An evaluation of the integration of a board game in introductory accounting

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Abstract

Accounting education must change and be relevant to add value to learners and the community. Regarding the ever-changing corporate world, a new generation of learners (generation Y) at university, learners lacking skills, educators' resisting calls for change in accounting education and the need for continuous improvement, the teaching methodology can make a difference. This research forms part of a bigger project where a literature study is done on the teaching-learning environment, teaching methodologies and the requirements of the content for professional accountants' training. A very creative and effective teaching methodology such as a board game was developed to improve learners' interest, knowledge and skills in financial accounting on introductory level where reality can be simulated and the link between theory and practice can be illustrated. This research contains an evaluation of the integration of a board game in introductory accounting, and conclusions and recommendations will be made. The methodology used was an exploratory approach to test the effectiveness of the board game and to reach the objectives of the study, experimental research was used to evaluate the board game and a survey was used for data collection. The main findings regarding the profile of the participants, the effect of the experiment and the evaluation of the game with positive and negative remarks are stipulated. Although the results of the pre-test/post-test comparison were inconclusive, it was concluded that the project contributed to the setting of a favourable learning environment, enhancing the learners' technical competencies and soft skills as well as broadening their view of the roles of the accountant. The project was also found to be an effective teaching methodology strengthening the link between theory and practice. Various further research possibilities exist – such as to incorporate the game into other subjects, to evaluate the game at multicultural universities, among learners without accounting knowledge and among previously disadvantaged learners.

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INTRODUCTION

'All of us, as accounting educators, have been warned many times that accounting education must change if it is to be relevant and add value to our learners and community' (Albrecht and Sack 2000, vii). Albrecht and Sack (2000, 3) quoted the following from the then fourteen-year-old Bedford Report: 'There is little doubt that the current content of professional accounting education, which has remained substantially the same over the past 50 years, is generally inadequate for the future accounting professional. A growing gap exists between what accountants do and what accounting educators teach. The Committee's analysis of accounting practice has indicated that accounting education as it is currently approached requires major adjustments between now and the year 2000.' Much research has been done since the Bedford Committee, but in 2007, it seems that the warnings outlined in this report still apply today.

Five main areas of consideration indicating the urge for change can be identified i.e., the ever-changing corporate world (Visser et al. 2001, 1), the new generation of learners (Shin 2004, 368–381), lack of skills on the part of the learners (Davidson et al. 2000, 53; Diller-Haas 2006), resistance to change from the side of accounting educators (Adler and Milne 1997, 191; Boyd et al. 2000, 36) and the requirement of continuous improvement (Rahman and Velayutham 1998, 287; Gonzalo and Garvey 2004, 432).

The above provides an overview of the turmoil that the average accounting lecturer and learner faces. The Public Accountants and Auditors Board of South Africa's report on the future of accounting education in South Africa (FAESA) (PAAB 1994) already addressed many of the above-mentioned matters in 1994. Still, the research unit of the South African Institute of Chartered Accountants (SAICA) again addressed the urgency of the matter in 2001. Several of the previous statements are echoed in a report published by the Institute (Dempsey and Stegman 2001). From the literature, even in 2006, the call for changes in accounting education still echoes around the globe. Albrecht and Sack's statement (2000, 1) that accounting education may not survive the future becomes more and more of a reality with every year passing.

This research attempts to evaluate the integration of a board game to make the teaching of accounting on introductory level more effective and to provide for the change needed to address the main areas of consideration that urge the change.

PROBLEM STATEMENT

The *demands* on both educators and learners in the accounting field are constantly increasing. This stems from the five main areas as mentioned above. Something needs to be done to address these areas and to improve the situation of accounting education. The increase in *criticism* indicates that the current accounting teaching practices are still not fulfilling the needs of the profession.

Much research has been done in the fields of improved methodology, subject content, and needed skills. However, responses from both the business world and the profession indicate that this research has not found much *practical application.* This is substantiated by Dempsey and Stegman (2001, 11) and Albrecht and Sack (2000, 3). It is thus necessary to develop an improved methodology for accounting education, addressing the shortcomings and criticism in a practical manner, and bearing in mind the whole teaching-learning environment. This environment encompasses lecturers/facilitators, prescribed course content and learner profiles. It would be important to evaluate this improved teaching methodology to determine if the insight and application skills of the learners increased.

