Preferred Learning Style and Academic Self-Efficacy as Predictors of Academic Engagement amongst University Students

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ABSTRACT

Academic engagement (AE) is a large predictor of academic success at university level (Green et al., 2012; Eryilmaz, 2015). AE of a student can be improved by contextual factors, alongside personal attributes (Skinner and Pitzer, 2012), such as academic self-efficacy (ASE). Previous literature has shown academic self-efficacy to be a large predictor of AE and educational success (Chemers et al., 2001; Green et al., 2012; Eryilmaz, 2015; Ansong et al., 2016); therefore allocating resources to improve students' AE could be considered worthwhile.

Students preferred learning styles are considered important by both educators and students (Knoll et al., 2016), with educators being urged to alter teaching methods to accommodate students learning styles (Pashler et al., 2009). Evidence largely shows that students learning styles, when catered to, do not cause better learning or performance (Loo, 2004; Pashler et al., 2009; Rieder and Willingham, 2010; Knoll et al., 2016); therefore it can be considered that allocating resources to accommodating students preferred learning style is wasteful (Paschler et al., 2008; Lewis, 2013). However, students may engage more if their preferred learning style is congruent with standard university teaching methods.

This study, consisting of 157 participants, seeks to explore whether, and the extent to which, ASE and preferred learning style congruence with university teaching methods can predict AE, as to better inform decision on resource allocation. A multiple regression analysis found both preferred learning style and ASE significantly predicted AE, although ASE more so. A two-way ANOVA showed that both ASE and preferred learning style had a significant main effect on AE score, of a large and medium effect size respectively. Further research should be conducted to determine whether this link with preferred learning style and ASE is as it seems, or if it is due to other factors, or possibly students having a higher ASE due to feeling as though they will achieve as their preferred learning style is congruent with university teaching methods.

KEY WORDS:	ACADEMIC SELF-EFFICACY	LEARNING STYLE	ACADEMIC ENGAGEMENT	TEACHING STYLE	UNIVERSITY STUDENTS

Introduction

Predictors of academic achievement are considered very important, as the improvement of the predicting constructs should correlate with higher academic achievement; therein knowledge of these may allow better allocation of resources within the academic spheres to improve students' achievement.

Academic engagement is a very strong predictor of academic success (Green et al., 2012; Eryilmaz, 2015), as well as higher levels of learning (Pintritch and De Groot, 1990; Skinner and Pitzer, 2012) with negative effects of lower engagement being higher absenteeism and boredom (Martin, 2003).

As academic engagement can be influenced by contextual factors within academic spheres (Skinner and Pitzer, 2012), it could be suggested to be more worthwhile investigating the caveats of such a construct as opposed to other specific constructs such as intelligence, which although being considered a key predictor of achievement (Gottfredson, 2004) is thought to remain stable throughout childhood to old age (Deary, 2014), suggesting that little can be done to directly influence that metric.

Self-efficacy is described as an individual's self-belief of their capabilities to perform at a certain level (Bandura, 1986), with academic self-efficacy being in reference to an individual's belief to achieve specific self-valued or standard goals within an academic context (Muris, 2001). Academic self-efficacy has been found to predict educational success (Chemers et al., 2001; Ansong et al., 2016), as well as being a strong predictor of academic engagement (Green et al., 2012; Eryilmaz, 2015). As self-efficacy has been found to correlate with both academic engagement and other

positive attributes, it could be suggested that it is a worthwhile characteristic to help develop within educational facilities. However it should be noted that previous attempts at nurturing positive emotional attributes such as academic self-efficacy in the classroom have only been partially successful (Gläser-Zikuda et al., 2005).

Learning styles, or an individual's preference on how to learn new material, are very popular within academia, with educators often being urged to incorporate learning style measures into their teaching (Pashler et al., 2009). Whilst some studies have shown that a match-up between how teaching is delivered and individuals preferred learning style results in better learning (Sadler-Smith, 1997; Sternberg et al., 1999), however whilst statistically significant, these studies only demonstrate a relatively weak effect. These studies, and others which seek to show the link between learning style preference and learning, have often been critiqued as having flawed methodology, and in fact it is suggested that preferred learning style matching teaching methods does not lead to an increase of student performance or information retention (Loo, 2004; Pashler et al., 2009; Rieder and Willingham, 2010; Knoll et al., 2016). Some studies suggest that implementation of ensuring teaching style accommodate for pupil preferred learning style only has positive affect on the engagement of some pupils for a limited time, due to a novelty effect (Lewis, 2013). In light of this, researchers have suggested that allocation and use of resources to help accommodate for students preferred learning style is both futile and wasteful (Paschler et al., 2008; Lewis, 2013). Further suggestion that not catering to preferred learning style, and instead exposing students to lot of different teaching styles, is beneficial; instruction individuals will receive will not always be in the format they

prefer, so it is more useful to be prepared to learn information in different ways (Loo, 2004; Lewis, 2013).

