and demotivated.</td>
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### EXPERIENTIAL TEACHING METHODOLOGIES: CONSIDERATIONS REGARDING IMPLEMENTATION

<table>
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</table>
- Care has to be taken that the learning outcomes are met.  
- One of the main strengths of PBL is that it connects the students to the ‘real world’.  
- It is vital that the problem requires more knowledge to solve it than the students have prior to being challenged by the problem.  
- The biggest challenge in PBL is writing good problems.  
- The problem needs to be balanced in order to engage, motivate and challenge the students without frustrating and demotivating them.  
- It has to be taken into account that the problem could have more than one acceptable answer.  
- The effectiveness of the PBL method is enhanced if assignments are graded with comments, questions and suggestions for improvement and if this is done in a timeous manner.  
- An effective problem must engage students’ interest and motivate them to probe for deeper understanding of the concepts being introduced.  
- Good problems require students to make decisions or judgements based on facts, information, logic or rationalisation. |
<table>
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<td></td>
<td>• If the PBL is taking place in teams, co-operation from all members of the team should be necessary to effectively work through a problem.</td>
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<td></td>
<td></td>
<td>• The content objectives of the course should be incorporated into the problems and the questions should challenge students to develop higher-order thinking skills such as analysis, synthesis and evaluation.</td>
</tr>
<tr>
<td>EDUCATIONAL GAMING</td>
<td>Ebner and Holzinger (2002)</td>
<td>• The ease of use of the game has to be a first priority, as difficult technology could affect motivation to play the game.</td>
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<td></td>
<td>Fouché (2006)</td>
<td>• Curiosity is the primary learning motivation, not goal seeking. The game therefore has to be designed to provoke students’ curiosity.</td>
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<td></td>
<td>Fowler (2006)</td>
<td>• A blend of different teaching models would yield the best overall results for learning.</td>
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<tr>
<td></td>
<td>Kiili (2007)</td>
<td>• Feedback provided to students should be frequent.</td>
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<tr>
<td></td>
<td>Lainema (2004)</td>
<td>• Teaching instruments (such as games) should take into account students’ previous skills and knowledge.</td>
</tr>
<tr>
<td></td>
<td>McEacharn (2005)</td>
<td>• Teaching instruments (such as games) should focus on the competencies required of students.</td>
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<td></td>
<td></td>
<td>• The aim should be to enhance students’ retention and application of knowledge.</td>
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<td></td>
<td></td>
<td>• It is important to ensure the game does not oversimplify real-life situations.</td>
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<td>• This method may require much preparation time of the lecturer.</td>
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<td></td>
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<td>• It may be financially expensive.</td>
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<td></td>
<td>• Educational games may be used to effectively show cause and effect relationships in a realistic, yet risk-free, environment.</td>
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<td></td>
<td></td>
<td>• When dealing with computer games, it is suggested that each student should have his/her own computer during gameplay to ensure equal participation.</td>
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<td></td>
<td></td>
<td>• Chat functions could be incorporated in computer games to reap optimal benefits from intergroup communication.</td>
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<td></td>
<td>• The game could also be used in a class setting in teams in order to enable students to interact with team members.</td>
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<td></td>
<td>• If used effectively, information technology could be used to deal with the challenge of an extensive workload for the lecturer, which most researchers of experiential methods report.</td>
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<td></td>
<td></td>
<td>• Educational games should appeal to the students visually and involve the user emotionally.</td>
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<td>• Games should incorporate a sense of competition in order to enhance intrinsic motivation.</td>
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<td>• The game should be designed in such a way as to require critical thinking of the students in order to develop a strategy for handling the gameplay.</td>
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                          - The case study must be realistic.  
                          - The case must be related to the material being covered in the course.  
                          - The case material must be presented in such a way that the student is drawn into the situation as a participant.  
                          - The situation must be resolvable.  
                          - The case study must be credible to the degree that the student views it as an actual occurrence or a situation that in all probability will occur.  
                          - The case method can be used to complement other teaching aids.  
                          - The case method can be time-consuming.  
                          - A challenge associated with the computerised case method is the lack of flexibility in interaction due to its programmed nature.  
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|                     | Waddell & McChlery (2009)  | - The aim of the case study should be pre-determined and the difficulty of the material set accordingly.  
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                          - A challenge associated with the computerised case method is the lack of flexibility in interaction due to its programmed nature.  
                          - The aim of the case study should be pre-determined and the difficulty of the material set accordingly.  
                          - The aim of the case study should be pre-determined and the difficulty of the material set accordingly. |
| Annual report       | Stainbank (2003, 2005)     | - The aim of the annual report project should be to enable students to visualise different theoretical concepts |
| project             |                       |                                                                 |
3.5 MOTIVATION FOR THE DESIGN OF AN EDUCATIONAL COMPUTER GAME

It is clear that experiential teaching methods not only add value to traditional theoretical lectures (Rudman & Terblanche, 2011), but also have some drawbacks and challenges that should be taken into account when planning to design and/or use an experiential teaching method. One of the major drawbacks of simulations and similar experiential teaching methods is that they are time-consuming (Fouché & Visser, 2008; Steenkamp & Rudman, 2007; Steenkamp & Von Wielligh, 2011). If students perceive any teaching method as time-consuming (in other words ineffective), this could damage the students’ morale and influence the number of students who attends class – something that cannot be afforded.

