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# Teaching problem-solving competency in Business Studies at secondary school level

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The high unemployment rate in South Africa compels potential entrepreneurs to start their own businesses in order to survive. Often this is with little or no formal training or education in entrepreneurship. Since problem recognition and problem-solving are amongst the most crucial competencies required for a successful entrepreneurial career, this study aimed to determine whether the application of an extended curriculum with a strong focus on active learning in a business-simulated set-up will enhance this competency. The performance of a specific group of Grade 11 Business Studies learners in this study was measured, both before and after they had been exposed to such an extended curriculum in different experimental settings (intervention). Assessments were done qualitatively through observations and interviews, and quantitatively, by means of question-based scenarios. The findings revealed that the intervention enhanced learners' entrepreneurial competencies concerning problem recognition and problem-solving considerably. This also contributed to these learners' positive approach towards Business Studies. In this article, it is argued that practical exposure in a business-simulated set-up will not only result in enhanced entrepreneurial proficiency in school learners, but also contribute to an accelerated pace of economic growth and job creation in our country.

**Keywords:** active learning; business-simulated set-up; entrepreneurship; extended curriculum; problem-solving

## Introduction

The role of entrepreneurs in an emerging economy is of great significance in accelerating the economic growth of a country (Ogunleye, Owolabi & Adeyemo, 2013:1). In an environment with widespread unemployment such as South Africa, where the unemployment rate in the first quarter of 2014 was a staggering 25.2% (Statistics South Africa, 2014), many potential entrepreneurs start their businesses for the sole reason of survival. These entrepreneurs often establish their survivalist businesses without any formal training or education in entrepreneurship, which results in ill-equipped business owners that do not possess a relevant set of knowledge principles and practical skills to start and operate their businesses (Maas & Herrington, 2007:8, 26).

Since many South Africans do not pursue tertiary education, where necessary skills are learned to function effectively in the business environment, secondary schools ought to provide learners with skills and knowledge to be entrepreneurs. The relevance of education in entrepreneurship at secondary school level worldwide should therefore not be disregarded, considering that these learners are on the verge of making consequential choice of career. Contemplating the deteriorating economic situation and high figures of unemployment globally, entrepreneurship and self-employment are likely to be vocational options, especially in emerging economies, and may even be chosen above the decision to proceed with tertiary education. Secondary school education should elevate learners' awareness of the option to be entrepreneurs, and since entrepreneurship as a school subject does not exist in South Africa, the best way of achieving this awareness is by incorporating practical entrepreneurship activities into the curriculum (Commission of the European Communities, 2006:7).

Bearing in mind that as many as 73.4% of South African learners who completed Grade 12 in 2012 did not proceed to tertiary education (Department of Basic Education (DBE), Republic of South Africa (RSA), 2012b:51), it would be advantageous to develop the learners' entrepreneurial competencies in order to prepare them for a successful entrepreneurial career. Studies in countries other than South Africa (Cope & Watts, 2000; Man & Lau, 2000; Raffo, Lovatt, Banks & O'Connor, 2000) show that the development of school learners' entrepreneurial competencies is beneficial not only for the learners, but also for the countries' economies. In light of this, the present study suggests a strategy where active learning by means of business simulations is used to develop secondary school learners' entrepreneurial competencies.

Although entrepreneurs need to be competent in various skills, which include flexibility, goal orientation, planning, teamwork, communication, self-confidence and a capacity to learn (Dixon, Meier, Brown & Custer, 2005:32-33), their ability to solve problems is deemed as the most prominent proficiency required to function effectively as entrepreneurs. They are continuously confronted by situations and tasks that need solving (Venter, Urban & Rwigema, 2008:56), and the way in which they approach and solve problems is detrimental to the success or failure of business operations (Kuratko & Hodgetts, 2007:121).

### Literature Review

In South Africa, several studies indicate that active learning in a business-simulated learning environment can enhance learners'entrepreneurial skills (Antonites & Wordsworth, 2009:83; Farrington, Venter & Neethling, 2012:28; Henrico, 2012:9458). Although these studies focused on students at tertiary level, these authors propose that learners in primary and secondary schools would also benefit from active learning in a business-

simulated learning environment (Neneh, 2011:224). According to Lundahl, Arreman, Lundström and Rönnberg (2010:46-59), learners' problem-solving abilities will be enhanced in learning environments where a business simulation, supplemented by active learning, is executed in combination with a cooperative learning strategy. Crebert, Patrick, Cragnolini, Smith, Worsfold and Webb (2011:9) further recommend that teachers who aim at enhancing learners' problem-solving skills need to inform learners on the clear identification, definition and discussion of the problem, before eventually focusing on a possible solution. The problem has to be carefully evaluated without bias and complications such as uncertainty, ambiguity and doubt. In a co-operative learning setting, the different opinions in a group are especially important when enhancing learners' problem-solving abilities, since the variety of possible solutions promotes their evaluative and creative senses (Crebert et al., 2011:9). Teachers therefore need to promote the creation of as many ideas as possible during the problem-solving process before focusing on the feasibility of the solutions (Tull, 2012:1-2).

