

Article

# Supporting Academic Self-Efficacy, Academic Motivation, and Information Literacy for Students in Tertiary Institutions

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**Abstract:** Academic self-efficacy, academic motivation, and information literacy are considered crucial to fostering student learning in tertiary institutions. The aim of this study was to examine the information literacy self-efficacy and academic motivation of college students and to identify the predictors of information literacy self-efficacy. The participants included students in their junior and senior years studying nursing, healthcare, and non-healthcare disciplines at a self-financing institution. Data were collected through a quota sampling method using a questionnaire. In total, 504 valid questionnaires were returned. The results indicated a moderate positive correlation between the two variables. The nursing students were found to have lower information literacy self-efficacy scores than those from the other disciplines. The results from a multiple regression analysis showed that the following factors are predictors of information literacy self-efficacy: being a nursing student, total scores for academic motivation, and owning a personal computer. Nurse educators are encouraged to strengthen the information literacy skills of nursing students, as this is an essential component in the application of evidence-based practices in the nursing profession.

**Keywords:** academic self-efficacy; academic motivation; information literacy; tertiary education

## 1. Introduction

As interest in assessing the learning outcomes of tertiary students grows, teachers and academic administrators have been collecting concrete, evidence-based information on student learning. Institutions can make use of data on learning outcomes to identify areas for improvement and to develop appropriate interventions. Almost two decades ago, information literacy came to be included as a student learning outcome [1]. Factors that influence learning outcomes include student demographics, the learning environment, and academic motivation [2]. Hughes [3] found that teacher–student relationships and supportive learning contexts are crucial to promoting psychological and behavioral engagement and academic achievement. Newton [4] stated that there are various reasons to assess the learning outcomes of students. From the perspective of student learning, it is to monitor the students to determine whether they are making sufficient progress. From the macro perspective, it is for institutional monitoring, to determine whether there have been improvements or declines in the performance of institutional standards.

According to the American Library Association, information literacy is defined as the ability of an individual to recognize when he or she needs information and has the capability to use and to evaluate the information that is identified [5]. In 2016, the Association of College and Research Libraries (ACRL) presented a new framework for information literacy in higher education and defined information literacy as “the set of integrated abilities encompassing the reflective discovery of

information, the understanding of how information is produced and valued, and the use of information in creating new knowledge and participating ethically in communities of learning" [6]. In 2018, the Chartered Institute of Library and Information Professionals (CILIP) released an updated definition of information literacy as "the ability to think critically and make balanced judgements about any information we find and use. It empowers us as citizens to reach and express informed views and to engage fully with society" [7]. In order to acquire the skills for lifelong learning, a person should be information-literate and have the ability to self-learn [8]. In higher education, information literacy is closely related to learning, and tertiary students are not only required to possess the competence to self-learn, but also need to acquire the ability to search for required information and evaluate its credibility before applying it in any circumstances [9]. It is therefore an important outcome of higher education.

Bandura (2010) stated that self-efficacy is the belief that determines how people feel, motivate themselves, and ultimately behave in ways that allow them to attain a goal, and that through the mastery of experience, people can create a strong sense of efficacy [10]. Bandura and Adams analyzed this self-efficacy theory of behavioural change by conducting experimental tests. The results revealed that self-efficacy was highly accurate at predicting improvements in behaviour at various phases of post treatment measures, confirming that behavioural changes correspond closely to levels of self-efficacy [11]. Perceived self-efficacy denotes a person's judgement of his/her ability to produce the designated level of performance for a given event [10]. However, acquiring information literacy is not simply about acquiring skills; rather, individuals also need to develop confidence. Students who exhibit low self-efficacy in learning have been found to be less inclined to develop the information literacy skills that promote lifelong learning [8,12]. Similarly, information literacy levels and academic self-efficacy of the prospective teachers are predicting their lifelong learning tendencies [13]. A recent integrative review based on 25 studies suggested new findings and concluded a positive correlation between students' information literacy skill development and librarians' involvement in undergraduate nursing students [14].

