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Approaches to learning IFRS by Chinese accounting students

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ABSTRACT

The teaching and learning of International Financial Reporting Standards (IFRS) are important for global accounting convergence. In China, many accounting students learn IFRS through education programs of the Association of Chartered Certified Accountants (ACCA). Based on a survey of 402 Chinese undergraduates registered as ACCA students, we investigate their study approaches and performance in learning IFRS. Study approaches are identified as the deep and surface ones based on the Revised Two-factor Study Process Questionnaire developed by Biggs, Kember, and Leung (2001). Results show that the deep approach is adopted more by Chinese students at the ACCA's professional level, with better adaptability and longer preparation time. We also find that the deep approach contributes to better learning performance in ACCA's global exams at both the fundamentals and professional levels. The findings are meaningful to IFRS education in non-English-speaking countries.

1. Introduction

International Financial Reporting Standards (IFRS), developed by the International Accounting Standards Board (IASB), are adopted or converged by all major economies (Hodgdon, Hughes, & Street, 2011), with the exception of the United States. The Emerging Economies Group was set up in 2011 to facilitate the development of IFRS in emerging economies, including China.[1] Substantial improvements have been made to the Chinese GAAP to converge to IFRS (Olesen & Cheng, 2017). The Association of Chartered Certified Accountants (ACCA) is one of the world-leading providers of IFRS education programs, with 200,000 members and 486,000 students in 178 countries as of 2017.[2] In China, more than 100 universities provide ACCA's program related courses, helping students to be future international accounting professionals.

Relevant education and professional training could improve accounting convergence (Chand & Patel, 2008). Carmona and Trombetta (2010) emphasize that the convergence also includes incorporating IFRS into the accounting curriculum. Chinese ACCA students, who study IFRS through ACCA's education programs, are important for accounting convergence in China. IFRS are recommended to be taught through Framework-based teaching, based on IASB's Conceptual Framework. Framework-based teaching provides students with a sound understanding of IFRS, helping students to apply concepts in various contexts (Wells, 2011). However, it remains unknown whether Chinese ACCA students adopt proper study approaches to achieve a sound understanding of IFRS.

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[1] https://www.iasplus.com/en/resources/ifrsf/advisory/eeg.

[2] ACCA official (2017), on the webpage of http://www.accaglobal.com/us/en/about-us.html.

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Study approach is the set of information-processing activities students habitually deploy while studying (Vermunt, 1996), which reflects the relationship among student, context, and task (Biggs, Kember, & Leung, 2001). Students with deep approaches can comprehend and master theories thoroughly, while students with surface approaches only memorize knowledge to pass an exam (Biggs, 1987). Preference to study approaches changes across disciplines (Booth, Luckett, & Mladenovic, 1999; Eley, 1992; Entwistle & Ramsden, 1983) and cultural backgrounds (Abhayawansa & Fonseca, 2010; Zhang, 2000). Accounting students appear to prefer surface approaches to deep ones (Booth et al., 1999; Eley, 1992; Hall, Ramsay, & Raven, 2004). In addition, teaching context and student factors can influence study approaches of accounting students (Duff, 1999; Elias, 2005; English, Luckett, & Mladenovic, 2004; Everaert, Opdecam, & Maussen, 2017; Hall et al., 2004), which in turn determine their learning performance (e.g. Booth et al., 1999; Byrne & Flood, 2008; Davidson, 2002; Duff, 2004; Everaert et al., 2017).

However, it is unclear whether the above findings hold for Chinese ACCA students. As Chinese ACCA students are learning IFRS across different languages and different cultures, they face many challenges to study IFRS and pass the ACCA's global exams. Therefore, this paper investigates the relationship among student factors, study approaches and learning performance of Chinese ACCA students.

For influencing factors of study approaches, we find that the deep approach is adopted more by students at ACCA's professional level, with better adaptability and longer preparation time. We also investigate the effect of study approaches on learning performance of Chinese ACCA students. Results show that the deep approach contributes to higher scores on ACCA's global exams at both the fundamentals and professional levels. The findings are also supported by subsample analysis, robustness tests and two-stage treatment effect models.

We fill the gap in the accounting education literature by providing the first evidence on study approaches of Chinese accounting students in learning IFRS. Most studies concerning study approaches are conducted in Australia or the US (Everaert et al., 2017). China is characterized as one of the largest non-English-speaking countries with the largest number of students. The findings are meaningful for non-English-speaking countries encouraging international accounting education and provide some practical suggestions for IFRS education in emerging markets.

This paper also improves several aspects of research designs for the study approach literature. To better measure students' preference for study approaches, we compute a gapped score by comparing their scores of deep and surface approaches. The gapped score helps to reflect students' different attitudes towards deep approaches and surface approaches. More importantly, we examine effects of study approaches on learning performance at different levels of ACCA and construct a two-stage treatment effect model to control for endogeneity. Prior studies are affected by different perceptions of assessment methods (Struyven, Dochy, & Janssens, 2003) and do not control for the potential endogeneity of study approaches. The exams at the fundamentals and professional levels of ACCA benefit us by providing non-subjective real examples of different assessment methods.[3] We use the exam levels of ACCA as an exogenous instrument to reduce endogeneity concerns. Our research design guarantees us better robustness and provides some reference for future research on study approaches.

The remainder of this paper proceeds as follows. In Section 2, we introduce the background of Chinese ACCA education and develop our hypotheses. Section 3 describes the methods and Section 4 reports the empirical results. Conclusions and discussion are provided in the last section.

