Comparative Study Between Traditional and Peer Assisted Learning of Business Management Students on Accounting Module

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Abstract

Candidates who study business disciplines are trained to be all-round administrative staff to handle business-related issues. Knowledge of a basic accounting principle for supporting financial decisions is vital in business operations, and is especially crucial for managerial workers of a listed company. Indeed, the accounting module is one of the core modules for higher education students who are studying in business disciplines. With the College Heads' endorsement when departments joined the Peer-Assisted-Learning using Supplemental Instruction (PALSI) scheme, the academic results of two accounting modules were collected anonymously for research purposes.

The subject registration information shows that each cohort had at least 300 enrolments and, at most, over 800 enrolments. A review of academic results throughout four academic years was performed, the sample size of the study consisting of a total of 1,815 PALSI students and 5,869 non-PALSI students. This article focuses on the quantitative analysis in comparing the performance of PALSI students and non-PALSI students by monitoring their academic results consecutively in different cohorts. In this study, a t-test is implemented to evaluate the effectiveness of the peer-assisted learning scheme by identifying the academic results of each cohort to ascertain if there is a significant difference between the two groups.

Similar investigation on the effectiveness of the PALSI scheme with different accounting knowledge background before joining the undergraduate programmes is implemented in the latter part. The findings of the analysis provide remarkable academic enhancement for students with PALSI support, and it is concluded that the scheme is worth extending to different subjects in the business discipline in the future.

Keywords: peer-assisted learning, business, accounting, learning support, deep-learning

Introduction

In the past, Hong Kong Certificate of Education Examination (HKCEE) and Hong Kong Advanced Level of Education Examination (HKALE) candidates were prescribed to select science, business, and arts subjects in a specific combination for fulfilling the entry requirements of the undergraduate programmes in the previous 3-4-3 academic structure – 3 years junior secondary level; 4 years senior secondary level; 3 years undergraduate level. Even though such modules were available for students to enroll, only the minority of high school students had the opportunity to take subjects "Principles of Accounts" in HKCEE or HKALE (Hong Kong Examinations and Assessment Authority, 2018a).

Hong Kong Diploma of Secondary Examination

A new 3-3-4 academic structure includes three junior years plus three senior years in secondary education as well as preparing candidates to enroll in a four-year higher education journey. It was first implemented in 2012 to offer the Hong Kong Diploma of Secondary Examination (HKDSE). Therefore, professional subjects are likely to be taught at university level rather than providing training with limited time in senior secondary school life. The Hong Kong Examinations and Assessment Authority offers twenty-four senior secondary subjects, which are four core subjects and twenty elective subjects. HKDSE candidates are required to select elective subjects to form a study combination on top of the four core subjects - Chinese Language, English Language, Mathematics, and Liberal Studies.

After implementing the four-year curriculum in higher education, the constraint of selecting high school elective subjects was removed. Four core subjects plus one elective subject are the general university entry requirement for HKDSE candidates. Usually, there are no specific entry requirements for enrolling in programmes in the business discipline. By reviewing the registration records of the HKDSE examination of the last several years, it has been found that nearly 70% of the candidates have enrolled in four core subjects plus two elective subjects. Moreover, the accounting subject was not as popular as other elective subjects, that is, biology, chemistry, or economics.

Accounting modules enrolments of HKDSE. When HKDSE was officially launched in 2012, there were two subjects related to the accounting discipline. One of them was classified as a Category A Senior Secondary Subject – "Business, Accounting and Financial Studies" – and another one was classified as a Category B Applied Learning subject – "Practical Computerised Accounting" (Hong Kong Examinations and Assessment Authority, 2018b). By reviewing the data source of the Hong Kong Examinations and Assessment Authority (HKEAA), the statistics of the subjects' enrolments were discovered. Table 1 shows that the number of candidates for the HKDSE entries in accounting and accounting-related subjects from 2012 to 2016 has been dropping continuously, from 17.7 percent to 15.2 percent. The figures conclude that the accounting subject was not as popular as other subjects in secondary students' mindset after the implementation of the new HKDSE curriculum. Therefore, the number of students with accounting training before entering university was limited.

