# Applying outcomes-based teaching and learning framework in the BSc Information Management Program in the Faculty of Education

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This study reports on the preliminary findings of a Teaching Development Grant project that applies the outcomes-based teaching and learning framework in the BSc Information Management (IM) Program in the Faculty of Education at the University of Hong Kong. The study investigates three kinds of learning outcomes related to the BScIM Program: (1) Program level learning outcomes; (2) Course specific learning outcomes; (3) Generic academic outcomes: Information literacy and IM & Technology skills and knowledge of the BScIM Program. We examined the program level learning outcomes that were desirable to equip students for an IM-related career and to help students become a well-rounded university graduate. We also measured to what extent that students have attained these learning outcomes. Similarly, we investigated to what extent the students have achieved the desirable learning outcomes at the course level. Generic academic learning outcomes are the core competencies that are expected for the students to achieve upon their graduation. Prior to the implementation of the main study with the 5th cohort of BScIM students (first registered in 2009), a pilot study was conducted with the 4th cohort of BScIM students (first registered in 2008) a year ago. The pilot study helped the research team further improve the methodology and the instruments of this project. During the actual study, 21 BScIM students from the 5th cohort were surveyed on their self-perceived attainment on the BScIM program level learning outcomes. Course level learning outcomes were measured for Knowledge Management (KM) and English in the Discipline (ED) courses while generic academic learning outcomes were assessed in two aspects: (1) information literacy; (2). information management and technology skills, in the form of surveys. Surveys for program level learning outcomes, information literacy, as well as information management and technology skills were performed for the first time at the beginning of the academic year and once again at the end of the same academic year to gauge the differences. Course level learning outcomes surveys (KM and ED) were also administered twice at the beginning and at the end of the first semester.

**Keywords:** learning outcomes, information literacy, information management skills

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## Introduction

Outcomes-based teaching and learning (OBTL) is a pedagogical approach that focuses on the tasks and competencies that students can demonstrate after they are taught by the instructors. All the curriculums and instructional approaches are designed to best facilitate students to attain the desired learning outcomes (Lorenzen, 1999). OBTL signifies a paradigm shift from the traditional teaching and learning approach which is teacher-centered and objectives-based, to a student-centered approach under which students are given more autonomy in determining their own learning trajectories and learning goals so that students' learning experiences can be more dynamic (McDaniel, Felder, Gordon, Hrutka, & Quinn, 2000; Shipley, 1995). Worldwide, OBTL has become more and more popular as it espouses to place less emphasis on content-driven curriculum and to focus more on cultivating the spirit of lifelong learning among the learners (Aldridge, Laugksch, & Fraser, 2006).

This study attempts to investigate the effectiveness of applying OBTL in the BSc Information Management (IM) Program under the Faculty of Education of the University of Hong Kong by specifically inspecting on the students' perceived attainment on the program level learning outcomes and two generic academic outcomes (1. information literacy and 2. information management and technology skills) once at the beginning of their program and once again after they had finished an academic year to examine the differences. It also aims at examining the course level learning outcomes by measuring students' perceived differences in their learning outcomes attainment at the pre-course level and post-course level within the second semester of the same academic year during which two courses, Knowledge Management (KM) and English in the Discipline (ED) were introduced.

## Literature Review

The inception of OBTL can be traced back to more than a decade ago when 'Outcomes-based Education' (OBE) became widespread in different levels of educational institutions. OBE has its roots on competency based education which was introduced in the North America during the 1960s in response to educational critics that voiced the concern of students not being equipped with the necessary competencies while they were in school (Butler, 2004). Many scholars had attempted to define and establish concrete concepts and meanings for OBE. For instance, Spady had since in the 90s coined OBE as a method of teaching that is "clearly focusing and organizing everything in an educational system around what is essential for all students to be able to do successfully at the end of their learning experiences" (Spady, 1994, p.12). Under OBE and OBTL, more emphasis was placed on evaluating the learning outcomes rather than the learning process. Learning process is usually perceived to be more personal, internal and varied among individuals, whereas a learning outcome is a more observable end product which can be measured, quantified and seen more clearly (Kovalik & Dalton, 1997). The research on defining learning outcomes and measuring the extent on how far learning outcomes were achieved had been performed extensively by many researchers worldwide (Butler, 2004; Faris, 1998; Hartel & Gardner, 2003; Jenkins & Unwin, 1996; Kovalik & Dalton, 1997; Lorenzen, 1999; Shipley, 1994; Spady, 1994). In simple terms, learning outcomes were defined as "clear statements specifying what a learner should know, understand, and able to do" (Faris, 1998, p.11). Another scholar more recently contrived the meaning as "precise statements of what faculty expect students to know and be able to do as a result of completing a program, course, unit or lesson" (Hartel & Gardner, 2003, p.35). In applying the concept of OBE into the teaching and learning processes, the intended learning outcomes for students to achieve should be delineated by faculty members. This process

should then be followed by developing appropriate curriculum and incorporating suitable instructional methods to equip the students with more capabilities to achieve the desired learning outcomes. Ultimately, assessments should take place to ensure that the desired learning outcomes are evaluated in order to gauge the extent of students' attainment of learning outcomes (Lorenzen, 1999; Spady, 1994).

