Unlocking creativity in tertiary students

Mary McLeod (McKavanagh), Student Services, Central Queensland University, Australia, m.mcleod@cqu.edu.au

Roslyn McCarthy, Student Services, Central Queensland University, Rockhampton, Australia, r.mccarthy@cqu.edu.au

Bradley McConachie, Student Services, Central Queensland University, Rockhampton, Australia.

Abstract

This study investigated how changes in the explanatory style of university students can lead to conditions that can enhance creative thinking. Seligman's theory of explanatory style optimism has been associated with increased feelings of well-being, academic success, popularity, and creative problem-solving. In contrast his theory of pessimism has been associated with depression, low achievements, poor social skills, and lack of creativity. Other theorists have linked blocks for creativity to attitudes of failure avoidance, past experiences of failure, repeated stress, extrinsic motivation, lack of enjoyment, and reactive attitudes. Qualitative analyses using Nvivo 7 was made of the comments of 50 students who completed the nine week programme "Get optimistic about study". The programme was presented using innovative and creative methodology. Data taken at pre-programme and post-programme intervals showed themes that suggest enhanced creativity in post-programme comments. Further quantitative analysis of the data is recommended to investigate how changes in creativity may have influenced the academic results of participants.

Introduction

Literature review

Creativity, as viewed within a Western way of thinking, is seen as a valuable gift of life, no less in the university setting than in the general community (Sawyer, 2006). While creativity can be conceptualised in a field as narrow as the art world, Sawyer's reference point is how people cope with life's challenges. Psychologists studying creativity have further demystified this characteristic by deducing that creativity is based on cognitive structures common to all persons. Sawyer and Schonoenherr (2005; cited in Sawyer, 2006)) define creativity as a skill to be learned and assert that a person needs to work hard to be more creative: in other words it requires diligence to think and act more creatively.

If it is normal to be creative, Abramson et al. (1978) explain the phenomenon that steals a person's creative powers by formulating the 'learned helplessness' model

for depression. Working from the discovery that certain dogs failed to escape from unpleasant situations, they investigated the syndrome of helplessness in humans. Seligman (1975) generalised their findings to people who feel battered by unsolvable problems and who learn to be helpless after failure. From the experiments with learned helplessness Seligman (1990) formulated a model of explanatory style optimism to determine whether the individual is more vulnerable following failure (pessimistic) or more likely to recover (optimistic). Although several theories conceptualise optimism as a stable trait (Scheier & Carver, 1993) Seligman's model lies closer to Masten's model of resilience (1999).

Seligman (1990) proposed that individuals with positive emotions possessed an optimistic explanatory style so that, even after many setbacks, they believe they can overcome obstacles to success. He defined explanatory styles as habits of explanation with consequences that optimists habitually strive for creative solutions while individuals with a pessimistic explanatory style habitually give up more easily.

Explanatory-style optimism is based on three tenets of thinking in response to adversity such as disappointment, distress or failure. These tenets are personalisation, pervasiveness and permanence. An optimistic explanatory style would encompass impersonal ("I can change this"), situational ("I can confine the negativity") and temporary ("next time I can do better"). In contrast the pessimistic explanatory style shows itself as personal ("I can't do this"), global ("I should stop studying") and permanent ("this always happens to me").

Siemenowski (1999) conducted a study to understand better how tertiary students explain academic disappointment and failure and why some students fail to maximise their learning potential. He found that a student's academic creativity is centred primarily on the individual's explanatory style which helps stabilise both self-efficacy and self-challenge. In fact the pessimistic explanatory style was found to reproduce, to varying extents, Seligman's (1975) finding of learned helplessness after adversity or stress.

Perhaps the pinnacle of stress in academia is doctoral studies. Past research into students studying at post-graduate level indicates that 50% of doctoral students in the United States do not complete their dissertation. Fries (2005) explored the coping cognitive strategies of doctoral-programme students. He found that optimistic students were able to maintain their creativity for longer periods while pessimistic students lost their creative energy after that period. It can be deduced from Fries' finding that pessimism is one of the reasons for poor stress management and diminished creativity in post graduate studies.