OBJECTIVES

This research forms part of a bigger project where a board game and support material were developed to assist learners and lecturers in obtaining more of the soft skills and technical knowledge required by the contemporary accounting environment in an effective and fun way. This is meant to increase interest in the subject of accounting and to promote life-long learning in the subject field.

In this study, the objective will be to evaluate the board game and support material by way of a questionnaire and to make conclusions and recommendations on the use thereof in order to enhance the teaching of introductory accounting.

HYPOTHESIS

Learners' interest, knowledge and skills in financial accounting on introductory level will be enhanced by making use of a creative and effective teaching methodology such as a board game where reality can be simulated, and where the link between theory and practice can be illustrated.

RESEARCH DESIGN AND METHODOLOGY

This research used an exploratory approach to test the effectiveness of the board game. In order to reach the objectives of the study, experimental research was used to evaluate the board game and a survey used for further data collection.

As the pre-test/post-test evaluation would only be done at one university, it was necessary to use a reputable design method that would incorporate the specific circumstances in order to address reliability and validity. It was decided that the more sophisticated Solomon four-group design should be applied. A representation of the design is provided in Table 1.

The first of the three sections of the questionnaire focused on biographical matters and contained questions on gender, mother tongue, academic performance in accounting and the province where the learners attended secondary school. The second section was developed from the findings of the literature and dealt with

technical skills and soft skills required of accountants, roles of accountants, the subject content of introductory accounting and what were perceived to be good teaching methodologies (Fouché 2006). The last section had questions for evaluating the board game.

Table 1: Experimental design

Type of group	Group no	Pre-test	Experiment	Post-test
Experimental	Group A	Perform pre-test	Undergo experiment	Perform post-test
Control	Group B	Perform pre-test		Perform post-test
Experimental	Group C		Undergo experiment	Perform post-test
Control	Group D			Perform post-test

The population was the first-year Financial Accounting class (mainly CA, CIMA and Forensic programme learners) and the learners of the two other Accounting classes (mainly SAIPA programme learners) at the North-West University (Potchefstroom Campus).

As the population consisted of three classes, it was decided to use one class group for the pilot study. From the results of the pilot study, it seemed that the questionnaire was reliable as Alpha was in all instances over 0,70. No item had a low correlation with the total, and the average intercorrelations were larger than 0,15. In some sections, the variances were explained by more than one factor, but this was not problematic since these sections consisted of many questions. Although the results on reliability and construct validity were satisfactory, minor changes were made to the questionnaire to improve it for the actual study.

A random sampling procedure was used. The official alphabetical class lists for the remaining two classes were obtained from the administrative system of the University. By using Excel, each of the classes was divided randomly into four groups in line with the experimental design. The groups that actually participated were divided more or less equally (89, 82, 97 and 93 participants respectively). Within a week of completion of the pre-tests by groups A and B the learners of groups A and C were required to complete the group assignment involving playing the Commercium™ game. After completion of the project, all groups were required to complete the post-test questionnaire. The post-test questionnaire was the same as the pre-test questionnaire, with the additional section on evaluating the game. All the groups eventually performed the assignment; no learner was thus disadvantaged by being placed in a control group.

The data was analysed using SAS (SAS Institute Inc. 2003–2005) computer software. The responses were subjected to classical frequency analysis as well as factor analysis for construct validity, and reliability was measured by the Cronbach alpha coefficient. A summary of the analysed data is provided in Tables 2 and 3.

