The impact of individual factors on the academic attainment of Chinese and UK students in higher education

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Abstract

This study investigates the academic performance differences between Chinese and UK students in a UK university using two undergraduate cohorts by uniquely exploring academic performance patterns among Chinese and UK students across a full degree study period (3 or 4 years). The results reveal a dramatic drop in performance among Chinese students from year 1 to year 2 and increasingly significant performance gaps between Chinese and UK students in the final academic year by gender, prior academic performance, degree programme, prior academic qualification and enrolment year. Among Chinese students, their final degree mark is not influenced by gender, prior academic performance, prior academic qualification or degree programme. The distinctive nature of Chinese students in higher education is clearly demonstrated here and such uniqueness warrants further work focusing on learning approaches, curriculum design and the contents of assessments, in the context of academic achievement.

Keywords: Chinese students, academic attainment, academic performance pattern, final year mark, prior academic achievement

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Introduction

The number of students studying outside their country of citizenship rapidly increased between 2000 and 2010 as a result of the internationalisation of higher education (OECD 2012). Recent data from the Higher Education Statistics Agency (HESA 2013) show that Chinese students are by far the largest component of the non-EU and EU student population in UK higher education. There is an increasing concern in UK higher education about whether Chinese students can perform as well as UK students. Iannelli and Huang (2013) reveal that Chinese students substantially underperform UK students in terms of the final classification of their degrees. Underperformance among Chinese students is not an unrecorded phenomenon since prior studies reveal a lower academic attainment among ethnic Chinese students compared with white students in UK higher education (Heath and Brinbaum 2007; Richardson 2008; Richardson 2012). However, the literature has yet to provide a clue to the underlying reasons for underperformance among Chinese students in UK higher education.

This paper uses individual differences to pinpoint the possible reasons for performance differences between Chinese and UK students in a UK educational setting. The literature on student attainment in UK higher education generates mixed results but highlights that individual differences like age, gender, ethnicity, prior academic achievement and experience are possibly significant factors in influencing learning outcomes (Naylor and Smith 2004; Richardson 2008; Richardson 2012; Hoskins *et al.* 1997; Cantwell *et al.* 2001; Richardson and Woodley 2003; McKenzie and Gow 2004; Woodfield *et al.* 2006; NAO 2002a and NAO 2002b). Morrison *et al.* (2005) and Iannelli and Huang (2013) are unable to explore the impact of certain individual differences on academic performance due to the limitation of

HESA data which lacks detailed information about individual students. This paper is the first, to the best of our knowledge, to use students' academic and personal data collected by a UK university to understand academic performance differences between Chinese and UK students.

This paper addresses the following two main research questions:

1. Do Chinese students perform differently from one year to the next during their degree study period of 3 or 4 years? Is the yearly average academic performance of Chinese students during their degree study period different from that of UK students? Are there any obvious performance patterns among Chinese students which are so different from UK students?
2. Are there individual differences such as gender, prior academic achievement, prior academic qualification and degree programme which can be used to explain yearly academic performance differences and/or overall degree classification differences between Chinese and UK students?

Changes in demand and supply in UK higher education since the 1990s

In 1963, the Robbins Report recommended substantial expansion in higher education. The principles and recommendations of the Robbins Report formed the basis for the development of the university sector in subsequent years (HEFCE 2011). The number of UK universities almost doubled following the 1992 Further and Higher Education Act which abolished the division between universities and polytechnics. Willmot (2003) argues that the significance of the research assessment exercise (RAE) does not reside primarily in their rationalisation of resources for research or in securing improvements in accountability for their expenditure, but, rather, in their contribution to legitimising the restructuring of higher education. The first

ever RAE conducted in 1986, combined with the subsequent four-yearly RAEs have facilitated a simultaneous expansion of UK higher education with a reduction in unit costs in research and teaching (Willmott 2003). An additional boost to the expansion of higher education was a bold plan by the then Prime Minister, Tony Blair, in 1999 to encourage 50% of young people into higher education by 2010 (Court 2004). The number of international and UK students enrolled for undergraduate, postgraduate taught and research programmes (part-time and full-time) in UK higher education have grown remarkably in the last decade from 1,720,094 in 1995/1996 to 2,551,065 in 2011/12 (HESA 1995; HESA 2011).

According to the Universities UK fourth report, the balance between supply and demand had narrowed substantially during the period between 1995 and 2007 (Brown and Ramsden 2009). In 2007, six undergraduate subjects including business and administration showed a below 1:1 ratio of applicants to acceptances through the Universities and Colleges Application System (UCAS) (Brown and Ramsden 2009). Those subjects which cannot fully be filled with UK applicants would need to fill their places with international students. The report showed that the number of EU and international applicants for full-time undergraduate study in UK higher education grew steadily between 2004 and 2009: EU applicants increased by 102.1% while international applicants increased by 16.9%. 2011/12 HESA data show that a large proportion of students studying in the UK were domiciled in the UK before entering higher education (82.6%), while 5.3% were from other countries within the EU and 12.1% were from the countries outside of the EU (HESA 2011). Among undergraduate students from outside of the UK, 41% came from Asia and 36.9% from the EU. More EU and international applicants are needed in the future if the demographic picture in the UK changes and caps on UK students stay the same. There are concerns for a reducing UK market and inevitable reliance on students from outside of the UK since some recent evidence shows that

the targeted age groups for universities are steadily declining in size (McClelland and Gandy 2012).

Academic performance of ethnic Chinese/Chinese students in higher education

For a student from Mainland China to study in a UK university for a degree course, the most obvious and difficult obstacle is the language barrier. There is scarce research in the UK regarding the relationship between academic performance and language skills. One exception is the study by Crawford and Wang (2012) who find that academic performance among first year accounting students in a UK university is not influenced by whether students are native or non-native English speakers. Internationally, the results are mixed. Using American data, Eskew and Faley (1988) find that secondary English knowledge has a positive impact on academic performance of first year accounting students, while two other studies show no evidence of the benefits of secondary English to subsequent academic performance in introductory accounting courses using Australian data (Auyeung and Sands 1993; Christopher and Debreceny 1993). A Hong Kong study reveals that a higher degree of proficiency in mathematics is associated with a higher level of performance in a financial accounting course for university students who are more competent in English (Wong and Chia 1996). An Australian study by Rankin *et al.* (2003) finds no significant difference in performance in introductory accounting between domestic students and international students as well as between native English speakers and non-native English speakers.