Despite this, students themselves feel as though they do have a specific learning style, and that if this is accommodated they will learn better; however this judgement has not been shown to be accurate (Knoll et al., 2016). However as students do consider their preferred learning style to be legitimate and crucial to their education, it could be suggested that those who do not feel as though the way they learn is congruent with the way they will be taught may not engage as well with the instruction.

This study seeks to consider further if whether students preferred learning style coinciding with how teaching is delivered in university style lectures is at all a predictor of whether they are more likely to engage with that content, or if the individuals' self-efficacy is a greater predictor.

The 'Verbal-Visualizer scale' (VVQ; Kirby et al., 1988) is used to determine preferred learning style. A higher score indicates higher preference for learning via verbal and visual means; therefore a higher score would indicate congruence with preferred learning style and university teaching style, as university lectures largely rely on verbal and visual elements of teaching (Laurillard, 2010). This measure is utilised within this study to easily identify participant congruence with university teaching style, as if they are not 'verbal' or 'visual' learners, regardless of their preference, then their preferred learning style will be incongruent with the average university teaching style.

Academic self-efficacy is measured using 'The Motivated Strategies for Learning Questionnaire' (MSLQ; Pintritch and De Groot, 1990), which allows identification of

those with high or low academic self-efficacy; used as it specifically assesses this construct, with statements relevant to those within university level of education. Academic self-efficacy can be improved within the classroom, and correlates with academic success (Chemers et al., 2001; Ansong et al., 2016), so therefore contributing to the research base confirming its link to bolstering academic engagement.

The 'Academic Engagement Scale' (AES; Rovan et al., 2016) is used to measure participant's academic engagement. Academic engagement as a construct is used as the dependant variable, as it is a large predictor of academic success (Green et al., 2012; Eryilmaz, 2015), and can be influenced by contextual factors (Skinner and Pitzer, 2012), so therefore determining what factors do influence and improve students' academic engagement can be used to help inform teaching methods and resource allocation, which in turn can improve students' academic achievement.

The information gathered from this study will help to contribute to how further education is delivered, offering insight on whether teaching methods designed to cater to different learning style preferences are worthwhile, or if perhaps there should be a greater focus on using teaching methods to develop the individual with focus on specific traits such as self-efficacy. The overall aim is to gather further understanding to help inform resource allocation within academic spheres, and ultimately improve student engagement and achievement.

Hypotheses

After reviewing previous literature, it was hypothesised that:

- Self-efficacy will strongly predict academic engagement;

- Those within a higher self-efficacy group will have a significantly higher academic engagement score;
- Preferred learning style will not significantly predict academic engagement;
- and, Preferred learning style being cohesive with university lecturing style will not cause a significantly higher academic engagement score.

Method

Design

This study is a web-based survey containing three questionnaires, to assess the independent variables (IV's) of academic self-efficacy and preferred learning style, and the dependent variable (DV) of academic engagement.

This study is a non-experimental within-groups correlational design, which seeks to explore whether measures of academic self-efficacy and preferred learning style can predict individuals having higher academic engagement, using a multiple regression method for analysis.

A two-way ANOVA is also used, with within-groups IVs of academic self-efficacy (high academic self-efficacy and low academic self-efficacy groups) and preferred learning style (high VVQ score group and low VVQ score group) to determine the difference between groups of the DV, their academic engagement score.

An independent samples t-test was used to determine difference in academic engagement score between those in their first and third year of university study; this demographic information was obtained after consent was given, and before questionnaires were presented.

All participants being current undergraduate students at a UK university is the control variable.

Participants

The 157 participants, undergraduate university students in the UK, were selected via opportunity sampling through Manchester Metropolitan University internal participation pool. This sampling method is both convenient and ensured participants were within the inclusion criteria of being current undergraduate students at a UK university. Participants who were not currently undergraduate students at a UK university were asked to not participate.