According to Daft and Marcic (2014:15), a problem indicates a gap between actual and desired performance, while Boddy and Paton (2011:197) define a problem as a gap between an existing state of affairs and a desired state of affairs. A problem requires a solution, and Treffinger, Selby and Isaksen (2008:390) define problems more broadly as questions for inquiry. However, Daft and Marcic (2014:15) view problem-solving as a process of taking corrective action to meet objectives and achieve desired results. The understanding of a problem is an important part of the solving of a problem (Reeff, Zabal & Blech, 2006:48). In addition, Hardin (2002:227) views problem-solving as a process of trial and error, with the aim of using various methods to find solutions.

### *Conceptualisation of the study*

Problem-solving can broadly be conceptualised as a process that includes five steps. During the teaching of problem-solving, the teacher should focus on the following steps that have to be executed by the learners (Crebert et al., 2011:10-11; Tull, 2012:1-2), namely:

Step 1: Recognise the problem only, without focusing on the consequences or implications of the problem.

Step 2: Define and analyse the problem. A broad search and gathering of relevant informationare essential to identify a problem to solve. A clear description of the problem in terms of its cause and possible effect is also needed. According to Crebert et al. (2011:11), a focused problem statement is needed for proper research of the problem.

Step 3: Generate possible solutions. In this step, it is important to create as many solutions as possible without initially evaluating the solutions' feasibility. The function of this phase is to generate possible solutions from different angles and perspectives.

Step 4: Choose the best possible solution. The evaluation of solutions in terms of their feasibility, advantages and disadvantages will assist in choosing the best alternative.

Step 5: Implement the chosen solution. If the solution does not address the problem adequately, the previous steps can be repeated to address areas of concern or that need improvement.

In this study, the broad concept of problem-solving was divided into problem recognition (step 1), and problem-solving (steps 2-5). These two skills are deemed higher order cognitive abilities, since they expect higher levels of thinking than the mere understanding or application of knowledge (Proctor, 2010:51). Education Queensland (2002:1) argues that higher cognitive abilities (HOCAs) are concerned with thinking skills, and aim to provide insight into the theoretical learning content of any specific curriculum and the discovery of new meaning. The author is also of the opinion that learners will only demonstrate HOCAs if they are able to design, plan, discover, verify, hypothesise, experiment with, evaluate, compare, organise and investigate new ideas. Consequently, the development of learners' HOCAs must be focused on the enhancement of their abilities to evaluate, interpret and think in a self-regulated and independent way (Wilson, 2000). In this regard, improving learners' ability to solve problems will not only enable them to master this critical entrepreneurial competency, but it will also enable them to demonstrate higher levels of thinking when solving problems (Lewis & Smith, 1993:131-137).

### Problem Statement

Since entrepreneurship is not presented as a secondary school subject in South Africa, the only subject where there is a direct link with entrepreneurship development is Business Studies. The present Grade 10-12 curriculum for Business Studies specifically focuses on the development of knowledge, skills and values that are necessary for productive and effective business activities in both the formal and informal sectors (DBE, RSA, 2011:7). This curriculum also includes various outcomes to be mastered by learners, which covers business principles, the theory and practice that encourage the development of entrepreneurial initiatives, as well as sustainable businesses and economic growth (DBE, RSA, 2011:7).

Despite the obvious advantages held by the Business Studies Grade 10-12 curriculum in enhancing entrepreneurial competencies, the National Diagnostic Report (DBE, RSA, 2012a:40) shows a remarkably low achievement of the desired entrepreneurial-based outcomes (only 52.9% learners achieved above 40% in 2012) during the period

2009 to 2012. It is therefore evident that although the curriculum focuses on the development of entrepreneurial skills in its outcomes, it does not specify how these outcomes can be mastered in normal classroom settings. It is therefore necessary to find relevant teaching strategies for the enhancement of entrepreneurial competencies in sources other than the curriculum.

### Goal

The goal of this study was to enrich the Business Studies secondary school curriculum by proposing a strategy for the enhancement of entrepreneurial competencies and to measure the effect of an intervention on problem recognition and problem-solving.

In order to reach this goal, the following objectives were set:

- Develop additional activities for the promotion of active learning in Business Studies that focus specifically on problem-solving and the recognition of problems;
- Measure learners' performance regarding problem-solving and problem recognition; and
- Determine learners' experience of the teaching strategy to which they were exposed.

### Research Methodology

The research design (Table 1), which included quantitative and qualitative data collection, was a non-randomised control group pre-test/post-test with quasi-experimental design, with a non-probability sample of Grade 11 Business Studies learners. In this explorative research design, the sample of 47 learners was non-randomly divided into two groups, of which one formed the experimental group and the other the control group (Leedy & Ormrod, 2005:227). Although this sample is neither large nor representative enough for the generalisation of the results to the larger South African context, this was not the aim of this research. This research is rather an in-depth examination of the study population and their response to the teaching strategy proposed in this article.

