

# Progression to intermediate level courses; is a “pass” enough?

Progression to  
intermediate  
level courses

Nicola J. Beatson

*Department of Accountancy and Finance, University of Otago, Dunedin,  
New Zealand*

David A.G. Berg and Jeffrey K. Smith

*College of Education, University of Otago, Dunedin, New Zealand, and*

Christine Smith-Han

*Investment Management, Forsyth Barr, Dunedin, New Zealand*

275

Received 12 March 2018

Revised 20 April 2018

1 October 2018

25 October 2018

Accepted 28 October 2018

## Abstract

**Purpose** – The purpose of this paper is to test the impact of a rule that affects tertiary students progressing from an introductory level finance course to intermediate level. The rule restricted students from progressing until they achieved a higher grade than just a “pass” mark.

**Design/methodology/approach** – Archival data were gathered from 11 semesters regarding student performance pre and post the rule being introduced.

**Findings** – Results show that the rule was associated with an increase in the chances of success at intermediate level for those students enrolled after the rule was introduced.

**Practical implications** – This paper’s main contribution regards the evidence that increasing prior learning at an introductory level has a positive follow-on effect for students learning at intermediate level. This has a practical implication for educators, as the rule has shown to increase the chance of success for knowledge development in the first year of studies.

**Originality/value** – The setting for this paper is unique and could potentially be replicated elsewhere. In 1980, Schaffer and Calkins called for an evaluation of the pre-requisites necessary for finance education at the tertiary level, and this paper answer this call stating that pre-requisites can contribute to the academic success of finance students.

**Keywords** Higher education, Progression, Finance education, Prior learning

**Paper type** Research paper

## 1. Introduction

Programmes of study, especially in professional disciplines such as accounting and finance, frequently have a degree of hierarchical structure where subsequent success is at least partially dependent upon having secured a solid understanding of pre-requisite material. Often, the curriculum experience as a whole is examined to investigate if there is adequate preparation of students at each stage of their degree (Adler and Milne, 1997; Carr and Mathews, 2004). One approach to ensuring adequate preparation is to require a higher level of performance than a mere passing level in introductory courses to progress to higher level courses. The following study examines the impact of increasing the requirements for



The authors would like to thank those that gave valuable feedback at the 2017 RMIT Accounting Educators conference.

students wanting to progress from an introductory level course to intermediate level courses in finance.

### *1.1 Motivation*

The university in which this study is set normally allows students to progress to the next course if they achieve a 50 per cent (C- grade) in the pre-requisite. Pre-requisites are courses that must be completed before progressing to the next more advanced course (Schaffer and Calkins, 1980). Several years ago, the Department of Accountancy and Finance at this university, which is the context for the present study, identified a large number of students who struggled to pass intermediate level courses. Therefore, the department opted to introduce a rule requiring a C+ (a C+ grade is 60 – 64 per cent) to progress to the next level, referred to in this paper as the “C+ rule”. The rule was instituted in 2012 to help students have success in their intermediate year by attempting to increase the base knowledge they had at introductory level courses. In 2015, an internal review was called for to see if the C+ rule was effective in helping reduce the long tail in second-year courses. This paper originated from the data being analysed as part of the 2015 review, as once the results were internally circulated, it was clear that we had findings that could be used for research purposes.

### *1.2 Contribution to the literature*

Over three decades ago, Schaffer and Calkins (1980) called for an ongoing evaluation of the necessity for pre-requisites in finance education at tertiary level; this paper both answers that call and reports on the findings from this unique context. With multiple cohorts of students to examine, this *in situ* research directly examines this important issue within accounting and finance education at the tertiary level. The literature shows that when a student succeeds in early courses, this often leads to greater success in later years (Gracia and Jenkins, 2003; Trine and Schellenger, 1999). This study provides evidence to support this claim. Furthermore, in course programmes that are hierarchical in nature, there is ample support for the positive effects of prior knowledge (Anderson *et al.*, 2001; Cannon and Feinstein, 2014); the research presented here takes those arguments and examines them with regard to a specific implementation of a programme policy. The findings here also support the basic tenets of Bloom’s mastery learning theory, where he argued that providing time for students to make up deficiencies early in instruction has benefits for performance with regard to later instruction (Ariasian *et al.*, 1971; Guskey and Pigott, 1988).