In recent years, Chinese graduates who hold A level or higher qualifications before entering UK higher education have increased. Iannelli and Huang (2013) find that the percentage of Chinese first-degree graduates in UK universities who held A level or higher qualifications doubled (10% to 20%) and 52 % of those Chinese students graduated from a Russell Group

university in 2008/09. Although the number of Chinese students with A level doubled, the odds of Chinese students being awarded a good degree (first-class or upper-second class) decreased from 37% of those of UK students in 2001 to 32% in year 2008/09 (Iannelli and Huang 2013). It is possible that the results reported by Iannelli and Huang (2013) are affected by Chinese graduates who transferred from China for final year study for a UK bachelor's degree. Recent studies (Wang 2012 ; Wang *et al.* 2012) suggest that Chinese students coming for final year study in a UK university are able to adapt to the host culture and change their learning approaches, though how such a different learning experience affects their academic performance and their final degree classification is not explored in these studies.

It is useful to understand the academic attainment of minority Chinese students in UK higher education since it can shed light on the academic performance of Chinese students from Mainland China. Using a database of all UK graduates from UK higher education institutions in 2004/05, Richardson (2008) finds evidence to support the conclusion of prior studies, that is, that the academic attainment of Asian, Chinese and black students at UK higher education institutions is lower than that of white graduates. Richardson concludes that the under-achievement of adults from ethnic minorities in higher education is a legacy of their under-achievement as children in secondary education. However, white students continuously perform better than ethnic minority students when the apparent differences in entry qualifications, demographic and institutional variables have been statistically controlled (Naylor and Smith 2004; Richardson 2008). These results seem to suggest that the low attainment among ethnic minority students is likely to be explained by discriminatory teaching and assessment practices or more subtle exclusionary attitudes and behaviour on the part of teachers or other students (Osler 1999). When there is a separation between the teachers and the students and also among the students in the setting of the UK's Open

University, Richardson (2012) demonstrates that the attainment gap in graduates between ethnic minority students and white students is just as apparent as that in campus-based education. Richardson (2012) offers explanations for the low attainment among ethnic minority groups, such as the approaches to study and students' conceptions of learning and being learners.

Sample, variables and methodology

Sample

The original sample consists of 112 full-time students domiciled respectively in the UK (60) and mainland China (52). These students were enrolled on the following undergraduate programmes: BSc (honours) Accounting and Finance (BAF) and BSc (honours) Accounting and Finance with Placement (BAFP) in the academic years 2006/07 and 2007/08 in a UK university[1]. A total of 82 students and 71 students in 2006/7 and 2007/8, respectively, registered for BAF and BAFP. Our sample includes all students who declared their nationality as either mainland Chinese or British. BAF is a three-year full time degree programme while BAFP is a four-year sandwich programme which requires students to complete a work placement in the third year. Work placement learning lasts at least 39 weeks and students are required to complete a portfolio which records their involvement with different projects and organisations and their self-assessment and reflection on their learning and achievement throughout the placement. Students can swap between these two programmes in the first two years after enrolment regardless of their initial registration with either of the programmes. To secure a work placement, students need to first apply for a place and then would have to be accepted by organisations following interviews. This arrangement seems to deter Chinese students from seeking to graduate with a degree in Accounting and

Finance with Placement. 19 out of 52 Chinese students (37%) and 40 out of 60 UK (67%) students in the sample graduated with a degree in Accounting and Finance with Placement.

Reasons for sample selection

To understand the underlying factors which affect the attainment of Chinese and UK undergraduates, one must select a sample containing a substantial number of Chinese students. Clearly, Chinese students prefer business related subjects, 50% of them who studied a first degree in UK higher education majored in business in 2008/09 (Iannelli and Huang 2013). Accounting and Finance programmes, part of business studies, seem to be the most popular among Chinese students[2] (M. Wang 2009). Thus, Chinese and UK students majoring in Accounting and Finance are selected for this study. The two undergraduate accounting and finance programmes have rather equal numbers of Chinese and UK students which would reduce possible statistical flaws and makes statistical analysis more reliable and representative.

The students in the sample are from two cohorts enrolled in the academic years 2006/07 and 2007/08. The entry requirements of this university are rather high for non-native English speakers. IELTS (International English Language Testing System) level 7 is a requirement for Chinese students unless they have obtained an appropriate number of A grades or results from foundation courses provided by UK institutions. As mentioned above, the impact of language skills on academic outcomes is not clear due to limited research, though extant papers suggest no apparent academic performance differences in introductory accounting courses between native and non-native English speakers in UK and Australian universities (Crawford and Wang 2012; Rankin *et al.* 2003). Nevertheless, Chinese students used in this

study had a high English proficiency or study experiences in the UK before entry, which will reduce any unknown influence of language skills on the analysis.

Variables: gender, prior academic achievement, prior entry qualification, degree programme, and enrolment year

Cassidy (2012) suggests that one must consider individual differences such as age, gender and prior academic performance to understand academic achievement. The literature on the impact of age is plentiful and generates mixed results across different subjects. In UK universities, age is not a significant factor in determining academic performance of accounting students (Bartlett *et al.* 1993; Richardson 1995; Duff 2004; Marshall and Nicholson 1991; Hartley and Lapping 1992), but has influence on academic performance of sport and exercise students as well as psychology, counselling and sociology students (Sheard 2009; Cassidy 2012). Age is not considered in this study and is justified on the basis of underrepresentation of mature students in the sample: only two female Chinese students were enrolled as mature students in two academic years while the rest of the students were classified as young students at entry. In the UK higher education system, students who are aged less than 21 years at 30 September of the academic year in which they are recorded as entering the institution are designated young (Smith 2008).