In contrast to the traditional learning concept which was more teacher-centered, OBE is learner-centered and more learning outcomes-centered nowadays (McDaniel, et al., 2000). Emphasis is no longer put on lecturers' didactic means but what the students can actually learn from the lessons and how well they have attained what they had been taught in their respective courses (Botha, 2002) by actively seeking different learning approaches to construct their understanding of particular knowledge via individual effort and group projects (Biggs, 1996). Independence and intrinsic motivation of the students are well accentuated in the students' learning processes while faculty members are responsible to create a learner-friendly environment by fostering more teacher-students interactions, encouraging peer interactions among the students as well as integrating new technologies into the lessons to ensure that the intended learning outcomes are achieved (McDaniel, et al., 2000). Explicit and well-formulated learning outcomes will reinforce the educational strategies stipulated above (Martinez-Moyano, Conrad, & Andersen, 2007), represent skills and abilities which are applicable to the students' future employment settings and could be convincingly demonstrated by students upon their graduation (Shipley, 1994).

OBE and OBTL had been applied internationally in all kinds of educational settings such as primary, secondary or tertiary institutions. Among the countries that had implemented OBE were South Africa (Aldridge, et al., 2006; Botha, 2002; Mailula, Laugksch, Aldridge, & Fraser, 2003), US (Berman, 1995), UK (Faris, 1998; Rees, 2004), Canada (Shipley, 1995; Wien & Dudley-Marling, 1998) and Australia (Andrich, 2002; Brindley, 2001). In terms of the curriculums in tertiary institutions, OBE had been vastly implemented in medical education (Harden, 2002; Rees, 2004; Ross, 1999), food science (Hartel & Gardner, 2003) and the life sciences (Ryder, 2004). The adoption of the OBE in different countries and different universities' across different academic disciplines had proven that it is a universally espoused model which can be applied to meet the educational needs of diverse cultural and educational settings.

There were a number of OBTL frameworks proposed by different scholars. These frameworks were slightly different in terms of their inner elements assessed, but rather the same with regards to their respective central concepts in defining the different levels of learning outcomes. Willis and Kissane (1997) came up with a three-level learning outcomes for an educational system: (1) overarching student outcomes which are broad exit outcomes that apply to the entire school system, (2) curriculum area outcomes which are restricted to particular part of curriculums and school's activities offered and (3) progressive outcomes which are more explicit and encompass the benchmarks and standards that the students need to achieve in the process of learning (Willis & Kissane, 1997). Allan (1996), on the other hand, also proposed three types of learning outcomes that encompass teacher specific outcomes, student/personal outcomes that can be further subdivided into personal transferable outcomes and generic academic outcomes, and subject-based outcomes. Under generic learning outcomes, the core competencies or core skills intended for a university graduate to achieve upon the completion of his/her studies were underscored (Allan, 1996). Such core competencies include items such as communications and interpersonal skills, information technology and computation skills, information management skills, problem-solving skills and

etc (Faris, 1998; Miles & Wilson, 2004). Other scholars generically differentiated learning outcomes into program level learning outcomes and course level learning outcomes (Butler, 2004; McCullough, 2008; Rigby & Dark, 2006). Program standards or learning outcomes statements were usually formulated by the faculty members from a series of consultations with different employers, practitioners and educators (Shipley, 1994, 1995).

The effectiveness of OBTL can be gauged by employing evaluations and assessments. The faculty members need to critically review the instructional approaches in order to recapitulate whether each learning outcomes statement is sufficiently addressed (Hartel & Gardner, 2003). Minimum learning outcomes achievement should be identified explicitly to the students (Faris, 1998) and authentic and tailor-made assessments should be developed to measure the student's specific learning outcomes (Lorenzen, 1999) in order to examine if they are able to attain the desired learning outcomes by the time they complete their courses and program. Students' project-based assignments in the forms of portfolios or course specific tests or examinations are the few common methods used in assessment (Brindley, 2001). Nevertheless, a few studies had also recommended the use of self-assessment surveys in determining the students' attainment of course level and program level learning outcomes (Brindley, 2001; Hartel & Gardner, 2003; McCullough, 2008; Shipley, 1994).

A review of literatures above revealed that relatively few studies had attempted to inspect the different levels of students' perceived attainment of their learning outcomes in their entire program, different courses as well as generic academic learning outcomes or core competencies that cut across different courses to date. By and large, this study attempts to integrate the central concepts from the different frameworks elucidated from the above literatures to investigate the students' program level learning outcomes, course level learning outcomes and generic academic outcomes.

**Research Methodology**

Drawing on both qualitative and quantitative approaches, this research is a 2-year longitudinal survey on the same cohort of Year 1 students of the BScIM program.