## **2. Theoretical background and hypotheses**

### *2.1 Prior learning*

How well students succeed at higher levels of education is dependent, in part, on the knowledge and skills they have acquired in lower levels. Learning hierarchies of this type are often investigated via the high school to tertiary transition (Andersson *et al.*, 2017; Byrne and Flood, 2005; Duff, 2004; Evans, 2000). Less frequently studied is the transition from introductory level coursework to intermediate level coursework at tertiary institutions, especially within the discipline of finance. Often, studies in accounting and finance education state that prior learning is a significant indicator of success (Bergin, 1983; Crawford and Wang, 2014; Jansen and de Villiers, 2016). As the disciplines of accounting and finance both build upon similar foundational concepts, it is appropriate to look at both accounting and finance based literature (Brown *et al.*, 2013). In addition, the context of this study is in a department of Accountancy and Finance, and the intermediate and advanced courses both require the same set of pre-requisite introduction courses.

## 2.2 Performance and prior learning in accounting and finance

A variety of factors can influence students and their learning. Performance, as measured by academic achievement, is well studied in the accounting and financial education literature (Borde *et al.*, 1998; Eskew and Faley, 1988; Farley and Ramsay, 1988; Wooten, 1998). This research often focuses on what influences achievement (Borde *et al.*, 1998; Koh and Koh, 1999; Terry, 2002) and, more specifically, the influence of a mathematics background (Alcock *et al.*, 2008; Ely and Hittle, 1990; Naser and Peel, 1998). Within finance education, Uyar and Gungormus (2016) stated the most influential factors that affect performance are the students' grade point average (GPA), their attendance in class, and the type of high school they attended. Other studies in finance and accounting have also found a positive association with prior learning and academic performance (Gracia and Jenkins, 2003). Trine and Schellenger (1999) investigated the relationship between a pre-requisite course in accounting and finance with a more advanced finance course. They found that past academic performance was a significant predictor of future academic success. In addition, the only non-cognitive factor that was significant in their model was motivation (Trine and Schellenger, 1999). Duff (2004, p. 425) stated that "prior academic achievement remains the best predictor of academic performance".

Knowing that a student needs to be able to build upon prior knowledge (Anderson *et al.*, 2001; Airasian *et al.*, 1971; Cannon and Feinstein, 2014), educators should be prepared to ensure that students have the necessary knowledge to be able to undertake that process of development. To that end, the question arises as to how best to ensure that students in upper level university courses possess the knowledge and skills requisite to be successful in those courses. Can it be productive to require students to achieve a level of mastery of the material that is beyond what is normally required for passing the course? (Kulik *et al.*, 1990).

## 2.3 Research questions and hypotheses

This study investigates the impact of the increased progression requirements from introductory level finance to intermediate level finance courses. As previously stated, the context for the study is a university that implemented a rule to require a C+ for advancement to intermediate level finance courses in 2012. Data are available from both pre and post implementation, allowing for a thorough investigation of the effects of the requirement.

To examine the efficacy of the C+ rule using the data available to us, we posited a series of research hypotheses that support the argument that the C+ rule was effective. Hypotheses are presented in the alternative rather than the null form to facilitate comprehension of the argument. First, we needed to establish that there is a relationship between a student's academic performance in their first introductory level finance course with their academic performance in the intermediate level course which follows. Without this relationship, there is no cause to investigate further, as the premise of the C+ rule is that it helps to build foundational knowledge. To test the effectiveness of the C+ rule, we need to first establish that this relationship exists. If we find that there is no relationship present between academic success in first-year and second-year finance courses, then there is no cause to further investigate this situation:

- H1. There is a positive relationship between performance in FINC100 and performance in intermediate level finance courses.

Second, we examined the students who were in the 50 to 59 per cent range after the C+ rule was introduced. These students had to repeat FINC100 before they were allowed to continue on and enrol in the intermediate level finance course. To test if the rule was indeed effective,

we needed to know if students who repeated the FINC100 course improved their performance in the second attempt of the first-year introductory course. If students did not improve upon their second attempt, again, the rule would not be working as intended, as the purpose of the C+ rule is to increase foundational knowledge so that students are better prepared for their intermediate learning:

- H2.* Students who score between 50 and 59 per cent in FINC100 improve their academic achievement in FINC100 upon repeating the course.