2. Background and hypotheses

2.1. Background

ACCA is the first international accounting association to operate in China; since 1990 (Yunwei, 1997). Nowadays, more than 100 Chinese universities offer ACCA education. There are two levels of ACCA exams: the fundamentals and professional levels. The fundamentals level requires students to pass nine exams, and the professional level includes seven exams and requires student to choose and pass five of them.[4] At the fundamentals level, students need to master fundamental knowledge and practical skills required of professional accountants. At the professional level, students need to develop a strategic vision and an integrated approach for analyzing future leadership position. For the March 2018 exam sitting, the average passing rate of exams is 57% at fundamentals level, and 41% at professional level.[5] Although the passing marks for ACCA are 50%, the passing rates are low and it is not easy to ultimately pass all the exams and get the final qualification.

For Chinese ACCA students, they are taught with both Chinese and English in ACCA courses. They need to learn not only the ACCA courses, but also other courses required of a bachelor's degree in universities. In China, an ACCA qualification helps students in getting jobs and career development. Qualified Chinese ACCA members are competitive to get jobs in various sectors, many of whom are hired by multinational companies (Senarath Yapa & Ping Hao, 2007). As an ACCA qualification is attractive to Chinese ACCA students, they spend plenty of time on ACCA courses.

[3] At the fundamentals level of ACCA, assessments are mainly based on MCQs (no additional deduction for a wrong choice) and calculation work, which focus on knowledge memorization. The professional level exams solely include practical case-based subjective questions, requiring better analytical and writing skills.

[4] Since 2018, two of the 7 exams are combined as a new one named ''strategic business leader'' and students are required to pass 4 of the remaining 6 exams.

[5] https://www.accaglobal.com/hk/en/news/2018/april/exam_results_mar2018.html. The average passing rates include students who are not the first time to take a certain exam.

2.2. Study approach

Marton and Säljö (1976) put forward the concept of study approach and identify two different levels of information processing: surface-level processing and deep-level processing. Biggs (1987) develops the Study Process Questionnaire (SPQ) and identifies three study approaches: the deep, surface and achievement approaches. Students with deep approaches are more likely to enjoy studying, to search for the meaning behind materials, to integrate prior knowledge into the current knowledge and to investigate the relation between them; while students who adopt surface approaches use memorization to meet the minimum course requirements and avoid searching for the meaning and relation between them (Biggs, 1987). Different from surface and deep approaches, an achievement approach emphasizes how students organize their learning. Students with achievement approaches strategically organize their time and working space to obtain higher grades (Biggs, 1987).

Biggs et al. (2001) further develop a revised two-factor version of Study Process Questionnaire (R-SPQ-2F) excluding achievement approaches, because achievement approaches have some overlaps with deep and surface approaches (Kember & Leung, 1998; Zhang, 2000). The R-SPQ-2F includes 20 items, with 10 items for the deep and surface approach respectively. The R-SPQ-2F is widely used in various cultural contexts (Everaert et al., 2017; Leung, Ginns, & Kember, 2008; Xie, 2014; Yin, Wang, & Han, 2016). Leung et al. (2008) find the R-SPQ-2F is valid among Hong Kong and Australia university students. Yin et al. (2016) and Xie (2014) also use R-SPQ-2F to investigate Chinese students and find that the R-SPQ-2F has acceptable reliability and validity.

2.3. Factors affecting study approach

Wilson, Smart, and Watson (1996) show that there is no significant difference in study approaches between male and female accounting students. Subsequent studies show inconsistent results on gender differences in study approaches (Elias, 2005; Everaert et al., 2017; Xie & Zhang, 2015). For example, Everaert et al. (2017) survey first-year accounting students in Belgium and find that male accounting students use more surface approaches than females. They explain the difference with less time spent by male accounting students on learning. However, Xie and Zhang (2015) find that male students use more deep approaches than females in China. In general, "Gender differences in learning approaches might emerge in particular academic or cultural contexts, with particular disciplines, curricula or program structure, or on different academic assessment methods" (Chan & Kan, 2017, p. 14). Based on above discussion, we propose the first hypothesis as follows:

H1: No gender differences exist in study approaches of Chinese ACCA students.

Students might select surface approaches strategically under certain conditions of assessment methods (Biggs et al., 2001). However, Smith and Miller (2005) show that assessment methods have no significant effect on study approaches. The inconsistency is attributable to different perceptions of assessment methods (Struyven et al., 2003). A multiple-choice question (MCQ) based exam is often perceived as assessing knowledge memorization or lower level cognitive processing (Scouller, 1998). Although Scouller and Prosser (1994), find that the MCQ-based exam is associated with deep approaches, most studies find that it associates with surface approaches (Ramsden, 1988; Scouller, 1998; Watkins, 1982). For example, Scouller (1998) finds that Australian students exhibit surface approaches in MCQ-based exams and deep approaches in essay-based exams (which emphasizes higher level cognitive processing, such as analysis, application and comprehension). At the fundamentals level of ACCA, assessments are mainly based on MCQs (no additional deduction for a wrong choice) and calculation work, which focus on knowledge memorization. The professional level exams solely include practical case-based subjective questions, requiring better written communication and analytical skills. Therefore, we develop the following hypothesis:

H2: Deep study approaches are adopted more at the professional level of ACCA than at the fundamentals level.

