

Issues in conducting quantitative studies on the impact of coaching and mentoring in Higher Education

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Abstract

Whilst there has long been a call for evidence of a more quantifiable nature to show the impact of coaching interventions, in particular within the education sector, there may be good reasons for why this has been absent thus far. This paper highlights the issues of conducting quantitative research to establish outcomes of coaching interventions. It explores peer coaching within an educational context and the use of a control group. The paper highlights the methodology used to conduct a quantitative study of a peer coaching intervention, comparing the academic attainment of a coached group of students with a group of students who received no coaching. Some findings are also discussed.

Key words: Peer coaching, academic attainment, higher education, mentoring, quantitative study

Introduction

Clutterbuck (2010), who discusses the future of both coaching and mentoring, suggested that coaching has received less attention than mentoring as regards research. He observed that the bulk of the coaching literature is qualitative in nature and went on to say that the methodology used is often poor. He reports other concerns such as findings often being self-reported as well as definitions of the interventions being confused. Clutterbuck (2010) is not the first to cite these issues with mentoring and coaching research. Merriam (1983) carried out an early review of the literature on mentoring, including schemes within an educational setting, concluding that many of them were based on testimonials and opinion alone. In her review of the literature, Jacobi (1991, p526) also recognised the difficulties in determining whether these interventions were successful or not. She commented that success is often 'assumed rather than demonstrated' and highlighted methodological weaknesses in the reviewed studies stating that data was rarely collected from more than 50% of the sample leaving some doubt into the judgement. Over a decade later, D'Abate, Eddy and Tannenbaum (2003) mirrored the same concerns in their review of mentoring and coaching, where they attempted to determine some meaning and create a framework.

In an early study of mentoring, Kulik, Kulik and Shwalb (1983) drew a similar conclusion from their meta-analysis of 500 programmes stating that only 12% were of acceptable methodological quality. Later, Woodd (1997, p336) also suggested that 'what is being measured or offered as an ingredient in success is not clearly conceptualised'. Rodger and Tremblay (2003) too recognised that although descriptions of mentoring programmes designed to promote academic success were common, substantially fewer evaluations were available.

In other examples of quantitative peer support studies to determine impact on academic attainment (e.g. Ashwin, 2003; Coe, McDougall & McKeown, 1999; Bidgood, 2010; and McCarthy & McMahan, 1995) improvements were reported in academic attainment for those attending peer support sessions. However, the methodology used to obtain such findings was questioned by

Capstick, Fleming and Hurne (2004) as perhaps being somewhat unreliable. They suggested that the data relied on the comparison of grades of those attending peer support sessions to those who did not and did not take into account the self-selecting aspect of the interventions. Self-selection to a peer coaching intervention may also impede the findings when compared to a control group of either non-attenders or those who simply do not apply.

A sufficiently large number of participants is essential when considering quantitative analysis for both any control and experimental group. This allows not only for attrition but also for the confidence that can be held in the findings. However, attrition of research participants is also seen as problematic, resulting in missing data again compromising some coaching studies. Sanchez, Bauer and Paronto (2006) and Short and Baker (2010) seemingly experienced this difficulty when collecting post intervention data of a coaching programme suggesting that the small sample size was more conducive to a qualitative study. Earlier, Mosely (1997) reported difficulty collecting data from control group participants particularly as they often have no vested interest in the intervention. Whilst these numerous criticisms of previous literature may be justified it may be that some of the issues raised are to a degree insurmountable when attempting to conduct quantitative analysis of a coaching programme, incorporating use of a control group.

In this paper the methodology used to conduct a quantitative study of a peer coaching intervention is discussed. The research adopted a case study approach and was conducted within one Higher Education institution that adhered to good practice as defined by Husband et al (2009), Andrews et al (2011) as well as Thomas (2012).

Whilst there remains some confusion in the terms coaching and mentoring, in this study the intervention was labelled as peer coaching. Coaching is often described as 'goal focussed' and concerned with maximising performance, Whitmore (2003) whilst mentoring is often thought to be more of a transfer of knowledge as described by Parsloe and Wray (2000). As the study specifically aimed to determine how academic performance is impacted through the support of an older more experienced student supporting another less experienced student on a one to one basis, coaching, having such a result-orientated objective was deemed an appropriate term to use. and some findings presented.