Table 1: HKDSE accounting subject enrolments from 2012 to 2017

Year	Business, Accounting and Financial Studies[+]	Accounting[++]	HKDSE number of candidates	Percentage of Accounting students
2012	12,412		70,282	17.7%
2013	11,482		69,750	16.5%
2014	10,375		65,270	15.9%
2015		9,288	61,136	15.2%
2016		8,300	56,112	14.8%
2017		7,783	51,192	15.2%

Notes:

[+]The figures are the number of candidates take the elective part "Accounting Module"
[++]After 2015, Business, Accounting and Financial Studies module was reformed into two subjects "Accounting" and "Business Management"

Entrance requirements for bachelor's degree programmes. HKDSE candidates are responsible for checking the entrance requirements of each undergraduate programme when they are applying to study. For example, calculus knowledge is an essential tool for engineering students in science and engineering disciplines, where such specific pre-requisite for mathematics knowledge would be an advantage. However, HKDSE Mathematics extended parts Module 1 (M1) – "Calculus and Statistics" or Module 2 (M2) – "Algebra and Calculus" is not defined as one of the compulsory subjects in HKDSE level for enrolling into science or engineering disciplines.

In contrast, admission requirements of studying Bachelor of Business Administration programmes under the College of Business do not have a pre-requisite for accounting studies at the HKDSE level. In other words, there is no advantage for the students who have taken accounting as the HKDSE elective module to apply for the undergraduate programmes in the College of Business (City University of Hong Kong, 2018).

Accounting modules in undergraduate programmes at the College of Business. In the business world, accounting is a profession about managing financial accounts, auditing, and communicating amongst different stakeholders in financial terms. Accountants are required to possess basic accounting knowledge in designing appropriate business models or solving any financial difficulties of existing business operations. Thus, national institutes and professional bodies in various countries recognise such professional qualifications mutually in accounting.

It is common to find that Bachelor of Business Administration (BBA) students in the College of Business need to take the accounting discipline modules. BBA students are required to study either one or two modules related to accounting in the first two years of their study. As shown in Table 2 below, there are thirteen programmes which require undergraduates to take module CB2100 – "Introduction to Financial Accounting" in Year One. Ten of these programmes also require module CB2101 – "Introduction to Managerial Accounting" as one of the core modules in Year Two. Regardless of whether the students are going to select accounting as the major or the minor discipline of their undergraduate programme, the curriculum dictates these two subjects. Due to the high demands on these two accounting modules, both courses are usually

offered to two cohorts for each academic year by the Department of Accountancy to serve a large number of students from the College of Business.

Table 2: Study requirements for students in College of Business

Undergraduate programme	CB2100 - Introduction to Financial Accounting	CB2101 - Introduction to Managerial Accounting
BSc Computational Finance	Y	
BBA Global Business	Y	Y
BBA Accountancy	Y	Y
BBA Business Economics	Y	
BBA Finance	Y	Y
BBA Global Business Systems Management	Y	Y
BBA Information Management	Y	Y
BBA Management	Y	Y
BBA Business Analysis	Y	Y
BBA Business Operations Management	Y	Y
BBA Marketing	Y	Y
BBA Human Resources Management	Y	Y
BBA International Business	Y	

Although these modules are the introductory level for students enrolled in the business programmes, teaching staff might encounter difficulties in handling Year One candidates with different accounting knowledge during the semester. The objectives of our study are to identify the effectiveness of implementing the Peer Assisted Learning with Supplemental Instruction (PALSI) scheme to support learning for business modules, and recognise that the scheme is still favourable to learners with subject knowledge background of the module.

Literature Review

Traditionally, teachers usually use the teacher-centred approach in a classroom or a lecture theatre to deliver knowledge in the lessons of primary school, high school, or university. In recent years, there are lots of teaching and learning approaches to strengthen the learning supports for new undergraduates, such as blended-learning, e-Learning, and flipped classrooms. Educators started adopting the student-centred learning model, as they believe that the deep-learning process will happen through indirect knowledge transfer. However, some of these approaches might require teaching staff to redesign the course curriculum, apply new teaching strategies, or even plan alternative activities to implement different teaching and learning tasks. Eventually, faculty staff in universities are reluctant to attempt such a new teaching approach because the teaching effectiveness might be unremarkable.