We further consider the effects of English competence, adaptability and preparation time. ACCA courses requires necessary English competency of Chinese students. Language barriers could cause low efficiency in study, pushing students towards a surface approach (Bobe & Cooper, 2017; Gow, Kember, & Chow, 1991; Watty, Jackson, & Yu, 2010). Gow et al. (1991) examine the relationship between study approach and English language ability of Hong Kong students, who are instructed in both Cantonese and English. They find that faced with more difficulties in understanding the meaning of content, students with lower English language ability are more likely to adopt a surface learning strategy. Bobe and Cooper (2017) find similar results for accounting students learning in English.

For Chinese ACCA students, their learning tasks are more difficult and require adequate adaptability. The Chinese accounting courses also help them better understand ACCA courses and adapt to ACCA exams. If students could not adapt to either ACCA courses or even Chinese accounting courses, they may lose interest or patience in studying. In addition, students should have adequate time to understand and integrate the knowledge in ACCA courses. Therefore, we propose the following hypothesis:

H3: Deep study approaches are positively associated with English competency, adaptability and preparation time of Chinese ACCA students.

2.4. Study approaches and learning performance

Study approaches have important implications for learning performance (Biggs et al., 2001). Although deep study approaches are expected to improve accounting students' learning performance, empirical results are not always significant. For example, Booth et al. (1999) find that deep approaches are not significantly associated with more successful objective performance or subjective performance based on a sample of Australian accounting students. In general, most studies still document a positive relation (Byrne, Flood, & Willis, 2002; Davidson, 2002; Duff, 2004; Eley, 1992; Elias, 2005; Everaert et al., 2017). Specifically, Davidson (2002) finds a significant and positive relationship between deep approaches and learning performance in an introductory financial accounting course. Byrne et al. (2002) investigate Irish accounting students in their study of management accounting and find that a deep approach is positively associated with learning performance. Similarly, Elias (2005) and Everaert et al. (2017) both find that deep approaches can result in higher learning performance. Therefore, we propose the fourth hypothesis as follows:

H4: Deep study approaches contribute to higher learning performance.

3. Method

3.1. Participants

We select the 3rd and 4th year undergraduates registered with ACCA programs as our subjects, because Chinese undergraduate students participate in ACCA's global exams mainly from the third year. We originally surveyed 455 ACCA students from several universities in China. We drop 41 responses with incomplete data and 12 responses with invariant choices for all the R-SPQ-2 items. After that, we keep the remaining 402 responses which include 240 females and 162 males. The final sample also includes 188 students at the fundamentals level and 214 at the professional level of ACCA.

3.2. Measurement instruments

3.2.1. Study approaches

Biggs (1987) originally develops a Study Process Questionnaire (SPQ) which encloses three approaches (the surface, deep and achievement approaches) with 42 items. However, Kember and Leung (1998) find that the motive and strategy of achievement approaches are associated with the surface and deep ones. Biggs et al. (2001) then revise the SPQ to a shortened version of R-SPQ-2F, with two scales for deep and surface approaches based on 20 items. Xie (2014) finds that the R-SPQ-2F shows acceptable reliability and validity among Chinese university students. We use the Revised Two Factor Study Process Questionnaire (R-SPQ-2F) to measure the study approaches of Chinese ACCA students. Scores of deep approaches (DA) and surface approaches (SA) are calculated by the mean scores of corresponding items.

3.2.2. Influencing factors

English competency is measured by score intervals of the College English Test Band Four (CET-4) in China, coded with 1–6 from low to high. Adaptability is measured by a 4-point scale from low to high, where "1" represents not adaptable to either Chinese accounting courses or ACCA courses, "2" represents more adaptable to Chinese accounting courses, "3" represents more adaptable to ACCA courses and "4" represents adaptable to both Chinese accounting courses and ACCA courses.[6] Preparation time is measured by a 5-point scale, with higher values representing longer preparation time. GPA is the Grade Point Average in prior college exams, coded as 1–4 from low to high. Level is coded as "1" for the fundamentals level and "2" for the professional level. Gender is coded as "1" for females and "0" for males.

3.2.3. Learning performance

The scores at fundamentals and professional levels are both measured by 6-point scales, where "1" represents equal or lower than 39, "2" represents 40–49, "3" represents 50–59 (passing), "4" represents 60–69, "5" represents 70–79 and "6" represents equal or greater than 80.[7]

[6] We measure the adaptability of Chinese ACCA students by comparing their perceptions on relative adaptability between Chinese accounting courses and ACCA courses. Although adaptability is also measured by general scales in education literatures, we do not use the scales because they include more questions for students to answer and cannot reflect the relative adaptability between Chinese accounting courses and ACCA courses.

[7] Scores higher than 90 are not separately coded because they are very high scores and not so observable in ACCA exams, especially at the professional level.

4. Results

4.1. Construct validity and reliability

Confirmatory factor analysis (CFA) is conducted based on data from our questionnaires. Our model corresponds to the model in Xie (2014). We delete the eighth item in the R-SPQ-2F which has a factor loading of 0.38, because Hair, Black, Babin, Anderson, and Tatham (2006) suggest that factor loadings should not be less than 0.40. Our first order two-factor model generates the following statistics: Chi-square = 413.99, Chi-square/df = 2.74, CFI = 0.91 (Comparative Fit Index), GFI = 0.90 (goodness-of-fit index), TLI = 0.90 (Tucker-Lewis Index), RMSEA = 0.07 (root mean square error of approximation). In addition, the Cronbach's alpha statistics are 0.821 for SA and 0.908 for DA. According to the criteria in Lomax and Schumacker (2004), we obtain satisfactory statistics concerning validity and reliability.