**Table 1** The non-randomised control group pre-test/post-test design (adapted from Leedy & Ormrod, 2005:227)

| Group | Pre-test on scenario 1 | Intervention 1 | Post-test 1 on scenario 2 | Intervention 2 | Post-test 2 on scenario 3 |
|---|---|---|---|---|---|
| Experimental group ($n$ = 23) | X | X | X | _ | X |
| Control group ($n$ = 24) | X | _ | X | X | X |

In this study, the proposed teaching strategy was applied during the intervention stage of the research. The intervention was applied over four months, firstly to the experimental group and thereafter to the control group. The rationale for applying the same intervention on both the experimental and control group, but at different points in time, was threefold: first, for ethical reasons to ensure that both groups received the same treatment; second, the effectiveness of the enriched curriculum would be tested twice; and third, the effect of a time lapse between the intervention and testing would be tested, and consequently, the sustainability of the effect would be able to be ascertained.

During the intervention, the learners were presented with three different scenarios at different stages. The scenarios were based on case studies retrieved from Grade 12 Business Studies papers, which were relevant to the learning outcomes as described in the Grade 11 curriculum (DBE, RSA, 2011:26). Before the intervention commenced, both the experimental and control groups were given the same scenario. This was done to determine the degree to which both groups might be compared. When it was determined statistically that both groups were comparative, they completed the same pre-test,which consisted of three scenarios. All the scenarios expected the learners to answer the following questions based on the five steps of the problem-solving process:

1. Q 1: Recognise and identify the problem from the scenario.
2. Q 2: Define the problem that was identified.
3. Q 3: Generate various solutions to the problem.
4. Q 4: Choose the best option from the various alternatives.
5. Q 5: How would you implement the solution?

The first scenario on which Q1 to Q5 were based described an asbestos mining company that generates toxic substances situated next to a nature reserve, where environmental groups opposed the mine's resolution to open a second mine.

In the second scenario, a furniture factory owner had the intent to manufacture unique items for the export market, but he experienced various problems with his employees, such as a high absence from work, weak motivation and disloyalty.

The third scenario describes a manufacturing business producing compact disks (CDs) and digital video disks (DVDs) for local artists, which experienced a drastic decline in production and sales. Complaints of bad quality and weak service had been received.

After the pre-test, the experimental group was isolated from the standard Business Studies class and exposed to the first intervention, which comprised the application of an active learning-oriented

teaching framework for the enhancement of entrepreneurial competencies. The intervention on the experimental group included 28 contact sessions of 40 minutes each. During this intervention, observations of the reactions of the participants were made in order to determine the reaction and functioning of the participants. The intervention that was applied focused on a business simulation accompanied by proficiencies directed at problem-solving, which are demonstrated in Table 2.

**Table 2** Items to test learners' problem-solving abilities

| Question | Problem-solving items |
|---|---|
| 1 & 2 | Recognise problems (Item 1) |
| 3 | Analyse problems (Item 2) |
| 4 | Generate solutions (Item 3) |
| 5 | Choose the best solution (Item 4) |
| 6 | Implement the best solution (Item 5) |

After this intervention, the experimental group completed a post-test. This post-test had the same questions, the same type of scenarios and was on the same complexity level as the scenarios in the pre-test (Table 2). Hereafter, the second intervention was performed on the control group and embraced exactly the same problem-solving competencies that were applied during the first intervention on the experimental group. Although only the experimental group completed the post-test after their intervention, both groups were expected to complete a second post-test after the second intervention. The rationale was to determine the control group's performance after the intervention, as well as whether the experimental group showed a decline, improvement or no change in their performance, during the time lapse between them completing post-test 1 and post-test 2.

All the tests (pre-test and both post-tests) were assessed by the researcher and moderated by an independent teaching adviser. To be able to make quantitative interpretations, all the questions were marked by means of an assessment rubric. The scores from the assessment rubric were transferred to a four-point Likert scale, where score 1 = cannot demonstrate competency, score 2 = demonstrates competency with gaps, score 3 = demonstrates competency and score 4 = outstanding demonstration of competency.

In order to support the above quantitative results, a qualitative investigation was undertaken, where 10 of the learners were interviewed, and observations of the learners' experiences were made during the intervention process.

### Ethical Considerations

In this research, the researcher purposefully presented the same treatment to both the experimental and control groups so as to ensure that some learners were not deprived of the opportunity to develop their entrepreneurial competencies. Although all the parents of all the learners gave their permission for their children to participate in this research, the learners were assured that their participation would remain anonymous.

## Results and Discussion

### Quantitative Results and Discussion: Learners' Achievement after Intervention embracing the enriched Curriculum

The validity of the measuring instrument was investigated by means of exploratory factor analysis on items 1 to 5 indicated in Table 2, which yielded two factors, explaining 63.90% of the variation in the data. Item 1 yielded one construct (problem recognition), and items 2 to 5 yielded another construct (problem-solving), clearly indicating that problem recognition was represented by item 1 and problem-solving was represented by items 2 to 5. Therefore, construct validity of the above-mentioned constructs was assured.