Creativity cannot be divorced from the concept of motivation. Rewards and punishments are often called "extrinsic" motivators because they are inducements superimposed upon the task itself. Extrinsically motivated students work primarily for rewards, for the good marks or the kudos which constitute a type of reward system. Kohn (1999) argues that although rewards are often used as motivators for all age groups extrinsic, rewards are, in fact, a poor substitute for genuine interest in a task particularly, in the case of adolescent university students. So, intrinsically motivated people are more likely to pursue optimal challenges, display greater innovativeness and to perform better than extrinsically motivated students under the same challenging conditions. In the words of Kohn (1999, p. 69) "intrinsic motivation is the protocol for self-determined creativity."

Linked to the above divergence is whether students are motivated by failure avoidance or by success orientation. In tertiary institutions Martin and Marsh (2003) noted how 30% of first-year students use failure avoidance to drive them to achieve and persist in the face of adversity. Failure avoidance induces a range of self-protective behaviours principal of which are self-handicapping and defensive pessimism. Self-handicappers deflect the reason for failure away from themselves while defensive pessimists set lower and lower standards thus reducing the likelihood that their behaviour will be judged as inadequate. In contrast Martin and Marsh described success orientation as characterised by optimism, energy and creativity, as well as resilience to setbacks. Students who are success oriented exhibit characteristics of self-belief, valuing of study, a love of learning and feelings of self-control, all of which relate to creative and expansive thinking and are associated with positive emotions. While this is undoubtedly a circular process in which either success or failure feed off circumstance Seligman's model is able to highlight how intervention can occur.

Tertiary experience inevitably contains a variety of negative events or interpretations that can induce an effect similar to learned helplessness. Hanley (1996) provided courses for students who had a history of failing in order to help them "take control of their learning." The researcher claimed that the main aim of the course was to change the students' perceptions of themselves and to induce creativity via catch cries such as "begin with the end in mind" so that this confidence would flow on to their studies. After the programmes those whose self-perceptions were enhanced showed a significant elevation in creative thought and deliberate action.

Diener and Dweck (1980) applied Seligman's theories to the educational field. They found that pessimistic children performed well on problems in which they continued to experience success but, under failure conditions, they used self-defeating thoughts like "I never had a good memory", harboured negative feelings towards the activity, and diverted their attention elsewhere (day dreamed, doodled, left the room). Their behaviour is similar to students who fail to achieve in a tertiary examination setting. In contrast the optimistic students in Diener's studies used more adaptive creative strategies and achieved better marks under the same failure conditions: 'That doesn't work. I'll try this", or 'I need to slow down and try to figure this out." These optimists enjoyed the challenge and learned from their mistakes. In other studies Kamen and Seligman (cited in More, 1998) found that, when comparing two people of equal academic abilities, the more optimistic person tended to get better grades than the pessimist.

Nevertheless students continue to fail at university. Furthermore, they continue to leave tertiary study in numbers that warrant investigation into the causes of attrition. Morgan and Tan (1999) examined the reasons for failure and attrition that students provided. It was difficult to differentiate successful from unsuccessful students as those surveyed presented similar attitudes towards the university experience. The key to the different outcomes for each group appeared to be how students vary in their responses to the challenges of university life specifically how they cope with adversity and disappointment.

In the meantime, Seligman (1995) studied the dichotomous explanatory styles of optimism and pessimism for more than 20 years before he developed an optimism training programme. This was the first programme that provided empirical evidence of the effectiveness of reformulating students' ways of thinking. In 1995 Seligman reported on this first optimism retraining programme conducted with 400 prepubescent children in Pennsylvania. Comparisons of pre and post-programme

data showed less depression and negative mood, increased social skills (popularity), higher academic achievement, and more creative problem-solving after the programme. This result was replicated in a study by McCarthy (2000) in which 150 Australian school children trained in explanatory-style optimism improved in areas of academic achievement, depression and social skills over children who received self-esteem training or those in a control group who received an alternate curriculum.