In recent years, there have been lots of researchers evaluating their learning performances in various disciplines, such as medical study (Burgess, McGregor, & Mellis, 2014; Herrmann-Werner et al., 2017), nursing study (McLelland, McKenna, & French, 2013; Williams, Olaussen, & Peterson, 2015; Williams & Reddy, 2016), radiography (Meertens, 2016), biology (Rayner & Papakonstantinou, 2018), geography (West, Jenkins, & Hill, 2017), mathematics (Duah, Croft, & Inglis, 2014), accounting (Marrone & Draganov, 2016; Sudhakar, Tyler, &

Wakefield, 2016; Supple, Best, & Pearce, 2016), mechanical engineering (Qonda, 2017) and other challenging subjects of undergraduate programmes. However, not many longitudinal studies have been conducted on the subjects in business disciplines with Peer Assisted Learning support.

Studies have been done to investigate the effectiveness of peer-assisted learning, and researchers conclude that academic mean scores are increased by comparison with groups without peer-assisted learning support (Riaz, 2014; Bennett, Morris, & Mirza, 2018). Moreover, Williams and Reddy (2016) state that the academic enhancement of student tutors is most significant.

In the light of this literature, this paper attempts to extend the study on peer-assisted learning support from science and engineering subjects to modules in business disciplines, and prove the academic performance of the PALSI group is enhanced effectively. The statistical t-test was implemented by comparing the academic mean results of the PALSI and non-PALSI groups in this longitudinal study. Moreover, this study would like to highlight that the peer-assisted learning scheme is not only for helping mid-range students, but also for boosting the performance of top-tier students.

Methodology

The PALSI course nomination form was sent to the College Heads seeking their endorsement to follow the PALSI guidelines before each semester started. The colleges and departments agreed that the academic results of the PALSI courses would be collected anonymously for research purposes, and such a statement was written on the PALSI course nomination form. During the orientation sessions, an acknowledgement about performance comparison was made to the students who wished to join the PALSI scheme. The anonymous analysis was to investigate the effectiveness of joining the PALSI scheme in each module. At the end of the academic year, all these findings were to be compiled into a PALSI report and sent back to the corresponding departments for reviewing the scheme on different modules.

Statistical tables and charts were compiled to present the academic performance mean value descriptively with different cohorts. After that, a t-test would be implemented to evaluate the effectiveness of peer-assisted learning between the PALSI and non-PALSI students. Interesting findings on the academic performance were revealed by comparing the Grade Point Average (GPA) mean value of PALSI and non-PALSI students. A similar study on the academic results related to the PALSI scheme on undergraduate mathematics modules has been done before (Im, Chiu, Shek, & Liu, 2017). The previous performance study was also divided into two groups based on whether they had advanced mathematics training or without advanced mathematics training before the undergraduate study.

Data Analysis

With collecting the academic results of four academic years, the sample size of the PALSI students and non-PALSI students are 1,815 and 5,869, respectively. Also, for each cohort, there were at least 300 enrolments to over 800 enrolments. To study the learning effectiveness of students who have joined the PALSI scheme, we list the grade distribution summary to obtain an overview of the academic performance. In Table 3 referring to CB2100, it shows that the number of PALSI students in “A range” is nearly the same as the number of non-PALSI

students in "A range" in most of the cohorts. For 2015-16 Semester B, it finds that over half of the "A Range" students have joined PALSI.

In another module CB2101, Table 4 shows that PALSI students are not the majority of the "A range" students; only a few cohorts of PALSI students are dominant in the "A Range". However, similar findings on the relationship between the percentage of "A Range" students and the percentage of PALSI students conclude that they are correlated positively. Two charts – Figure 1 and Figure 2 are created to visualize the relationship of the "A Range" students and the PALSI students for different cohorts of CB2100 – Introduction to Financial Accounting and CB2101 – Introduction to Managerial Accounting.