Based on the research gaps identified in the literature review, the below research questions were formulated:

1. To what extent had the BScIM students attained the two generic academic outcomes inspected in this study, which are the information literacy as well as IM & technology skills and knowledge after completing an academic year?
2. To what extent had the BScIM students attained the KM course and 'English in the discipline' course learning outcomes after the completion of these two courses within a semester?
3. To what extent had the BScIM students attained the BScIM program learning outcomes after completing an academic year?

Paper-based surveys were developed by the researchers in collaborations with faculty members from Faculty of Education of the University of Hong Kong. Prior to the commencement of this study, the research team had spent a year piloting all the survey instruments with the previous cohort ($4^{th}$ cohort) of BScIM students. After the pilot, there were revisions and amendments on the learning outcomes statements and items before they applied to the actual study on the $5^{th}$ cohort of the BScIM students.

The two generic academic learning outcomes surveys were administered at the beginning of the academic year of 2009/2010 (first year of study of the 5th cohort). The same survey was then conducted with the same group of students in May 2010 after they completed the first academic year. As for the course level learning outcomes surveys for both KM and ED, they were both conducted in the first lesson in January 2010 and the last lesson in May 2010 within the second semester of the 2009/2010 academic year. Consistent with the generic academic learning outcomes surveys, the BScIM program learning outcomes surveys were performed once at the beginning of the academic year (September 2009) and once again at the end of the same academic year (May 2010).

**Finding and Discussion**

This section will discuss the results and compare the differences on the students' surveys at two different points of a semester or an academic year, on the three areas of learning outcomes stipulated at the beginning of this paper: generic academic learning outcomes (Information management & technology skills and knowledge and Information literacy), course level learning outcomes (KM & ED) as well as program level learning outcomes. The research findings have pedagogical implications for how the research team designs appropriate curriculum for the BScIM program in future.

**Generic Academic Learning Outcomes**

Two types of generic academic learning outcomes were inspected in this study: (1) information management & technology skills and knowledge and (2) information literacy. Both generic academic learning outcomes aim to research on the students' perceived familiarity and perceived importance on a few areas of competencies.

**Information Management & Technology Skills and Knowledge**

Table 1: Students' perceived attainment in IM & technology skills and knowledge

| *Item* | *Mean ratings at the beginning of the program* | *Mean ratings after 1 year of the program* | *t statistic* | *p value* |
|---|---|---|---|---|
| | *Mean (SD)* | *Mean(SD)* | | |
| Perceived importance with various information management & technology skills and knowledge | 2.89 (0.69) | 3.19 (0.67) | -3.345 | .003* |
| Familiarity with various information management & technology skills and knowledge | 2.21 (1.07) | 2.74 (0.92) | -3.831 | .001* |

Note:

1. * indicates $p < .05$
2. 0= Don't know, 1= Not important, 2= A little important, 3= Somewhat important, 4= Important, 5= Very important

For the first generic learning outcome which is information management & technology skills that we investigated, significant differences ($p<.05$) were found in both students' perceived importance and students' perceived familiarity with all 22 items as a whole (see Figure 1a and Figure 1b). The 22 items were shown on the two bar Figures below. The results presented that the 5th cohort of the BScIM students had gained substantial improvement in the various information management and technology skills and knowledge in the past academic year.