4.2. Descriptive statistics and correlations

Table 1 provides variable descriptions. The mean DA score is significantly higher than SA score ($P < 0.001$), suggesting that Chinese accounting students prefer deep approaches in ACCA courses. The mean exam scores of fundamentals level and professional level are 3.98 and 3.31, indicating that most students pass ACCA exams slightly above the required scores, especially when difficulty increases at the professional level. Other variable descriptions are also included in Table 1.

Table 2 shows the Pearson correlations between all the variables. DA is significantly and negatively related to SA (−0.115), which is consistent with previous studies (Biggs et al., 2001; Everaert et al., 2017). In addition, DA is significantly and positively correlated with English competence (0.133), ACCA level (0.281), preparation time (0.247), adaptability (0.314) and GPA (0.248) respectively. Meanwhile, SA is significantly negative correlated with Gender (−0.105), adaptability (−0.205) and GPA (−0.109). The correlations with DA and SA are basically consistent with the predictions of related hypotheses.

Fscore and Pscore are both significantly and positively (negatively) related to DA (SA), consistent with our fourth hypothesis. In addition, Gender is not correlated with both Fscore and Pscore. Values of all the correlations are less than 0.45, indicating that there is no serious multicollinearity.

4.3. Main regression results

4.3.1. Factors affecting study approaches

For factors affecting the adoption of surface and deep approaches, we construct the following model:

$$\text{Study approach} = \beta_0 + \beta_1\ \text{Gender} + \beta_2\ \text{Level} + \beta_3\ \text{English} + \beta_4\ \text{Adapt} + \beta_5\ \text{Time} + \varepsilon \quad (1)$$

We measure study approaches based on the scores of deep approach (DA), surface approach (SA) and the difference between DA and SA scores (i.e. DA-SA). Because DA and SA are significantly and negatively correlated, the value of DA-SA can better reflect student's different attitudes to the two approaches. The calculation of DA-SA also helps reduce the inappropriate influence of some students answering with indifferent scores of DA and SA. The results of model (1) are presented in Table 3. The dependent variables are DA, SA, DA-SA, and the dummy of DA-SA (using the average of DA-SA as the cut value) respectively. In general, the model statistics (R^2_adj. and F values) are much more significant for columns (1), (3) and (4) than those for column (2) where SA is the dependent variable. Therefore, we put more weight in results from column (1), (3) and (4) in the following discussion.

As for hypothesis H1, the coefficients of Gender are not significant in columns (1), (3) and (4) of Table 3, but is significantly negative in column (2). That is, no gender difference exists if we measure study approaches based on the value of DA or DA-SA. Therefore, hypothesis H1 is supported overall.

As for hypothesis H2, the coefficients of Level are significantly positive in columns (1), (3) and (4) of Table 3. Consistent with hypothesis H2, the results show that ACCA students at the professional level are more inclined to adopt deep approaches than those at the fundamentals level. The preference and necessity for deep approaches can be attributed to the assessment methods at the professional level, which require higher cognitive processing ability and include more analytical and case-based questions. Therefore, it is valuable to make students fully aware of the upgraded assessment methods when they start the professional level of ACCA.

As for hypothesis H3, the coefficients of English are not significant in all the regressions of Table 3, which are not consistent with expectation and previous research (Bobe & Cooper, 2017; Gow et al., 1991). One possible explanation is Chinese ACCA students in our sample generally have adequate English competence (mean = 3.89). Before they take the ACCA education programs, they are preselected (by themselves and by program recruiters) based on their English language level.[8]

[8] Although English competence does not affect the preference of study approaches, it is still very important because it can affect learning performance significantly (see the coefficients of English in Table 4).

Table 1
Descriptive statistics.

Variable	Obs	Mean	Std.Dev.	Min	Median	Max
DA	402	33.10	7.658	10	33	50
SA	402	25.85	6.144	9	26	43
Gender	402	0.60	0.491	0	1	1
English	402	3.89	1.092	1	4	6
Level	402	1.53	0.500	1	2	2
Time	402	3.18	1.144	1	3	5
Adapt	402	3.09	0.906	1	3	4
GPA	402	2.63	0.804	1	3	4
Fscore	402	3.98	1.062	1	4	6
Pscore	214	3.31	0.811	1	3	6

DA and SA refer to deep approach and surface approach; Gender is coded as one for female students, and zero otherwise; English means English competency, measured by CET-4 exam score intervals; Level is coded as one for the Fundamentals level and two for the professional level. Time means preparation time for ACCA global exams; Adapt is the adaptability of Chinese students in ACCA education programs; GPA is Grade Point Average; Fscore (Pscore) is average score at Fundamentals (Professional) level. The sample includes 402 observations, with 188 (214) students at the Fundamentals (Professional) level.

Table 2
Pearson correlations.

	DA	SA	Gender	English	Level	Time	Adapt	GPA	Fscore
DA	1								
SA	−0.115*	1							
Gender	−0.053	−0.105*	1						
English	0.133*	−0.085	0.148*	1					
Level	0.281*	−0.082	0.002	0.087	1				
Time	0.247*	−0.075	0.016	0.220*	0.114*	1			
Adapt	0.314*	−0.205*	0.021	0.211*	0.258*	0.234*	1		
GPA	0.248*	−0.109*	−0.048	0.308*	0.148*	0.326*	0.269*	1	
Fscore	0.377*	−0.114*	−0.035	0.345*	0.260*	0.278*	0.367*	0.427*	1
Pscore	0.362*	−0.114*	0.014	0.151*	0.942*	0.200*	0.295*	0.240*	0.374*

* Indicates that correlation is significant at the 0.05 level (2-tailed).