Motivation is the desire to perform an action and is directly linked to performance in the sphere of education. There are three types of motivation, namely controlled (extrinsic), autonomous (intrinsic), and lack of motivation (amotivation) [15]. Intrinsic motivation refers to an individual's desire to engage in an activity to experience the satisfaction of doing so, as well as to succeed. Extrinsic motivation is the carrying out of tasks or responsibilities out of a sense of obligation [16]. According to the theory of self-determination of behaviour, motivation can be illustrated using the self-determination and motivation continuum, which reflects degrees of self-determined behaviour. Amotivation contrasts with intrinsic and extrinsic motivation, and represents a complete lack of self-determination. A person becomes self-determined by moving through levels of extrinsic motivation until eventually attaining the level of intrinsic motivation [17]. Motivational problems are considered very common in the sphere of education, with teachers becoming frustrated if their students are not motivated to learn. The findings revealed academic motivation is having an effect on students' academic achievement, it is inferring that motivation is important to the academic achievement and performance [18].

Previous studies have been conducted on the academic motivation (AM), information literacy, and information literacy self-efficacy (ILSE) of students. One study found that ILSE was lowest among first-year students, but it increased significantly in the second year of study and remained relatively stable thereafter [12]. ILSE and motivation increased as students advanced academically. Positive correlations have been found between self-efficacy in online learning and self-efficacy in information-seeking strategies [19]. Therefore, measures should be designed to strengthen the academic motivation and self-efficacy of students in their early years of study [20]. In spite of an effective academic support system, students who hold a part-time job might experience academic difficulties, which could affect their motivation to learn. Ross et al. found that students with a part-time job exhibited significantly lower intrinsic motivation than those who devoted their full time to their studies [21]. The same group of authors found that both intrinsic and extrinsic AM were positively

related to ILSE, while amotivation was negatively related [22]. These overseas studies suggest that senior students have both higher motivation and higher ILSE. However, the relationship between ILSE and student employment, as well as the adverse effects, remain unclear. Also, there have been no previous studies comparing the ILSE and AM of students in different disciplines.

In Hong Kong, a project funded by the University Grants Council (UGC) conducted in the period 2012–2015 found that although new students reported that they had less actual experience than senior students in conducting research and using libraries, they still perceived themselves to be good researchers. These students also demonstrated a poor ability to evaluate online information [23]. Patient safety and effectiveness in healthcare services are emphasized in evidence-based practice. In the nursing profession, there is a need for students to be empowered in information literacy to enable them to successfully engage in evidenced-based nursing practices as well as in professional continuing education programmes [24]. For healthcare professionals, the importance of having access to information as well as of possessing the skills to process that information needs to be widely acknowledged [25]. The above evidence confirms that an interdisciplinary study with students from different cohorts will allow researchers and educators to determine the characteristics of the students, which will be of help in developing effective approaches to interdisciplinary teaching to facilitate more meaningful learning.

Taken together, there is a gap in the literature on whether student demographics, student employment, study disciplines, and year of study affects ILSE and AM. Little attention has been paid to examining the AM and ILSE of students in nursing, healthcare, and non-healthcare disciplines. The current study, which focuses on the ILSE and AM of students from a private institution of higher education, may contribute to a theoretical understanding of the factors influencing the ILSE and AM of students.

To align with the current education system and curriculum reforms for higher education, information literacy and AM can be regarded as a framework for teachers to use in developing strategies to improve and support student learning. The guiding research questions in this study were:

1. What are the ILSE and intrinsic/extrinsic AM of college students?
2. Is there any relationship between ILSE and AM?
3. How do students' AM and ILSE evolve over time?
4. What are the predictors of ILSE?

## 2. Materials and Methods

### 2.1. Participants

Data were collected in 2019 at a self-financing tertiary institution in Hong Kong. The participating institution offers programs in various disciplines. Quota sampling was employed to invite eligible students from four academic units in the institution to participate. This is a semi-purposive sampling method that involves identifying population strata and determining how many participants would be needed from each stratum. Essentially, the procedures of quota sampling are similar to those of convenience sampling in that people in any of the subgroups are a convenience sample from that stratum of the population. Conducting quota sampling allowed the researcher to ensure that a diversity of groups was represented in the sample according to their proportion of the population [26]. In this study, stratification was based on students in their first and third years of study from the four schools, as this could reflect important differences in their characteristics. At the time that the data were collected, the Year 1 students had almost completed the academic year, and it was deemed appropriate to measure their information literacy and AM.