Table 3: Grades distribution for eight cohorts of CB2100

		Grades										
Year/Cohort	PALSI	A+	A	A-	B+	B	B-	C+	C	C-	D	F
2014-15	Y	5	11	15	19	19	17	14	7	5	3	20
Semester A	N	3	16	27	43	49	41	37	36	28	12	63
2014-15	Y	16	13	15	24	21	15	11	8	6	0	4
Semester B	N	28	13	37	52	38	53	33	25	19	13	39
2015-16	Y	11	10	19	34	38	25	17	11	12	2	9
Semester A	N	7	18	22	47	36	37	42	21	16	12	35
2015-16	Y	30	18	22	30	36	19	21	5	3	1	2
Semester B	N	15	17	31	57	51	44	43	30	5	1	19
2016-17	Y	10	10	23	35	19	13	7	7	3	1	12
Semester A	N	9	25	26	38	42	41	23	21	13	8	37
2016-17	Y	4	12	12	25	35	16	6	5	0	1	5
Semester B	N	12	21	34	45	65	50	29	16	8	8	42
2017-18	Y	9	11	10	9	31	16	10	1	3	1	6
Semester A	N	50	26	21	33	57	48	30	11	9	6	29
2017-18	Y	5	16	15	21	33	14	11	2	3	1	6
Semester B	N	21	42	34	39	90	58	52	28	14	1	48

Table 4: Grades distribution for seven cohorts of CB2101

		Grades										
Year/Cohort	PALSI	A+	A	A-	B+	B	B-	C+	C	C-	D	F
2014-15	Y	0	2	4	2	2	7	9	2	0	1	0
Semester A	N	14	28	42	43	73	49	19	18	13	9	11
2015-16	Y	19	23	16	27	30	22	14	11	6	1	4
Semester A	N	35	59	48	51	68	78	37	27	24	2	25
2015-16	Y	1	8	8	12	11	10	8	2	0	0	2
Semester B	N	23	35	56	81	72	53	36	18	6	9	22
2016-17	Y	23	31	31	46	42	22	11	7	0	1	8
Semester A	N	43	74	86	123	97	97	75	31	8	4	39
2016-17	Y	6	5	5	5	1	3	2	0	1	0	3
Semester B	N	26	32	58	73	62	51	28	13	9	5	21
2017-18	Y	25	21	20	26	26	3	2	2	2	0	1
Semester A	N	43	66	70	105	126	56	45	18	23	8	25
2017-18	Y	7	7	2	7	2	2	1	0	1	2	1
Semester B	N	29	45	68	63	36	41	34	20	8	9	21

Descriptive Statistics Information about Studies with "A Range" Students

In Figure 1, it shows that in seven out of eight cohorts PALSI students had a higher percentage in "A Range" students than non-PALSI students for CB2100. In most of the cohorts, the PALSI group has at least 5% more than the non-PALSI group with such substantial differences. Similarly, Figure 2 shows that CB2101 has five out of seven cohorts PALSI students with the percentage of the "A Range" students higher than the non-PALSI students. All the cohorts of the PALSI students having "A Range" results are over 20%, and three cohorts are significantly as high as 50%.

According to these two figures, it draws our attention that PALSI students' contribution to "A Range" is far more than the percentage than a normal distribution should have. Although not all the cohorts were consistent to draw the same conclusion, it is believed that students who had joined the PALSI scheme were aimed high and capable of achieving excellent academic performance.