Limitations of control group selection

The use of control groups has been discussed within many fields of research (Cole, 1979; Miettinen, 1970; Wacholder, Silverman, McLaughlin and Mandel, 1992). Randomized selection of control group participants, for example, is often cited as a robust. However, some authors such as Bryman (1998) suggest that conducting control group experiments within a laboratory setting may impact on the findings due to the clinical surroundings. Denscombe (2010) suggests that field experiments, being conducted in the participant's natural environment, allows for stronger external validity but that there is a high price to pay in terms of the controlling the variables. In a study of peer coaching however, because those in the coaching group usually self-select, it is not normally feasible to utilise a randomized selection method to identify those in a control group.

Selection of control group participants therefore is problematic and draws much criticism from researchers such as D'Agostino and Kwan (1995) who suggest that they are often performed with such restrictions that they do not provide a true measure of efficacy. To demonstrate effectiveness, they suggest a non-randomized trial whereby the participants can be selected through matching to the control group.

However, matching techniques, such as stratified sampling described by Fuller (1993) also brings difficulties as it is almost impossible to achieve a complete match of the control group with an experimental group. Whilst it is possible to statistically control for extraneous variance it is necessary

to first know the factors that might impact on the findings. It is likely also that some important variables may go unmeasured. D'Agostino and Kwan (1995) suggest that the efficacy of this type of technique is contingent on the researcher's ability to identify the important biasing variables. In particular, with regard to academic attainment there are said to be many factors that contribute to success.

As has been noted in previous studies of peer support interventions, the use of control groups has also been criticised for using a group comprised of non-attenders (Capstick, 2004). It is supposed that the characteristics of those participants who elect to engage with a peer support intervention will be different to those who select not to engage. An alternative approach may have been to deny the coaching to a proportion of those who applied for it and compare their data with those who were allocated a coach. However, in the current study it would have been deemed as unethical to deny or delay the requested coaching intervention to participants who had requested and needed it. Aside from the ethical issues it would likely have proved impossible to achieve a complete match of the control group participants with the coaching group.

Another consideration would be the possible impact on the data provided by those who had been denied a coach. This data might also be affected by the withholding of the coaching intervention. Selection of a control group by creating a 'waiting group' of participants who had applied for coaching might also be considered. However, this delayed approach too is likely to be not only unethical but impractical as the timeframe for a coaching intervention of perhaps just a few weeks or months would not allow for such a delay and deprive participants of the intervention that they were seeking.

Other possible influences on academic attainment

Another issue with the study of impact on academic attainment through coaching or indeed any similar intervention, is the number of factors that are said to impact achievement of higher education students. Kyllonen (2012) suggests that non-cognitive skills are as important for academic success as academic readiness. Poropat (2009) found that conscientiousness (the trait indicating the degree to which one works hard, persists, and is organised) had the highest correlate with grades. A meta-analysis conducted by Richardson, Abraham, and Bond, (2012) identified 89 distinct correlates out of which 41 were significantly correlated with grades. Prior academic measures were found to have a medium correlate with grades whilst demographic factors showed a small correlation. The strongest predictor was performance self-efficacy and academic self-efficacy. These findings were consistent with the meta-analysis conducted by Robbins, Lauver, Le, Davis, Langley, and Carlstrom (2004) who also found that retention was best predicted by academic goals, academic self-efficacy and academic-related skills. Students Grade Point Average (GPA) was best predicted by academic self-efficacy and achievement motivation. It was found that these relationships held true even after controlling for socioeconomic status, achievement test scores, and high school GPA.

Other factors such as ethnic and socioeconomic group are also frequently reported as being significant factors in student achievement (Connor, Tyres, Modood and Hillage, 2004; Crawford, 2014), and McKenzie and Schweitzer (2001) suggest that integration into university, self-efficacy, and employment responsibilities were also predictive of university grades. Student engagement with their institution has also been reported to be linked to success and a robust body of literature is available to support the link between educationally purposeful activities and positive outcomes such as student satisfaction, persistence, academic achievement and social engagement (Astin, 1984, Berger and Milem, 1999; Chickering and Gamson, 1987; Goodsell, Maher and Tinto, 1992; Kuh, 1995; Kuh et al., 2005; Pace, 1995; Pascarella and Terenzini, 1991, 2005).