To investigate reliability, Cronbach's alpha coefficients were computed. For the construct problem recognition, a Cronbach alpha value could not be calculated since the construct consisted of only one item. It is only necessary to calculate Cronbach alpha coefficients (internal consistency among items) in cases where constructs consist of more than one item. The Cronbach alpha coefficient for problem-solving was 0.61. According to Field (2005), alpha coefficients not lower than 0.6 indicate satisfactory reliability of the measuring instrument.

#### *Results of problem recognition*

The results of the pre-test, post-test 1 and post-test 2 pertaining to problem recognition are presented graphically in Figure 1. There was no remarkable difference between the two groups regarding the pre-test scores, as was to be expected, since none of them had been subjected to any intervention at that stage. This also confirms that both groups were comparable before the intervention commenced. The first intervention was performed on the experimental group only, and took place between the pre-test and post-test 1. During this time, the control group was not subjected to any intervention and continued with their normal school programme. The second intervention was performed on the control group only between post-test 1 and post-test 2. At that stage, the experimental group was not subjected to any intervention and continued with their normal school programme. The test scores were calculated out of a maximum of 4.0.

When comparing the achievement of the two groups, it can be noted from Figure 1 that the experimental group, which was exposed to the first intervention, performed remarkably better in post-test 1 than the control group, who had not received an intervention at that stage. After the second

intervention, applied to the control group only, the control group's achievement in post-test 2 was on a par with the experimental group's performance in post-test 1. However, in post-test 2, the experimental group's achievement was not only lower than the control group, but also lower than in post-test 1. This is an indication that the intervention should be continuously implemented and integrated with the curriculum, failing which, the effect might not be sustainable. It is noted that both groups yielded higher results for problem recognition after having being exposed to an intervention. Henrico (2012:9458) confirms that active learning enables learners to develop skills such as problem recognition. Man and Lau (2000:235-254), in a similar study, also found that learners performed better after an intervention embracing actual practices and situations.