Table 3
Factors affecting study approaches (N = 402).

	(1) DA	(2) SA	(3) DA-SA	(4) DA-SA_average
Gender	−1.047	−1.215**	0.169	−0.007
	(−1.50)	(−1.97)	(0.18)	(−0.05)
Level	3.118***	−0.361	3.480***	0.485***
	(4.31)	(−0.57)	(3.49)	(3.58)
English	0.305	−0.135	0.439	0.083
	(0.87)	(−0.49)	(0.94)	(1.28)
Adapt	1.816***	−1.257***	3.073***	0.453***
	(4.61)	(−3.76)	(5.81)	(5.88)
Time	1.102***	−0.115	1.217***	0.135**
	(3.23)	(−0.42)	(2.65)	(2.26)
Constant	18.665***	31.893***	−13.228***	−2.991***
	(10.72)	(21.06)	(−5.47)	(−7.67)
R^2_adj	0.164	0.042	0.165	0.137
(Pseudo R^2)				
F(Wald-chi2)	21.190	5.282	20.973	73.18

The regression model is:
Study approach $= \beta_0 + \beta_1$ Gender $+ \beta_2$ Level $+ \beta_3$ English $+ \beta_4$ Adapt $+ \beta_5$ Time $+ \varepsilon$
The dependent variables for study approach are DA, SA, DA-SA and DA-SA_average. Other variable definitions are in Table 1. T statistics are presented in parentheses.
* Indicate significance at 0.10.
** Indicate significance at 0.05.
*** Indicate significance at 0.01.

The coefficients of Adaptability are significantly positive in columns (1), (3) and (4) of Table 3, and significantly negative in column (2). They show that with better adaptability, students will be more likely to take deep approaches. Higher adaptability may make students engaged more in study. This suggests that teachers should take measures to help students adapt to accounting courses, especially the ACCA courses.

Table 4
Study approaches and learning performance.

	(1) Fscore	(2) Fscore	(3) Pscore	(4) Pscore
DA	0.030***		0.031***	
	(4.19)		(3.98)	
SA	−0.002		−0.011	
	(−0.23)		(−1.45)	
DA-SA		0.018***		0.023***
		(3.63)		(3.98)
Gender	−0.100	−0.132	0.064	0.063
	(−1.12)	(−1.47)	(0.68)	(0.67)
English	0.191***	0.192***	0.135**	0.143***
	(3.72)	(3.74)	(2.48)	(2.63)
Adapt	0.208***	0.212***	0.023	0.017
	(3.68)	(3.77)	(0.37)	(0.28)
Time	0.057	0.068	0.102**	0.110***
	(1.36)	(1.59)	(2.51)	(2.68)
GPA	0.318***	0.325***	0.230***	0.229***
	(5.07)	(5.08)	(3.88)	(3.88)
Constant	0.689*	1.455***	0.900**	1.441***
	(1.78)	(6.51)	(2.14)	(4.54)
N	402	402	214	214
R^2_adj	0.325	0.313	0.310	0.303
F	34.881	38.956	9.061	10.209

The regression model is:
$\text{learning performance} = \beta_0 + \beta_i \text{ study approaches} + \beta_j \text{ controls} + \varepsilon$
The learning performance variables are Fscore for the first two columns and Pscore for the last two columns, representing the score at Fundamentals and Professional level. The study approach variables are DA, SA and DA-SA. T statistics are presented in parentheses.
* Indicate significance at 0.10.
** Indicate significance at 0.05.
*** Indicate significance at 0.01.

Finally, the coefficients of Time are also positively significant in columns (1), (3) and (4), showing that students with longer preparation time tend to adopt deep approaches. It is consistent with intuition because longer preparation time allows them to better understand and comprehend knowledge. Based on the coefficients for English, Adaptability and Time, we find that hypothesis H3 is partially supported.

4.3.2. Effects of study approaches on learning performance

Then, we examine hypothesis H4 regarding the effects of study approaches on learning performance with the following model:

$$\text{learning performance} = \beta_0 + \beta_i \text{ study approaches} + \beta_j \text{ controls} + \varepsilon \quad (2)$$

The dependent variables are learning performance scores based on the global ACCA exam scores (Fscore and Pscore) at the fundamentals and professional levels. The study approach measures include deep approach (DA), surface approach (SA) and the difference between DA and SA scores (DA-SA). The control variables include Gender, English, Adaptability, Time and GPA, which are defined as in Table 1.

The results on hypothesis H4 are shown in Table 4. For the fundamentals level learning performance, we find that the coefficients of DA and DA-SA are both significant and positive in columns (1) and (2) of Table 4. For the professional level learning performance, we also find significantly positive coefficients of DA and DA-SA in columns (3) and (4) of Table 4. In addition, the coefficients of SA in column (1) and (3) are negative but insignificant.[9] Overall, the results show that deep approaches contribute to better learning performance at both fundamentals level and professional level, consistent with hypothesis H4. ACCA exams, especially at the professional level, are scenario-based and emphasize the application (not simple reproduction) of knowledge. Therefore, Chinese ACCA students should try to adopt more deep approaches, with an emphasis to understand, master and apply professional knowledge.