Based on the literature, the following independent variables are used here to understand academic performance of UK and Chinese students: gender, prior academic achievement, prior academic qualification, degree programme and enrolment year. Gender is a demographic variable which has a significant albeit varied influence on students' academic achievement across subjects (Richardson and Woodley 2003), with women outperforming men on both final GPA and final year dissertation mark (Sheard 2009; Cassidy 2012). Other

studies (Duff 2004; Crawford and Wang 2012) report no apparent relationship between gender and academic performance in first year accounting studies. On the balance of previous studies, it is likely that female Chinese and UK students would perform better than their male counterparts.

A host of accounting studies show a positive correlation between prior academic achievement and subsequent academic performance in universities (Eckel and Johnson 1983; Dockweiler and Willis 1984; Clark and Sweeney 1985; Schroeder 1986; Eskew and Faley 1988; Farley and Ramsay 1988; Doran *et al.* 1991; Christopher and Debreceny 1993; Rohde and Kavanagh 1996; Koh and Koh 1999; Rankin *et al.* 2003; Alcock *et al.* 2008; Duff 2004; Crawford and Wang 2012). Other studies (Bartlett *et al.* 1993; Bourner and Hamed 1987) show weak or no correlation. On this basis then, it is likely that prior academic achievement is a significant factor in determining academic performance of both UK and Chinese students. Following NAO (2002a) and Crawford and Wang (2012), excellent prior academic achievement is measured by the number of A grades a student obtained in A level, preferably 3 or above.

Prior entry qualification is considered to be crucial in determining whether Chinese students can successfully enter and complete a higher education programme in the UK (Iannelli and Huang 2013). It is reasonable to suggest that Chinese students with A level experience should outperform those without A level experience. Choice of degree programme can influence academic performance as extant papers (Mansfield 2011; Surridge 2009) have noted a positive relationship between work placement and final degree classification. On the other hand, work placements do not seem to enhance students' learning or their engagement in critical thinking (Lucas and Tan 2013; Walmsley *et al.* 2006; Boud and Walker 1998). In our sample, students had a choice of taking the degree programme with or without work

placement. Thus, we hypothesise that work placements are beneficial academically to both Chinese and UK students. The last independent binary variable is enrolment year since Crawford and Wang (2012) find evidence of the variability of the effects of individual differences on students enrolled in different academic years.

Finally, the dependent variables to measure academic performance include Y2 and Y3/4 marks and final degree mark[3], which, as suggested by Sheard (2009) and Cassidy (2012), is the most reliable indicator of undergraduate achievement in UK higher education over time. Yearly marks and final degree mark are calculated by the department based on the weights attached to each different module which students attempted in different academic years. Yearly and final marks are recorded as arithmetical numbers out of 100 (e.g. 75). Final degree classifications are awarded based on final mark: final mark is 70 or over, first class degree (1); final mark is between 60 and 69, upper second class degree (2:1); final mark is between 50 and 59, lower second class degree (2:2); final mark is between 40 and 49, third class degree (3); and final mark of 38 and 39 with sufficient credits in essential units, unclassified degree.

Method

This is a three-year (BAF) and four-year (BAFP) longitudinal study involving the univariate analyses of academic performance differences between Chinese and UK students from Y1 to Y3/Y4 and on aggregation, final year mark. The result from the work placement in Y3 is excluded from the analysis because students who complete the module are assigned the same qualitative mark, pass. Y2, Y3/Y4 and final programme marks are used for stepwise regression analyses to detect significant predictor variables on academic attainment among Chinese and UK students. Because of the long study period (3 or 4 years), the sample size

reduces from 112 to 99 students. Failure to progress successfully from Y1 to Y2 and from Y2 to Y3/4 accounts for 10 students and 3 students respectively disappearing from the sample. Among these 13 students, two of them (one Chinese female and one UK male student) attempted the first year in both years 2006/7 and 2007/8. The Chinese student graduated in 2010/11 while the British student gave up study at the end of academic year 2007/8. Students who failed to progress to Y2 and/or to Y3/4 are dropped from the regression analysis, similar to Sheard (2009). Moreover, 19 students enrolled with prior academic qualifications which cannot be converted into equivalent A grades are also excluded from regression analyses.

Results

Summary analysis

Part A of Table 1 provides summary descriptive analysis of 112 students by the following factors: enrolment year, domicile, prior academic qualification, prior academic achievement, gender and degree programme. It appears that the average academic quality is higher among students enrolled in 2007/08 than students in 2006/07 even though the university did not change the entry requirements from 2006/07 to 2007/08. 20 out of 50 students enrolled in 2007/08 had 3 A grades or above while in 2006/07 15 out of 62 students had the same level of prior academic achievement. There were a higher proportion of students who chose to study BAFP in 2007/08 (33 out of 50) than in 2006/07 (35 out of 62). The gender imbalance in 2006/07, almost twice as many females as males, was completely readdressed in 2007/08, almost equal number of females and males. Amongst Chinese students, 36 out of 52 studied A level though only 11 of them obtained 3 A grades or above. Amongst UK students, 55 out of 60 had A level and 24 of them with 3 A grades or above. Among 21 students enrolled with other prior academic qualifications, 16 of them are Chinese and 5 are British. Among these 21 students, 19 of them had a qualification which cannot be converted to A level grades[4].

There are considerably more UK students (45) than Chinese students (23) who chose BAFP at the start. Chinese students are overwhelmingly females (35 out of 52) while there is no similar disparity among UK students.

Insert Table 1

Part B of Table 1 reveals final degree classifications based on domicile, prior academic qualification, prior academic achievement, gender, degree programme and enrolment year. There are several noteworthy differences: over 81% of 2007/08 students graduated with a good degree (classified as first and upper second class) while only 50% of 2006/07 students achieved the same attainment at graduation; 80% of UK students graduated with a good degree while 43% of Chinese students obtained a good degree[5]; over 82% of students with 3 A grades or more obtain a good degree, which is 31% higher than students achieving less than 3 A grades; 69% of BAFP students get a good degree, which is 14% higher than BAF students; finally, male students are 5% more likely than female students to graduate with a good degree.