The criteria for inclusion in this study were: (1) full-time students studying in a bachelor's degree program, and (2) who had experience in using e-data bases in the library. The second criterion was to ensure that the participants had been exposed to electronic resources in the college library. Part-time and non-bachelor's program students were excluded from the study.

## 2.2. Sample Size

The estimation of sample size was conducted according to the following equation developed by Rea (2014):

$$\frac{Z_{\alpha}^2(0.25)(N)}{Z_{\alpha}^2(0.25) + (N - 1)ME_p^2} \quad (1)$$

According to information from the Registry, the total number of students enrolled in bachelor's degree programmes at the participating institution was 2001 as of 31 December 2018. The calculation was based on a 95% confidence level with a margin of error not exceeding  $\pm 5\%$ . In the formula,  $Z_{\alpha}^2$  was 1.96, indicating a 95% level of confidence, while  $ME_p^2$  was 0.05 for a  $\pm 5\%$  margin of error. Thus, a sample size of 322 would be required for a study population of 2001.

Based on figures on student enrolment in bachelor's degree programmes in the four schools, the total sample required was 17 for the School of Arts and Humanities, 4 for the School of Management, 82 for the School of Medical and Health Sciences, and 221 for the School of Nursing. Half of the sample was made up of junior students, and the other half of senior students.

## 2.3. Study Design

A cross-sectional quantitative study was adopted for the design.

## 2.4. Questionnaire

The researchers developed questions to examine the personal particulars and learning experiences of the students. In the questionnaire, the students were asked about their personal information, study discipline, number of hours engaged in a part-time job, and whether or not they had enrolled in subjects related to health informatics or information technology.

Levels of information literacy were assessed using the information literacy self-efficacy scale (ILS) developed by Kurbanoglu, Akkoyunlu, and Umay [8]. The tool consists of 28 items that measure an individual's perception of his/her information problem solving skills. The students were asked about their perception of their information literacy skills. The ILS uses a 7-point Likert scale ranging from 7 = strongly agree to 1 = strongly disagree. Scores on the 28-item scale range from 28 to 196, with a higher score indicating a higher level of information literacy. The scale was originally developed in Turkish and translated into English. The results showed that the 28-item scale had a high Cronbach's alpha (0.91 for the English version and 0.92 for the Turkish version). The reliability and validity of the scale were confirmed through discriminant validity, an item analysis, and a principal component analysis. The ILS was found to be highly valid and reliable, and of reasonable length. This scale is well established in the literature and has been widely used by authors from various countries since its development [22].

The academic motivation scale (AMS) developed by Vallerand et al. [27] was used to examine student motivation for learning. The AMS consists of seven subscales, each with four items. Each subscale assesses the three types of motivation, namely intrinsic motivation, extrinsic motivation, and amotivation. The items are rated on a 7-point Likert scale (1 = strongly disagree; 7 = strongly agree). The AMS was originally developed in French, and the 7-factor structure of the French version of the scale was confirmed to have satisfactory internal consistency and construct validity, as supported by a series of correlational analyses among the subscales. The AMS was later translated into English and cross-culturally validated in a study involving a group of university students. The validation process included back translation, a confirmatory factor analysis, and a reliability test. Psychometric tests supported the finding that the scale possesses factorial validity and reliability. Vallerand et al. [27] reported that the scale has good internal consistency. The Cronbach's alpha coefficients for the subscales ranged from 0.93 to 0.86. The test-retest coefficient ranged from 0.71 to 0.83 for the subscales. Since its development, the AMS has been widely used by various scholars to examine the motivations of students in various educational settings, such as high schools, junior colleges, and universities [28–31].

Because the scales were developed in a Western country, to address any questions about the possibility that cultural differences might affect the applicability of the scales in Hong Kong, the authors examined the content validity and reliability of the ILS and AMS. For the content validity test, a review panel consisting of one experienced librarian and two nurse educators was formed. The experts were required to comment on the questions to determine their relevance and representativeness in relation to the research objectives, using a 4-point scale. The content validity index (CVI) of each scale needed to be above 0.8 [32]. Any question considered irreverent or not representative by two experts was removed. The CVI of both the AMS and ILS was found to be 0.964. For the reliability test, 10 college students were invited to take part in examining the test-retest reliability of the scales. They were asked to answer the same questionnaire again two weeks later. The ICC was used to determine the reliability of the test, with an ICC value of above 0.75 indicating good reliability. The ICC of the two scales was found to be 0.997. In the present study, the Cronbach's alpha of AM was 0.905 and that of ILSE was 0.968.