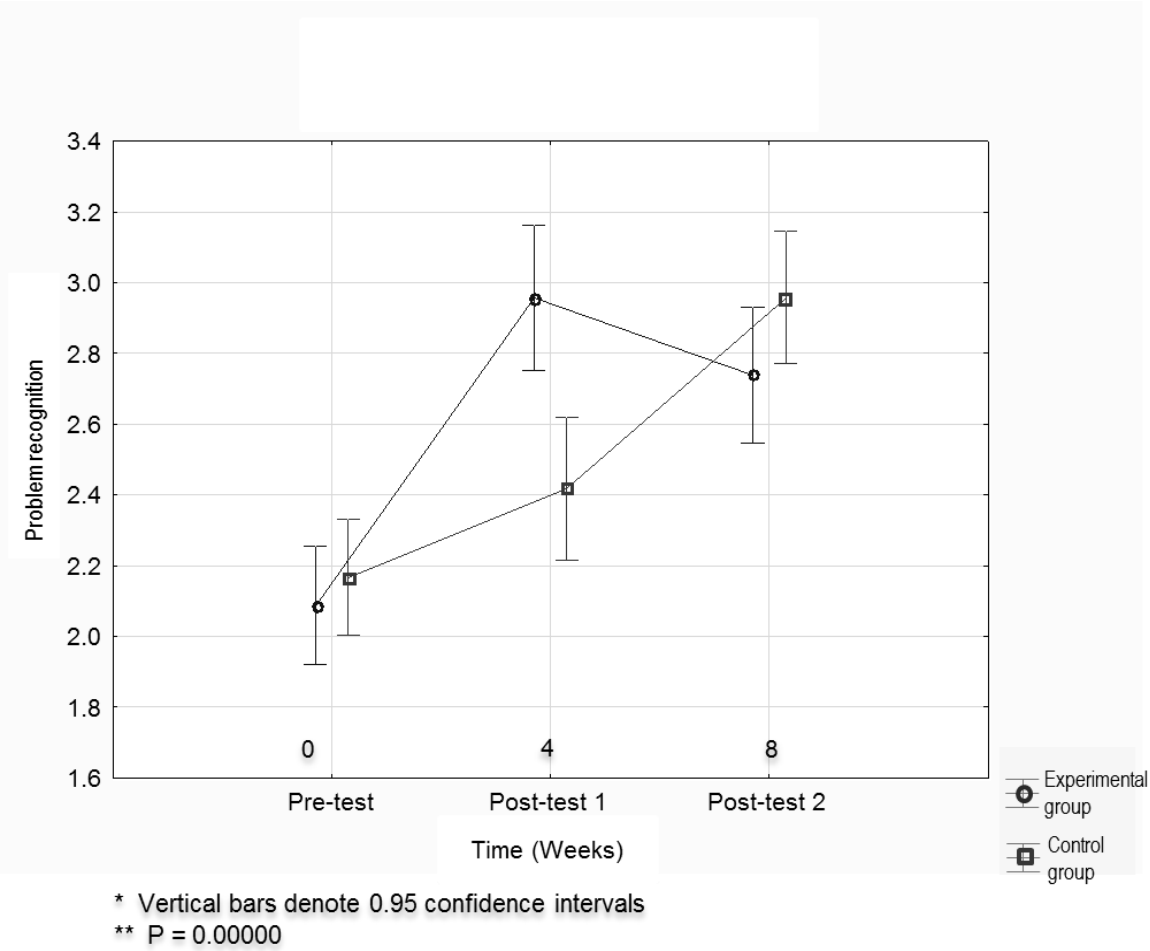


**Figure 1** Problem recognition scores

From Figure 1, it is apparent that a highly significant time interaction effect was obtained ($p < 0.00001$). Statistical significance, the $p$ value, shows that there was a difference between two groups based on some treatment (Steyn, 2005:1). This means that the performance of a specific group was dependent on a specific point in time. To bring this fact into perspective for the study being reported here, with the particular experimental design, it can be concluded that the groups performed differently, depending on whether the group was exposed to the intervention at a certain stage, or was busy with their normal school programme.

In Tables 3 and 4, the results of the statistical analysis regarding problem recognition of the first and second intervention, respectively, are provided. This will be discussed to statistically confirm the trend of Figure 1.

**Table 3** ANOVA for problem recognition of experimental group

| *n* | LS mean pre-test | LS mean post-test 1 | *p* value | *d* value | LS mean post-test 2 | *p* value | *d* value |
|---|---|---|---|---|---|---|---|
| 23 | 2.09 | 2.96 | < 0.05 | 2.6 | 2.74 | 0.7 | 0.4 |

The ANOVA is a statistically significance measure (Cohen, 1988:25). Table 3 shows that the Bonferroni *p* value after the first intervention (experimental group only) was < 0.05 ($p = 0.00000$), indicating a statistically significant difference (Steyn, 2005:1) between the pre-test and post-test 1 for problem recognition scores of the experimental group.The least squares (LS) mean value for the pre-test on problem recognition was 2.09, and for post-test 1 it was 2.96, which means that for the experimental group, there was a statistically significant improvement in problem recognition after the implementation of the intervention. Furthermore, a *d* value of 2.6 indicates that the improvement was also highly practically significant. Cohen (1988:25) defines the *d* value as the difference between two means divided by a standard deviation for the data. According to Cohen (1988:25), a *d* value > 0.8 has a large practically significant effect.

Table 3 also shows that the Bonferroni *p* value was 0.7 after the second intervention, indicating no statistically significant difference between post-test 1 and post-test 2 in terms of problem recognition scores for the experimental group that was not submitted to the second intervention at this stage of the research. The LS mean value for post-test 1 on problem recognition was 2.96 and for post-test 2 it was 2.74, meaning that there was no statistically significant deterioration in skills of problem recognition from post-test 1 to post-test 2. The *d* value of 0.4 indicates that the decline was insignificant, with only a small effect (Cohen, 1988:25).

**Table 4** ANOVA for problem recognition of the control group

| *n* | LS mean pre-test | LS mean post-test 1 | *p* value | *d* value | LS mean post-test 2 | *p* value | *d* value |
|---|---|---|---|---|---|---|---|
| 24 | 2.17 | 2.42 | 0.3 | 0.7 | 2.96 | < 0.05 | 1.5 |

Table 4 shows that the Bonferroni *p* value after post-test 1 was 0.3, indicating no statistically significant difference between the pre-test and post-test 1 for problem recognition scores of the control group that was not submitted to the intervention at this stage of the research. The LS mean value for the pre-test on problem recognition was 2.17 and for post-test 1 it was 2.42 and the *d* value was 0.7, which means that for the control group, there was an improvement in problem recognition with a medium practical effect. The slight improvement in knowledge of problem recognition between the pre-test and post-test 1, despite the fact that this control group had received no intervention at this stage, could possibly be ascribed to the fact that problem recognition is generally not such a difficult exercise in the process of problem-solving, and the group probably became more alert by merely participating in this intervention.

Table 4 also shows that the Bonferroni *p* value after the second intervention (control group only) was < 0.05 ($p = 0.00000$), indicating a statistically significant difference between the post-test 1 and post-test 2 problem recognition scores for the control group. The LS mean value for post-test 1 on problem recognition was 2.42, and for post-test 2 it was 2.96, which means that for the control group, there was a statistically significant improvement in problem recognition after the implementation of the intervention. Furthermore, a *d* value of 1.5 indicates that the improvement was also highly practically significant (Cohen, 1988:25). Tull (2012:1-2) as well as Crebert et al. (2011:10-11) confirm the enhancement of problem recognition in the process of problem-solving through the application of active learning.