Nicol (2009) suggests that academic engagement is likely to be enhanced when students have some understanding of what they are trying to achieve, actively engage in relevant learning activities

in and out of class, receive regular and constructive feedback on their performance and have opportunities to use this feedback to make performance improvements in their work.

With so many factors that may contribute to academic attainment it is difficult for any study to determine with any degree of confidence that the differences found in the attainment of a control group and the coached group can be attributed to any intervention offered.

Methodology

The research explored a 10-week long peer coaching intervention at a university in the south of England. A moderated process was used to formulate an experimental coaching group and control group for comparison. The aim of the research was to explore the impact of the peer coaching on academic attainment. A mixed methods approach was used where the module grades of those who received coaching were compared to those who did not. In addition, the academic behaviour confidence was measured pre and post coaching using the Sander and Sanders (2009) ABC questionnaire.

Participants were invited to be part of the study as either a coachee or as part of a control group. A purposive approach to selection, described by Denscombe (2010), was used to select the control group participants with respect to categories such as sex, age, course studied and year group and matched as closely as possible to those who elected to be coached. Frequency matching described by Gail (2005) sought to assure that cases and controls had the same distribution over strata defined by matching factors. However, it was found to be impossible to match a similar proportion of participants who shared exactly the same characteristics as the coached group as can be seen in Tables 1. and 2.

Year	1 st (level 4)	2 nd (level 5)	3 rd (level 6)	4 th year	Total
Control Group	48	39	6	0	93
Coached Group	82	52	14	2	150

Table 1: Number of participants in the control and coached groups

Academic School	Number of control group students	Number of coached students
Life & Medical Sciences	20	30
Law School	18	23
Business School	35	40
Engineering	9	13
Physics, Astronomy & Maths	1	13
Humanities	7	16
Education	3	14
Nursing	0	1
Total Number	93	150

Table 2: Breakdown of students who took part in the study

It can be seen that a greater number of students participated in the study as a coachee than in the control group. Attempts were made however to homogenise the groups by, for example, eliminating those who could not be matched with any student in the coached group. Denscombe (2010) states the necessity of selecting two groups as similar as possible in terms of their composition, one identified as the 'treatment group' and the other the 'control'.

The method used to select the control group followed Mosely's (1997) use of a quasi-experimental methodological approach which he describes as being less intensive in its data requirements. This approach requires two populations to be compared where one benefits from an intervention and the other does not. Mosely (1997) suggests that this method calls for baseline data and well as post data collection. He also discusses the issues of data collection from the control group who are unlikely to be motivated to provide it having had no connection to the activity being evaluated.

Whilst this matching process is less precise than might have been preferred, the need for precise matching is reduced as the sample sizes grow and the differences in the participants counteract each other. Denscombe (2010) suggests that with a larger sample size there will be some balance between the proportions within the sample and the proportions which occur in the overall population. The relatively large sample sizes in this study allowed for a relative degree of confidence to be held in the findings.

Agudo and Gonzalaz (1999) suggest that each study should be evaluated on its own merits. There are certainly limitations in the selection methods of any control groups since, as described, precise matching to the coached group will likely be impossible. In addition, there will possibly be some differences in the characteristics, such as motivation levels of the participants who applied for a coaching intervention when compared to those who did not.

For the majority of coaching interventions, it is likely that participants will self-select to take part or not. Even if the peer coaching has been recommended to them or the participant is referred to the programme due to under-achievement they will still have a degree of choice in whether to subsequently arrange to meet with their coach or not. Whilst a proportion of these referred participants in this study might not have subsequently engaged with the coaching it is debatable as to whether they would be deemed suitable for inclusion in the control group. Using those who express an interest in coaching but then subsequently decline to take up the offer could also form a control group. However, it may be that those who are performing worst academically are either more or less motivated to take part and even if the variables could be factored into the statistical calculations they would also be likely be self-reported perceptions and therefore deemed as questionable.

Quantitative data were collected from the participants both pre and post coaching in the form of Likert scale questions. In total 65 completed sets of pre and post questionnaires were collected from the 150 students who received coaching. This quantitative data was stored and manipulated using SPSS. Coachees were asked both pre and post coaching to specify their level of confidence and satisfaction in the following areas using a 7 point Likert scale:

- How satisfied they were with their academic progress so far
- How they felt they were managing the requirements of their course
- How satisfied overall they were with student life

Whilst the peer coaching was not particularly designed to support student satisfaction there would be likely be a link with this and academic performance as has been explored by McKenzie et al (2001) and Martirosyan (2014).