The potential was then tested for applying this process to tertiary students. A programme named "Get optimistic about study" (GOAS) was adapted from the model of the Penn Programme by Seligman (1995) for use with tertiary students at Central Queensland University (CQU). As with Seligman's original programme the CQU programme consisted of two main components: (1) cognitive therapy based on Ellis' identification of irrational thought patterns (Ellis & Dryden, 1987) and (2) techniques for identifying and changing patterns of pessimistic thinking. The letters that describe this process are ABCDE, where A stands for the activating negative event, B stands for the first catastrophic belief a person might have, and C for the feelings and actions that occur as a consequence of the negative thinking. Here Seligman introduces D, a skill of disputing the previous negative cognitions, which then leads to E, renewed hopefulness and energy for creative action.

In 2002 the GOAS programme was delivered in a small group format specifically for students on the Rockhampton campus of CQU. In 2004 delivery of the programme was broadened to include three other Queensland CQU campuses in Mackay, Bundaberg and Gladstone. It was also offered as an email-delivered course in which students used "reply all" in their weekly communications so that participants could discuss and support each other's progress.

The course focused on increasing the creative power of its participants and aimed to present the material in a creative, innovative manner. All areas were designed to be presented in fun and challenging ways. Sessions contained group games, cartoons, role plays, discussions and linking with peer support networks. The programme was organised to partner students through the challenges posed by a term of university study and ended with an examination preparation workshop.

Following the example of Hanley (1996), each session was prefixed by a large banner containing a catch cry that identified the session, e.g., "If you Do what you've always Done, you will Get what you've always Got." The banner was followed by reflection on progress and/or difficulties experienced. One aspect of explanatory style was introduced which encompassed techniques and strategies that students were asked to apply for the next week. These were directed towards a particular aspect of study skill, for example, blocks to writing assignments, coping optimistically with a disappointing result for an assignment, putting stress into perspective. The sessions ended with a game to process the experience such as "You want to be a Graduate?"

In 2005 the same programme was reformulated in a style suited for online delivery so that students studying in both distance and flexible modes could access this course. Games and exercises of the original programme were converted to other modes of delivery including discussion boards, unlimited access to facilitators and an audio/visual input for each session. In place of group discussions students were, as far as possible, organised into programme or faculty similar groups. The online course is now available as a free non-assessable course for each term of the university calendar.

This current study of the effects of the GOAS programme explores the hypothesis that pre- and post-programme self-evaluations will differ in factors that have been associated with cognitive and behavioural creativity such that post-program students' comments will show less learned helplessness and stress, but more intrinsic motivation, be more success-oriented in addition to a greater focus on the future than in the pre-program period.

Method

One hundred and fifty students participated in the online GOAS course over two terms of study in 2006. Participants were surveyed for their opinions before starting the programme and again post-program. Only 50 students (30%) completed both surveys. Respondents were 40 females and 10 males. Participants were asked one question pre-programme "Why have you enrolled in GOAS?" and one question post-programme "What difference, if any, has the optimism training made in your life as a student?"

Results

Data analysis

The qualitative data used in this research were sorted and coded using Nvivo 7, software developed by QSR International. This programme allows a researcher to develop themes in a practical and logical manner. The pre- and post-programme comments were imported into Nvivo 7 and were coded using the five areas of student creativity studied in this paper as:

1. Optimistic versus Learned Helplessness (OP)
2. Intrinsic versus extrinsic motivation (IM)
3. Success orientation versus failure avoidance (SO)
4. Effective versus poor stress management (SM)
5. Future versus past orientation (FO).

Nvivo 7 was used for data entry, searching and sorting program. The researcher can increase the rigour of the results by running what are known as queries in order to search the data accurately and code all the concepts into manageable themes. Thus a combination of computer and manual techniques was used to minimise some of the restrictions of computer based analyses and to minimise human error.

The most effective function allowed by Nvivo 7 for this particular type of research is a Matrix Query. This allows for a search relating to comments on the identified six themes before and after the programme. Using the data in Table 1 it is possible to identify comments relating to a particular attitude at two different times in a student's study. This allows an extrapolation of the effect the Optimism Program has on students' levels of creativity.