Table 2: Reliability and construct validity of pre-test questionnaire

Section	Number of questions	Number of factors explaining a variance of more than 1	Cumulative % of variance explained by factors	Questions with low communalities (<0.40)	Alpha	Average inter-correlation
Technical skills	6	2	60.21	Q12	0.728	0.32
Roles	5	1	93.18	Q20	0.795	0.45
Soft Skills	8	2	57.69	None	0.807	0.34
Subject Content	30	7	66.72	None	0.934	0.33
Teaching methodology	15	5	63.17	None	0.824	0.24

Table 3: Reliability and construct validity of post-test questionnaire

Section	Number of factors explaining a variance of more than 1	Cumulative % of variance explained by factors	Questions with low communalities (<0.40)	Alpha	Average inter-correlation
Technical skills	1	42.8	Q14	0.722	0.31
Roles	1	52.8	Q20	0.770	0.40
Soft Skills	2	57.22	Q28	0.812	0.36
Subject Content	5	62.86	None	0.941	0.35
Teaching methodology	4	52.42	None	0.812	0.23

VALIDITY AND RELIABILITY

From Table 2 and Table 3 it is evident that the results from the questionnaire would be reliable, as Alpha was for all sections larger than 0,70. Very few items had a low

correlation with the total, and the average intercorrelations were larger than 0,15. The fact that in some sections the variances were explained by more than one variable was acceptable, since these sections consisted of many questions. Very few questions also had a low communality. Overall, there thus existed construct validity.

The advantage of the four-group design is that in comparing the post-test results of groups C and D with that of A and B respectively the t-values could indicate whether changes in the dependent variables were due to some interaction effect between the pre-test and the experiment (Anon. 2006a). This is important for reliability, as completing the pre-test questionnaire may influence the participants.

MAIN FINDINGS

Profile of the participants

Of the participants, 47.5 per cent were male and 52.5 per cent female, while 95.4 per cent were Afrikaans speaking. Very few participants did not have accounting at school on higher-grade level (3%). The learners were above-average performers (56.65% received a mark of 80% and above at school). The participants came from all over South Africa and a few (1.05%) were from outside the country. The majority of participants (28.31%) were, however, from the North West and Gauteng provinces (23.28%) which are the closest situated to the city hosting the university campus.

Effect of the experiment

The average scores (number and percentages) for each section of the questionnaire for the four groups for the pre-test (Table 4) and the post-test (Table 5) were used in calculating the effect of the experiment and the statistical significance thereof. The maximum mark that could have been scored is indicated in Table 4.

Table 4: Average scores for pre-test

Section	Max mark	Group A		Group B		Average	
	n	*n*	%	*n*	%	*n*	%
Technical skills	30	21.44	71.49	21.31	71.04	21.38	71.27
Roles	25	17.80	71.22	18.28	73.16	18.05	72.19
Soft skills	40	29.48	73.71	30.05	75.13	29.77	74.42
Subject content	150	117.79	78.53	115.98	77.32	116.89	77.92
Teaching methodology	80	53.36	66.71	53.82	67.28	53.59	66.99

Table 5: Average scores for post-test

Section	Group A		Group B		Group C		Group D		Average	
	n	%	N	%	n	%	n	%	n	%
Technical skills	21.57	71.91	20.92	69.73	20.97	69.90	21.90	73.00	21.34	71.14
Roles	18.07	72.27	18.18	72.73	18.02	72.08	18.28	73.12	18.14	72.55
Soft skills	29.32	73.29	29.33	73.33	28.80	72.00	30.09	75.22	29.38	73.46
Subject content	111.60	74.40	111.16	74.11	108.39	72.26	114.32	76.21	111.37	74.25
Teaching methodology	55.06	68.83	54.40	68.00	54.54	68.18	55.26	69.07	54.82	68.52

T-tests indicate whether the value of the t-statistic that is arrived at by the procedure indicates that the sample characteristics or pattern lies in the extreme tails of the normal curve (Blaikie 2004, 193). This assumes that there are no differences between the two group means. The first set of tests was performed to determine the effect of the experiment on the learners' skills and knowledge. The results are shown in Table 6.