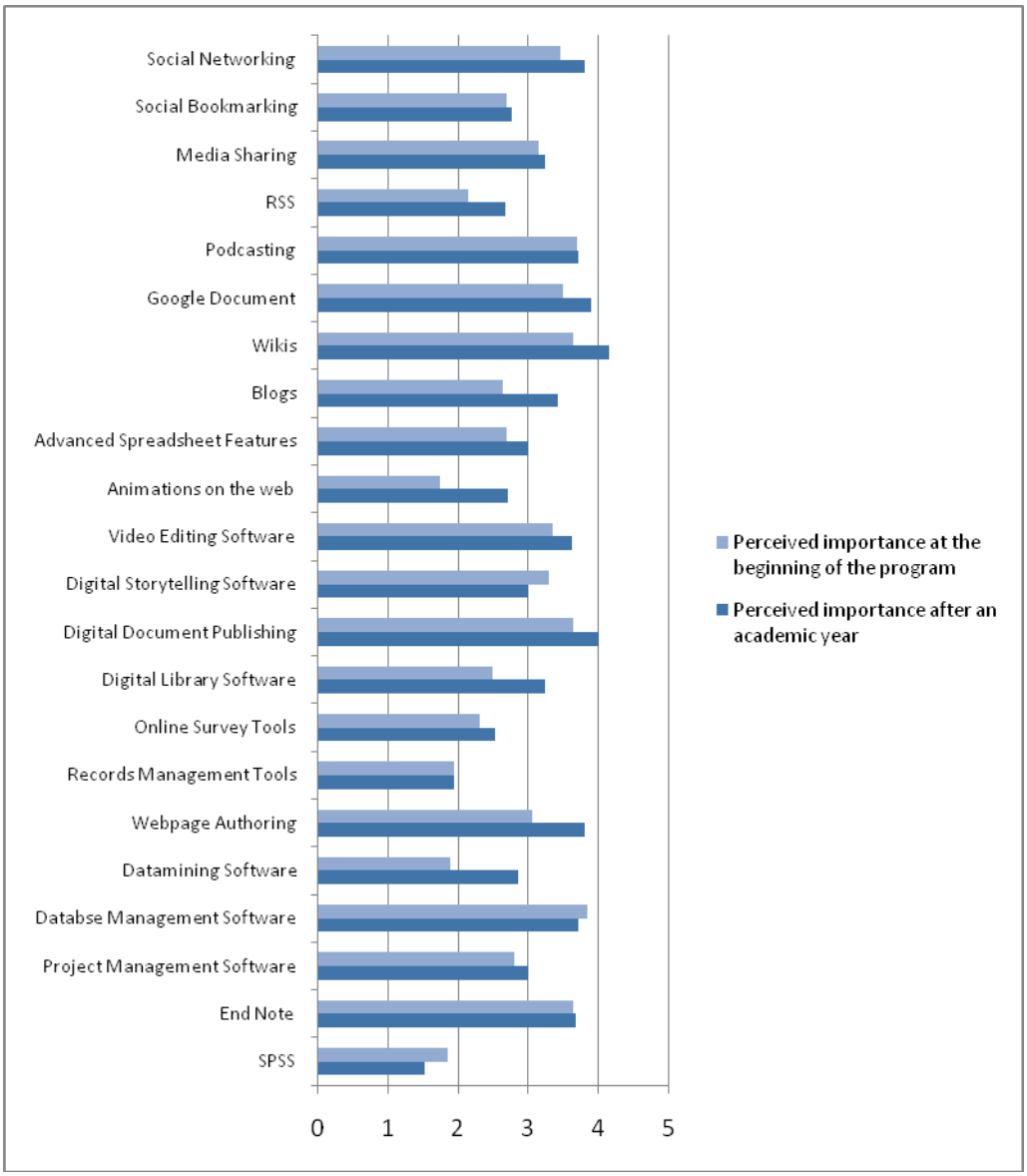


Figure 1a: Students' perceived importance on IM & technology skills and knowledge

Notes:

1. 0= Don't know, 1= Not important, 2= A little important, 3= Somewhat important, 4= Important, 5= Very important
2. Students were asked to rate their perceived importance on the above items at two points of their study (September 2009 and May 2010).

Figure 1a clearly shows that the students generally perceived various information management, technology skills and knowledge to be more important upon the completion of one academic year except SPSS and records managemet tools. Among these 22 items, wikis received the highest rating as the perceived most important item by the students after an academic year. This contradicted with the previous finding by Chu (2008) that students who

had limited experience with a wiki rated it useful while more experienced students rated it less favourably. In addition, items such as social networking tools, social bookmarking, podcasting, Google document, blogs, video editing software, digital document publishing, digital library softwre, webpage authoring, database management software and Endnote were also perceived to be quite important by the student with a mean rating of >3 after an academic year. Students seemed to perceive SPSS to be less important after a year while records management tools indicated a plateau. This is perhaps due to the reason that students had not been exposed to courses under which these two skills are taught in the first year of their study.