Table 1: Number of comments made before and after The Optimism Programme coded into the six factors of creativity

	BEFORE		AFTER	
	Negative	Positive	Negative	Positive
1 Optimistic Attitude (OA)	14	3	0	15
2 Intrinsic Motivation (IM)	17	0	2	4
3 Success Orientation (SO)	9	3	0	10
4 Stress Management (SM)	7	0	0	2
5 Future Orientation (FO)	7	0	0	1

The above table was created using a Matrix Query in Nvivo 7 which retrieved data coded along the five creativity factors both before programme and after programme. Table 1 relates to all comments made by students on each attitude which has been manually coded to record positive and negative comments.

Figure 1: Number of Pre and Post-programme comments on the six factors of creativity
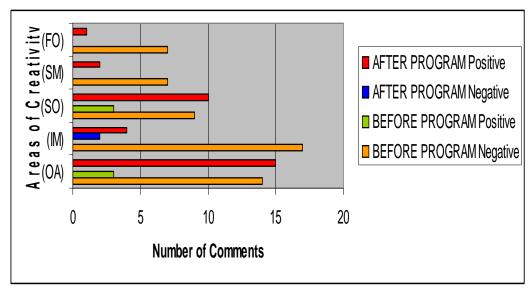

Figure 1 represents the data collected from Nvivo 7 in graphic form allowing a direct comparison between comments made before the programme both negative and positive as well as after the programme.

Figure 2: Themes Created in Nvivo 7 around creativity factors along both before/after and negative/ positive contingencies
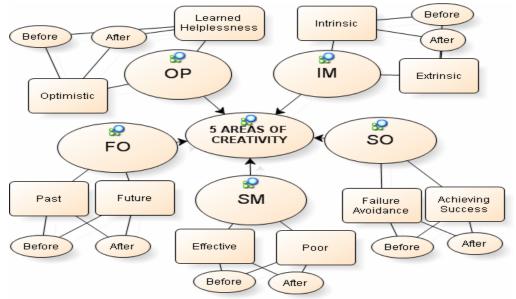

Figure 2 describes the five areas of creativity and their relationship to both productive and unproductive attitudes along each factor. For example a student's motivation (IM) can lead to intrinsic (positive) or extrinsic (negative) motivation measured before and after the Optimism Programme.

Results

Results of the 50 participants' pre- and post-program comments were analysed into the five factors as illustrated above.

Optimistic attitude (OA)

Optimistic attitude (OA) as described by Seligman et al. (1990) is how students perceive their studies and whether they make positive or negative explanations of past events. Before the Optimism Programme 17 comments were made about students' attitude towards the course they were studying of which 14 were pessimistic. These included comments such as, "This made me feel stupid and I felt like I mustn't be a uni person" and "The high expectations to succeed made me act out and not do as well." Other pessimistic comments related to poor motivation such as "After four years of study I am starting to lose my motivation" and "this term I have been struggling with motivation."

After completing the Optimism Programme no pessimistic remarks were made but 15 students expressed optimistic thoughts and feelings, such as "Overall I feel absolutely fantastic … the leader was like a big sister I never had" and "I value my study enormously." Other comments were oriented towards increased motivation, such as "I am more focused on my studies" and "I often found the remarks of others and the stories on the blackboard comforting."

Intrinsic motivation (IM)

Extrinsic motivation refers to any motivators that are offered to the students external to their control, for example rewards and punishments, whereas intrinsic motivation is energy driven from internal motivation (Kohn, 1999). External

motivation was clearly the biggest concern for students before commencing the programme. Over a quarter of all the comments (28.33%) made before the programme related to student concerns with external factors. These concerns were evident in comments such as "My problem has always been that all other jobs come before my studies and I would like it to be the other way around", or "What about when I am deliberately taking a long time organising my work schedule just so that I don't actually have to study?" and "There have been times when I have had huge work commitments as well as other work-related training, frantic studying for interviews etc."