Once we established that students were able to improve their foundational knowledge on the second attempt at FINC100, the next stage was to compare academic performance of students' pre and post the rule being introduced. To fully test the effectiveness of the C+ rule, we needed to compare the results of those that went on to intermediate level finance course before the C+ rule was introduced with those that had to repeat FINC100 before progression. The expectations is that students who had to repeat FINC100 would have a greater level of foundational knowledge and would therefore have greater success at intermediate level finance courses than those who were allowed to progress with a grade between 50 and 59 per cent, prior to 2012. The hypothesis below focuses on only those students affected by the rule post 2012, and those that would have been affected pre 2012:

- H3.* Students who pass FINC100 but do not get the necessary C+ to progress, but then retake the course and get a C+, have more academic success in intermediate level courses than C or C- students who had progressed prior to the C+ rule.

Finally, we compared all students. The purpose of the rule being introduced was to help students perform more successfully in their intermediate level finance courses. Therefore, we investigated if overall the performance of all students increased post the rule being introduced in 2012:

- H4.* Performance of students in intermediate level finance courses increases following the implementation of the C+ rule.

In summary, *H1* makes the case that performance in FINC100 is in fact associated with success in intermediate level courses. Without this relationship, there is no basis for the C+ rule. *H2* argues that re-taking FINC100 results in increased knowledge that facilitates performance in higher level courses. *H3* argues that the specific students who are affected by the C+ rule (those who pass, but without a C+) benefit from retaking the course when one looks at their subsequent performance in intermediate level courses as compared to those students (under the former system) who did not have to retake the course. *H4* argues that the intermediate level courses benefit overall from having a more prepared cohort of students taking those courses.

### 3. Method

The setting for this investigation was a large New Zealand university. The Department of Accountancy and Finance was the specific setting for this research. To the best of the research team's knowledge, there are no other departments in business schools in Asia Pacific universities that have a similar C+ rule. All other institutions allow a "pass" mark to progress to the intermediate level courses. This context, where a student can pass a course, and yet be restricted from progression, is unique.

### 3.1 Context

The C+ rule came into effect in 2012. Discussion in the department had been ongoing for a number of years prior to 2012 about how to best address the large number of students who failed in intermediate year. Although variation in performance occurred in the different courses at intermediate level, an example of one course demonstrates why the department was concerned as it had a pass rate in the years 2009 to 2011 that ranged from 57 to 59 per cent. In staff meetings in 2011, options were considered about how to best help students to succeed. One alternative was to introduce a limited number of places for intermediate level accounting and finance. For example, only the top 100 students from introductory year would be allowed to progress. This option was consistent with other departments in the university who restricted entry based on first-year results, such as the Law School and the Medical School. The second option was the introduction of the C+ rule. The latter was preferred as it offered more students the option of progressing. It did not seem fair to students to stop them from progressing if they were able to demonstrate a certain level of mastery of the material. At a staff meeting in 2011, the department voted unanimously in favour of adopting the C+ rule. Some of the concerns raised during discussion at staff meetings included how the rule would work for part-time students, whether the rule would have the desired effect of helping students to succeed in intermediate level courses, if there would be increased administration as a result of the rules introduction, and if there would be a negative impact to other departments in the School of Business. All concerns raised were addressed by the department as the various university committees considered the proposal, and in 2012, the rule came into effect for students who enrolled in a Bachelor of Commerce. All Department of Accountancy and Finance first-year courses are affected by this rule, as all courses at first year are a pre-requisite for an intermediate course within the department. The strategic teaching and learning plan for the department included a 2015 review of the effectiveness of the rule, and as previously stated, the present study was first undertaken as part of that review process. Now in the department, and indeed in the wider university, the rule is accepted as the norm for the Department of Accountancy and Finance.

The university for the present study uses a grading system as shown in [Table I](#), where both D and E represent fail grades and all other grades are deemed a “pass”. In the Department of Accountancy and Finance, two of the three intermediate level courses which are required for the Bachelor of Commerce degree, name FINC100 as a pre-requisite, thereby ensuring that students achieve a C+ or better in FINC100 before progression to these intermediate level courses.