Table 6: Testing difference between the means of Group A[1] and Group B[2] for the pre-test and post-test, assuming unequal variances

T-Tests	Pre-test		Post-test	
Variable	t Value	P-value	t Value	P-value
Technical skills	0.27	0.7858	1.32	0.1895
Roles	-0.98	0.3307	-0.25	0.8047
Soft skills	-0.83	0.4057	-0.02	0.9804
Subject content	0.80	0.4242	0.19	0.8470
Teaching methodology	-0.41	0.6858	0.54	0.5867

[1] Group A (completed pre-test, experiment and post-test)
[2] Group B (completed pre-test and post-test)

As the p-values were calculated for two-sided tests, the value can be halved in order to test only one-sided. A p-value (when divided by two) of less than 0.05 would indicate a significant difference, which would indicate that the change from the pre-test to the post-test is noteworthy or important. The t-value read with the p-value for the pre-test in Table 6 indicates that there was no significant difference. This indicates that the groups can be compared for the post-tests.

A negative t-value in the post-test (Table 6) in this instance indicates a positive movement between the pre-test and post-test. Although it seems that the experiment had a positive effect in some areas (roles and soft skills), none of these were significant. Indeed, it seems from Table 6 that the experiment had a negative effect on the learners in respect of their technical skills, subject content coverage and teaching methodology. Their perceived negative effects were, however, also not significant.

At first, the findings were disappointing. The purpose of the board game was to increase the skills, knowledge and perceived effectiveness of the teaching methodology. The pre-test required the learners to indicate their level of technical skills, knowledge of the roles of the accountant, soft skills, subject content, and how they perceived the teaching methodology. After the experiment, which could only have added to the cumulative effect of the various matters, the learners indicated a decrease in the level of technical skills, subject content and effectiveness of the teaching methodology. This cannot be possible, as cumulative knowledge should not decrease within a week.

The second set of tests was performed to determine if the pre-test may have had an effect on the results of the post-test. The results are shown in Table 7.

Table 7: Testing difference between the means of the different groups for the post-test indicating effect of pre-test on post-test, assuming unequal variances

T-Tests	Group A[1] and Group C[3] for the post-test (Test 1)			Group B[2] and Group D[4] for the post-test (Test 2)			C[3] and Group D[4] for the post-test (Test 3)		
Variable	DF	t Value	Pr > |t|	DF	t Value	Pr > |t|	DF	t Value	Pr > |t|
Technical skills	183	1.30	0.1937	146	-2.20	0.0296	179	-2.27	0.0241
Roles	177	0.10	0.9206	159	-0.21	0.8365	180	-0.55	0.5824
Soft skills	180	0.76	0.4480	153	-1.12	0.2625	185	-2.13	0.0344
Subject content	183	1.30	0.1940	164	-1.53	0.1289	174	-2.61	0.0098
Teaching methodology	166	0.50	0.6182	154	-0.78	0.4379	184	-0.79	0.4314

[1] Group A (completed pre-test, experiment and post-test)
[2] Group B (completed pre-test and post-test)
[3] Group C (completed experiment and post-test)
[4] Group D (completed post-test)
[5] Degree of Freedom

Test 1 was done to determine the effect of the pre-test on the post-test (where the experiment was included). It indicated that the pre-test had a negative effect on the

outcome of the post-test results, but it was not significant ($p>0.05$ when p-value is divided by 2).

Test 2 was done to determine the effect of the pre-test on the post-test (without the experiment). It indicated a positive difference in favour of group D where no pre-test was performed (Table 7). The difference in terms of the technical skills was significant ($p<0.05$ when divided by 2). This should not have been. The learners in the groups were supposed to be similar and nothing differed between the two groups of learners except for the pre-test performed with group B. It again seems that the pre-test had an influence on post-test results.

During and after performing the post-test, learners gave the impression that the experiment made them realise their shortcomings regarding the technical skills, roles of the accountant, soft skills and the subject content they have mastered. One explanation for the unexpected results could therefore be that learners acquired a more realistic view on their cumulative knowledge and skills during the post-test.