After the programme more comments (4:2) related to intrinsic motivation with such statements as "GOAS helped me to access other students suffering similar issues as myself and gave me greater motivation" and "I find that I have so much more motivation this term and focus." Although the number of students expressing extrinsic motivation decreased from 17 to 2 some negative comments were retained post-programme such as "I seem to have spent a fair bit of time just trying to get used to everything again" and "well that's a challenge at the moment owing to my housing situation and the fact that the other people concerned are totally inconsiderate of my needs regarding] study."

Success orientation (SO)

Orientation towards study relates to whether a student is oriented towards avoiding failure or achieving success (Martin & Marsh, 2003).

Before the programme, responses from the participants (9:3) were oriented towards failure with such comments as "I am terrified!" and "I also feel that I struggle with my assignment writing, grammar and getting my thoughts down on paper properly." Students made reference to their failures and weaknesses rather than to actions that could rectify the situation. In contrast comments of post-programme students (10:0) were more success-oriented. "Utilising the GOAS programme has allowed me to be a little less critical of myself and therefore more in control" and "I have learned not to give up, to use my time more effectively, and that the impossible can be achieved." Participants were also more forward-looking: "I have learned to plan ahead and keep track of actual hours I study. I also know how to catch my pessimistic thoughts."

Stress management (SM)

Repeated stress can cause a person to develop a perspective in which they dwell on stressors and fail to work towards stress management (Hanley, 1996).
In the current study there was a reduction in negative stress reaction (7:0) and an increase of effective stress management (2:0) after the programme. Pre-programme comments included:

- "I spent far too much of my time worrying about what was coming next";
- "I really got overwhelmed and at the prospect of just having to do them, this includes investigation recording and writing draft versions let alone attempting a final product";
- "[I] found assignments and exams very stressful. Ended up with several physio appointments at the end of term to get the knots out of my shoulders";
- and "This semester I am studying two subjects over the Xmas holidays!! Eeeek! What have I done?"

By comparison post-programme comments showed better stress management strategies including peer networking and relaxation:

- "discussing things with other students was helpful especially when I felt overwhelmed and panicked over assignments. It was good to know that other professionals have been in the same boat as me";
- and "I particularly found the relaxation exercises helpful during the exam period."

Future orientation (FO)

Negative past experiences in study can deprive a student of the confidence to use their natural creativity when working in an academic setting (Morgan & Tan, 1999).

Prior to the Optimism Programme students focused on failure (7:0) when talking about their studies as the selected quotes show:

- "In the end I only completed one of the two assignments, and got so far behind with study that I was too embarrassed to sit the exam. I don't need to wait to find out what grade I got—I know I failed":
- "Failed all but 2 units":
- "I failed a subject last term; my first":
- and "I have trouble also with committing myself and organising my time, as such failed last term."

Only one post-programme comment fell into this category but was more positive and future focused (1:0):

"Just letting you know that I passed all my subjects this term different from last term when I failed them all. The course helped me a lot. This coming term will be busy but now I am armed with the tools of the program I am confident that I will get through it all with even better success."

Discussion

Results of this study showed that after participating in the Optimism Programme comments from participating students generally increased on the five indicators of potential creativity selected for analysis although no evidence was forthcoming that any one participant increased simultaneously in all factors. This agrees with Sawyer's (2006) claim that changes in creativity can be acquired through diligence and hard work. Although no student expressed the specific goal for increased creativity before commencing the programme, several comments illustrated students' desire to improve their capacity what researchers would qualify as cognitive creativity: " … I want to make a difference to my life … " and "I know I can do it."

The largest area of change occurred in students' increased optimism. In regard to the first theme of reducing learned helplessness (Abramson et al., 1978) and increasing optimistic thinking (Seligman, 1990), results strongly indicated that students' pessimistic thinking style before the programme (n=14) was replaced by comments demonstrating a more optimistic explanatory style (n=15). After completing the GOAS Programme comments attributed the negative experiences of a tertiary term in an optimistic framework. In contrast to the pre-programme

pessimistic triad of *permanence* ("It's too hard"), *personal* ("I can't do it") and *pervasive* ("I'm a failure at tertiary study") post-programme comments from students showed positive optimistic attributions associated with thoughts that are *temporary* ("This term I have done it"), impersonal ("I have learned new skills") and *specific* ("some courses are harder than others") thoughts. It can be concluded that training offered in the programme does lead to an increase in participants' optimistic explanatory style.