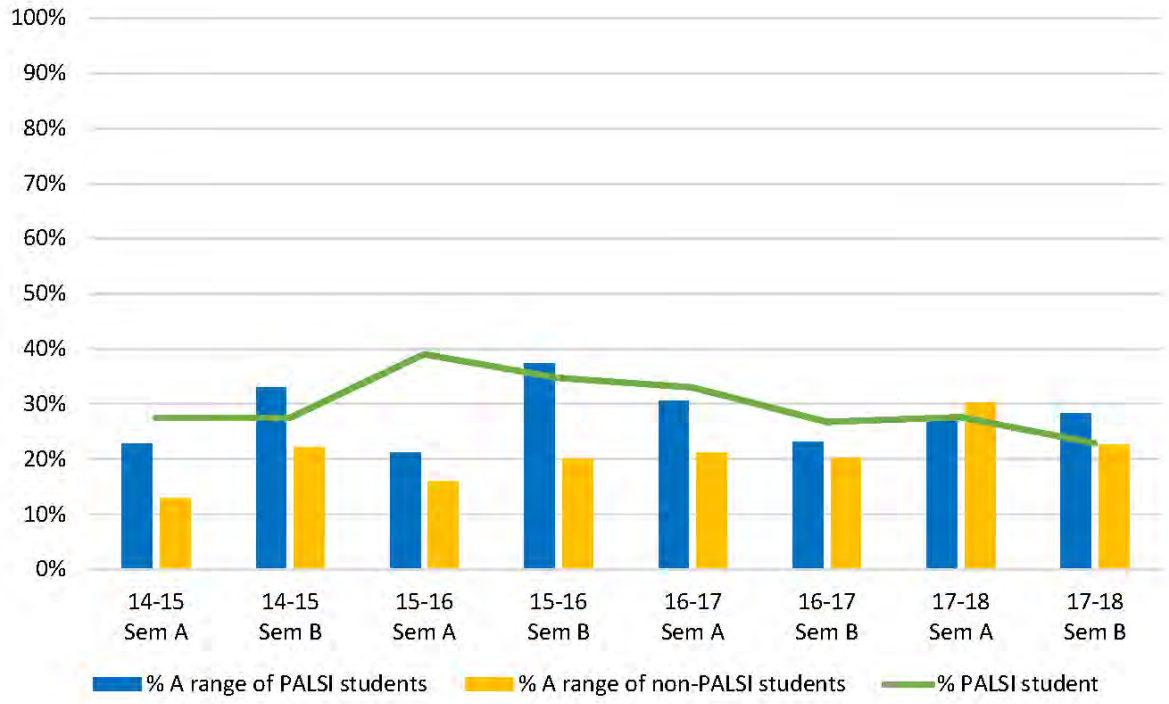

Figure 1: CB2100 – "A Range" percentage of PALSI students and non-PALSI students

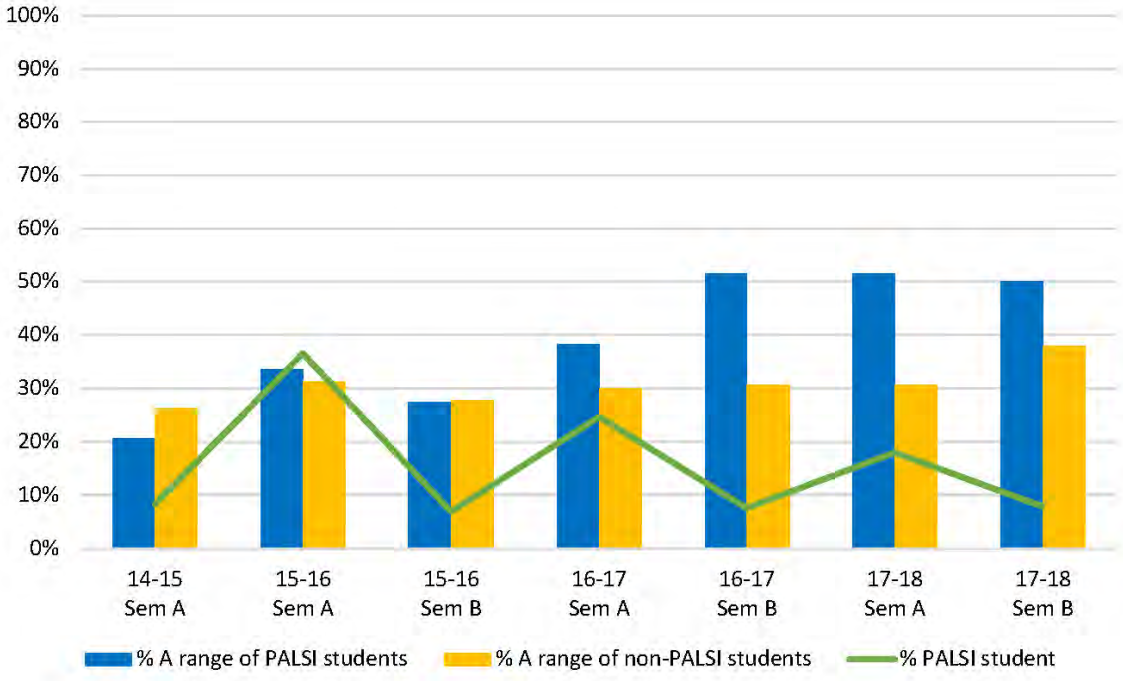

Figure 2: CB2101 – "A Range" percentage of PALSI students and non-PALSI students

Findings with t-test on PALSI and Non-PALSI Students' Performance

The academic results are collected from 2014-15 to 2017-18, and the data include a total of eight cohorts in CB2100 and seven cohorts in CB2101. In general, the data of different grades would follow the normal distribution, and only the top tier percentile part represents "A Range"