*Results of problem-solving*

The results of the pre-test, post-test 1 and post-test 2 are presented graphically in Figure 2. There was no remarkable difference between the two groups regarding the pre-test scores, as was to be expected, since none of the participants had been subjected to any intervention at that stage. The first intervention was performed on the experimental group only, between the pre-test and post-test 1.

The control group was not subjected to the first intervention and continued with their normal school programme. The second intervention was performed on the control group only between post-test 1 and post-test 2. At this stage, the experimental group did not receive any intervention and continued with their normal school programme.

When comparing the achievement of the two groups, it can be noted from Figure 2 that the experimental group, which was exposed to the first intervention, performed remarkably better in post-test 1 than the control group did. This was to be expected, as the latter group had not received an intervention at that time. After the second intervention, in post-test 2, the control group's achievement was on a par with the experimental group's achievement in post-test 1. However, in post-test 2 the experimental group performed lower than the control group, but slightly higher than they did in post-test 1. It is noted that both groups yielded higher results for problem-solving after having been exposed to an intervention. Coffman (2006:3) confirms that a simulative set-up encourages learners to solve real-world problems and therefore problem-solving. Farrington et al. (2012:28) agree that business simulations will improve entrepreneurial skills such as problem-solving.

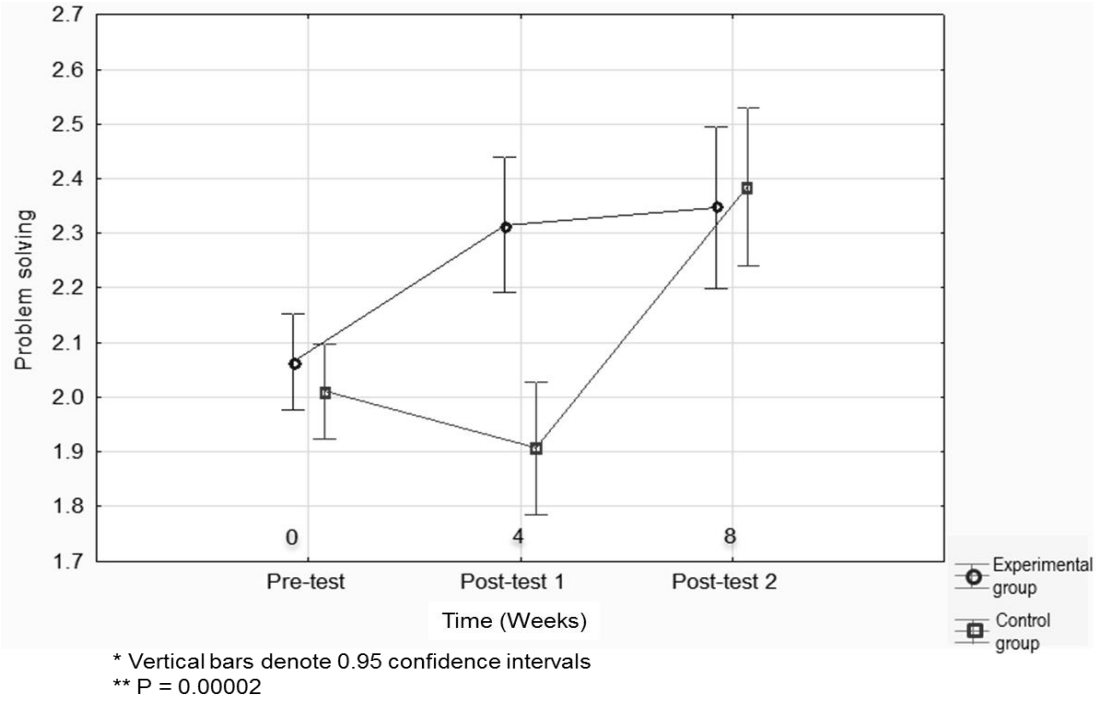


**Figure 2** Problem-solving scores

From Figure 2, it is apparent that a highly significant group time interaction effect was obtained ($p < 0.00001$). This means that the performance of a specific group was dependent on a specific stage in the study. To bring this fact into perspective for this study, with the particular experimental design, the conclusion can be made that the groups performed differently, depending on whether the group had been exposed to the intervention at a certain stage, or was busy with their normal school programme.

Findings derived from both Figures 1 and 2 clearly indicate that this teaching strategy involving active learning and business simulation advances problem recognition and problem-solving skills, which will be to the advantage of secondary school learners world-wide. The Commission of the European Communities (2006:7) as well as Marques, Ferreira, Gomes and Rodrigues (2012:669) confirm the importance of integrating entrepreneurship education into secondary school curriculums. Consequently, it is crucial for secondary school learners in South Africa and in the rest of the world to take note of the findings of this study.

In Tables 5 and 6, the results of the statistical analysis of the first and second intervention are provided and will be discussed to confirm the trend of Figure 2 statistically.