Coefficients of control variables are also presented in Table 4. The coefficients of Gender are all insignificant, showing no gender difference in learning performance of Chinese ACCA students. English and GPA are positively and significantly related to learning performance at both the fundamentals level and the professional level. Although English competence does not mean more deep approaches to learning (see the coefficients in Table 3), it is helpful for Chinese accounting students to get higher scores in ACCA exams. Particularly, better English language ability may facilitate students to understand exam

[9] Hypothesis H4 propose a positive relation between deep approaches and learning performance, which does not necessarily mean significantly negative coefficients of SA. Moreover, we find that the coefficient of SA is more negative (although still insignificant) at professional level, indicating that surface approaches seem to be more ineffective at higher examination levels.

Table 5
Subsample tests.

Panel A: sub-Adapt samples				
	Adapt ≤ 3 Fscore	Adapt > 3 Fscore	Adapt ≤ 3 Pscore	Adapt > 3 Pscore
DA-SA	0.024***	0.014*	0.018**	0.031***
	(3.62)	(1.78)	(2.46)	(3.88)
N	246	156	112	102
R^2_adj	0.276	0.205	0.285	0.304
F	23.833	11.092	6.101	6.499
Panel B: sub-Time samples				
	Time ≤ 3 Fscore	Time > 3 Fscore	Time ≤ 3 Pscore	Time > 3 Pscore
DA-SA	0.025***	0.009	0.012*	0.035***
	(3.58)	(1.29)	(1.89)	(3.58)
N	245	157	118	96
R^2_adj	0.249	0.273	0.136	0.262
F	18.896	14.563	3.721	6.086
Panel C: sub-GPA samples				
	GPA < 3 Fscore	GPA ≥ 3 Fscore	GPA < 3 Pscore	GPA ≥ 3 Pscore
DA-SA	0.016*	0.016**	0.003	0.030***
	(1.74)	(2.51)	(0.47)	(3.87)
N	147	255	62	152
R^2_adj	0.212	0.208	0.085	0.269
F	10.196	16.306	2.328	8.580

Control variables are not reported. t statistics in parentheses.
* Indicate significance at 0.10.
** Indicate significance at 0.05.
*** Indicate significance at 0.01.

questions and better communicate their answers in ACCA exams. GPA scores reflect students' general learning ability. The significantly positive coefficients of GPA indicate that Chinese ACCA students who study well in other courses also get higher scores in ACCA exams. The coefficients of Adaptability are significant and positive for learning performance at the fundamentals level, but not significant for performance at the professional level. It is consistent with the intuition that adaptability is more influential for students who start to learn a new series of courses. Educators should put more emphasis on improving ACCA students' adaptability especially at the fundamentals level. Finally, Time is not significantly related to learning performance at the fundamentals level, but positively related to performance at the professional level. The results indicate that students need to spend more time to prepare for the professional level exams, which are more difficult and demanding than the fundamentals level exams.

To reduce the concern that more competent students are more likely to adopt deep approaches, we further conduct three subsample tests. Results are shown in Table 5. We divide the general sample according to medians of Adaptability, Time and GPA respectively. Results show that the coefficients of DA and DA-SA are significant and positive in most subgroups (10 of 12 subgroups), supporting hypothesis H4 with good robustness. More importantly, the results suggest that even for students with lower adaptability, lower preparation time and lower GPA, deep study approaches are still helpful for improving the scores of ACCA exams.

4.4. Treatment effects

We further construct two-stage treatment effect models to test whether results in Table 4 are robust when treatment effects are considered. At the first stage we use DA-SA_ average (a dummy coded as one if DA-SA is larger than its average, and zero otherwise) as the dependent variable. Regression results of the first stage are as in column (4) of Table 3.

At the second stage, we run regressions as in column (1)–(3) of Table 6. The dependent variable in the first column of Table 6 is Fscore and the sample size is 402; and in the second column the dependent variable is Pscore and the sample size is 214. For the last regression in Table 6, we create a new standardized learning performance variable named "Score" to improve the comparability of exam scores across different ACCA levels. The value of "Score" is computed by dividing the demeaned Fscore and Pscore with their standard deviations, following the method in Shell, Soh, Flanigan, and Peteranetz (2016). The regression in the last column of Table 6 is solely based on students at the professional level of ACCA. They are asked questions on both their Fscore and Pscore, which doubled the sample size from 214 to 428.

Table 6
The treatment effect models.

	(1) Fscore	(2) Pscore	(3) Score
DA-SA	0.019***	0.032***	0.032***
	(2.79)	(3.75)	(4.56)
Gender	−0.132	0.067	−0.004
	(−1.47)	(0.72)	(−0.05)
English	0.191***	0.137**	0.209***
	(3.74)	(2.50)	(4.44)
Adapt	0.209***	−0.011	−0.008
	(3.51)	(−0.17)	(−0.14)
Time	0.067	0.096**	0.123***
	(1.54)	(2.32)	(3.32)
GPA	0.325***	0.240***	0.237***
	(5.08)	(3.94)	(4.25)
Lambda	−0.017	−0.144*	−0.143*
	(−0.21)	(−1.72)	(−1.93)
Constant	1.464***	1.481***	−2.086***
	(6.44)	(4.64)	(−8.63)
N	402	214	214×2
R^2_adj	0.311	0.308	0.289
F	33.302	9.058	21.513

The form of the second stage treatment effect models is as follow:
$\text{Learning Performance} = \beta_0 + \beta_1(\text{DA} - \text{SA}) + \beta_2\ \text{Gender} + \beta_3\ \text{English} + \beta_4\ \text{Adapt} + \beta_5\ \text{Time} + \beta_6\ \text{GPA} + \beta_7\ \text{Lambda} + \varepsilon$
The learning performance variables are Fscore and Pscore in columns (1) and (2), and Score in column (3). Score is a standardized learning performance variable additionally created to improve the comparability of exam score across different ACCA levels. It is computed by dividing the demeaned Fscore and Pscore with their standard deviations. The study approach variable is DA-SA in the first and second stages of regressions. We run the first stage regression as in column (4) of Table 3 and estimate the inverse Mills ratio variable named "Lambda" from the first stage. Lambda is then included as a control for treatment effects in second stage regressions. T statistics are presented in parentheses.
* Indicate significance at 0.10.
** Indicate significance at 0.05.
*** Indicate significance at 0.01.