Numerical grade achieved	Represented by
90-100	A+
85-89	A
80-84	A–
75-79	B+
70-74	B
65-69	B–
60-64	C+
55-59	C
50-54	C–
40-49	D
<40	E

**Table I.**  
Grading system at  
the university

FINC100, “Business Finance”, is offered in both semesters and is described as an introduction to the principles of finance, especially in the context of a business. The first of the two intermediate level courses that require FINC100 covers the fundamentals of corporate finance and is described as covering the theory and application of why and how optimal corporate financial decisions are made. The second of the two courses that requires FINC100 covers investment analysis and portfolio management and is designed to expose students to the theory of financial asset valuation, selection and the valuation of financial securities and portfolio management. The teaching team on FINC100 has had some changes over the time period of this study; however, the content of the course has remained stable. Both intermediate courses build upon prior knowledge taught in FINC100.

3.2 Data collection and participants

Data were collected using the student management system at the university. Records from eleven semesters were gathered. The new C+ rule was introduced in 2012. Thus, to determine the impact, records were sourced from 2010 semester two (S2), and each semester through 2015. The data were gathered for the first-year finance course (FINC100), and all of the intermediate level finance courses that have the FINC100 course as a pre-requisite. Students who chose to not proceed to intermediate level courses were excluded for further testing, leaving only students with results for intermediate level courses to be tracked over time. Students who did not take FINC100 at the university that this study was set in or were exempt from taking FINC100 were eliminated from the sample. An average was calculated from students’ course results for the two courses that named FINC100 as a pre-requisite to proxy for students’ overall performance in the intermediate level courses. Ethics approval was granted retrospectively, as originally this research project was for internal purposes only to determine the effectiveness of the C+ rule. The department had questioned if the C+ rule was helping students, so an internal working party was created to test the effectiveness and impact upon students. Once the internal report had been received by the department, it was realised that there were important findings that could be disseminated, so at that point, ethics approval was sought and granted.

The statistical methods used in the analyses are described along with the presentation of the results in the following section of the paper.

4. Results

In the absence of other studies that have examined this phenomenon, and given the uniqueness of the context, a model of student performance was constructed to reflect this unusual situation. The first hypothesis states that performance in FINC100 is related to performance in the two intermediate level courses that require FINC100. To test *H1*, we regressed the intermediate level averages on FINC100 results for the periods pre and post the implementation of the C+ rule. The regression model used for testing *H1* is as follows:

$$\text{Average intermediate level Finance results} = \alpha + \beta \text{FINC100 results} + \epsilon$$

These regressions are reported in [Table II](#). The sample sizes prior to the C+ rule (across three courses) were between 109 to 179 and post the C+ rules (across seven courses), ranged between 19 to 149. To keep the variability in the predictor variable (FINC100 Results) consistent before and after the implementation of the C+ rule, we only used students who scored at a C+ or better in the “pre” semesters. As shown by the results, students who achieve high results in the introductory finance course also tend to achieve high results at intermediate level finance courses.

As can be seen in Table II, the coefficients of the FINC100 results in the regression for intermediate level finance averages across pre and post C+ rule time periods were strongly significantly positive. This occurs in course after course both before and following the implementation of the requirement. Therefore, it can be said that hypothesis one is supported and that there is a statistically significant positive relationship with students' success in FINC100 and subsequently success in their intermediate level finance courses.

H2 stated that students would improve their performance in FINC100 in their second try at the course. When the C+ rule was implemented, there was some concern within the department that students who had technically "passed" the course would not be motivated to increase their grade on the next attempt. Without improvement in a second try, there would be little purpose in repeating the course. We identified students who scored between 50 and 59 per cent in their FINC100 results after the inception of the C+ rule and compared their respective first and second attempted results. As shown in Table V, there is a significant increase in the overall distribution of grades in students second attempt at FINC100 compared with the original result (Table III).