### 2.5. Ethical Considerations

The study was approved by the research ethics committee of the participating institution (Ref. No. REC2019022). The questionnaire was conducted on an anonymous basis. The students were well informed of the study and their participation was voluntary.

### 2.6. Data Collection

Data collection was conducted in early 2019. During the process, quota sampling was carried out using procedures similar to those in convenience sampling. The questionnaires were distributed during lectures to both Year 1 and Year 3 students in the different schools, with the assistance of their teachers. The students participated on a voluntary basis.

### 2.7. Data Analysis

SPSS Statistics, Version 26.0 (SPSS Inc., Chicago, IL, USA), was used for the statistical analysis. Descriptive statistics (mean and percentage) were used to summarize all demographic variables. Due to the large size of the sample, parametric tests were conducted throughout the analysis. A t-test was used to compare the mean ILS and AMS scores of the junior and senior year students. One-way ANOVA with a post-hoc test were used to examine the mean scores of students from the four schools. A multiple linear regression was conducted to examine the predictors of the ILSE of the students. The significance was set at 0.05, in a two-tailed test.

## 3. Results

### 3.1. Demographic Characteristics of the Students

Of the 504 participants, 308 were in their junior year (i.e., Year 1 and Year 2), while 196 were Year 3 to Year 5 students (the baccalaureate degree in Hong Kong is a 5-year full time programme). There were more female students than male students in the two cohorts. More than half of the students were studying Nursing, while more than 30% were in the Medical and Health Sciences, and only 3.1% were studying Management. More than 70% of the senior students had a part-time job. About 90% of the students owned their own computer, which they used for their studies. A majority of the senior students had studied 1–2 subjects related to health informatics or information technology, whether as core or elective subjects within the curriculum. More than three-quarters of the junior students had never attended workshops offered by the library. Of those students who had attended the library workshops, more than 90% had done so in their first year of study. Among the senior students, 56.2% had participated in the workshop in Year 3 of their studies. Please refer to Table 1 for details.

**Table 1.** Demographic characteristics of the students (N = 504).

	Junior Years (Year 1–2) (N = 308)	Senior Years (Year 3–5) (N = 196)
	N (%)	N (%)
<b>Demographic Characteristics</b>		
Gender		
Male	67 (21.8%)	36 (18.4%)
Female	241 (78.2%)	160 (81.6%)
Age (N = 502)		
19 or below	275 (89.6%)	15 (7.7%)
20–25	32 (10.4%)	178 (91.3%)
26–30	0 (0.0%)	2 (1.0%)
School currently enrolled in		
Arts and Humanities	19 (6.2%)	10 (5.1%)
Management	0 (0%)	6 (3.1%)
Medical and Health Sciences	134 (43.5%)	68 (34.7%)
Nursing	155 (50.3%)	112 (57.1%)
Engaged in a part-time job		
Yes	174 (56.5%)	140 (71.4%)
No	134 (43.5%)	56 (28.6%)
Have own computer for study (N = 501)		
Yes	289 (94.8%)	179 (91.8%)
No	16 (5.2%)	16 (8.2%)
Taking subject(s) related to health informatics or information technology (N = 494)		
None	163 (54.3%)	12 (6.2%)
1–2 subjects	107 (35.7%)	176 (90.7%)
3 subjects or more	30 (10.0%)	6 (3.1%)
Have you attended any library workshop? (N = 503)		
None	235 (76.3%)	122 (62.6%)
1–2 times	58 (18.8%)	67 (34.4%)
3–4 times	12 (3.9%)	4 (2.1%)
5 times or more	3 (1.0%)	2 (1.0%)
In which year did you attend a library workshop? (N = 146)		
Year 1	67 (91.8%)	22 (30.1%)
Year 2	5 (6.8%)	9 (12.3%)
Year 3	1 (1.4%)	41 (56.2%)
Year 5	0 (0.0%)	1 (1.4%)

There were missing data, as some students did not respond to all of the items.