QUESTION (Likert scale 1-5)	Pre- coaching	Post-coaching	Increase/
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Tests were carried out on the reliability of the scales and to determine internal consistency using the guidance provided by Pavot, Diener, Colvin and Sandvik (1991). Using these guidelines, the three scales were found to have a good internal consistency, with a 0.86 Cronbach alpha coefficient reported. A paired sample t-test was then calculated to determine whether there was a statistical increase from pre to post coaching

Findings

The results would indicate that the students perceived themselves to be performing better academically, were more satisfied with their academic progress and with general student satisfaction from pre to post coaching. There was found to be a statistically significant increase in student satisfaction with their academic progress from pre-coaching (M = 3.56, SD = 1.45) to post coaching (M = 4.30, SD = 1.43), $t(60) = 3.65$, $p < .0005$ (two-tailed). The mean increase in satisfaction with academic progress was 0.74 with a 95% confidence interval ranging from 1.14 to 0.33. The eta squared statistic (.18) indicated a LARGE effect size.

There was also a statistically significant increase in the student's perception of how they were managing their course requirements from pre coaching (M = 3.98, SD = 1.41) to post coaching (M = 4.72, SD = 1.37), $t(59) = 4.24$, $p < .0005$ (two-tailed). The mean increase in perception of being able to manage their course requirements was 0.74 with a 95% confidence interval ranging from 1.08 to 0.39. The eta squared statistic (.24) also indicated a LARGE effect size.

There was also a statistically significant increase in the student's satisfaction with student life from pre coaching (M = 4.24, SD = 1.48) to post coaching (M = 4.77, SD = 1.30), $t(61) = 3.07$, $p < .0005$ (two-tailed). The mean increase in satisfaction with student life was .53 with a 95% confidence interval ranging from 0.88 to 0.19. The eta squared statistic (.13) indicated a MODERATE effect size.

Post Coaching Perceptions

In addition to pre-coaching questions the Sander et al (2009) Academic Behaviour Confidence (ABC) scale which has been widely utilised as a survey instrument in pedagogical research and practice was also administered both pre and post coaching. This enables self-efficacy and self-concept to be measured on academic confidence only. Self-efficacy has been demonstrated to be instrumental in academic success as has been reported by Pajares et al (2006), Crozier (1997) and Sander et al (2009). In particular, within a higher education context where autonomy and independence of students are essential to success it is said to affect academic performance. The full table of pre and post results can be found in Table 3.

From the calculations presented it was seen that there was an increase in the mean scores of all 24 aspects of self-efficacy from pre to post coaching. The Eta squared statistic was calculated to determine the effect size of each item using Cohen's (1998) guideline where .01 is a small effect, .06 is a moderate effect and .14 is a large effect. The least impact or movement was seen with 'attending tutorials' although the initial pre coaching mean score for this question was relatively high at 4.1. As the aim of the coaching was academically focused it is not surprising that 'Making the most of the opportunity of studying for a degree at university' showed little change from pre to post coaching. The more social aspects of attending university were not stated to be a particular focus for the peer coaching intervention

It can be seen that the most notable areas of improvement as shown in Table.3 were with 'Producing your best work under examination conditions' showing a mean increase of 0.84 (from 2.59 to 3.33) and 'Managing your workload to meet coursework deadlines' showing a mean increase of 0.63 (from 3.27 to 3.98)