We use the variable "Level" as the exogenous instrumental variable. As in Table 3, the ACCA's professional level is positively associated with the possibility to adopt deep study approaches, which can be at least partially attributed to the assessment methods at the professional level. Moreover, the exam scores, especially the standardized "Score" in the last regression, should not be positively affected by higher ACCA levels in theory. Therefore, ACCA's exam levels are exogenous to the decision of students and the relationship between study approaches and learning performance. We run the first stage regressions and estimate the inverse Mills ratio variable named "Lambda" from the first stage. Lambda is then included as an additional control for treatment effects in the second stage regressions. The coefficients of DA-SA are still significant and positive in Table 6, consistently supporting the relation between study approaches and learning performance proposed in Hypothesis H4.

5. Conclusions

International accounting convergence also includes incorporating IFRS into the accounting curriculum (Carmona & Trombetta, 2010). Chinese ACCA students embrace international accounting convergence by studying IFRS through ACCA's education programs. Both the framework-based teaching of IFRS and ACCA's global exams expect students to achieve a sound understanding of accounting standards. Therefore, it is meaningful to investigate the study approaches of Chinese ACCA students.

We explore the main factors influencing study approaches of Chinese ACCA students, which include gender, exam level, English competency, adaptability, and preparation time. We find that gender or English competency is not significantly related to the adoption of study approaches. For exam level, we find that deep approaches are adopted significantly more at the ACCA's professional level. Compared to the fundamentals level, assessment methods at the professional level are more likely to be perceived as requiring higher levels of cognitive processing. For adaptability, we find that students with better adaptability are more likely to adopt deep approaches. Therefore, Chinese ACCA teachers might consider additional instructions after class to help improve the adaptability of students. We also find that more study time leads to deep approaches. Therefore, students should be encouraged to prepare with more time for exams.

We also investigate the effects of study approaches on learning performance of Chinese ACCA students. Like Elias (2005) and Everaert et al. (2017), our findings confirm that deep approaches contribute to higher scores in ACCA's global exams. The

positive relation between study approaches and learning performance is robust to alternative measurement methods and corrected treatment effects. Therefore, it is valuable if educators can motivate students to adopt deep study approaches.

We fill the gap in accounting education literature by providing the first evidence on study approaches of Chinese accounting students in learning IFRS. Our results are meaningful for non-English-speaking countries encouraging international accounting education and provide some practical suggestions for IFRS education in emerging markets. This paper is also featured with several aspects of improved research designs in study approach literature. Particularly, we examine effects of study approaches on learning performance at different levels of ACCA and construct two-stage treatment effect models to control for endogeneity. We use the exam levels of ACCA as an exogenous instrument to reduce endogeneity concerns. Our research design guarantees better robustness and provide some reference for future research on study approaches.

Generalization of our findings should be done with caution because the survey is only conducted towards Chinese ACCA students. The results may also be affected by social desirability of the surveyed subjects. We leave this gap to be filled in future research.