### 3.2. Academic Motivation and Information Literacy Self-Efficacy of the Students

Descriptive statistics were used to examine the mean and standard deviation of the two variables. The overall AM score was 135.58 out of 196 (SD 17.72), while the overall ILS score was 139.56 out of 196 (SD 23.04). An independent t-test was used to examine the means of the two cohorts of students, and no significant differences were found between the two groups. Please see Table 2 for details.

**Table 2.** Scores on the academic motivation (AMS) and information literacy self-efficacy (ILS) of the two groups of students.

	Total	Junior Years (N = 308)	Senior Years (N = 196)	p-Value
AMS total score	N = 468 135.58(17.72)	135.1 (17.99)	136.33 (17.37)	0.465
ILS total score	N = 471 139.56(23.04)	139.29 (22.5)	139.97 (23.93)	0.756



### 3.3. Correlations between Academic Motivation and Information Literacy Self-Efficacy

A Pearson's correlation coefficient was used to illustrate the relationship between AM and ILSE in the entire study group. The results showed a significant positive moderate correlation between academic motivation and information literacy self-efficacy ( $r = 0.546, p < 0.05$ ).

### 3.4. Differences in the Academic Motivation and Information Literacy Self-Efficacy of Students in Different Schools of Study

To determine whether there were significant differences in AM and ILSE among all of the students in the four Schools, a one-way ANOVA followed by a Sidak comparison was conducted in this analysis. An analysis of variances showed that there were significant differences in ILSE among the students from the four Schools ( $F = 2.801, P = 0.04$ , Effect size partial eta squared = 0.018), while there were no significant differences in the AMS scores ( $F = 0.619, P = 0.603$ , effect size partial eta squared = 0.004). Please refer to Table 3 for details.

**Table 3.** Comparisons between students from different schools on academic motivation and information literacy self-efficacy.

	Arts and Humanities	Management	Medical and Health Sciences	Nursing	F	p-Value	Effect Size Index
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)			
AMS score	137.64 (18.5)	129.17 (9.41)	136.36 (18.9)	134.93 (16.89)	0.619	0.603	0.004
ILS score	146.04 (22.77)	150.5 (24.75)	141.69 (24.87)	136.95 (21.26)	2.801	0.04 *	0.018

\*  $p < 0.05$ .

The comparisons made using the Sidak correction were to counteract the problems arising from making multiple comparisons by decreasing the likelihood of making a type I error in the findings [33]. An attempt was made to identify whether there were significant differences in the ILS scores of the students from the four Schools. The results showed that there were no significant differences between the students in the various Schools, despite an overall significant result in the ANOVA test.

### 3.5. Regression Analysis for the Predictors of Information Literacy Self-Efficacy

Referring to the results of the correlation analysis, a stepwise regression analysis was conducted to determine the predictors of ILSE. The dependent variable was the ILS scores, while the independent variables included the AMS scores, the schools where the students were from, gender, junior or senior student cohort, whether or not the students had attended the library workshop and studied subjects related to health informatics, and their academic performance (GPA scores). Higher AMS scores ( $\beta = 0.729$ ; 95% CI =  $-16.298-1.117$ ;  $p = 0.025$ ) and having one's own computer at home ( $\beta = 7.557$ ; 95% CI =  $0.206-14.908$ ;  $p = 0.033$ ) were found to be significant predictors of better ILSE. Students from the School of Nursing were less likely to have higher ILS scores ( $\beta = -8.707$ ; 95% CI =  $0.206-14.908$ ;  $p = 0.033$ ) than students from the School of Arts and Humanities and the School of Management. The R-square was 0.361, while the adjusted R-square was 0.349. The predictors accounted for 34.9% of the total variance. Please refer to Table 4 for details.

**Table 4.** Multiple regression analysis for predictors of ILS.

Variables	$\beta$ (95% CI of $\beta$ )	p-Value
School: Medical and Health Sciences (reference group: Arts and Humanities/Management)	-3.696 (-11.518-4.125)	0.353
School: Nursing (reference group: Arts and Humanities/Management)	-8.707 (-16.298-1.117)	0.025 *
AMS total score	0.729 (0.626-0.833)	<0.001 *

Table 4. Cont.