The above assumption is substantiated by the following findings:

1. When ignoring the pre-test totally (Test 3, Table 7) it is noted that the experiment had a significant negative effect on the outcome of the post-test for Technical Skills ($p=0.0241$), Soft Skills ($p=0.0344$) and Subject Content ($p=0.0098$). The learners therefore gave a lower score on their cumulative technical skills, soft skills and subject content knowledge after they had completed the project.
2. Questions 77 to 79 of the questionnaire were introduced as a test for the results of the findings of the previous sections. The results shown in Table 8 indicate that the learners reported that the experiment had a positive effect on all the areas. However, this does not correlate with the pre-test/post-test.

It seems that the pre-test/post-test data thus cannot be used to prove any positive or negative effect the game may have had on the technical knowledge, roles, soft skills, subject content or feeling towards the teaching methodology. The pre-test/post-test results were thus not analysed further.

Evaluation of the game

The last part of the questionnaire was only completed by the learners who were part of Groups A and C of the experimental design and had completed the experiment (144 learners). These questions were evaluated on a 5-point Likert scale of strongly disagree (1), disagree (2), neutral (3), agree (4) and strongly agree (5). Table 8 shows the score the project received for various questions.

From Table 8, it is evident that the learners felt that the project enhanced their interest in financial accounting (68%), enhanced their technical competencies (72%), broadened their view on the roles that accountants have to fullfil (77%), enhanced their soft skills (73%), was an effective learning experience (73%), helped them to

acquire knowledge and skills that would stay with them in the long run (72%) and increased their insight into the relationship between theory and practice (77%).

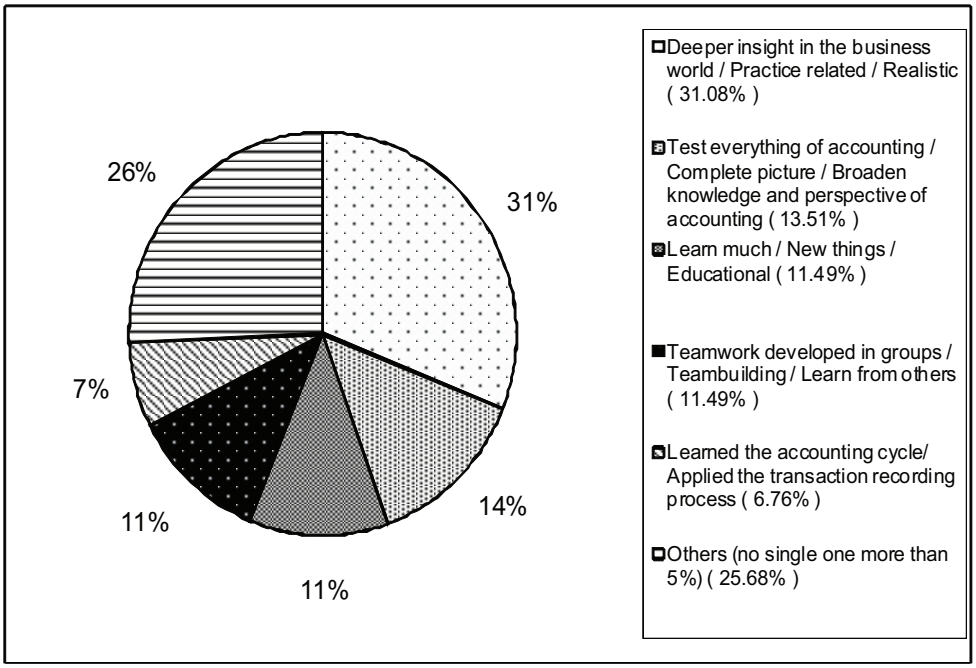
Table 8: Effect of the Commercium™ project, averages

Questions		Average (out of 5)
76	My interest in financial accounting has been enhanced by the Commercium project	3.411
77	Participating in the project enhanced my technical competencies	3.624
78	Participating in the project broadened my view on the role of the accountant	3.865
79	Participating in the project developed / enhanced my soft skills as stated in questions 21-28	3.638
80	The project was an effective learning experience	3.652
81	What I have learned during the project will stay with me on the long run	3.604
82	The project increased my insight into the relationship between the theory and practice	3.837
83	I prefer the project instead of lectures	2.635
84	I enjoyed the social aspects of the exercise	3.821
85	I took the exercise seriously even though it was in the form of a game	4.113
86	I was motivated by the project	3.290
87	The project demanded insight/application from me and not only knowledge replication	4.135

The learners furthermore enjoyed the social aspects of the project (76%). The highest rated items were that they took the project seriously, even though it was a game (82%) and that the project demanded insight and application and not only knowledge replication (83%).