A possible remedy for this negative perception seems to be the integration of information technology (see Section 2.3.10.1 in Chapter 2) into the experiential method. In this way, students will be empowered to work at their own pace and get things done faster. An added benefit will be the cultivation of information technology skills (a necessary skill for any modern-day auditor/accountant). This is in line with the work of Borthick and Curtis (2004), who state that accounting education is increasingly required to integrate information technology skills with professional subjects such as Financial Accounting, Management Accounting and Finance, Taxation and Auditing. In terms of its new competency framework, SAICA (2012a) also requires the integration of information technology in accounting programmes.

It is proposed that information technology can be integrated and used effectively to achieve maximum learning efficiency as long as the area covered by the programme is not too wide (simulating a complete audit, for example, would negatively influence students’ morale and perceptions). Instead, the programme should focus on specific important areas.

Again, if students perceive the project as not adding value to their learning experience, their morale will be negatively influenced and class participation will dwindle. That is why it is imperative that students be guided to make the link between practice (or simulated practice) and theory. They also need to understand how to use these new techniques in preparing and writing tests and examinations. This was achieved successfully by Rudman and Terblanche (2011) when 84% of their respondents indicated that they thought back to the role-play activity when answering questions and that the role-play activity assisted them in answering questions on the specific subject matter. This led to students feeling
that they could move away from the memorising of facts to creating an understanding of
the subject matter. The role-play activity also created awareness of multiple solutions and
ambiguous information.

The importance of students being able to understand how to utilise the skills, insight and
knowledge gained from such an experiential teaching experience is emphasised by
Ballantine and Larres (2004), who mention the various ways that examination questions
are constructed to require students to use the generic skills developed through case
studies. Questions that include terms such as “critically analyse”, “reflect” and “discuss an
alternative perspective” are examples of this (Ballantine & Larres, 2004, p. 178). These
terms also frequent past examination papers as set by SAICA (SAICA, 2012b).

One reason for the success achieved by Steenkamp and Rudman (2007) in getting
students to realise how experiential teaching can assist them with achieving better marks
in examinations and tests could be that they recognised the need for the lecturer to be
able to facilitate the process very well and to encourage students to co-operate, as
opposed to Arens et al. (1970), whose study was mainly criticised by students due to the
lack of supervision by lecturers. The integration of information technology simplifies this
approach, by providing the chance for built-in pre-programmed guidance (see Section
2.3.10.1 in Chapter 2) to assist students throughout the process of learning and illustrate
the link between what is being taught and how this will be of use in an examination setting.

The risk of having students not being able to make the link between the content and skills
being addressed by the case study and how to practically apply the gained knowledge and
skills in an examination setting can also be counteracted if the method succeeds in
generating interest in the auditing subject, as this will encourage student participation and
create an enhanced learning experience (Rudman & Terblanche, 2011; Steenkamp &
Rudman, 2007; Wolmarans, 2005). Educational games are known to have the potential
benefit of generating interest and joy while educating (see Section 2.3.7.1 in Chapter 2)
and the integration of information technology also has a motivating effect (see Section
2.3.10.1 in Chapter 2).

Another constraint highlighted by the respondents in the study conducted by Rudman and
Terblanche (2011) refers to the danger of oversimplifying the subject matter. Although the
experiential method should assist students in visualising schemes that are less
complicated and therefore can be simultaneously processed by working memory, auditing
questions remain difficult and the method should therefore not aim to inaccurately
oversimplify the subject matter (Rudman & Terblanche, 2011). The students should
remain challenged and experience a sense of competition. It should therefore be taken
into account that whichever method is used to act as an aid in teaching the various concepts and processes of auditing, it has to be adaptable to the students’ skill and knowledge level and should not oversimplify the subject matter.

In order to take above-mentioned considerations into account, it was decided that an educational computer-assisted simulation game that incorporates role play and animations will be designed to be used in an undergraduate auditing class.

3.6 CONCLUSION

The literature review provided no evidence that the development of a computer-assisted simulation game in auditing education has been attempted before. Simulations and case studies have, however, been extensively researched and used in auditing education and there is evidence that these experiential methods are an effective way of addressing the various challenges facing current auditing education. The literature also provides evidence that lecturers as well as public accountants have recognised the impact of information technology on the training requirements of chartered accountants and there has been a tendency among researchers and lecturers to favour computer-assisted methods. In addition, the method of educational gaming has been introduced and researched in both the accounting and auditing fields and the findings show that the strength of this method lies in motivating and engaging students. The aim of this study was then to incorporate all of the strengths of these methods (simulation, gaming and information technology) in designing an educational aid not previously researched within the auditing field. This study will therefore contribute to the literature in providing an empirically tested prototype simulation game to be used in an undergraduate auditing class.

This chapter addresses Specific objective 5: Through review of research done on the use of experiential teaching methods, identify best practice and restrictions to be taken into account when developing the prototype game.

Next, an overview of the use of computer games as teaching tools is given.