performance. Nevertheless, the academic performances of PALSI students of both modules have formed skewed distribution with a higher mean value than the normal distribution from previous observations. Further analyses for in-depth inferential statistical t-test are conducted to investigate whether there is a significant difference in the GPA mean values of these two groups. Relevant data of both modules are shown in Table 5 and Table 6 as below.

The performances are analysed by comparing their GPA mean values with the SPSS statistical package (IBM) to show the mean difference. The p-values of the t-test for PALSI and non-PALSI students found that all eight cohorts of CB2100 are <.05, which represent their means of these two groups are different with statistically significant results. In another module CB2101, three cohorts have p-values <.05, and it is noted that those cohorts with p-values >.05 are relatively low PALSI enrolment numbers.

Table 5: Inferential statistics for studying CB2100

	PALSI			Non-PALSI			
Year / Cohort	Mean	N	SD	Mean	N	SD	p-value
2014-15 Semester A	2.55	135	1.27	2.23	355	1.25	.013*
2014-15 Semester B	3.09	133	0.91	2.60	350	1.21	<.001*
2015-16 Semester A	2.85	188	0.95	2.47	293	1.17	<.001*
2015-16 Semester B	3.11	167	0.74	2.80	313	0.96	<.001*
2016-17 Semester A	2.94	140	1.10	2.55	283	1.22	.002*
2016-17 Semester B	3.02	121	0.84	2.61	330	1.19	.001*
2017-18 Semester A	2.96	107	0.98	2.67	280	1.13	.02*
2017-18 Semester B	3.01	127	0.91	2.67	427	1.16	.002*

Note: *$p < .05$ statistically significant

Table 6: Inferential statistics for studying CB2101

	PALSI			Non-PALSI			
Year / Cohort	Mean	N	SD	Mean	N	SD	p-value
2014-15 Semester A	2.76	29	0.69	2.92	319	0.91	.35
2015-16 Semester A	3.10	173	0.88	2.93	454	1.02	.05*
2015-16 Semester B	3.03	62	0.80	2.95	411	0.98	.51
2016-17 Semester A	3.22	222	0.87	2.97	677	0.99	.001*
2016-17 Semester B	3.17	31	1.25	2.99	378	0.99	.34
2017-18 Semester A	3.51	128	0.67	3.03	585	0.95	<.001*
2017-18 Semester B	3.31	32	1.09	3.00	374	1.05	.11

Note: *$p < .05$ statistically significant

Results and Discussion

In general, the p-values of both modules support that there is a difference in the academic performance of the PALSI group and non-PALSI group. In other words, students who have joined the PALSI scheme could attain better performance in the accounting modules, after

analysing the academic results with a series of the cohort. As mentioned in the former part, HKDSE graduates might have taken the "Accounting" subject when they were studying in senior secondary school. According to the information provided by the Academic Regulations and Records Office (ARRO), only their previous accounting knowledge in HKDSE of the PALSI students could be identified. Thus, Table 7 shows the percentage of PALSI students who have enrolled in HKDSE "Accounting" subject; the results show that around one-third of them had accounting knowledge before the undergraduate studies. In the light of that, another set of paired t-tests were run to investigate any performance advantages for PALSI students with previous accounting qualification background.

Table 7: PALSI enrolments details from 2014 to 2017

Year	No. of students enrolled in PALSI	No. of PALSI students enrolled in HKDSE Accounting subject	% of all PALSI students enrolled in HKDSE Accounting subject
2014	297	93	31.3%
2015	590	184	31.2%
2016	514	178	34.6%
2017	394	107	27.2%

The endorsement form for joining the PALSI scheme signed from the colleges and the departments allowed us to collect academic results anonymously to perform data analysis for the research purpose. Therefore, we are able to access the study background of PALSI students. However, for those who did not participate in the PALSI scheme, the study background of non-PALSI students could not be analysed.