**Table 5** ANOVA of problem-solving of experimental group

| *n* | LS mean pre-test | LS mean post-test 1 | *p* value | *d* value | LS mean post-test 2 | *p* value | *d* value |
|---|---|---|---|---|---|---|---|
| 23 | 2.07 | 2.31 | < 0.05 | 0.6 | 2.35 | 1.0 | 0.1 |

Table 5 shows that the Bonferroni *p* value after the first intervention (on the experimental group only) was < 0.05 ($p = 0.00000$), indicating a statistically significant difference between the pre-test and post-test 1 for problem-solving scores of the experimental group. The LS mean value for the pre-test on problem-solving was 2.07 and for post-test 1 it was 2.31, which means that for the experimental group there was a statistically significant improvement in problem-solving after the implementation of the intervention on the experimental group. Furthermore, a *d* value of 0.6 indicates that the improvement was also of medium practical significance (Cohen, 1988:25).

Table 5 also shows that the Bonferroni *p* value after the second intervention was 1.0, indicating no statistically significant difference between post-test 1 and post-test 2 for the problem-solving scores of the experimental group. The LS mean value for post-test 1 on problem-solving was 2.31 and for post-test 2 it was 2.35, which indicates that there was no statistically significant increase in the knowledge of problem-solving from post-test 1 to post-test 2. The *d* value of 0.1 also indicates that the slight increase had no practically significant effect (Cohen, 1988:25).

**Table 6** ANOVA for problem-solving of the control group

| *n* | LS mean pre-test | LS mean post-test 1 | *p* value | *d* value | LS mean post-test 2 | *p* value | *d* value |
|---|---|---|---|---|---|---|---|
| 24 | 2.01 | 1.91 | 1.0 | 0.5 | 2.38 | < 0.05 | 2.2 |

Table 6 shows that the Bonferroni *p* value after post-test 1 was 1.0, indicating no statistically significant difference between the pre-test and post-test 1 for the problem-solving scores of the control group, which was to be expected, since this group had not been exposed to the intervention at this stage. The LS mean value for the pre-test on problem-solving was 2.01 and for post-test 1 it was 1.91 and the *d* value was 0.5, which means that for the control group, there was a slight decline in the scores of problem-solving with a medium practically significant effect which can possibly be ascribed to teaching problems in the classroom (an absent teacher at that point of time).

Table 6 also shows that the Bonferroni *p* value after the second intervention (control group only) was < 0.05 ($p = 0.00000$), indicating a statistically significant difference between post-test 1 and post-test 2 with regard to problem-solving scores for the control group. The LS mean value for post-test 1 on problem-solving was 1.91 and for post-test 2 it was 2.38, which means that for the control group, there was a statistically significant improvement regarding problem-solving after the implementation of the intervention. Furthermore, a *d* value of 2.2 indicates that the improvement was also highly practically significant.

### Qualitative Results and Discussion

The qualitative results are discussed by reporting the findings of the observations and interviews.

#### *Observations*

The Grade 11 learners' reactions were observed by the researcher and also the expert teaching advisor during the presentation of the intervention as well as during the three tests. Before any intervention, the participants initially struggled to solve problems from a scenario during the pre-test, because they could not identify enough problems in the scenario. The participants were also unable to analyse the chosen problems correctly. Participants could generate ideas, but struggled to identify the best possible solutions. The participants could not at all implement the chosen solutions. During the course of the intervention, the researcher used a process of encouragement and mediated learning (scaffolding) to enable the participants to identify and describe all the possible problems. Mediated learning entailed the provision of teaching support until the participants were competent enough to identify and solve problems without the support of the researcher. By the end of the intervention, participants were able to identify more problems on their own and could analyse these problems effectively. They also offered effective solutions. Their implementation of the chosen solutions had also improved.

The validity of the observations in this investigation was strengthened through confidentiality and credibility of the observations. Although the observations were not anonymous, the participants were assured that none of the results would be linked to their names. The researcher is confident about the degree to which there was meticulous analysis of the data, and believes that the observations gave an accurate representation of the social world of the participants (Neuman, 2007:294). Confirmation was obtained through the verification of the observations to literature. A reflective analysis was applied through the awareness of the researcher in terms of his influence on the behaviour of the participants (O'Leary, 2004:58).

The reliability of observations was assured through the internal and external consistency of the happening that was observed (Neuman, 2007:294). In the current study, internal consistency was obtained through the actual completion of the observation sheet that focused on the same aspects of the different teaching sessions and the same criteria. External consistency was obtained through the involvement of the expert teaching advisor,who observed the teaching of the researcher.

#### *Interviews*

The validity of the interviews was assured, through the trustworthiness of the interviews, namely their credibility and transferability (Bezuidenhout, 2005:170-172). Credibility was obtained through the extended and varied involvement of the researcher in the empirical field, peer evaluation, monitoring of progress and evaluation of the research process (Poggenpoel & Myburgh, 2004:421). In addition, a thorough, relevant literature study was done to confirm the purpose of the study was reached (Kruger & Gericke, 2004:44), to formulate interview questions, and verify data (Shenton, 2004:69).