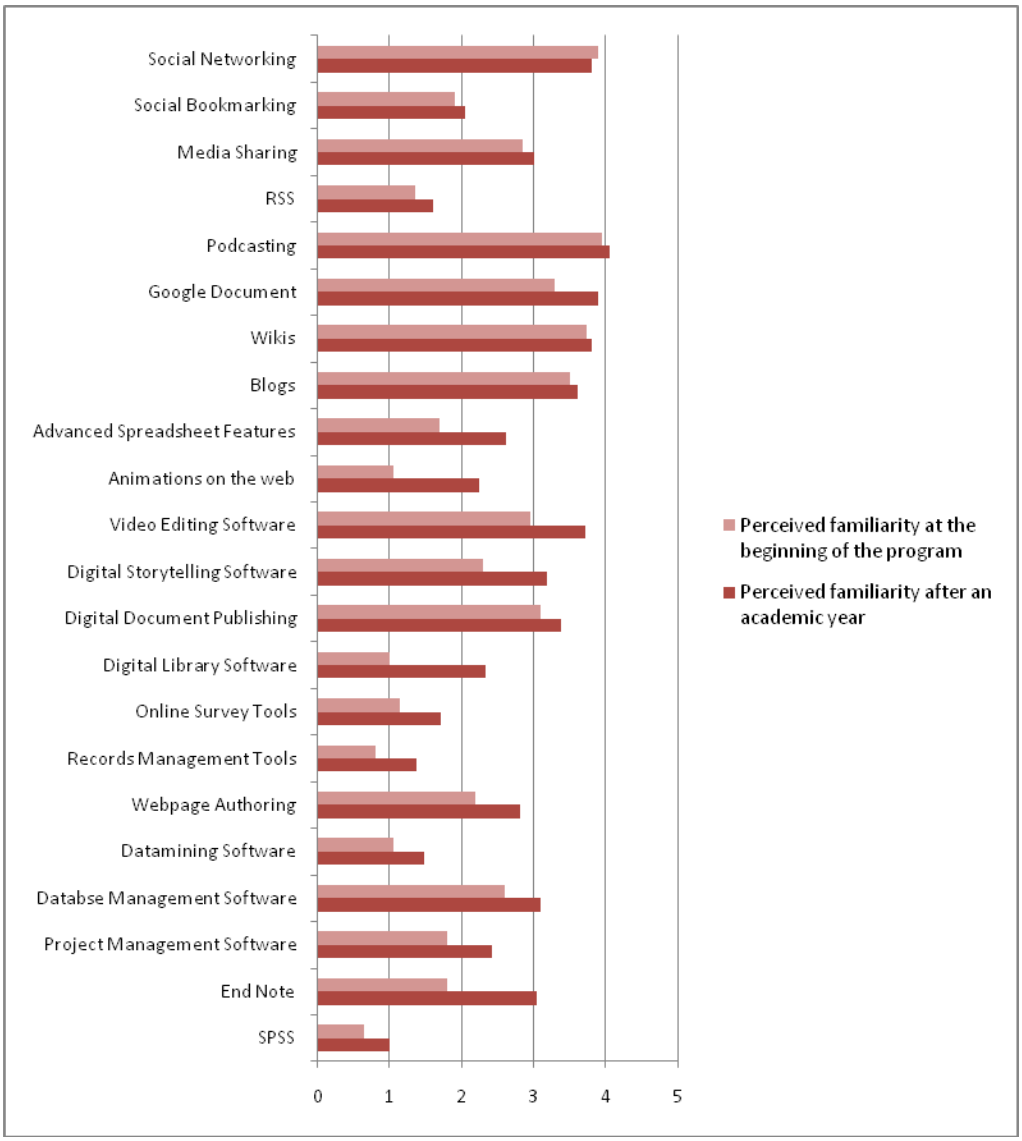


Figure 1b: Students' perceived familiarity on IM & technology skills and knowledge

Notes:

1. 0= Don't know, 1= Not familiar, 2= A little familiar, 3= Somewhat familiar , 4= familiar, 5= Very familiar
2. Students were asked to rate their perceived familiarity on the above items at two points of their study (September 2009 and May 2010).

Slightly contrary to the perceived importance, students had basically rated themselves to be more familiar with all kinds of information management, technology skills and knowledge in every aspect except social networking tools. Out of the 22 items, podcasting, Google document, wikis, blogs, video editing software, digital storytelling software and digital

document publishing had improved and reported a rating of >3 by the students after an academic year. Social networking tools, though reported a rating of >3, was perceived to be less familiar by the students after an academic year. Database software and End Note had also received a rating of slightly >3 after an academic year. The other items (eg. SPSS and Records management tools) , though had improved, did not seem to be perceived familiar enough (mean rating <3) by the students after an academic year. Figure 1a and Figure 1b demonstrate that the ratings on perceived familiarity are parallel with the ratings for perceived importance. In other words, if the students perceive certain items to be familiar to them, they also tended to perceive them to be important. As such, the instructors will need to help the students to boost their knowledge and skills in the above identified items so that they could gain more familiarity with those items, which may help them see the importance of these various IM and teechnology skills and knowledge.

**Information Literacy**

Table 2: Students perceived attainment in information literacy

| *Item* | *Total ratings at the beginning of the program* | *Total ratings after 1 year of the program* | *t statistic* | *p value* |
|---|---|---|---|---|
| | *Mean (SD)* | *Mean (SD)* | | |
| Perceived importance of various sources types | 3.31 (0.56)[2a] | 3.34 (0.75)[2a] | -.310 | .760 |
| Familiarity with various electronic databases/ internet resources/ search engines | 1.80 (0.90)[2b] | 2.43 (1.04)[2b] | -2.762 | .012* |
| Perceived importance with various electronic databases/ internet resources/ search engines | 1.80 (1.00)[2a] | 2.48 (1.13)[2a] | -2.545 | .019* |
| Familiarity with various information search knowledge and skills | 3.25 (0.78)[2b] | 3.58 (0.40)[2b] | -2.335 | .030* |
| Perceived importance of various information search knowledge and skills | 3.60 (0.60)[2a] | 3.92 (0.26)[2a] | -1.973 | .062 |

Note:

1. * indicates p< .05

2a. 0= Don't know, 1= Not important, 2= A little important, 3= Somewhat important, 4= Important, 5= Very important

2b. 0= Don't know, 1= Not familiar, 2= A little familiar, 3= Somewhat familiar , 4= familiar, 5= Very familiar

For the second generic learning outcome inspected (information literacy), students had basically shown improvement in all five aspects indicated in Table 2. Three out of five items demonstrated significant improvement in terms of the ratings: familiarity and perceived importance with various electronic databases/ internet resources/ search engines, as well as familiarity with various information search knowledge and skills. In addition, improvement in perceived familiarity also led to improvement in perceived importance in the same aspects (see Figure 2b, Figure 2c, Figure 2d & Figure 2e). This is similar to the finding of Chu and Law (2005) that when students are getting more familiar with the database, they tend to perceive it as more important.