Confidence in your ability to:	mean score	mean score	Decrease
1 Study effectively on your own in independent/private study	3.35	3.92	+ 0.57
2 Produce your best work under examination conditions	2.59	3.33	+ 0.74
3 Respond to questions asked by lecturer in front of a full lecture theatre	2.57	3.12	+ 0.55
4 Manage your workload to meet coursework deadlines	3.27	3.98	+ 0.71
5 Give a presentation to a small group of fellow students	3.43	3.88	+ 0.45
6 Attend most taught sessions	4.12	4.33	+ 0.21
7 Attain good grades in your work	3.08	3.70	+ 0.62
8 Engage in profitable academic debate with your peers	3.08	3.40	+ 0.32
9 Ask lecturers questions about the material they are teaching, in a one-to-one setting	3.60	3.90	+ 0.30
10 Ask lecturers questions about the material they are teaching, during a lecture	2.83	3.33	+ 0.50
11 Understand the material outlined and discussed with you by learners	3.31	3.63	+ 0.32
12 Follow the themes and debates in lectures	3.33	3.55	+ 0.22
13 Prepare thoroughly for tutorials	3.10	3.53	+ 0.43
14 Read the recommended background material	2.86	3.24	+ 0.38
15 Produce coursework at the required standard	3.15	3.64	+ 0.49
16 Write in an appropriate academic style	3.12	3.47	+ 0.35
17 Ask for help if you don't understand	3.42	3.88	+ 0.46
18 Be on time for lectures	4.10	4.34	+ 0.24
19 Make the most of the opportunity of studying for a degree at university	3.51	3.73	+ 0.22
20 Pass assessments at the first attempt	3.49	3.68	+0.19
21 Plan appropriate revision schedule	2.79	3.41	+0.62
22 Remain adequately motivated throughout	2.66	3.24	+ 0.58
23 Produce your best work in coursework assignments	3.17	3.58	+ 0.41
24 Attend tutorials	4.20	4.32	+ 0.12
Average Scores	3.26	3.68	+ 0.42

Table 3: Pre and Post Mean Scores for Sander and Sanders (2009) ABC Scale

Another significant increase was found with 'Planning an appropriate revision schedule' showing a mean increase of 0.62 (from 2.79 to 3.41). This aspect was again reported by coachees in the focus groups and survey questionnaires to be one of the most useful topics discussed.

Although these results might initially appear very positive it should be noted that the increases may have occurred naturally through the passage of time alone or even through other interventions and support received. Bong (2001) noted that students with a strong sense of self-efficacy are willing to invest greater effort and persistence in completing challenging tasks. Robbins, Lauver, Davis, Langley and Carlstrom (2004) noted that the best psychosocial and study skills predictor of academic performance are academic self-efficacy and achievement motivation. Therefore, the increased scores found in the self-efficacy of the coached students are likely to result in higher levels of performance.

Module Grade Data

An independent t-test was conducted to compare the overall average module grades of the coached group (M = 57.24, SD = 8.8) and the non-coached, control group (M = 52.81, SD = 13.52); $t(239) = 2.80$, $p = .006$ (two-tailed). The eta squared statistic was calculated to be .03 which demonstrated a small but statistically significant effect size overall.

Group	Number	Mean	Std. Deviation
Average Grade Overall	Coached 149	57.24	8.80
	Control 92	52.81	13.52
Average Grade Semester A	Coached 146	56.54	9.34
	Control 92	52.16	14.14
Average Grade Semester B	Coached 127	58.57	10.90
	Control 72	54.70	14.61

Table 4: Mean grade comparisons between coached and control groups

The independent t-test was repeated to compare the average semester A module grades of the coached group (M = 56.54, SD = 9.34) and the non-coached, control group (M = 52.17, SD = 14.14); $t(236) = 2.63$, $p = .009$ (two-tailed). The eta squared statistic was calculated to be .03 which again demonstrated a small but statistically significant effect size overall.

The same independent t-test was repeated to compare the average semester B module grades of the coached group (M = 58.57, SD = 10.91) and the non-coached, control group (M = 54.71, SD = 14.62); $t(197) = 2.63$, $p = .053$ (two-tailed). The eta squared statistic was calculated to be .02 which again demonstrated a small but statistically significant effect size overall.

Exploring the effect on students studying different courses

Having established a small effect size for the participants as a whole, calculations were then performed for students from each of the different academic schools. Within the Business School only the independent t-test revealed that the overall module grades of the coached group (M = 57.75, SD = 9.74) and the non-coached group (M = 51.38, SD = 12.66); $t(72) = 2.44$, $p = .02$ (two tailed). The eta squared statistic was calculated to be .08 which demonstrates a moderate effect size. It is worth noting that the peer coaching within the business school was extremely well established with the scheme being in its third year of delivery. Many of the peer coaches were in their second year of participation in the programme and the scheme itself well-embedded within the department. This may be a contributing factor in the success of the programme for business school students in particular.

Additional calculations were made to explore the difference in modules grades between the control and coached groups at differing achievement levels in semester A. Table 5 demonstrates the differences found between the two groups.

It could be deduced from these figures that the coaching is most effective in raising the grades of students who are performing least well at the onset. It can also be seen that there was a slight decline in the semester B grades of the control group attaining > 55% in semester A but who received no coaching intervention at all.