13 data sets were removed due to incomplete data, leaving 96 females, 45 males and 3 non-binary/self-describing gender participants, with this including 134 participants within the age range of 18 to 24 and 10 participants within the age range of 25 to 54 years old; 144 total used in main analysis. The minimum number of participants for this study design would be 74, as stipulated by Green (1991); therefore the number of participants was adequate.

Data sets removed due to incomplete data were securely destroyed.

Measures

The web-based survey was created using Qualtrics (2005).

The three variables of academic self-efficacy, preferred learning style, and academic engagement were measured using different questionnaires (Appendix 6, 7 and 8).

Preferred learning style was measured using ‘The Verbal-Visualizer Scale (VVQS; Kirby et al., 1988) (Appendix 6), involving answering true or false to 20 questions,

such as ‘I prefer reading instructions about how to do something than have someone show me’. The scale has a reported Cronbach’s Alpha of .70 and .59, for visual and verbal scales respectively (Kirby et al., 1988), which is considered adequate internal reliability.

Academic self-efficacy was measured using ‘The Motivated Strategies for Learning Questionnaire’ (MSLQ; Pintritch and De Groot, 1990) (Appendix 7), comprised of 9 questions, such as ‘I expect to do very well in this class’, answered via a 7-point Likert scale. A score of 1 indicated the statement is ‘not at all true of me’, with 7 being ‘very true of me’. The scale has good internal reliability, with a reported Cronbach’s Alpha of .89 (Pintritch and De Groot, 1990).

Academic engagement was measured using ‘The Academic Engagement Scale’ (AES; Rovan et al., 2016) (Appendix 8), composed of 15 questions, such as ‘I am very focused in class’, and answered with a 5-point Likert scale; 1 being ‘strongly disagree’, 5 ‘strongly agree’. The scale has good internal reliability, with a reported Cronbach’s Alpha of .73, .76 and .87, for the cognitive, negative emotional and behavioural engagement aspects of the scale respectively (Rovan et al., 2016).

Procedure

Participant’s personal internet-connected devices were used to display questionnaires via a website, found on the Manchester Metropolitan University participation pool. Participants were shown an on-screen consent form (Appendix 4) and participation information sheet, explaining fully their right to withdraw and right to confidentiality. Questionnaires of aforementioned scales were then presented and

completed online, a total of 44 items, taking approximately 10 minutes. Demographic data such as age and gender was also collected. Once completed, debrief and researcher contact information was given (Appendix 5).

Data was then analysed using IBM SPSS Statistics 24 to examine interaction between academic self-efficacy, preferred learning style and academic self-efficacy, using a multiple regression analysis and two-way ANOVA, alongside post-hoc t-tests.

The study was carried out both in accordance with Manchester Metropolitan University ethical guidelines, and BPS ethical guidelines.

Results

Some scale items were reversed as per author instructions.

Preparation of data

The data was checked for normality; 0 data sets were removed due to being extreme outliers, leaving 144 data sets for analysis. To determine academic self-efficacy (ASE), VVQ and academic engagement (AE) level total questionnaire scores were found for participants. The median score (ASE, *M*= 45.00; *VVQ, M*= -25.00; AE, *M*= 51.00) was used to split participants into groups; 77 participants in the low academic self-efficacy group, 67 in the high academic self-efficacy group; 69 participants in the low VVQ group, 75 in the high VVQ group; 73 in the low academic engagement group, 71 in the high academic engagement group.

Reliability analysis

Following internal consistency analysis, reliability for the 'Academic Engagement' scale was good, α = .83; reliability for the 'Academic Self-Efficacy' scale was excellent, α = .96.

The 'Verbal-Visualizer Scale' (VVQ) is comprised of two scales, with adequate reliability; the 'verbal' scale reliability was acceptable, α = .75, and the 'visual' scale reliability being poor, α = .55.

Descriptive statistics

As show in Table 1, Pearson's correlations, as computed for each variable, indicated that there was a moderate positive correlation between academic self-efficacy and academic engagement, r(142) = .49, p < .001; a moderate positive correlation between VVQ score and academic engagement, r(142) = .42, p < .001; and a small positive correlation between academic self-efficacy and VVQ score, r(142) = .34, p < .001.