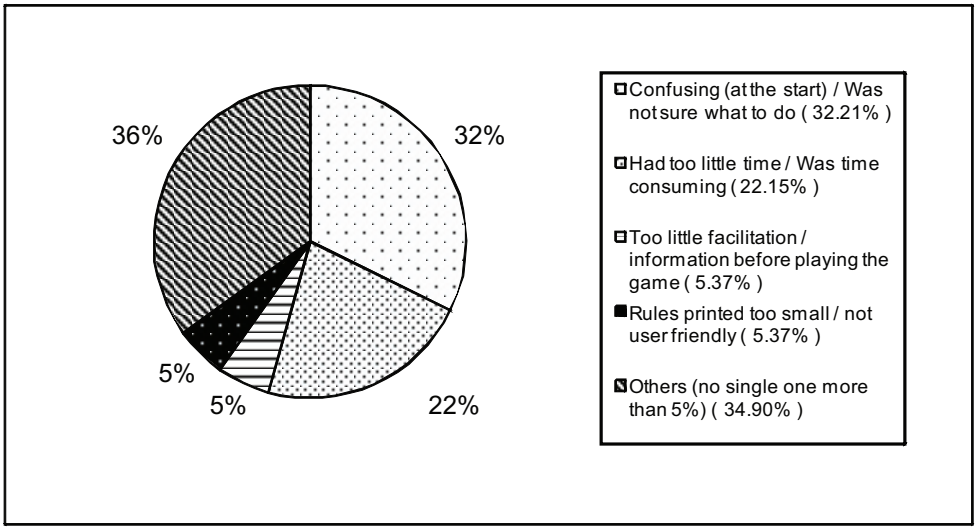
At the end of the questionnaire, the learners were expected to give one positive and one negative remark regarding the game. In the next section, the remarks the learners had on the project, are analysed.

Most of the positive remarks (Graph 1) were about the fact that the project resembled the business world in a realistic and practical manner (31.08%). The next grouping of remarks (11%–14%) all had to do with the project testing a broad range of accounting topics. The learners also had the opportunity to practice and develop team-building skills.



* Percentages on the chart have been rounded.

Graph 1: Positive remarks on the project



* Percentages on the chart have been rounded. Percentage of 'others' adjusted to add up to 100%.

Graph 2: Negative remarks on the project

From Graph 2 it can be seen that a major negative remark was that the game was confusing at the start (32.21%). This is also echoed in the remark that they would have wanted more facilitation before the game started (5.37%). This could be expected, as the learners were not familiar with the game, which was done at a difficult time of the semester. It was the first time ever that the game was played and the game was received late from the printers. This could also explain the fact that the learners felt that they had too little time to complete the project (22.15%). The fact that it was also experienced as time consuming (22.15%) may reflect on the comparison to the amount of assignments normally given to accounting learners and the time it normally takes them to complete these. This assignment needed to be completed over a few days. The matter of the rules being printed too small (5.37%) would also need attention during future projects.

CONCLUSION

The results of the pre-test/post-test comparison were inconclusive. A reason for this may be that participants overestimated their knowledge and skills during the pre-test and by participating in the project acquired a more realistic view. This conclusion is substantiated by the results of comparing the post-test results for control groups C and D. It indicated that the experiment had a significant negative effect on the outcome of the post-test for technical skills, soft skills and subject content, although cumulative knowledge should not decrease within one week. The control questions also did not correlate with the pre-test/post-test findings.

From the results of the survey it can be concluded that the project aided in creating a favourable learning environment as the learners took the project seriously even though it was a game. It was an effective learning experience as the learners felt that the project enhanced their technical competencies, broadened their view on the roles of the accountant and enhanced their soft skills.