**Table II.**  
Regression analysis

	Coefficient	t-statistic	p-value	n
<i>Combined period prior to C+ rule</i>				
2010 S2	1.06	7.02	<0.001	179
2011 S1	1.02	6.04	<0.001	109
2011 S2	1.10	10.37	<0.001	199
<i>Semester period after 2012</i>				
2012 S1	1.12	7.98	<0.001	149
2012 S2	1.07	7.82	<0.001	137
2013 S1	1.35	9.38	<0.001	145
2013 S2	1.39	10.80	<0.001	147
2014 S1	0.98	5.30	<0.001	109
2014 S2	1.37	7.24	<0.001	71
2015 S1	1.28	3.16	<0.001	19

**Table III.**  
Students who scored  
50-59 in FINC100  
post the C+ rule  
(n = 56)

	First attempt at the course FINC100	Second attempt at the course FINC100	Change
Mean	55.2	70.3	
Std Dev	3.0	8.8	
Grades			
A+	0%	0%	No change
A	0%	2%	2% increase
A-	0%	9%	9% increase
B+	0%	27%	27% increase
B	0%	29%	29% increase
B-	0%	9%	9% increase
C+	0%	14%	14% increase
C	50%	5%	45% decrease
C-	50%	4%	46% decrease
D	0%	0%	No change
E	0%	2%	2% increase



A dependent samples *t*-test was calculated to determine if the mean differences were significant. The mean increased from 55.21 in the first attempt to 70.34 in the second attempt. The differences in means is significant at *p*-value < 0.001. There were 56 observations of students who had repeated the FINC100 course. Findings show that students who repeated FINC100 on average scored 15.13 points higher in their second attempt marks compared with their first attempt marks, an effect size of 1.72 using the standard deviation of the second attempt scores (the standard deviation of the first attempt is truncated due to only selecting students with a score between 50 and 59, inclusive). Thus, we see a strong increase in performance for students who retook the course.

*H3* stated that students who initially scored a C or C− (score between 50 and 59 inclusive) and who retook FINC 100 subsequently outperformed students who were not required to retake the course (prior to the implementation of the C+ rule). Groups were formed for both pre and post the C+ rule by extracting only the students who had achieved a C or a C− in FINC100. Students who scored between 50 and 59 per cent in their FINC100 results pre the C+ rule were identified in one group and the second group consisted of students who scored between 50 and 59 per cent in FINC100 post the C+ rule being introduced in 2012 (these student repeated the course to progress to intermediate level courses). Students who scored between 50 and 59 per cent in FINC100 *before* the C+ rule was introduced would have progressed to intermediate level Finance courses without having to repeat the introductory course. For these two groups of students, we tracked their intermediate level finance results, calculated an average and assigned a letter grade to the averages as seen in [Table IV](#). As shown, there is a reduction in the left tail students and an increase of students in the B− to C− grade ranges in the post C+ period compared with the pre C+ period.

The data were analysed using an independent samples *t*-test to determine if there was a significant difference in the two groups. There were 66 students in the pre C+ group, and 56 in the post C+ group. (Although we do not have exact figures, based on information we do have, we estimate that roughly two-thirds of the Finance majors who received an initial score of 50-59 chose to repeat the course.) Again, significant differences were found between the two groups. Pre the C+ rule being introduced, the

**Table IV.**  
Intermediate level  
grades: students that  
scored 50-59 in  
FINC100

	Pre C+ rule (did not repeat FINC100)	Post C+ rule (did repeat FINC100)	Change
Mean	34.9	44.9	
SD	19.3	17.6	
n	66	56	
<i>Grades</i>			
A+	0%	0%	No change
A	0%	0%	No change
A−	0%	0%	No change
B+	0%	0%	No change
B	2%	2%	No change
B−	3%	14%	12% increase
C+	2%	5%	3% increase
C	3%	7%	4% increase
C−	9%	14%	5% increase
D	27%	25%	2% decrease
E	53%	32%	21% decrease



mean was 34.91 for students who progressed to intermediate level courses and post; the mean increased to 44.94. The differences between these two groups was significant at  $p\text{-value} < 0.001$ , with an effect size (Cohen's  $d$ ) of 0.54. Thus, the third hypothesis is supported as students who scored in the grade range of 50-59 in FINC100, who had to repeat the course, performed at a significantly higher level in intermediate courses than those students who were allowed to progress immediately prior to the C+ rule being introduced.

*H4* stated that overall performance in the intermediate level courses would increase due to the C+ rule. To investigate the overall effectiveness of the C+ rule, we needed to look at the average intermediate level course grades for *all students* and determine if they were the same or different pre and post the implementation of the C+ rule. These results are presented in Table V. There were 520 students in pre C+ courses and 1,390 in post C+ courses. To determine if the two groups were significantly different from one another, an independent samples  $t$ -test was performed. The mean pre the C+ rule being introduced was 52.83 and post was 56.10. The italic statistic was  $t(1908) = 2.94$  with  $p = .003$ . The effect size here is fairly small (Cohen's  $d = 0.147$ ), but it should be noted that except for students originally in the C or C- range, there essentially is no difference in student background. Thus, the implementation of the C+ rule has a small, but salutary effect on performance overall.