Table 1. *Correlations among all study variables*

Variable	ASE	VVQ	AE
ASE		.34**	.49**
VVQ			.42**
AE			

Note. * indicates *p* < .05; ** indicates *p* < .001

Regression analysis

Parametric assumptions of absence of outliers, multicollinearity, independent errors, homoscedasticity and linearity of data were tested, and confirmed that multiple regression was a valid means of analysis. The analysis of standard residuals showed that the data contained no outliers (Std. Residual Min = -2.97, Std. Residual

Max = 2.14). Collinearity tests indicated that the data met the assumption of no multicollinearity (Academic Self-Efficacy, Tolerance = .886, VIF = 1.13; VVQ, Tolerance = .886, VIF = 1.13). The data met the assumption of independent errors (Durbin-Watson = 1.84). The scatterplot of standardised residuals indicated that the data met the assumptions of linearity and homoscedasticity (see Appendix 9 for all SPSS output).

A multiple regression analysis was used to test the extent to which the variables 'academic self-efficacy' and 'VVQ score' were predictive of academic engagement amongst the sample. Using the 'enter' method, a significant model emerged ($F(2,141) = 31.99$, $p < .001$). The relationship between the variables was strong ($R = .56$) and the model could explain approximately 31.2% ($R^2_{adj} = 30.2\%$) of the variance in academic engagement scores. Out of the variables, academic self-efficacy significantly predicted academic engagement, $\beta = .396$, $t(141) = 5.34$, $p < .001$. VVQ score also significantly predicted academic engagement, $\beta = .282$, $t(141) = 3.80$, $p < .001$. The contribution of each predictor variable in accounting for the variance in academic engagement scores is shown in Table 2.

Table 2. *Summary of regression analysis for predicting student academic engagement*

Variable	***B***	***SE B* (std. Error)**	***β* (beta score)**
Constant	56.24	8.41	
ASE	.364	.07	.40**
VVQ	.838	.22	.28**
Note: R^2 = .31			

Note. * indicates $p < .05$; ** indicates $p < .001$

The regression analysis results indicate that academic self-efficacy and VVQ score are significant predictors of academic engagement.

Two-way ANOVA analysis

The data satisfied parametric assumptions for a two-way factorial ANOVA to be used for analysis of the within-subjects IV's (academic self-efficacy group and VVQ group) to examine their effect on academic engagement. Further post-hoc tests were used to analyse the relationships between variables.

Table 3 shows that high academic self-efficacy group had a higher mean academic engagement score than the low academic self-efficacy group regardless of VVQ group; however academic engagement score was higher for both groups in the high VVQ groups.

Table 3. *The mean and standard deviation of participants' academic engagement scores*

Condition		Academic Engagement score		95% CI	
		M	*SD*	*LB*	*UB*
Low ASE	High VVQ	50.714	8.624	48.119	53.309
	Low VVQ	45.190	5.562	42.821	47.560
High ASE	High VVQ	55.200	7.978	52.772	57.628
	Low VVQ	52.777	9.120	49.823	55.732

Note. LB = Lower bound; UB = Upper bound

The ANOVA showed a significant main effect of academic self-efficacy group on academic engagement, $F(1, 143) = 21.124$, $p < .001$, $\eta_p^2 = .131$.The interaction between VVQ group and academic engagement was also found to be significant, $F(1, 143) = 9.151$. $p = .003$, $\eta_p^2 = .061$. A non-significant interaction between academic self-efficacy group and VVQ group was also found, $F(1, 143) = 1.394$, $p = .240$, $\eta_p^2 = .010$.