The project was also found to be an effective teaching methodology as it increased interest in the subject and ensured that what was learned would stay with the learners. It was an unstructured learning environment that incorporated practical experience and that required more than knowledge replication. Lastly, it gave learners the opportunity to work with and learn from their peers – an aspect which they enjoyed. Overall, the evaluation proved to be very positive.

After the evaluation, it can be noted that the hypothesis was proven correct because learners' interest in financial accounting was enhanced. The project also addressed the content of the introductory accounting syllabus in an effective manner by giving a complete overview. It was found to be an effective teaching methodology. From the evaluation is seems that the project did indeed simulate reality, as this was the most frequent positive remark noted, and learners indicated that the project strengthened the link between theory and practice.

RECOMMENDATIONS

It was proven in the study that the Commercium™ board game is a teaching instrument that can address various aspects of the criticism against traditional accounting education. The project could even keep more learners in the accounting field. Implementing the project and using the board game in introductory accounting would indeed enhance the technical and other skills required of accountants in a practical and effective manner.

To address the disappointing results of the pre-test/post-test evaluation, it would be necessary to redesign the questions to eliminate the effect of the pre-test on the experiment. The negative remarks should be addressed to improve the impact of the game. These shortcomings could be addressed by making an introductory DVD to give the learners a feel for the game before they play it for the first time. More time could also be allocated to play the game.

Various further research possibilities exist. The first would be to evaluate the possibilities of incorporating the game into other subjects. A further set of future research possibilities could be to test and evaluate the game at multicultural universities, among previous disadvantaged learners and learners without accounting knowledge.

REFERENCES

Adler, R. W. and M. J. Milne. 1997. Improving the quality of accounting students' learning through action-oriented learning tasks. *Accounting education* 6 (3): 191–215.

Albrecht, W. S. and R. J. Sack. 2000. *Accounting education: charting the course through a perilous future.* Florida:American Accounting Association. (Accounting Education Series, v.16).

Anon. 2006. True experimental design and their meaning. Available at: http://www.socialresearch methods. net/tutorial/Abrahams/true.html.

Blaikie, N. 2004. *Analyzing quantitative data.* Thousand Oaks, Calif.: Sage.

Boyd, D. T., S. C. Boyd and W. L. Boyd. 2000. Changes in accounting education: improving principles content for better understanding. *Journal of education for business* 76 (10): 36–42, Sept/Oct.

Davidson, R. A., S. A. Slotnick and D. A. Waldman. 2000. Using linguistic performance to measure problem solving. *Accounting education* 9 (1): 53–66.

Dempsey, A. and N. Stegman. 2001. Accounting 1 – Attracting and retaining learners. Available at: http://www.saica.co.za/documents/Accounting1pdf.

Diller-Haas, A. 2006. Time to change introductory accounting. Available at: www.nysscpa.org/cpajournal/2006/506/essentials/p66.htm.

Fouché, J. P. 2006. Programme development for first year accounting in South African Higher Education. Ph.D. thesis, North-West University, Potchefstroom.

Gonzalo, J. A. and A. M. Garvey. 2004. In the aftermath of crisis: the post_Enron implications for Spanish University accounting educators. *European accounting review* 14 (2): 429–439.

PAAB, *see* Public Accountants and Auditors Board.

Public Accountants and Auditors Board. 1994. *Report on the future of accounting education in South Africa.* PAAB.

Rahman, A. R. and K. S. Velayutham. 1998. Instructional approaches and the nature of obsolescence in continuing professional education (CPE) in accounting. *Accounting education* 7 (4): 287–303.

SAS Institute Inc. 2003. *The SAS System for Windows Release 9.1 TS Level 1M0.* Copyright© 2002–2003 by SAS Institute Inc., Cary, NC, USA.

Shin, N. 2004. Exploring pathways from television viewing to academic achievement in school age children. *Journal of Genetic Psychology* 165 (4): 367–381.

Visser, S. S., F. J. Bibbey and J. P. Fouche. 2001. Continuous development in management accounting, information technology and training as facilitators for competitive management. (NRF proposal submitted in 2001). Potchefstroom. (Not published).