5. Findings

The goal of this study was to shed light on the efficacy of increasing the standards in an introductory course in finance on performance in subsequent coursework for students continuing on in finance. A series of analyses of extant data are supportive of the efficacy of the "C+ rule". We posed four hypotheses that we felt would be determinative of whether the rule was effective.

In relationship to those hypotheses, we first tested if there was a relationship between academic performance in the first-year introductory finance course, and academic performance in the second-year intermediate finance course. We found that there is a strong relationship between performance in FINC100 and performance in two subsequent courses. This result is consistent with the literature on prior learning, showing that foundational

	<i>Pre C+ rule</i>	<i>Post C+ rule</i>	<i>Change</i>
Mean	52.8	56.1	
SD	23.7	21.1	
n	520	1390	
<i>Grades</i>			
A+	3%	2%	1% decrease
A	4%	3%	1% decrease
A-	5%	6%	1% increase
B+	5%	8%	3% increase
B	8%	9%	1% increase
B-	10%	12%	2% increase
C+	10%	11%	1% increase
C	7%	9%	2% increase
C-	10%	8%	2% decrease
D	14%	12%	2% decrease
E	25%	20%	5% decrease

Table V.  
Intermediate level  
grades: all students

knowledge is important (Airasian *et al.*, 1971) and that pre-requisites in finance education are necessary to establish that base (Blaylock and Lacewell, 2008). Pre-requisites knowledge is important in both finance and accounting education, as the development of the necessary skills in these numerically based subjects is crucial for a student's ongoing chance of academic success (Sargent, 2013).

H2 showed that students who repeated FINC100 strongly improved their academic performance upon a second attempt. Importantly, if students had not improved their academic performance in FINC100 on the second time, this would have left doubt to the effectiveness of the C+ rule. The results showed a significant improvement, and this helped establish that the rule was working as intended. The risk was that students may feel despondent and reluctant to engage in the course the second time (Shepard and Smith, 1989). Students who gained a 50 to 59 in their first attempt would be faced with a choice. They had passed the course; however, they were not allowed to continue on with their finance or accounting major. The choice at this point in time would be to change their major, or retake FINC100 to improve their grade and gain the C+ necessary to re-enrol in the intermediate level courses. Therefore, it can be assumed that the less motivated students would choose to change their choice of major, leaving only those students who really wanted to continue their studies in accounting or finance to choose to re-take FINC100. Our results reflect this, as students' performance improved upon their second attempt.

Third, we found that students who retook FINC100 successfully had much better performance in intermediate level coursework than students who were not required to retake the course (prior to the introduction of the C+ rule). Again, this is consistent with the literature, as building foundational knowledge in accounting and finance will lead towards greater success in later courses (Gracia and Jenkins, 2003; Trine and Schellenger, 1999). This finding further supports the implementation of the C+ rule and shows that there are positive student outcomes from the rule being in place.

H4 tested if course performance in intermediate level courses overall (for all students) improved after the introduction of the C+ rule. We found that this was the case, and that all students had improved their academic performance post 2012 when the rule had been introduced. Anecdotal evidence from students who were affected by the C+ rule supports that students often worked harder in the first-year introductory courses, as they did not want to fall in the 50 to 59 grade band and have to repeat the course. The C+ rule has appeared to act as a motivator to increase the effort of students in first-year courses, although this has yet to be examined and is outside the scope of the present study.

## 6. Conclusions, limitations and implications

The analyses presented here support the department's decision to implement the C+ rule. There are, of course, considerations beyond performance in subsequent courses. Students who have to retake FINC100 fall behind their peers in their progress toward a degree and incur additional financial burdens due to the necessity of retaking the course. However, performance at the intermediate level clearly indicates the benefit of having done so. The question arises as to why students perform better when retaking the course; is motivation increased, or does the student have a better introduction to the course from having taken it before? Such issues, while extremely interesting, were beyond the scope of this research.