Accepting that extrinsic motivators of reward and punishment exercise control over a student and reduce their potential for creativity (Kohn, 1999), students' comments in this study showed decreased extrinsic motivation for study and increased intrinsic motivation. While extrinsic motivation is likely to privilege short-term activity at the expense of long-range interest in a subject, it is also contra-indicative to the goals of tertiary learning. Kohn believes it is essential that either external motivators be balanced by internal motivators or that extrinsic motivation become internalised through specific processes. In the present study optimism retraining focused on replacing the habit of personalising negative events with more objective thinking about external influences. The process of impersonalising negatives changes the person's thinking away from external motivation towards internal motivation. Seligman (1995) claimed that an optimistic explanatory style can dispute negative externals because it reduces *permanent* negative perceptions. "This adversity is not forever. I can find ways to improve." This helps to explain why comments changed from extrinsic motivation pre-programme (n=17) to intrinsic motivation post-programme (n=4). According to Kohn this movement towards intrinsic motivation indicates the possibility of an increase in creative thinking.

However although intrinsic motivation is highly desirable, most of the activities which students engage in are mainly influenced by extrinsic rather than intrinsic motivation (Czikszentmihalhyi & Nakamura, 2002).Thus the relationship between intrinsic and extrinsic motivation (4:2) in post-programme comments recognises that external motivation remains part of the reality of the student life.

According to Martin and Marsh (2003), 30% of first year university students use failure avoidance as their primary motivation although failure avoidance is seen as a predictor of learned helplessness and eventually of reduced creativity. Martin and Marsh stated, alternately, that success-oriented students tend to be optimistic. Results of this study assent to this phenomenon with pre-programme comments classified as failure avoidant reduced after students completed the programme (9:0). By contrast success-oriented comments increased from zero pre-programme to ten in the post-programme period. This result is consistent with Seligman's (1995) theory that optimistic people are more success-oriented than pessimistic people because of the different attributions pessimists and optimists use in regard to time. A pessimist is conditioned to view adversity as stable and *permanent* ("this bad thing always happens") and responds by initiating action to avoid such failure. In contrast the optimist uses a future oriented focus using specifically *temporary* atttributions ("next time I will try …") and is thus more focused on future success. It is this success-orientation that Martin and Marsh have linked with creativity in the first year of university study.

The third theme relating creativity to stress management was outlined by Fries (2005) whose work with prolonged stress showed its deleterious effect on post-graduate study. The present study into the creative affects of optimism training provided evidence for the efficacy of effective stress management. Before the programme seven students expressed negative stress responses while two

students identified positive management of stress after completing the programme. This holds additional significance in the experience of students because post-programme data was collected just before the term examination period when stress would normally be at its highest point. These results support generalisation from Diener and Dweck's (1980) explanation that optimistic children are likely to respond to stressful challenge in a more adaptive, creative way than pessimistic children. Likewise results are consistent with Seligman (1975) who proposed that pessimistic people are likely to believe challenges are unsolvable and will become passive, slow to learn, anxious and sad while optimists tend to be more actively involved in managing their stress.

The fifth area of creativity was directed towards the ability of a student to change focus from past failures to future possibilities. Hanley (1996) found that failing students had more difficulty learning how to succeed in study when they identified with their past failure, for example, saying of themselves "I am a failure." Orienting oneself to a positive future, according to Seligman (1990), can only occur when the person is able to deal with past disappointment or failure. Seligman's theory of optimism is centred on the person's ability to use helpful attributions to deal with past negatives (optimism) rather than negative attributions about past adversity (pessimism). The comments that fell into this category before the programme (n=7) were not repeated in the post-programme period but rather comments were made showing how student focus on past failure had been replaced by an optimistic future orientation viz., " … I am confident that I will get through it all with even greater success" and "I am now the one that is in full control of my course life as eventually, at the end of the day, it is my hard work that earns me the degree." From this result combined with Hanley's findings we can infer that students who become future-focused are likely to assume a creative cognitive perspective on study.