Variables	$\beta$ (95% CI of $\beta$ )	<i>p</i> -Value
Gender: Male (reference group: female)	−0.570 (−5.134–3.994)	0.806
Junior years (reference group: senior years)	−2.414 (−6.349–1.522)	0.229
With personal computer (reference group: no personal computer)	7.557 (0.206–14.908)	0.033 *
Attended library workshop (reference group: did not attend library workshop)	−0.312 (−3.416–2.792)	0.844
Studied subjects related to health informatics (reference group: had not studied subjects related to health informatics)	−0.419 (−3.642–2.805)	0.799
Grade point average (GPA) score	0.583 (−1.701–2.866)	0.616

Adjusted R-square = 0.349.; \*  $p < 0.05$ 

#### 4. Discussion

The aim of this study was to examine the AM and ILSE of students studying in a tertiary institution. This study used a quota sampling method to enable diverse groups to be represented in the sample. The representativeness of the sampling method provided a robust base of research evidence to determine the ILSE and AM of the students.

##### 4.1. Academic Motivation and Information Literacy Self-Efficacy of the Students

Our study showed that there were no significant differences in these two variables between the junior and senior students. Presumably, the senior students were more mature, motivated, and had acquired better information literacy skills. However, although cognitive and behavioral outcomes are essential for academic success, these might not necessarily improve while students are studying in a tertiary institution. In our study, more than 75% of the junior students and 60% of the senior students had not participated in any of the library workshops. Junior and senior students are encouraged to take part in collaborative learning activities. Throughout these activities, the senior students could act as mentors to the juniors to promote the development of problem solving abilities and improve learning outcomes. Personality traits influence information competency [34]. Extroverted students can always seek help from librarians and teachers or learn on their own. By contrast, introverted students and those with low motivation are at a disadvantage in that they will tend to largely learn by themselves. An older systematic review confirmed that few students were willing to give up learning if schools worked to improve their sense of self-efficacy [35]. To support low-achieving students, teachers could consider using a motivational approach coupled with strategies to enhance the students' information-seeking skills to trigger their motivation to acquire new knowledge, which could lead to an increase in self-efficacy. Folk [36] stated that students with higher levels of ILSE generally possess a better understanding of the process of research and know how to locate and select credible sources of information. These are beneficial lifelong skills that enhance critical thinking, which goes beyond specific knowledge and occupational areas. In order to promote information literacy, teachers are encouraged to integrate information literacy skills into the first-year curriculum for students of all disciplines. To further strengthen skills in searching for information, teachers should require senior students to make use of different resources such as various search engines, websites, library catalogues, databases, and printed sources to locate information and crosscheck details that they have obtained. The strategy is to guide students in developing the skills of scientific inquiry that are required to become a critical learner. Learners should also acquire the skills to prepare a bibliography and reference list using different types of software, and to make proper citations and quotations within a text.



#### *4.2. Correlations between Academic Motivation and Information Literacy Self-Efficacy*

Our study revealed a moderate positive correlation between AM and ILSE. An early study by Schunk [36] summarized previous studies and confirmed that self-efficacy is positively related to AM. AM includes allowing students to set goals to accomplish, as self-set goals promote a sense of self-efficacy. Likewise, self-efficacy can predict diverse learning outcomes, such as academic achievement, social skills, and so on. Saracaloğlu and Dinçer [37] revealed similar results for university teachers, namely, that AM and a sense of efficacy were moderately correlated in a group of prospective teachers. A recent systematic review that integrated 12 years of research in the university population further confirmed that academic self-efficacy was moderately correlated with academic performance, with goal orientation identified as a mediating and moderating factor [38]. The above studies are consistent with our findings on the positive correlation between self-efficacy and academic motivation. Although our study focused on ILSE, self-efficacy is multi-dimensional and includes the aspects of problem solving, controlling situations, reaching a goal, completing a task, and facing challenges, all of which very much affect how people motivate themselves and how they behave [39]. To point young people in the direction of acquiring a quality education, it is useful to refer to Bandura's social cognitive theory on the important function played by self-efficacy in determining the outcomes of important life events [40]. New instructional models involve a shift in paradigm from the traditional lecture style to student-centered learning, such as flipped classrooms, blended learning, peer learning, collaborative work, and reflective and problem-based learning. All of these pedagogies help students to synthesize information and develop new ideas using interactive approaches, while at the same time bring fun into their educational experience. In that sense, teachers are working with students to make them feel comfortable in their own patterns of learning. Before students can effectively engage in these active learning activities, they first need to set goals and acquire the skills of searching for information and selecting credible resources. As students have diverse learning needs, by networking with librarians they will be able to increase their cognitive outcomes and achieve a higher level of conceptual knowledge in a more linear way. This would have a positive impact on student learning and satisfaction. To foster student learning in tertiary educations, a well-structured two-step process that includes the use of new instructional models along with strategies to increase academic motivation and enhance information literacy skills will produce significant effects on the cognitive outcomes and self-confidence of the learners. Further studies on whether a two-step process would enable students to learn better and result in additional improvements in educational outcomes are warranted.