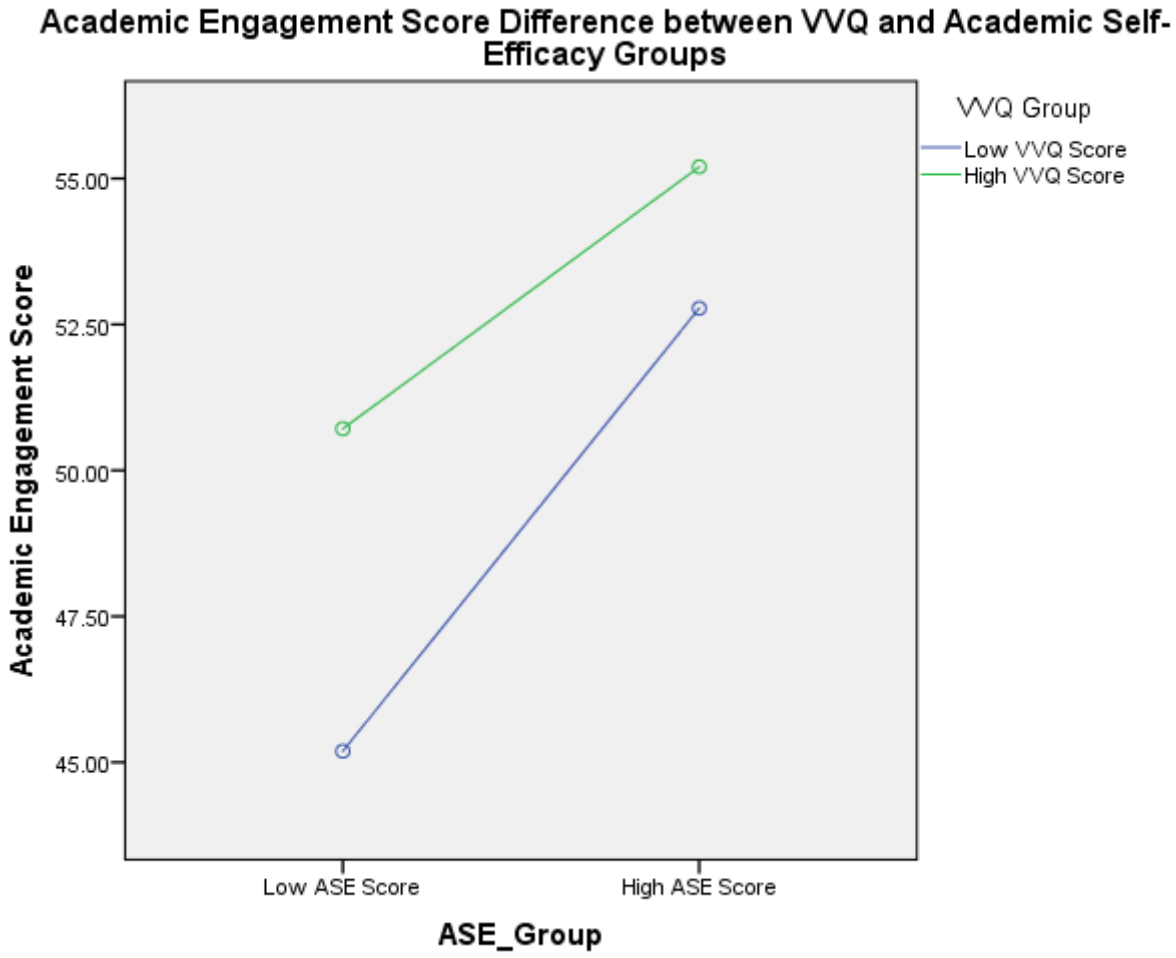

Figure 1. Mean academic engagement score between academic self-efficacy and VVQ groups

To interpret the significant interactions, further post hoc testing was required. Effect size, adjusted for sample size, was measured using Cohen's D (Cohen, 1992), and was calculated using CLiCal (Rowley, 2015).

As data satisfied parametric assumptions, the use of independent t-test was appropriate.

An independent samples t-test indicated significant difference in academic engagement between the low academic self-efficacy group and the high academic

self-efficacy group, $t(142) = -4.87$, $p < .001$, $d = -0.81$, 95% CI [- 1.15, - 0.46], of a large effect size.

A further independent samples t-test indicated significant difference in academic engagement between low VVQ group and high VVQ group, $t(142) = -3.58$, $p < .001$, $d = -0.59$, 95% CI [- 0.93, - 0.46], of a medium effect size.

To determine whether academic self-efficacy improves throughout time at university, testing was conducted to find difference in score between participants within the first and third year of university. Data satisfied parametric assumptions, so independent t-test was used.

The independent samples t-test indicated a non-significant difference in academic engagement between first year group and third year group, $t(82) = -1.66$, $p = .099$.

Discussion

This study aimed to determine whether, and the extent to which, academic self-efficacy and preferred learning style were predictive of academic engagement.

Preferred learning style was measured using the VVQ (Kirby et al., 1988), with a higher score indicating a preference for more verbal and visual learning, which would be more congruent with the teaching style of university lecturing (Laurillard, 2010). A higher score on the AES (Rovan et al., 2016) and the MSLQ (Pintritch and De Groot, 1990) indicated higher academic engagement and higher academic self-efficacy, respectively.

The results from a Pearson's correlation test indicated that both academic self-efficacy and preferred learning style, as measured by VVQ scores, moderately correlated positively with academic engagement. Academic self-efficacy and VVQ scores also had a small positive correlation.