Univariate analyses

The yearly mean marks and final degree mark of Chinese and UK students are reported by gender, degree programme, prior academic qualification, prior academic achievement and enrolment year in Table 2. The mean mark differences by domicile and predictor factors are examined using independent sample *t* tests. The significance cut-off level used here to determine whether the mark differences are significant or not is 10%, instead of more conventional 5%. As noted by Field (2005), there is very little justification in choosing a 5% significance level other than Fisher said so. A 5% significant level would reduce Type I error (the performance differences do not exist in the population) but increase Type II error (failure to notice the significant performance differences in the population) and researchers would

like to minimise the probability of Type II error (Field 2005). Iannelli and Huang (2013) clearly demonstrate that there is a performance difference between Chinese and UK students in UK higher education. Thus, a 10% significance level is employed in the univariate analysis to reduce an increased risk of failing to detect significant performance differences among students in the sample.

First and foremost, Chinese students significantly outperform UK students in the first year by 3.13 and then underperform UK students in the second year and final year by a significant 3.86 and 8.40, respectively. Overall, the final degree mark difference between Chinese and UK students is - 6.18, statistically significant at a 1% level. The rather different performance patterns between Chinese and UK students are presented most clearly on aggregation and by enrolment year in Figures 1 (a, b and c). In both academic years, Chinese students start brightly and are better academically than UK students, but their academic performance is evidently and increasingly worse than UK students in the second and final years though their performance improves slightly in the final year.

Insert Figures 1 (a, b and c)

Looking at Chinese students, their final degree marks are not affected by predictor factors, such as, gender, degree programme, prior academic qualification and prior academic achievement, though Chinese students enrolled in 2007/08 obtain a significantly higher final mark than those enrolled in 2006/07. Yearly marks appear to be inconsistently influenced by enrolment year and prior academic achievement. Chinese students with a high prior academic achievement perform better in the first year and final year. Among UK students, their final degree marks are statistically influenced by predictor factors such as gender, degree programme, prior academic achievement and enrolment year. Across the three and four years study period, enrolment year and prior academic achievement have a consistent and

significant impact on yearly marks. Another telling sign is the positive and significant impact of work placement. UK BAFP students perform significantly better, 4.10, in the final year compared with UK BAF students. Performance comparisons between UK and Chinese students reveal that UK students significantly perform better across all predictor variables than Chinese students in the final year (Y3/4) which explains why significantly more UK students graduated with a good degree.

Insert Table 2

Regression analyses

In this section, the determinants of Y2, Y3/4 and final degree marks are examined using stepwise regressions[6], similar to Cassidy (2012). The results are reported in Table 3. The resultant models for Y2, Y3/4 and final year marks explain about 35% of variance with two predictors which are significantly related to academic performance, prior academic achievement and enrolment year, suggesting that students enrolled in the year 2007/08 perform academically better than students enrolled in the year 2006/07 and students with excellent A level grades perform better than students with more modest A level grades. After controlling for individual differences, UK students persistently perform better than Chinese students in the final year (Y3/4 mark) and on aggregation (final mark), 8.6 and 5.6 more marks, both statistically significant at 1% levels. Female students on average obtain 4 marks more than male students in the second year. The results are largely in line with the univariate results reported earlier.

Insert Table 3

The sample is then split into two subsamples based on domicile: Chinese subgroup and UK subgroup. The stepwise regression results of these two subgroups are shown in Table 3. The obvious difference is that prior academic achievement is no longer a significant factor in influencing academic performance of any subgroups. Enrolment year becomes the most

consistent variable in explaining academic performance of the UK subgroup. In the Chinese subgroup, enrolment year is significant in determining performance in Y2 and on aggregation. The possible explanation is that enrolment year is a better variable than prior academic achievement in reflecting differences in A grades among these subgroups. Prior academic achievement for the Chinese and the UK subgroups is further analysed in Table 4 by domicile, gender, degree programme and enrolment year. Enrolment year (55%) is a better proxy to represent students' excellent A grades among UK students than prior academic achievement (42%). Among Chinese students, prior academic achievement (31%) is a better proxy than enrolment year (23%). Further regression tests are conducted to determine the impact of prior academic achievement by dropping enrolment year. The results are not reported here but reveal that prior academic achievement is the only significant factor in explaining final degree marks of UK students (adjusted R-squared 11.5%, significant at a 1% level) while final degree marks of Chinese students are not related to prior academic achievement.

Insert Table 4

Splitting the sample reduces the explanatory power of the models, except for UK students in the second year, for whom the model explains nearly 44% of the variance in the marks. In fact, enrolment year explains 40.3%, while gender accounts for 3.6% of the variance in Y2 mark for UK students. In line with the univariate analysis, UK students who completed a work placement in year 3 outperform other UK students in the final year by nearly 4 marks. For Chinese students, enrolment year accounts for 11.9% and 11% of variance in final degree mark and Y2 mark but fails to explain Y3 mark at any significant level. Other variables (gender, prior academic achievement, prior academic qualification, degree programme) do not seem to explain academic attainment of Chinese students, consistent with the univariate results.

Discussion

The research has its limitations due to the small sample size and diversity among Chinese students in their prior academic qualification, prior academic achievement, age, degree programme, cultural awareness and learning approach all of which can cause qualitative and quantitative differences in their academic attainment. However, despite these reservations regarding the findings, this present work helps to understand the academic attainment differences between Chinese and UK students in UK higher education.

This paper exposes an observable performance pattern difference between UK and Chinese students. Chinese students perform better than UK students in the first year but their subsequent academic performance in the second and final year is poor compared with that of UK students. In particular, UK students academically and significantly outshine Chinese students in the final year and on aggregation in univariate analysis. Richardson (2008) suggests that under-achievement of ethnic minority students in UK higher education is caused by a legacy of their prior academic under-achievement. After controlling for individual differences in prior academic achievement in regressions, the attainment differences between UK and Chinese students are still significant. It is clear that other factors rather than prior academic achievement are instrumental in determining performance differences.