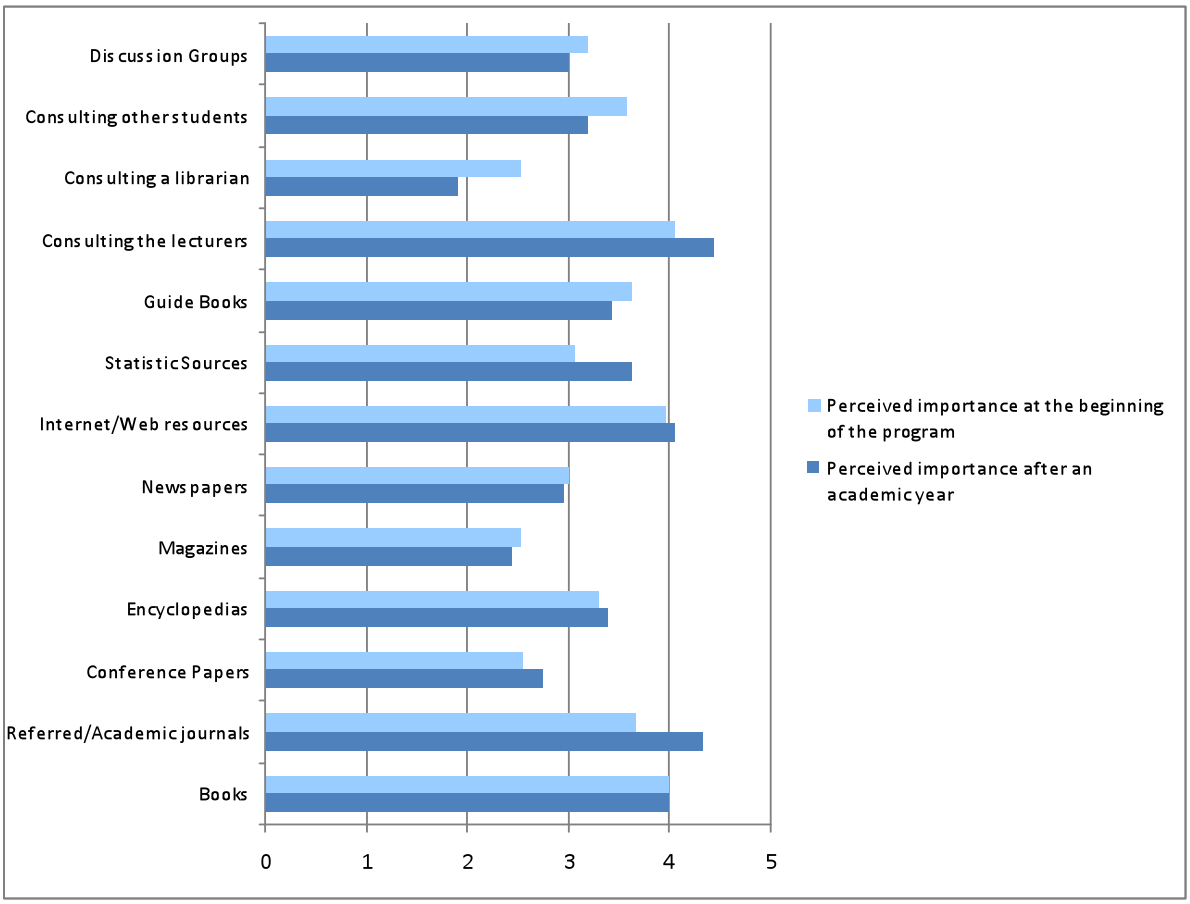


Figure 2a: Students' perceived importance of various types of sources

Notes:

1. 0= Don't know, 1= Not important, 2= A little important, 3= Somewhat important, 4= Important, 5= Very important
2. Students were asked to rate their perceived importance on the above items at two points of their study (September 2009 and May 2010).

Figure 2a reveals that students found consulting the lectures, using web sources, and academic journals, and books to be most important, whereas students percevied consulting a librarian, magazines, and conference papers to be least important. It is noted that students' perception changed the most for consulting the librarian and their use of acadmiec journals. Reasons behind such change will be investigated more in-depth through interviews with students at a later stage of this study.