Academic self-efficacy and VVQ scores were found by the multiple regression analysis to predict academic engagement significantly, explaining around 31% of the variance in engagement scores (30% when adjusted for small sample size). Academic self-efficacy was found to have a stronger effect on academic engagement scores (β = .40) than VVQ scores (β = .28).

Through use of a two-way ANOVA, academic self-efficacy group (high and low scorers) was found to have a significant main effect on academic engagement with a large effect size. Interaction between VVQ group (high and low scorers) and academic engagement was also found to be significant, of a medium effect size. A non-significant interaction between academic self-efficacy group and VVQ group was also identified.

Independent samples t-test found a significant difference between the academic engagement of low and high academic self-efficacy groups, with a large effect size. A further independent samples t-test also found significant difference in academic engagement of low and high VVQ groups, with a medium effect size.

To determine if academic engagement increases from first year of university study to third year, an independent samples t-test was conducted, finding a non-significant difference.

These results indicate that hypothesis 1 and 2 may be accepted; academic self-efficacy was found to moderately correlate with and strongly predict academic engagement, as well as having a large effect size on academic engagement score. The academic engagement scores of those with high self-efficacy were also significantly higher than those in the lower academic self-efficacy group.

This falls in line with previous research, which found academic self-efficacy to be a strong predictor of academic engagement (Green et al., 2012; Eryilmaz, 2015). These results are expected, demonstrating that an individuals' belief in their capability to perform within the academic setting predicts how much they will also engage with the course. This may create a feedback loop, in that those who believe they will do well and are capable within university are more likely to engage with the course content, and therefore likely end up with better grades (Chemers et al., 2001; Ansong et al., 2016). As they receive better grades, this will bolster their academic self-efficacy, as it becomes evidence based with concrete proof of their capability to succeed, thus repeating the cycle and creating a self-fulfilling prophecy.

However it may also be possible to create a negative feedback loop, in that those who do not think they are capable will not engage as much with their course, and therefore are not as likely to achieve to their greatest potential; validating their conception of them not being able, and potentially causing a downward spiral, due to reducing their engagement further and therein academic success.

This highlights the need to have a focus on improving individuals' academic self-efficacy, amongst other traits, as to ensure they remain engaged with the course and ultimately be more likely to achieve. As both academic engagement and academic self-efficacy can be improved by contextual factors within the classroom (Skinner and Pitzer, 2012), it is justifiable to allocate more resources to do this.

Hypothesis 3 and 4, however, must be rejected; that VVQ score, or preferred learning style, will not significantly affect academic engagement. Preferred learning style congruence with university lecturing style, measured in the form of a higher VVQ score, was found to correlate in a small extent with and significantly predict academic engagement score. VVQ group was found to have a significant main effect on academic engagement, alongside those within the high VVQ score group also having a significantly higher academic engagement score compared to those within the low VVQ score group

Whilst this result is comparable to other studies of preferred learning style, which suggest it is important and the teaching style should accommodate this to increase academic engagement (Lewis, 2013), it should be considered that this result may be due to methodological issues, such that previous studies have encountered in this area. Due to the small sample size, the risk of a type 1 error is higher, an issue faced by similar studies (Knoll et al., 2016), as well as possibility that the construct was not investigated in a valid way. The measure for preferred learning style, the VVQ (Kirby et al., 1988), had an internal reliability that could only be considered adequate to poor. Therein the validity of the results cannot be given with much confidence. Scale items such as ‘I find maps useful in finding my way around a new city’ do not have face validity in determining if someone is a ‘visual’ learner, as maps are a useful navigation tool regardless as to how individuals prefer to learn. The VVQ also does not assess peoples preferred learning styles outside of ‘verbal’ or ‘visual’ groups; so whilst a participant might score highly, and appear to have the learning style preference of ‘verbal’ or ‘visual’, given further questioning it may become apparent that whilst they find those methods of learning useful, they feel as though they are a

kinaesthetic learner, for example. It was also assumed that a low VVQ score indicated incongruence with standard university teaching methods, such as lecturing, however to assess the validity of this statement would require determining what their preferred learning style actually is, alongside the general teaching practices of specific universities.