Transferability was obtained through a description of the method whereby participants were chosen for the interviews, provision of a correct and rich description of the results so that the voices of the participants could be heard (Poggenpoel & Myburgh, 2004:421) and by determining the appropriateness within similar contexts (Shenton, 2004:71). Data from the interviews was discussed, based on appropriate direct quotations, to confirm results after an intensive data analysis was done.

Reliability was investigated by examining consistency and confirmation of the data (Bezuidenhout, 2005:170-172). Consistency was assur-

ed by investigating the contribution of dependability of the data (Poggenpoel & Myburgh, 2004:421). In this investigation, the dependability was obtained through a process of verification and data reduction. The interview questions were evaluated by the teaching advisor, and with the consensus of the researcher, further refined to address the themes (Kruger & Gericke, 2004:44).

In this investigation, the confirmation was obtained through the verification of the data to literature. A reflective analysis was applied through the awareness of the researcher in terms of his influence on the data (O'Leary, 2004:58).

The Grade 11 learners were interviewed after completion of the intervention. Although some of the respondents indicated that they had struggled with problem-solving, most of them indicated that they had learned to correctly identify and solve problems. A few remarks of the learners were (responses are given verbatim):

- "*...to work in a group and sit there and sort out the problem is pleasant*" [*sic*].
- "*I learned a lot, I acquired skills, I do not like scenarios, but I acquired the skill to approach scenarios in a better way*" [*sic*].
- "*...because now I know how to do problem recognising and problem-solving and therefore understand case studies correctly, my business skills increased*" [*sic*].
- "*I had a different approach to problem recognition after the intervention*" [*sic*].
- "*I enjoy completing the scenario because of better understanding of how to recognise and solve problems after the intervention*" [*sic*].

## Conclusion

The main aim of the study was to establish whether the enhancement of the problem-solving competencies of Grade 11 learners in Business Studies can be achieved through an extended curriculum. This entailed the development of additional activities in the Business Studies curriculum regarding problem-solving competencies, specifically the recognition of problems and solving these problems in a true to reality business simulated set-up, particularly applicable to groups of learners in a cooperative learning environment.

Relevant literature and definitions were studied to assure that the problem solving process was broadly described and therefore used in the study. In addition, teaching methods focusing on simulative, active and cooperative learning that can assist in the enhancement of problem-solving were studied. The current curriculum of Business Studies for Grade 11 for term two regarding problem solving was also investigated. An extended curriculum was developed in order to enhance Grade 11 learners' problem recognition and problem-solving competencies. The curriculum focused on active learning in a business-simulated set-up.

Learning gain when applying this extended curriculum, was measured quantitatively by comparing learners' pre-test and post-test scores. The results revealed that the experimental and control groups' problem recognition as well as problem solving competencies, increased statistically and practically in a significant way after application of the intervention.

Qualitative assessment of the application of the extended curriculum by ways of observations and interviews clearly indicated that the extended curriculum can be used successfully to enhance the entrepreneurial competencies of Grade 11 learners in Business Studies. It also revealed that the learners had a positive experience during the intervention, and that they experienced the activities as challenging, useful and interesting. The implementation of the extended curriculum also promoted social interaction between the learners, and therefore, the curriculum is deemed suitable for group work, and not individuals, during the teaching and learning process. It is consequently strongly recommended that secondary school curricula for Business Studies are enriched by these strategies, not only in South Africa, but worldwide. Further consideration should also be given to teacher training and parental awareness about the benefits of these specific strategies. Although the teaching framework was applied to relatively small groups of learners, it should also be successful in bigger groups.

An extended Business Studies curriculum with a strong focus on active learning in a business-simulated set-up is highly recommended. Furthermore, it should be continuously implemented, to assure a sustainable, long-term effect. This curriculum could have the advantage that learners would be challenged to recognise and solve problems in different scenarios, which would enable them to apply their competencies in a wider range of practical situations and therefore respond to scenarios more effectively. In addition, the enhancement of problem-solving as an entrepreneurial competency will also equip learners with a relevant set of knowledge principles and practical skills to both start and operate a business.

Limiting factors included a lack of financial support for the research, which could be carried out in one school only. Secondly, although all theGrade 11 learners in the school that took Business Studies were involved in this study, there were only 47 of them. Thirdly, the teaching framework was also not tested on all race and socio-economic groups in society. Future research would be useful to test the extended curriculum in more secondary schools and grades (Grade 7-10). This curriculum can also be tested in circumstances that include all the race and socio-economic groups in our diverse population.

The contribution of this study is the development of an enriched curriculum for Business Studies that demonstrates enhanced problem-

solving skills as an entrepreneurial competency and also increases exposure of the learners in practice. In addition, this curriculum can enhance entrepreneurial proficiency, and therefore also contribute to an accelerated pace of economic growth and job creation in our country. Since many potential entrepreneurs in a largely unemployed environment in South Africa start their businesses owing to a need to survive, and without the necessary skills, we aver that the extended curriculum discussed in this study can address this challenge.

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