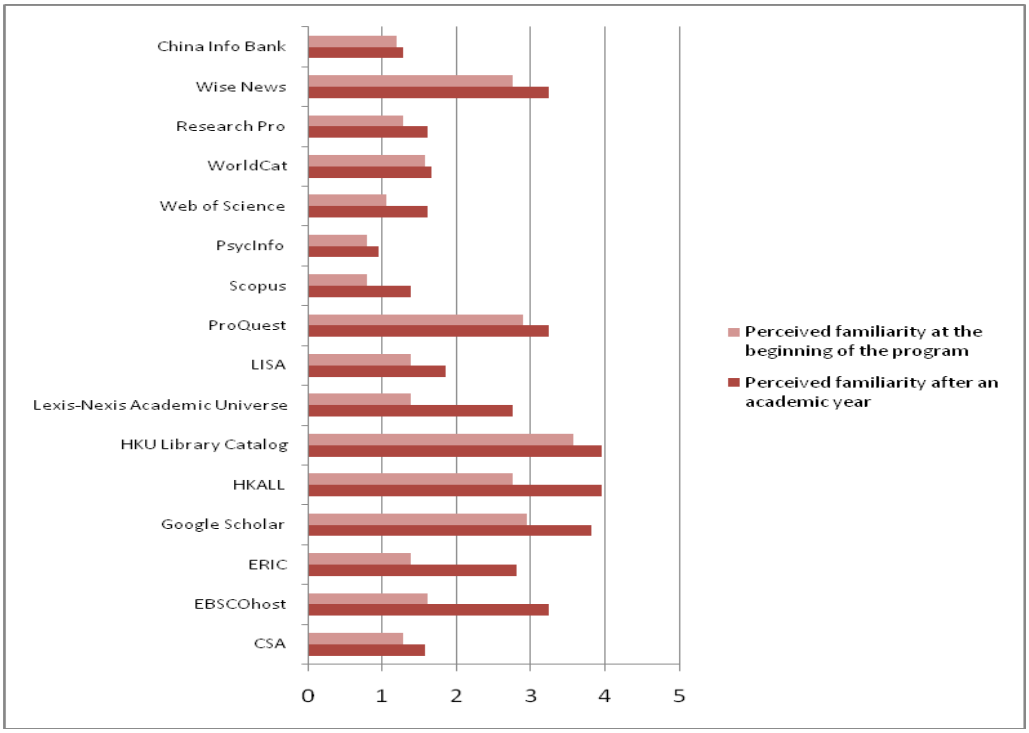


Figure 2b: Students' perceived familiarity with various electronic databases/ internet resources/ search engines

Notes:

1. 0= Don't know, 1= Not familiar, 2= A little familiar, 3= Somewhat familiar, 4= Familiar, 5= Very familiar
2. Students were asked to rate their perceived familiarity on the above items at two points of their study (September 2009 and May 2010).

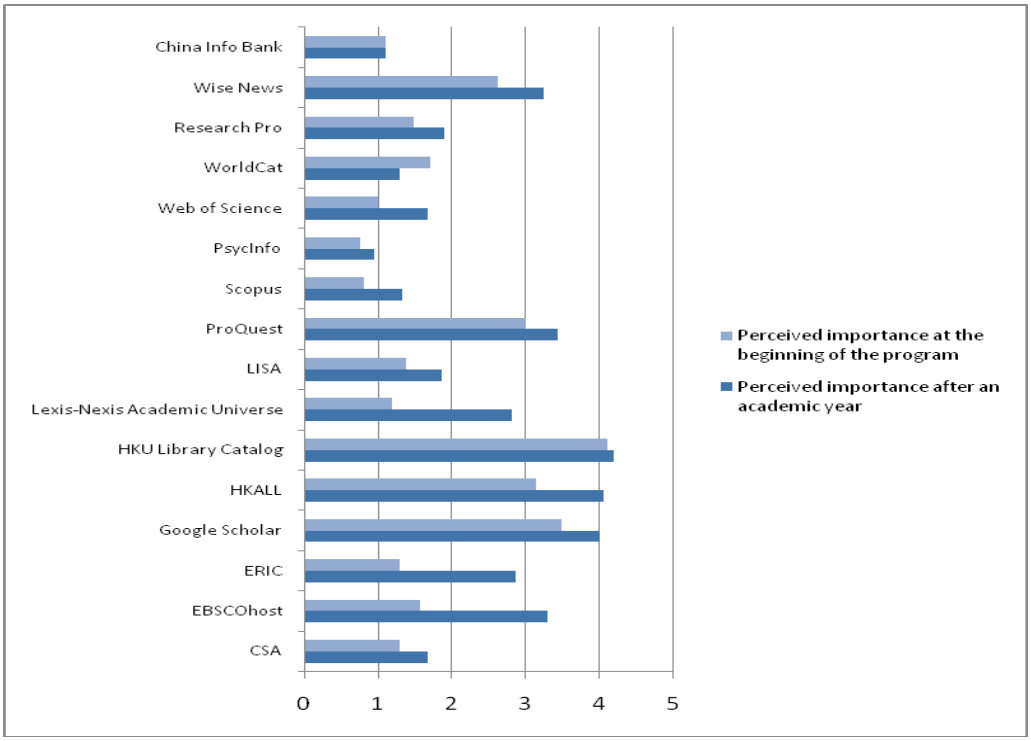


Figure 2c: Students' perceived importance with various electronic databases/ internet resources/ search engines

Notes:

1. 0= Don't know, 1= Not important, 2= A little important, 3= Somewhat important, 4= Important, 5= Very important
2. Students were asked to rate their perceived importance on the above items at two points of their study (September 2009 and May 2010).