Academic performance of UK students is consistently and significantly influenced by enrolment year, which is the best proxy for prior academic achievement, in the second and final years as well as on aggregation. This finding is in line with the results of prior studies (Cassidy 2012; Sheard 2009; Richardson 2008; Richardson 2012; Crawford and Wang 2012; Duff 2004). Other factors such as gender and degree programme are significantly correlated

to the UK students' Y2 mark and Y3 mark, respectively, which is consistent with the literature (Cassidy 2012; Sheard 2009; Richardson 2008; Richardson and Woodley 2003; Mansfield 2011; Surridge 2009).

On the other hand, academic performance of Chinese students is an enigma. Regression results show that enrolment year rather than prior academic achievement is significant in determining academic performance for the Y2 marks and final degree marks. The results are impossible to comprehend since enrolment year (23%) is a much worse variable than prior academic achievement (31%) in representing the number of A grades Chinese student have. Univariate results highlight additional unique characteristics of Chinese students. First, unlike their UK counterparts, Chinese females statistically insignificantly underperform Chinese males. Second, different from UK students, Chinese students choosing the degree programme with a work placement (BAFP) insignificantly underperform those choosing the degree programme without a work placement (BAF). It is possible that the results are affected by a disproportionately large number of females in the sample. The ratio of Chinese females and males is over 2 to 1. On the other hand, it is difficult to understand why prior academic achievement fails to explain academic performance of Chinese students and why Chinese BAFP students who completed a work placement fail to outperform Chinese BAF students in the final year even though Chinese BAFP students (30%) have a higher prior academic achievement than Chinese BAF students (14%) at entry.

Richardson (2012) suggests that underperformance of ethnic minorities is probably related to students' learning approaches and their perception of learning and being a learner in higher education. The observable turning point among Chinese students is from first year to second and final years. It is possible that first year subjects largely require a surface learning

approach which Chinese students master before entry, while subjects in the second and final years demand deep and strategic learning approaches which Chinese students fail to develop. Cassidy (2012) reveals that students show significant increases in deep and strategic learning approaches along with a significant reduction in surface approach to learning, when they progress from the first year to the final year. A number of contemporary studies suggest a link between student approaches to learning and academic performance (Cassidy 2012; Richardson 2003; Diseth 2002; Diseth *et al.* 2006; Duff 2004). Indeed, Duff (2004) and Cassidy (2012) reveal that deep and strategic approaches to learning are positively correlated to academic achievement. The research on Chinese students' learning approaches in UK higher education is limited. One study suggests that Chinese postgraduate students score lower than British postgraduate students on both deep and strategic approaches to studying in UK business schools (Sun and Richardson 2012).

The results of this present study suggest a direction for future research which should focus on how Chinese students' characteristics such as learning approaches to studying, development of learning approaches throughout the degree period and background information regarding parents' education, profession and income can affect their academic attainment in UK higher education. We may also need to look at curriculum design and the contents of assessments to see whether Chinese students are academically influenced by different types of questions or contents. Furthermore, research needs to be done into the relevant prior academic achievement levels for Chinese students as the present findings suggest that the number of A level grades is not a good and relevant indicator[7] of Chinese students' subsequent academic attainment in UK higher education.

Endnotes:

[1] Permission from all appropriate university authorities to collect data for the purpose of this research was obtained at the outset. Students were identified by a unique but anonymous student number rather than by name. Data was anonymised prior to the authors' access to it.

[2] In a presentation given by Mingzhu Wang (Oxford Brookes University), Mingzhu suggested that accounting and finance seemed to be one of the Chinese students' favourite choices in the UK.

[3] Y1 mark is not included in the calculation of final degree mark, since final degree mark is determined by Y2 and Y3 marks (40% and 60%, respectively). Thus, the determinants of Y1 mark are not relevant to this study.

[4] Two students enrolled with International Baccalaureates which can be converted to A level and A level grades.

[5] 43% is a little higher than percentages reported by Iannelli and Huang (2013). Around 83% of Chinese students in our sample studied A level or foundation courses in the UK before entry, which is significantly higher than 52% reported by Iannelli and Huang (2013). That might contribute to the better performance in this study.

[6] Residuals analyses indicate that the regression models have not violated underlying assumptions of normality, linearity, homoscedasticity, independence of errors and multicolinearity.

[7] Cassidy (2012) suggests that previous mixed results reported might be caused by inappropriate proxy for prior academic achievement and selects first year research methods module marks as an index of prior academic achievement. Based on the performance pattern of Chinese students in this study, it is unlikely that any first year course marks would be a better proxy of prior academic achievement than A level grades.

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Table 1 Descriptive statistics of sample students based on domicile, prior academic qualification, prior academic achievement, degree programme, gender and enrolment year.

Part A	**Domiciles**		**PAQs**		**PAVs**			**Degrees**		**Gender**	
	Chinese	**UK**	**A levels**	**Others**	**3 As**	**< 3 As**	**Missing**	**BAF**	**BAFP**	**Female**	**Male**
2006/7	31	31	52	10	15	37	10	27	35	40	22
2007/8	21	29	39	11	20	21	9	17	33	23	27
Chinese			36	16	11	25	16	29	23	35	17
UK			55	5	24	33	3	15	45	28	32
Grant total	52	60	91	21	35	58	19	44	68	63	49

Part B	**Domiciles**		**PAQs**		**PAVs**			**Degrees**		**Gender**		**Enrolment years**	
	Chinese	**UK**	**A levels**	**Others**	**3 As**	**< 3 As**	**Missing**	**BAF**	**BAFP**	**Female**	**Male**	**2006/07**	**2007/08**
First	6	17	21	2	16	6	1	5	18	13	10	6	17
Upper second	13	27	31	9	13	19	8	17	23	22	18	22	19
Lower second	21	11	27	5	5	22	5	16	16	19	13	26	6
Third	2	0	1	1	0	1	1	1	1	2	0	1	1
Unclassified	2	0	2	0	1	1	0	1	1	1	1	1	1
Total	44	55	82	17	35	49	15	40	59	57	42	56	44
No progress (Y2)	5	5	7	3	0	7	3	3	7	5	5	6	4
No progress (Y3)	3	0	2	1	0	2	1	1	2	1	2	1	2
Good degrees	19	44	52	11	29	25	9	22	41	35	28	28	36
Percentages	(43.2)	(80.0)	(63.4)	(64.7)	(82.9)	(51.0)	(60.0)	(55.0)	(69.5)	(61.4)	(66.7)	(50.0)	(81.8)

Notes: PAQs refers to prior academic qualifications which includes two categories, A level and others including all alternative qualifications. PAVs refers to prior academic achievement whereby students are classified based on the number of A grades they obtained at A level. BAF and BAFP refer to BSc (honours) Accounting and Finance and BSc (honours) Accounting and Finance with Placement. Finally, good degrees include first and upper second degrees.