		Number of students	Semester A mean grade	Semester B mean grade	Difference from semester A to B
Students scoring < 40% in semester A	Coached group	3	29.1	49.0	+ 19.9
	Control group	10	31.8	38.2	+ 6.4
Students scoring < 50% in semester A	Coached Group	22	42.8	50.5	+ 7.7
	Control group	24	39.7	47.5	+ 7.8
Students scoring < 55% in semester A	Coached group	47	47.8	53.6	+ 5.8
	Control group	34	43.7	48.8	+ 5.1
Students scoring > 55% in semester A	Coached group	75	62.3	62.4	+ 0.1
	Control group	35	62.9	62.3	- 0.6

Table 5: Comparisons between grades of coached and control groups

Gender

The difference between the average grades of male and female students was examined in closer detail. Table 1.6 shows that whilst there was little difference in the academic performance of male and female students in the peer coaching group, males in the control group achieved poorer grades than females.

Gender	Group	N	Mean	Std. Deviation	Std. Error Mean	
Male	Average Grade	Coached	45	57.33	9.85	1.47
		Control	42	51.11	14.73	2.27
Female	Average Grade	Coached	104	57.20	8.37	.82
		Control	50	54.24	12.40	1.75

Table 6: Difference between male and female grades

An independent sample t-test was performed to compare the average grades of both males and females. There was no significant difference found in the grades of females who were coached ($M = 57.20$, $SD = 8.37$) and females in the control group ($M = 54.24$, $SD = 12.40$); $t(152) = 1.75$, $p = .08$ two-tailed).

However, an independent sample t-test to compare the average grades of males who were coached ($M = 57.33$, $SD = 9.85$) and males in the control group ($M = 51.11$, $SD = 14.73$); $t(85) = 2.33$, $p = .02$ two-tailed). The magnitude of the difference in the means (mean difference = 6.22 95% CI 0.92 to 11.55 was moderate ($\eta^2 = 0.06$)).

It could perhaps be inferred from these results that the peer coaching was more effective for male students than females. However, it may be that males without any supportive intervention fail to improve as well as females who do not receive any support.

Year Group

Independent samples t-tests were performed for students in all four year groups to compare the results of those who received coaching to those in the equivalent control group. The results for Year 4 students can be ignored due to low number of participants in this year. The number of 3rd year student participants is also low reducing the dependability of the results. The tables in 1.7 show the different results for each of the year groups.

Year of study = 3rd year

	Group	N	Mean	Std. Deviation	Std. Error Mean
Average Grade	Coached	14	59.51	7.52	2.01
	Control	6	54.89	6.84	2.79

Year of study = 2nd year

	Group	N	Mean	Std. Deviation	Std. Error Mean
Average Grade	Coached	52	56.48	7.61	1.05
	Control	39	53.99	14.03	2.24

Year of study = 1st year

	Group	N	Mean	Std. Deviation	Std. Error Mean
Average Grade	Coached	81	57.18	9.64	1.07
	Control	47	51.56	13.81	2.01

Table 7: Difference in attainment for different year groups

No significant increase in average grades was found between those in the 2nd and 3rd year of study and those students in each of the equivalent control groups. However, for those in the first year of study there was a significant increase in average grade for those who were coached (M = 57.18, SD = 9.64) and those in the control group (M = 51.56, SD = 13.81); $t(126) = 2.70$, $p = .008$, two tailed). The magnitude of the different means (mean difference = 5.62, 95% CI: 1.50 to 9.73) was small ($\eta^2 = 0.05$).

From these calculations it could be concluded that the peer coaching was more effective in increasing grades for those students in their first year of study. Whilst the increase in grades is statistically small, it is likely to impact more effectively in overall degree attainment and graduation as the skills learned through peer coaching can be implemented in subsequent years of learning.

Student Retention

Exploration was also made into the number of students who had withdrawn from their studies. In the control group it was found that by a total of 19 students had withdrawn by the end of the academic year making a total 20% of the students in that group. In the coached group, 11 students had withdrawn from their studies by the same date, a total of 9.9%. Whilst it is evident that there was less attrition in the coached group it should be remembered that the grades of the students in the control group were lower overall. This may have been a contributory factor in the higher withdrawals in this group.