### 6.1 Contributions to theory and practice

The research presented here harkens back to Schaffer and Calkins (1980) call for an evaluation of the pre-requisites necessary for finance education at the tertiary level; the findings may have been delayed, but they seem fairly clear: pre-requisite knowledge is

clearly beneficial. Broadly speaking, the findings here are supportive of the arguments of Gracia and Jenkins (2003), and more directly, Trine and Schellenger (1999), that success in earlier courses in accounting and finance are associated with later success.

In practice, this paper provides evidence that requiring above passing level performance to continue in a programme of study can have overall beneficial effects for students. Other institutions may wish to implement a similar programme requirement, as the evidence is clear from this research that there has been a positive influence to students learning at intermediate level.

### 6.2 Limitations

There are some limitations with the present study that need to be noted. First, there has been no analysis done on students as the progress to their third year of student at the institution. In the advanced courses, we do not know if there has been any impact from the C+ rule being introduced. This should be investigated. Second, as previously mentioned, there were some changes to teaching staff on FINC100 over the period 2010-2015; however, all changes made to the course were made in consultation with the prior teachers, thus ensuring continuity in the time period analysed as part of this project. We do not know if and how the C+ rule may impact on students' effort and study habits, both in the short and long term. A clear need for research on motivation related to this rule is apparent.

We acknowledge that this is one study at one institution. This work will need to be replicated and expanded upon, both at other universities, and in related programmes of study such as accounting and business.

### 6.3 Future research

There is much work to continue to be done in this area. This would include not only additional quantitative studies of outcomes and influences on outcomes, but qualitative research as well that might explore the mechanisms that underlie the differences in performance. What if the requirement for performance were raised to a B– as opposed to a C+? Would the benefits continue to accrue, or would some sort of breaking point be reached? What if the numerical requirements had been left in place (C– is sufficient), but the difficulty of the tests administered increased? That is, what if the demand for increased performance were realised through a more stringent set of examinations rather than the declaration that a C+ was required for moving on? We are intrigued by these possibilities and hope to be able to explore at least some of them in subsequent work.

## References

- Adler, R.W. and Milne, M.J. (1997), "Translating ideals into practice: an examination of international accounting bodies' calls for curriculum changes and New Zealand tertiary institutions' assessment methods", *Accounting Education*, Vol. 6 No. 2, pp. 109-124.
- Airasian, W., Bloom, B.S. and Carroll, J.B. (1971), *Mastery Learning: Theory and Practice*, Holt, Rinehart and Winston, New York, NY, pp. 47-63.
- Alcock, J., Cockcroft, S. and Finn, F. (2008), "Quantifying the advantage of secondary mathematics study for accounting and finance undergraduates", *Accounting and Finance*, Vol. 48 No. 5, pp. 697-718.
- Anderson, L.W., Krathwohl, D.R. and Bloom, B.S. (2001), *A Taxonomy for Learning, Teaching, and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives*, Allyn and Bacon, Boston.
- Andersson, P., Fejes, A. and Sandberg, F. (Eds) (2017), *Recognition of Prior Learning: Research from around the Globe*, Routledge, Abingdon.