Table 2 Independent sample *t*-test results of academic performance differences between Chinese and UK students as well as among Chinese and UK students based on gender, degree programme, prior academic performance, prior academic qualification and enrolment year.

	No. students	**Chinese**	**No. students**	**UK**	**Diff**	***P***
Y1 mark	52	63.59	60	60.46	3.13	*0.057**
Female	35	63.02	28	61.96	1.06	0.620
Male	17	64.77	32	59.15	5.62	*0.039***
Diff		-1.75		2.81		
P		0.482		0.220		
BAF	29	64.18	15	59.30	4.87	*0.006****
BAFP	23	62.85	45	60.85	2.00	0.388
Diffs		1.33		-1.55		
P		0.575		0.560		
3As	11	67.51	24	65.50	2.01	0.445
without 3As	25	62.88	33	56.89	5.99	*0.003****
Diffs		4.63		8.61		
P		*0.038***		*0.000****		
A levels	36	64.29	55	60.03	4.26	*0.008****
Others	16	62.01	5	65.22	-3.21	0.594
Diffs		2.28		-5.19		
P		0.367		0.208		
2006/07	31	63.33	31	57.27	6.06	*0.008****
2007/08	21	63.97	29	63.87	0.09	0.967
Diffs		-0.64		-6.61		
P		0.790		*0.003****		
Y2 mark	47	56.66	55	60.52	-3.86	*0.032***
Female	31	57.10	27	62.34	-5.24	*0.006****

Male	16	55.82	28	58.77	-2.95	0.395
Diff		1.28		3.57		
P		0.726		0.109		
BAF	26	57.70	15	58.12	-0.42	0.869
BAFP	21	55.38	40	61.44	-6.04	*0.023***
Diffs		2.32		-3.30		
P		0.422		0.189		
3As	11	60.72	24	64.00	-3.29	0.314
without 3As	22	54.60	29	57.56	-2.96	0.235
Diffs		6.12		6.45		
P		0.113		*0.004****		
A levels	33	56.64	51	60.13	-3.49	*0.091**
Others	14	56.72	4	65.55	-8.83	*0.072**
Diffs		0.09		5.42		
P		0.978		0.209		
2006/07	28	54.50	28	55.43	-0.93	0.684
2007/08	19	59.84	27	65.80	-5.96	*0.009****
Diffs		-5.34		-10.38		
P		*0.063**		*0.000****		

Y3/4 mark	44	58.02	55	66.42	-8.40	*0.000****
Female	30	56.87	27	67.81	-10.94	*0.000****
Male	14	60.49	28	65.08	-4.59	*0.060**
Diff		-3.63		2.73		
P		0.150		0.115		
BAF	25	58.82	15	63.44	-4.62	*0.058**
BAFP	19	56.96	40	67.54	-10.57	*0.000****
Diffs		-1.86		-4.10		

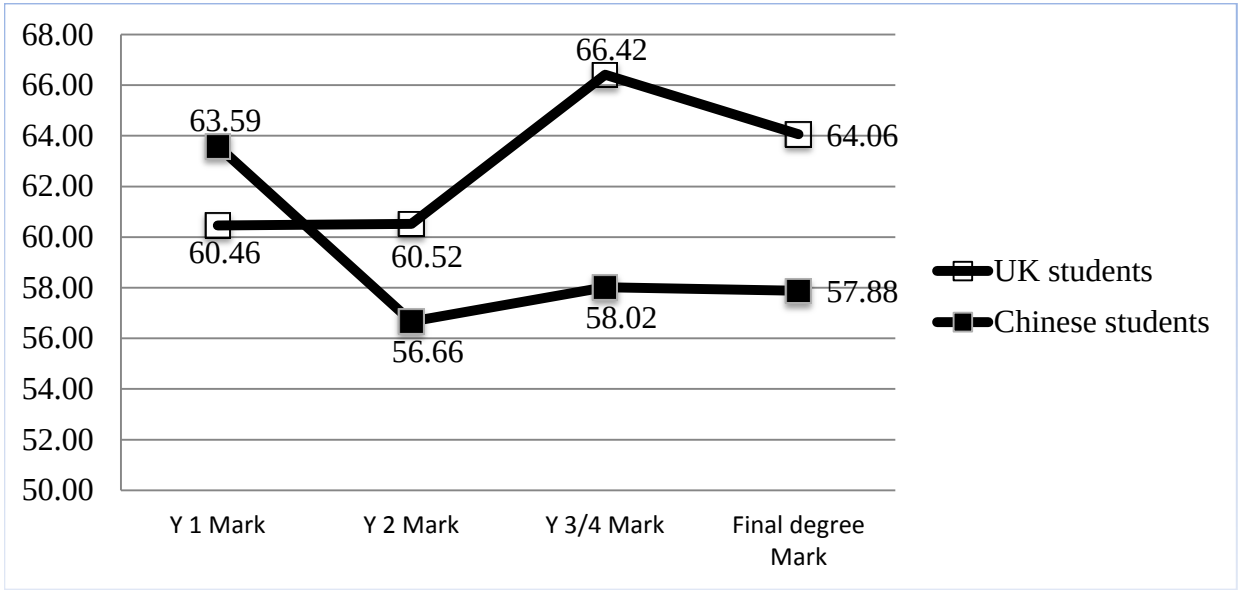
P		0.436		*0.033***		
3As	11	60.46	24	68.44	-7.97	*0.003****
without 3As	20	55.23	29	64.78	-9.55	*0.000****
Diffs		5.23		3.66		
P		*0.087**		*0.041***		
A levels	31	57.09	51	66.17	-9.09	*0.000****
Others	13	60.25	4	69.55	-9.30	*0.022***
Diffs		-3.16		-3.32		
P		0.221		0.314		
2006/07	27	56.59	28	64.60	-8.01	*0.000****
2007/08	17	60.29	27	68.30	-8.02	*0.002****
Diffs		-3.70		-3.70		
P		0.124		*0.030***		
Final degree mark	44	57.88	55	64.06	-6.18	*0.000****
Female	30	56.95	27	65.62	-8.67	*0.000****
Male	14	59.87	28	62.56	-2.69	0.279
Diff		-2.92		3.06		
P		0.228		*0.080**		
BAF	25	58.51	15	61.31	-2.81	0.209
BAFP	19	57.05	40	65.09	-8.04	*0.000****
Diffs		1.46		-3.78		
P		0.526		*0.053**		
3As	11	60.57	24	66.66	-6.10	*0.024***
without 3As	20	55.80	29	61.89	-6.09	*0.020***
Diffs		4.77		4.77		
P		0.104		*0.070**		
A levels	31	57.49	51	63.76	-6.26	*0.000****