The Optimism Programme focuses on developing the person's internal strengths specifically their explanatory attribution style. Firstly it challenges the student to retrain their attributions into a more optimistic framework while providing information and practice. Thus it can minimise the impact of negative experiences by reformulating negative attributions exampled here as depersonalising: "Utilising the GOAS programme has allowed me to be a little less critical of myself and therefore more in control."

Secondly the programme teaches applied study skills in an innovative, creative way through activities like group games, visuals and cartoons all presented in a small group where students learn from each other in a learning community. In its approach the optimism programme reframes change as a journal of personal growth taken in the company of peers. From the results of this study such programmes have value in maximising conditions that may increase the creativity of its students, expressed by one student as: "Value the work, of course I do, it's going to see me achieve my life goals. Enjoy the work....I LOVE IT! excellent or I should say pretty good."

Limitations of the study

A limitation of this data is the sample from which students' comments were taken. As the GOAS programme is conducted online it is difficult to involve students in informal processes. Students enrolled in the flexible mode of delivery tend to fall into three distinct groups: those who enter fully into communications held on discussion boards; those who 'lurk' but do not make a comment; and those who make only a minimal entry into areas other than content delivery.

Although150 students completed the GOAS programme only 50 actually completed both pre- and post-test comments. While it is possible that such a sample would be biased towards students who have experienced positive outcome, this sample of 33% is within the acceptable range for analysis. However it must be acknowledged that this research failed to identify demographics of age, gender or culture that might provide significant information about which students are more likely than others to benefit from optimism training.

Due to the subjective nature of qualitative data, Nvivo 7 can be criticised on the question of reliability. Although Queries were used to help sort themes for the analysis, there was still a level of manual sorting which can lead to human error and bias. The Queries option in Nvivo 7, although a great help, is also rather selective depending on what the researcher is seeking. If a student did not use a particular word within the search then that comment would not show up. This was rectified by combining manual and thematic sorting. Finally, due to student anonymity, no direct correlations between before and after comments could be made although trends could still be identified. Future research could consider coding students' comments for individual pre and post comparison.

Recommendations and conclusions

This study set out to link the creative aspects of tertiary students' development to a psycho-educational programme "Get optimistic about study". Seligman (1995) claimed that retraining in optimism can produce improvement in social, emotional and cognitive areas of life which other theorists have identified as indicators for increased creativity in educational settings. The two major findings of this study were that a retraining programme in explanatory style optimism resulted in responses that demonstrated a more optimistic explanatory style and secondly that optimism training can change students' perceptions of themselves and their study in a number of areas theoretically linked to creativity. Changes identified in participating students' attitudes were from learned helplessness to optimism, from extrinsic to intrinsic motivation, from failure-avoidance to success-orientation, from poor stress to effective stress management and from dwelling on past failure to future success focus.

Diener and Dweck (1980) provided indicators for further research into the effects of optimism training on tertiary students. The optimistic students in their study were not only more creative but were also more academically successful. Other studies mentioned by Kamen and Seligman (1998) compared the results of students with equivalent abilities and found optimists to be more successful academically than pessimists. As this study has been able to suggest that improved optimism can provide a cognitive change that can lead to greater creativity, it would be fruitful to explore any further links between explanatory style optimism and improved academic progress.

It is recommended that further study include quantitative data concerning the academic consequences that follow optimism retraining of tertiary students in order to replicate the findings of McCarthy (2000) with school children. It can be hypothesised that an academic flow-on effect would be part of the profile of the student with an optimistic explanatory style (Seligman,1990), who is a normal person who uses creative thinking patterns (Sawyer, 2006) and from thence may be more intrinsically motivated (Kohn, 1999) and dynamically optimistic (More, 1998).

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