Discussion and Conclusion

It can be seen from this study that the peer coaching has impacted significantly on academic performance although it is more evident for some students than others. In particular, it appears to have had more impact for those in their first year. It might also be concluded that peer coaching had a greater impact for male as opposed to female students although the findings may be interpreted as females faring better than males without any support. It should be noted also that a larger proportion of females participated in the coaching than males. It has already been recognised in previous studies such as Grebennikov and Skaines, (2009) and Anastasia, Tremblay, Makela and Drennen (1999) that male students are less aware of opportunities for self-development and consider personal support as less important than female students

Other students for whom the impact was greatest were those who were performing least well, pre-coaching; attaining under 50%. These students appeared to reap the most benefit from the peer coaching. There are a number of influences that may have been present in this study that are unknown. Prior academic performance is said to be a significant factor in academic attainment and is linked to self-efficacy, (Pajares, 1997); (Marsh and Craven, 2006); (Marsh, 2007). In addition to this, data on the socioeconomic background of the participants was not collected which can also impact on academic performance. These variables were not collected or controlled for in either the coached or control group which might be considered a significant weakness in the study. The lack of comparison data utilising the Sander and Sanders (2009) ABC questionnaire for the control group is also a weakness in the study as no comparison of pre and post results can be made to those who were coached.

Further study is suggested using a similar methodological approach although selection of the control group is likely to be problematic as it has been for this and previous studies. It would be of value to incorporate other factors, such as prior academic attainment upon entering higher education and socioeconomic backgrounds when exploring the impact of peer coaching on academic attainment. Inclusion of these variables would enable further analysis of impact to determine for which groups of students the intervention has greatest impact. Research of a more longitudinal nature would also be of benefit to determine whether the increased impact seen in first year students on academic attainment, which has been demonstrated in this study, continues into subsequent years. O'Donovan, Price and Rust (2004) found in their study, that the improvement seen in first year student performance through attendance at a 'marking workshop' designed to increase understanding of assessment standards and criteria continued into subsequent years albeit at a diminished level.

When it is taken into consideration that the improved self-efficacy and academic skills learned in the first year can be utilised in subsequent years of study, it might be deemed prudent for higher education institutions to direct resources to students in their first year. It has already been suggested by Bowden, Subhash and Bahtsevanoglou (2014) that early intervention for higher education students should be utilised to combat the difficulty of over-confidence leading to a negative relationship between self-efficacy and final marks. Another factor to consider for higher education institutions is the financial savings that can be made in reducing attrition especially for those in their first year. In Andrews and Clark (2011) study of what works with regards to student success in higher education,

the financial implications of a student leaving prematurely was stressed. It was noted that not only the fees for first year are lost but also the fees in subsequent years which could equate to a figure of at least £24,300 of lost income based upon an annual fee of £7,500 over a three-year course. This financial loss would be even larger in the event of losing a residential student.

Whilst this study does appear to suggest that a peer coaching intervention can impact positively on academic attainment it may be argued that the methodological approach has limitations and that the findings are skewed by contamination of the control group. Perhaps those who actually seek coaching have a better understanding of their developmental needs or have more ambition to succeed. These possible influences were not tested for in this study, neither for the coached or control group, and so cannot be factored in. Had these variables been collected and factored into the statistical analysis then more confidence may have been held in the findings. However as suggested by D'Agostino and Kwan (1995) such biases are difficult to determine with accuracy and are reliant upon a researcher's ability to identify them. In addition, there are said to be several contributory factors to student success. As a researcher I was unable to identify exactly what these biasing variables might have been. There were a number of possible influences identified such as prior academic attainment and non-cognitive skills but these could not be determined with any sense of accuracy nor their degree of influence on academic success. It could be argued however that those in the control group were subject to the same influences as those in the coached group although this type of perception and background data was not collected in this study and so this is an area to be explored further. In the light of these caveats, it is essential that readers make their own judgement and evaluation of the methods and merits presented in the study, as suggested by Agudo and Gonzalaz (1999).

That said, it does appear that peer coaching may have the potential to improve grades, academic behaviour and confidence. So it may be a worthwhile consideration for educational institutions to address the attainment gap in BME students or to support those with identified lower retention rates such as mature students or those from widening participation backgrounds. This improvement in academic behaviour confidence may also translate to a wider context and be seen to improve performance in individuals within such areas as the business community although this may be harder to measure in quantitative terms.

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