Others	13	58.80	4	67.95	-9.15	*0.031***
Diffs		-1.31		-4.19		
P		0.601		0.216		
2006/07	27	56.29	28	60.93	-4.64	*0.010****
2007/08	17	60.40	27	67.30	-6.90	*0.004****
Diffs		-4.11		-6.37		
P		*0.074**		*0.000****		

Notes: BAF and BAFP refer to BSc (honours) Accounting and Finance and BSc (honours) Accounting and Finance with Placement. 3 As refer to the students having 3 A grades in A level study. The students whose prior academic qualifications cannot be converted into the number of A grades are excluded from the study. There are 15 Chinese students and 5 UK students enrolled with alternative prior academic qualifications which cannot be converted into A grades. A level represents all students who studied A level in high school while others include the rest of students with alternative academic qualifications. Throughout the degree study period 3 or 4 years, a number of students, 10 and 3, dropped from the study in Y2 and Y3 so the sample sizes have reduced in Y2 and Y3. *significant at 10% level; **significant at 5% level and ***significant at 1% level.

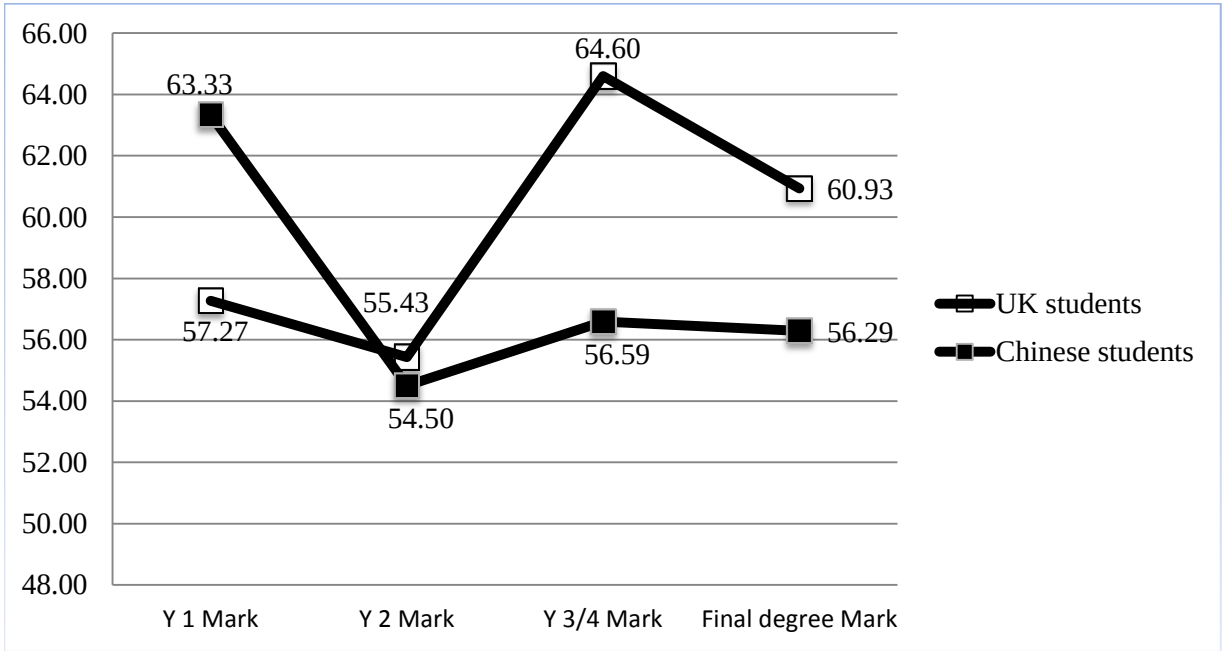
Figures 1: Comparison of academic performance across the degree period between UK and Chinese students on aggregation and by enrolment year

a. Comparison of academic performance across the degree period between UK and Chinese students for both enrolment years