PALSI students' performance of each module is further categorized into two smaller groups based on their prior accounting experience. In Table 8 and Table 9, the two groups are named "HKDSE accounting = YES" and "HKDSE accounting = NO", with a t-test on the mean values comparisons.

Table 8: Comparison with different accounting background of CB2100 PALSI students

	HKDSE accounting=YES			HKDSE accounting=NO			
Year	Mean	N	SD	Mean	N	SD	p-value
2014-15 Semester A	2.98	39	1.00	2.38	96	1.33	.012*
2014-15 Semester B	3.46	47	0.77	2.88	86	0.92	<.001*
2015-16 Semester A	3.06	50	0.87	2.77	138	0.96	.065
2015-16 Semester B	3.32	56	0.76	3.00	111	0.71	.009*
2016-17 Semester A	3.34	52	0.75	2.71	88	1.21	.001*
2016-17 Semester B	3.38	25	0.57	2.92	96	0.88	.02*
2017-18 Semester A	3.16	30	0.54	2.88	77	1.10	.18
2017-18 Semester B	3.40	23	0.48	2.93	104	0.97	.02*

Note: *$p < .05$ statistically significant

Table 9: Comparison with different accounting background of CB2101 PALSI students

	Advanced accounting=YES			Advanced accounting=NO			
Year	Mean	N	SD	Mean	N	SD	p-value
2014-15 Semester A	2.43	7	0.84	2.86	22	0.63	0.15
2015-16 Semester A	3.29	62	0.75	3.00	111	0.93	.04*
2015-16 Semester B	3.12	16	0.54	3.00	46	0.88	.62
2016-17 Semester A	3.47	86	0.58	3.06	136	0.99	.001*
2016-17 Semester B	3.06	15	1.45	3.27	16	1.08	.65
2017-18 Semester A	3.43	42	0.58	3.55	86	0.72	.34
2017-18 Semester B	3.60	12	0.95	3.15	20	1.16	.27

Note: *$p < .05$ statistically significant

From the analysis of the PALSI students' performance, both accounting modules with a large number of PALSI enrolments show that at least one sub-grade improvement is achieved. The continuous study on different cohorts in four academic years – eight semesters proves that the PALSI scheme contributes substantial enhancements in the academic performance of accounting disciplines. Those findings also provide supportive evidence that the PALSI scheme is not solely for "high-risk" modules of the engineering undergraduate programmes (Im et al., 2017). Students with accounting training before are also interested in joining the PALSI scheme in order to achieve higher academic performance.

Conclusions

In the City University of Hong Kong, the Peer Assisted Learning (PAL) scheme has been implemented to support learning for those most challenging "high risk" subjects of undergraduate candidates. Especially in various subjects of engineering and science disciplines, the peer group learning approach has ensured that the learner-centered approach could enhance the learning experience.

In this study, the accounting modules of the College of Business were selected to evaluate academic performance. These core modules of thirteen undergraduate programmes provide nearly two thousand quotas for every academic year. The PALSI scheme was introduced to junior year students to provide extensive teaching and learning support. Such peer-to-peer support opportunities have engaged students more interactively through the small class-size teaching mode.

Topping and Ehly (1998) state that collaborative learning experience is constructed through a series of the understanding process – questioning, answering, discussing, clarifying, giving examples, and receiving feedback. More interactive discussions during peer-assisted learning sessions could offer additional opportunities to develop metacognition, which are different from traditional tutoring sessions in higher education (Vygotsky, 1978). Peer tutoring with supplemental instruction not only encourages students to be engaged in group discussions but also turns them from passive listeners to active learners in collaborative learning. Researchers have studied the different perspectives about education learning, Marton and Säljö (1976a, 1976b) point out that there are two kinds of learning development processes, which are "surface-level processing" and "deep-level processing".

The findings from this longitudinal study in accounting modules show that increasing the time given to accounting topics with the learner-centred approach can eventually help to enhance the study performance. Although scaffolding the knowledge through peer learning could achieve a good learning experience, it might require regular meeting schedules with an adequate attendance rate. Therefore, further studies on the relationship in attendance records and academic performance would be our future analysis direction.

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