Despite VVQ score, or preferred learning style, being predictive of academic engagement, it may not be a direct causal link. As students view their preferred learning style as very important (Knoll et al., 2016), this may mean that they presume they will do well at university if their preferred learning style and the teaching style is congruent. Whilst this match-up between learning and teaching style may not directly cause students to perform better, it may still make the individual feel as though they can learn better and thus increase their academic self-efficacy, which may be evidenced by this studies result showing a positive correlation between academic self-efficacy and VVQ score; however this is postulation, which could be dismissed as the correlation between the variables was of a small size. This, however, if true, could again lead to a self-fulfilling prophecy.

Despite this, however, recommendation to further allocate resource to accommodating students preferred learning style is not given, due to the large research base casting doubt on the efficacy of catering to learning styles. As learning styles have been found to not be helpful in improving learning (Loo, 2004; Pashler et al., 2009; Rieder and Willingham, 2010; Knoll et al., 2016), using resource to accommodate them can be considered wasteful (Paschler et al., 2008; Lewis, 2013), to which the current researcher would agree.

As an independent samples t-test did not indicate a significant difference between academic self-efficacy between first and third year university students, it could be assumed that currently university does not do much in the way of improving positive attributes such as this; thus possibly indicating that much more integration of improving traits such as academic self-efficacy is much needed. However, the sample size of those who participated who were in their first year was very small (n = 23), which may mean the result is not valid. To improve the validity, a larger sample size would be required; further recommendation could be the study being longitudinal with a between-groups design, assessing the participants' academic self-efficacy every year to see if it is in fact stable for individuals.

Whilst the study has the minimum participants for the method used (Green, 1991), as 13 data sets were removed due to incomplete data, this left the remaining participant count at 144; which, as lower than 150, can lead to lack of generalizability and difficulty interpreting significant results (Biau et al., 2008). Due to the small sample size, and that the majority of participants were from Manchester Metropolitan University, generalization to wider student populations may not be appropriate. The significance of the results is also cast into doubt, and to ascertain validity of these results a large sample size would be required.

Seeing the extent to which academic self-efficacy and preferred learning style predict academic outcome may have been a more valid measure, however this was not used due to difficulty of requesting that information for every participant from the university. An estimate could have been used, however may have been inaccurate,

or may not have been possible for certain participants, particularly if in their first year, to guess.

The study could have also been improved by investigating the importance the participants viewed their preferred learning style with, alongside a more rigorous investigation into their preferred learning style. Factors which affected their academic self-efficacy could have also been investigated, to determine whether or not feeling as though their preferred learning style being accommodated was a factor.
Whilst academic engagement was measured using a questionnaire, further insight could have been gained through finding their attendance percentage at university, alongside further study outside of contact time. Factors which affect academic engagement should have also been sought.
This current study leaves too many variables and other factors unaccounted for to stand by the results with much certainty; however the present study does highlight the possible importance of academic self-efficacy on academic engagement, giving justification on trying to improve students' academic self-efficacy within universities, as well as offering reason to fully study the effect preferred learning style has on academic engagement; as whilst preferred learning style does not, as reflected in literature, improve learning, there is an interaction identified which may be important once fully uncovered.

The relationship between positive, alterable, psychology constructs of the individual, and the effect on their academic achievement should be further studied, as to properly create valid and worthwhile interventions to allow all to achieve, and effectively use resources. Regarding this, further research into factors which affect

academic self-efficacy should be conducted, through perhaps qualitative study to first determine what aspects affect and create this construct; through understanding this, quantitative study can be conducted to determine the most important factors, and thus begin to inform intervention to improve students' self-efficacy whilst at university.

Whilst there is a plethora of research into preferred learning style, the effect it has on academic self-efficacy and possibly other traits of an individual, should be better investigated. This would help to determine if those engaging more due to having a preferred learning style congruent with standard university teaching are doing so due to feeling confident they will learn better, or if due to other reasons.

Conclusion

In conclusion, this current study found that preferred learning-style congruence with standard university lecturing methods is predictive of academic engagement, and that academic self-efficacy is also predictive of academic engagement, however more so. The results suggested hypothesis 1 and 2 could be accepted, that academic self-efficacy is predictive of academic engagement. However hypothesis 3 and 4 should be rejected, as preferred-learning style was, contrary to belief, found to predict academic engagement. No significant difference in academic engagement scores was found between first and third year participants, suggesting more should be done to improve this trait. Further research should be conducted to fully understand the relationship between preferred learning style and academic engagement, as well as to further uncover the components of academic self-efficacy, as to inform intervention and methods to improve, and effectively use resource.

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