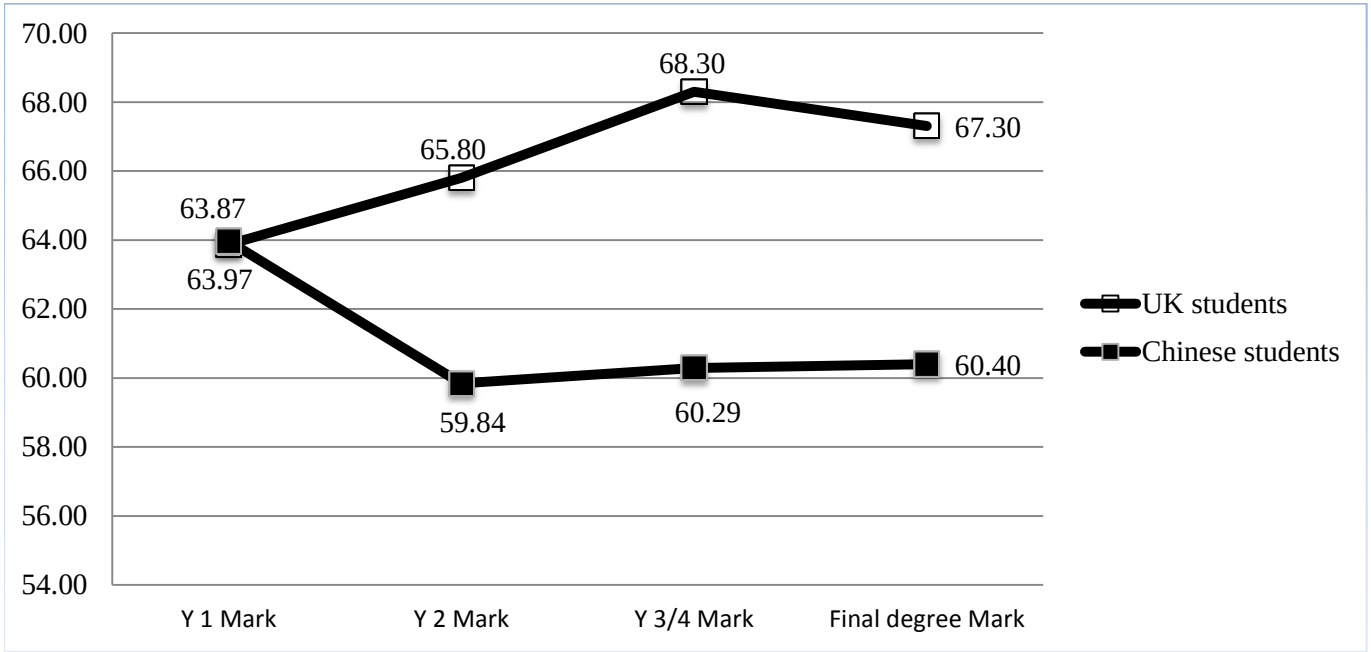
a. Comparison of academic performance across the degree period between UK and Chinese students for both enrolment years

b. Comparison of academic performance across the degree period between UK and Chinese students for enrolment year 2006/07



b. Comparison of academic performance across the degree period between UK and Chinese students for enrolment year 2006/07

c. Comparison of academic performance across the degree period between UK and Chinese students for enrolment year 2007/08



c. Comparison of academic performance across the degree period between UK and Chinese students for enrolment year 2007/08

Table 3 Stepwise regression results of factors affecting academic performance by years and by domicile

	Y 2 mark		Y3/4 mark		Final degree mark	
Constant	63.924		58.331		59.863	
P	0.000		0.000		0.000	
British/Chinese (1:0)			8.584		5.571	
P			0.000 *** (1)		0.000 *** (2)	
BAF: BAFP (0:1)						
Sig.						
Male/female (1:0)	-4.001					
P	0.020 ** (3)					
Prior Academic Qualification (Alevels:1)						
Sig.						
3 As (3As:1)	4.667		3.324		3.454	
P	0.008 *** (2)		0.033 ** (3)		0.016 ** (3)	
Enrolment Year (2006: 1)	-9.111		-3.756		-5.577	
P	0.000 *** (1)		0.016 ** (2)		0.000 *** (1)	
Adjusted R square	0.342		0.373		0.363	
F	15.738		17.432		16.741	
P	0.000		0.000		0.000	
No. of cases	86		84		84	
	Chinese	**UK**	**Chinese**	**UK**	**Chinese**	**UK**
Constant	62.164	67.85		65.584	61.345	67.546
P	0.000	0.000		0.000	0.000	0.000
BAF: BAFP (0:1)				3.821		
P				0.046 ** (2)		
Male/female (1:0)		-3.579				

P		0.043 ** (2)				
Prior Academic Qualification (Alevels:1)						
Sig.						
3 As						
P						
Enrolment Year (2006: 1)	-6.304	-10.632		-3.573	-5.974	-6.612
P	0.033**	0.000 *** (1)		0.039 ** (1)	0.039**	0.000***
Adjusted R square	0.119	0.439		0.127	0.110	0.240
F	5.034	21.375		4.782	4.698	17.545
P	0.000	0.000		0.013	0.000	0.000
No. of cases	33	53	31	53	31	53

Notes: Y2, Y3/4 and final year marks are analysed using the following binary variables: British/Chinese which takes one if the student is British, zero otherwise; BAF/BAFP takes one if the student chose BAFP in the corresponding academic years, zero otherwise; Male/female takes 1 if the student is male, zero otherwise; prior academic qualification take one if the student studied A level, zero otherwise; 3As takes 1 if the student obtained 3 A grades in A level study, zero otherwise; finally, enrolment year take one if the student enrolled in 2006/07, zero otherwise. The regression analyse exclude all students without A level results and students who failed to progress from Y1 to Y2 and/or from Y2 to Y3. **significant at 5% level and ***significant at 1% level. (1), (2) and (3) represent the explanatory power of different variables with (1) the most powerful variable.

Table 4 Comparison of prior academic achievement by domicile, gender, degree programme and enrolment year

	Chinese students			UK students		
	3 As or above	**Total No.**	**Percentages**	**3 As or above**	**Total No.**	**Percentages**
Female	7	35	(20.0)	13	28	(46.4)
Male	4	17	(23.5)	11	32	(34.4)
BAF	4	29	(13.8)	6	15	(40.0)
BAFP	7	23	(30.4)	18	45	(40.0)
2006/07	7	31	(22.6)	8	31	(25.8)
2007/08	4	21	(19.0)	16	29	(55.2)
3As	11	36	(30.6)	24	57	(42.1)
without 3As	25	36	(69.4)	33	57	(57.9)

Notes: in the analysis of prior academic achievement, the students whose prior academic qualifications cannot be converted into the number of A grades are excluded from the study. There are 15 Chinese students and 5 UK students enrolled with alternative prior academic qualifications so the sample sizes for prior academic achievement (3 As/without 3 As) are not the same as those for gender, degree programme and enrolment year.