#### *4.3. Students from Different Schools on Academic Motivation and Information Literacy Self-Efficacy*

Although the ANOVA and post hoc test results were not significant, our study results showed that the nursing students achieved lower ILS scores than the students in other disciplines. Nursing is a professional career that requires lifelong learning through continuing education in order to stay current and grow within the practice. Dorner, Taylor, and Hodson-Carlton [41] suggested that nursing students need to possess adequate information literacy skills to be successful as future healthcare professionals. The academic staff members in their study worked with librarians to design a tiered approach to progressively build the research skills of nursing students. A series of information literacy competencies were targeted for both undergraduate and post-graduate students. Similarly, Courey, Benson-Soros, Deemer, and Zeller [42] designed specific learning programs embedded in a foundation nursing course for first-semester associate degree nursing students. Our study is an exploratory one, and future studies are warranted to examine why the nursing students in our study achieved lower scores than students in other disciplines. Nurse educators, as agents for change, should promote quality education and recognize the importance of developing future nurses who possess the information literacy skills required for evidence-based practice.

#### 4.4. The Predictors of Information Literacy Self-Efficacy

The regression analysis showed that achieving higher AMS scores and having one's own computer are positive predictors of ILSE in students, but that nursing students were less likely to have higher ILS scores than students of other disciplines.

Personal computers are now part of everyday life, and people depend on them for learning, entertainment, and business. Around 5–8% of our student population need to share a computer with other family members. Our study is not the first to look for a positive impact on student learning from access to computers outside school. A study conducted in 2006 reported that nearly twenty million children in the U.S. did not possess a computer at home, and that there was a positive relationship between having a home computer and educational outcomes [43]. A Canadian study conducted in 2010 reported on the positive effects on student learning of “access to adult support for schoolwork” and “access to a computer at home for schoolwork”. Having a computer at home was found to be directly related to student achievement [44]. Another recent study conducted in Spain stated that information and communication technology play an essential role in improving the academic performance of students [45]. For those students who grew up with technology tend to have better likelihood of possessing higher information literacy self-efficacy [46]. The results of our study provide further evidence of the relationship between having a computer at home and information literacy. Education policies that include a long-term loan scheme, subsidies, or emergency loans to allow tertiary students to own their computer should be supported. In Hong Kong, the Students' Union of tertiary institutions has setup an annual 'Notebook Ownership Programme' to sell computers to students at discounted prices. This sends the message that it is important own a personal computer and encourages computer vendors to offer computers at a low mark-up to students studying in tertiary institutions.

This study has several limitations. There was a sampling limitation in that the research data were generated from a single institution, which could affect the generalizability of the study. The design was merely a general survey focusing on the Hong Kong context. For part of the regression analysis, data from the two different cohorts were combined; thus, the interpretation of the results linking the two groups must be read carefully to reach a better understanding of this topic. Another challenge was the relatively small sample size from the School of Management, which could have affected the study results.

## 5. Conclusions

This study documented the academic motivation and information literacy self-efficacy of students in a tertiary institution. The results indicate that the two elements are related and affect student learning. There were no significant differences between the two cohorts of junior and senior students in academic motivation and information literacy self-efficacy. The findings could have been the result of the traditional education pedagogy employed in the tertiary institution. There were moderate positive correlations between academic motivation and information literacy self-efficacy. There are a number of factors that affect information literacy self-efficacy. Our nursing students were having lower ILS scores than the students in other disciplines, nurse educators are encouraged to design strategies to progressively improve the information literacy skills of nursing students. Similar to previous studies, it was found that students having their own computer was a positive predictor of information literacy self-efficacy in students. Therefore, policies to help tertiary students acquire their own computer should be implemented.

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