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References

Abhayawansa, S., & Fonseca, L. (2010). Conceptions of learning and approaches to learning—A phenomenographic study of a group of overseas accounting students from Sri Lanka. *Accounting Education: An international Journal, 19*(5), 527–550.
Biggs, J. B. (1987). *Student approaches to learning and studying. Research monograph*. Radford House, Frederick St., Hawthorn 3122, Australia: Australian Council for Educational Research Ltd.
Biggs, J., Kember, D., & Leung, D. Y. (2001). The revised two-factor study process questionnaire: R-SPQ-2F. *British Journal of Educational Psychology, 71*(1), 133–149.
Bobe, B. J., & Cooper, B. J. (2017). The effect of language proficiency on approaches to learning and satisfaction of undergraduate accounting students. *Accounting Education*, 1–23.
Booth, P., Luckett, P., & Mladenovic, R. (1999). The quality of learning in accounting education: The impact of approaches to learning on academic performance. *Accounting Education, 8*(4), 277–300.
Byrne, M., & Flood, B. (2008). Examining the relationships among background variables and academic performance of first year accounting students at an Irish University. *Journal of Accounting Education, 26*(4), 202–212.
Byrne, M., Flood, B., & Willis, P. (2002). The relationship between learning approaches and learning outcomes: A study of Irish accounting students. *Accounting Education, 11*(1), 27–42.
Carmona, S., & Trombetta, M. (2010). The IASB and FASB convergence process and the need for 'concept-based'accounting teaching. *Advances in Accounting, 26*(1), 1–5.
Chan, Y. K., & Kan, A. C. (2017). The interplay between gender, learning approaches and academic performance in chinese sub-degree and degree students. *Global Journal of Educational Studies, 3*(1), 10.
Chand, P., & Patel, C. (2008). Convergence and harmonization of accounting standards in the South Pacific region. *Advances in Accounting, 24*(1), 83–92.
Davidson, R. A. (2002). Relationship of study approach and exam performance. *Journal of Accounting Education, 20*(1), 29–44.
Duff, A. (1999). Access policy and approaches to learning. *Accounting Education, 8*(2), 99–110.
Duff, A. (2004). Understanding academic performance and progression of first-year accounting and business economics undergraduates: The role of approaches to learning and prior academic achievement. *Accounting Education, 13*(4), 409–430.
Eley, M. G. (1992). Differential adoption of study approaches within individual students. *Higher Education, 23*(3), 231–254.
Elias, R. Z. (2005). Students' approaches to study in introductory accounting courses. *Journal of Education for Business, 80*(4), 194–199.
English, L., Luckett, P., & Mladenovic*, R. (2004). Encouraging a deep approach to learning through curriculum design. *Accounting Education, 13*(4), 461–488.
Entwistle, N., & Ramsden, P. (1983). *Understanding student learning*. London: Croom Helm.
Everaert, P., Opdecam, E., & Maussen, S. (2017). The relationship between motivation, learning approaches, academic performance and time spent. *Accounting Education, 26*(1), 78–107.
Gow, L., Kember, D., & Chow, R. (1991). The effects of English language ability on approaches to learning. *RELC Journal, 22*(1), 49–68.
Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (Vol. 6) Upper Saddle River, NJ: Pearson Prentice Hall.
Hall, M., Ramsay, A., & Raven, J. (2004). Changing the learning environment to promote deep learning approaches in first-year accounting students. *Accounting Education, 13*(4), 489–505.
Hodgdon, C., Hughes, S. B., & Street, D. L. (2011). Framework-based teaching of IFRS judgements. *Accounting Education, 20*(4), 415–439.
Kember, D., & Leung, D. Y. (1998). The dimensionality of approaches to learning: An investigation with confirmatory factor analysis on the structure of the SPQ and LPQ. *British Journal of Educational Psychology, 68*(3), 395–407.
Leung, D. Y., Ginns, P., & Kember, D. (2008). Examining the cultural specificity of approaches to learning in universities in Hong Kong and Sydney. *Journal of Cross-Cultural Psychology, 39*(3), 251–266.
Lomax, R. G., & Schumacker, R. E. (2004). *A beginner's guide to structural equation modeling*. Psychology Press.
Marton, F., & Säljö, R. (1976). On qualitative differences in learning: I—Outcome and process. *British Journal of Educational Psychology, 46*(1), 4–11.
Olesen, K., & Cheng, F. (2017). Convergence of accounting standards does not always lead to convergence of accounting practices: The case of China. *Asian Journal of Business and Accounting, 4*(1), 23–58.
Ramsden, P. (1988). Context and strategy. In *Learning strategies and learning styles* (pp. 159–184). Boston, MA: Springer.
Scouller, K. (1998). The influence of assessment method on students' learning approaches: Multiple choice question examination versus assignment essay. *Higher Education, 35*(4), 453–472.
Scouller, K. M., & Prosser, M. (1994). Students' experiences in studying for multiple choice question examinations. *Studies in Higher Education, 19*(3), 267–279.
Senarath Yapa, P. W., & Ping Hao, Z. (2007). An analysis of current trends in accounting professional development in People's Republic of China. *Asian Review of Accounting, 15*(1), 25–44.

Shell, D. F., Soh, L. K., Flanigan, A. E., & Peteranetz, M. S. (2016). Students' initial course motivation and their achievement and retention in college CS1 courses. In *Proceedings of the 47th ACM technical symposium on computing science education* (pp. 639–644). ACM.
Smith*, S. N., & Miller, R. J. (2005). Learning approaches: Examination type, discipline of study, and gender. *Educational Psychology, 25*(1), 43–53.
Struyven, K., Dochy, F., & Janssens, S. (2003). Students' perceptions about new modes of assessment in higher education: A review. In *Optimising new modes of assessment: In search of qualities and standards* (pp. 171–223). Dordrecht: Springer.
Vermunt, J. D. (1996). Metacognitive, cognitive and affective aspects of learning styles and strategies: A phenomenographic analysis. *Higher Education, 31*(1), 25–50.
Watkins, D. (1982). Factors influencing the study methods of Australian tertiary students. *Higher Education, 11*(4), 369–380.
Watty, K., Jackson, M., & Yu, X. (2010). Students' approaches to assessment in accounting education: The unique student perspective. *Accounting Education: An International Journal, 19*(3), 219–234.
Wells, M. J. (2011). Framework-based approach to teaching principle-based accounting standards. *Accounting Education, 20*(4), 303–316.
Wilson, K. L., Smart, R. M., & Watson, R. J. (1996). Gender differences in approaches to learning in first year psychology students. *British Journal of Educational Psychology, 66*(1), 59–71.
Xie, Q. (2014). Validating the revised two-factor study process questionnaire among Chinese university students. *The International Journal of Educational and Psychological Assessment, 16*(2), 4–21.
Xie, Q., & Zhang, L. F. (2015). Demographic factors, personality, and ability as predictors of learning approaches. *The Asia-Pacific Education Researcher, 24*(4), 569–577.
Yin, H., Wang, W., & Han, J. (2016). Chinese undergraduates' perceptions of teaching quality and the effects on approaches to studying and course satisfaction. *Higher Education, 71*(1), 39–57.
Yunwei, T. (1997). The recent accounting development and internationalization of accounting education in China. *Issues in Accounting Education, 12*(1), 219.
Zhang, L. F. (2000). University students' learning approaches in three cultures: An investigation of Biggs's 3P model. *The Journal of Psychology, 134*(1), 37–55.