- Blaylock, A. and Lacewell, S.K. (2008), "Assessing prerequisites as a measure of success in a principles of finance course", *Academy of Educational Leadership Journal*, Vol. 12 No. 1, p. 51.
- Bergin, J.L. (1983), "The effect of previous accounting study on student performance in the first college-level financial accounting course", *Issues in Accounting Education*, Vol. 1 No. 1, pp. 19-28.
- Borde, S.F., Byrd, A.K. and Modani, N.K. (1998), "Determinants of student performance in introductory corporate finance courses", *Journal of Financial Education*, Vol. 24, pp. 23-30.
- Brown, G.A., Bull, J. and Pendlebury, M. (2013), *Assessing Student Learning in Higher Education*, Routledge.
- Byrne, M. and Flood, B. (2005), "A study of accounting students' motives, expectations and preparedness for higher education", *Journal of Further and Higher Education*, Vol. 29 No. 2, pp. 111-124.
- Cannon, H.M. and Feinstein, A.H. (2014), "Bloom beyond bloom: using the revised taxonomy to develop experiential learning strategies", *Developments in Business Simulation and Experiential Learning*, Vol. 32.
- Carr, S. and Mathews, M.R. (2004), "Accounting curriculum change and iterative programme development: a case study", *Accounting Education*, Vol. 13 No. S1, pp. 91-116.
- Crawford, I. and Wang, Z. (2014), "Why are first-year accounting studies inclusive?", *Accounting and Finance*, Vol. 54 No. 2, pp. 419-439.
- 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*, Vol. 13 No. 4, pp. 409-430.
- Ely, D.P. and Hittle, L. (1990), "The impact of math background on performance in managerial economics and basic finance courses", *Journal of Financial Education*, Vol. 19, Fall, pp. 59-61.
- Eskew, R.K. and Faley, R.H. (1988), "Some determinants of student performance in the first college-level financial accounting course", *Accounting Review*, Vol. 63 No. 1, pp. 137-147.
- Evans, M. (2000), "Planning for the transition to tertiary study: a literature review", *Journal of Institutional Research*, Vol. 9 No. 1, pp. 1-13.
- Farley, A.A. and Ramsay, A.L. (1988), "Student performance in first year tertiary accounting courses and its relationship to secondary accounting education", *Accounting and Finance*, Vol. 28 No. 1, pp. 29-44.
- Gracia, L. and Jenkins, E. (2003), "A quantitative exploration of student performance on an undergraduate accounting programme of study", *Accounting Education*, Vol. 12 No. 1, pp. 15-32.
- Guskey, T.R. and Pigott, T.D. (1988), "Research on group-based mastery learning programs: a meta-analysis", *The Journal of Educational Research*, Vol. 81 No. 4, pp. 197-216.
- Jansen, J. and de Villiers, C. (2016), "Determinants of student performance in an accounting degree programme", *South African Journal of Accounting Research*, Vol. 30 No. 1, pp. 1-28.
- Koh, M.Y. and Koh, H.C. (1999), "The determinants of performance in an accountancy degree programme", *Accounting Education*, Vol. 8 No. 1, pp. 13-29.
- Kulik, C.L.C., Kulik, J.A. and Bangert-Drowns, R.L. (1990), "Effectiveness of mastery learning programs: a meta-analysis", *Review of Educational Research*, Vol. 60 No. 2, pp. 265-299.
- Naser, K. and Peel, M.J. (1998), "An exploratory study of the impact of intervening variables on student performance in a principles of accounting course", *Accounting Education*, Vol. 7 No. 3, pp. 209-223.
- Sargent, C.S. (2013), "Find it, fix it, and thrive: the impact of insisting on proficiency in prerequisite knowledge in intermediate accounting", *Issues in Accounting Education*, Vol. 28 No. 3, pp. 581-597.

- Schaffer, B.F. and Calkins, D.O. (1980), "An appraisal of prerequisites to business finance", *Journal of Financial Education*, Vol. 9, Fall, pp. 51-55.
- Shepard, L.A. and Smith, M.L. (1989), *Flunking Grades: Research and Policies on Retention*, Education Policy Perspectives, The Falmer Press, Taylor and Francis, 1900 Frost Rd., Suite 101, Bristol, PA, 19007.
- Terry, A. (2002), "Student performance in the introductory corporate finance course", *Journal of Financial Education*, Vol. 28, Fall/Winter, pp. 28-41.
- Trine, J.A. and Schellenger, M.H. (1999), "Determinants of student performance in an upper level corporate finance course", Proceedings of Allied Academies International Conference, Academy of Educational Leadership, Vol. 4, No. 1, *Jordan Whitney Enterprises*, p. 91.
- Uyar, A. and Gungormus, A.H. (2016), "Factors associated with student performance in financial accounting course", *European Journal of Economic and Political Studies*, Vol. 4 No. 2, pp. 141-156.
- Wooten, T.C. (1998), "Factors influencing student learning in introductory accounting classes: a comparison of traditional and nontraditional students", *Issues in Accounting Education*, Vol. 13 No. 2, p. 357.

### Further reading

- Block, J.H. and Airasian, P.W. (1971), *Mastery Learning: Theory and Practice*, Holt Rinehart and Winston.
- Evans, N. (1987), *Assessing Experiential Learning: a Review of Progress and Practice*, Longman for FEU publications.

### Corresponding author

Nicola J. Beatson can be contacted at: [nicola.beatson@otago.ac.nz](mailto:nicola.beatson@otago.ac.nz)