Figure 2b and Figure 2c show the mean values of students' perceived familiarity and perceived importance with various electronic databases/ internet resources/ search engines at the beginning of the porgram and after an academic year. The results show that only a total number of 8 out of 16 items showed a mean rating of >2 after one academic year. These items are Wise News, ProQuest, Lexis-Nexis Academic Universe, HKU Library Catalog, HKALL, Google scholar, ERIC and EBSCOhost. In other words, students had gained a little familiarity and perceived a little importance on these items after going through one academic year. The other items (China Info Bank, Research Pro, World Cat, Web of Science, PsycInfo, Scopus, LISA and CSA) were still rated lower than a rating of 2 even after an academic year. This finding suggests that more trainings and interventions will need to be introduced in the coming academic year in order to enhance the students' mastery on those items with a mean rating of <2.

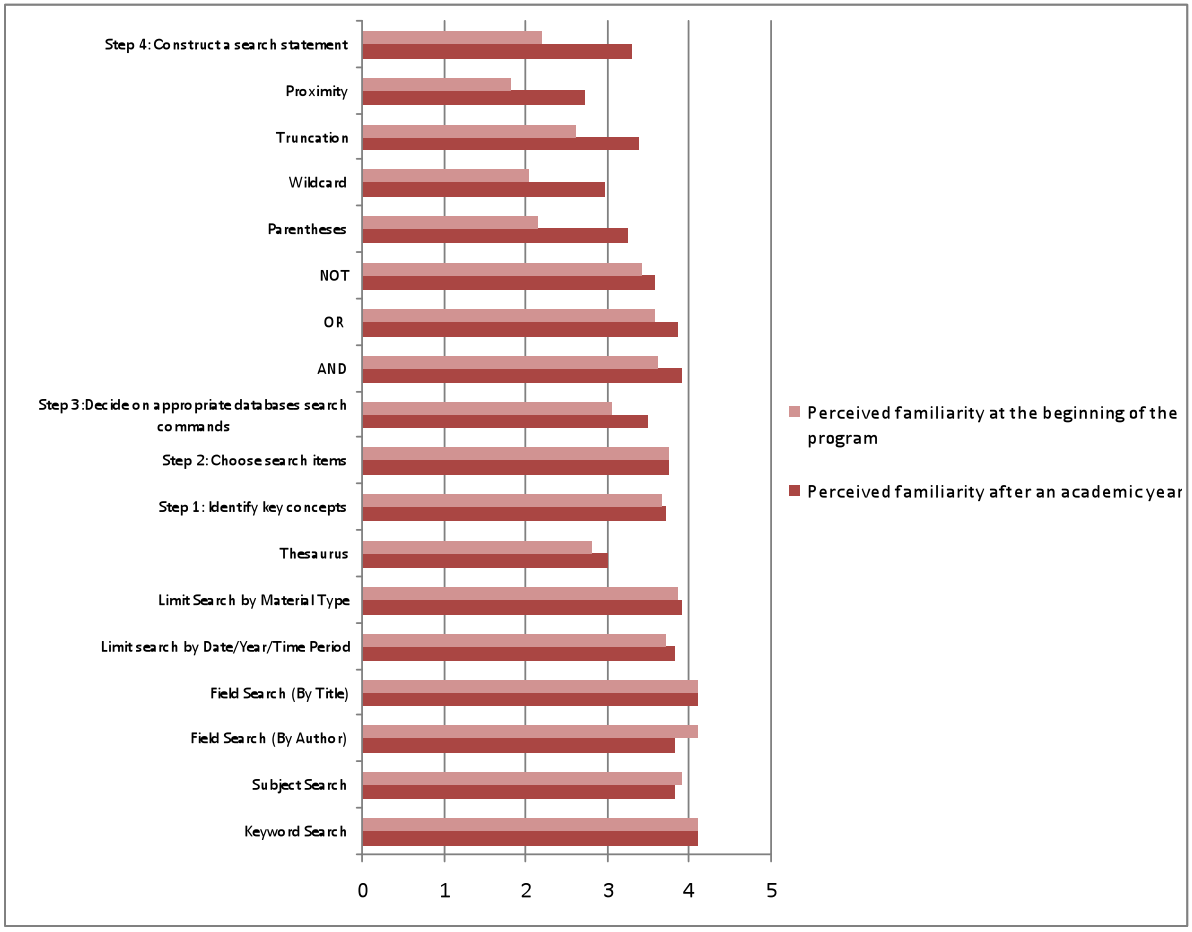


Figure 2d: Students' perceived familiarity with various information search knowledge and skills

Notes:

1. 0= Don't know, 1= Not familiar, 2= A little familiar, 3= Somewhat familiar, 4= Familiar, 5= Very familiar
2. Students were asked to rate their perceived importance on the above items at two points of their study (September 2009 and May 2010).

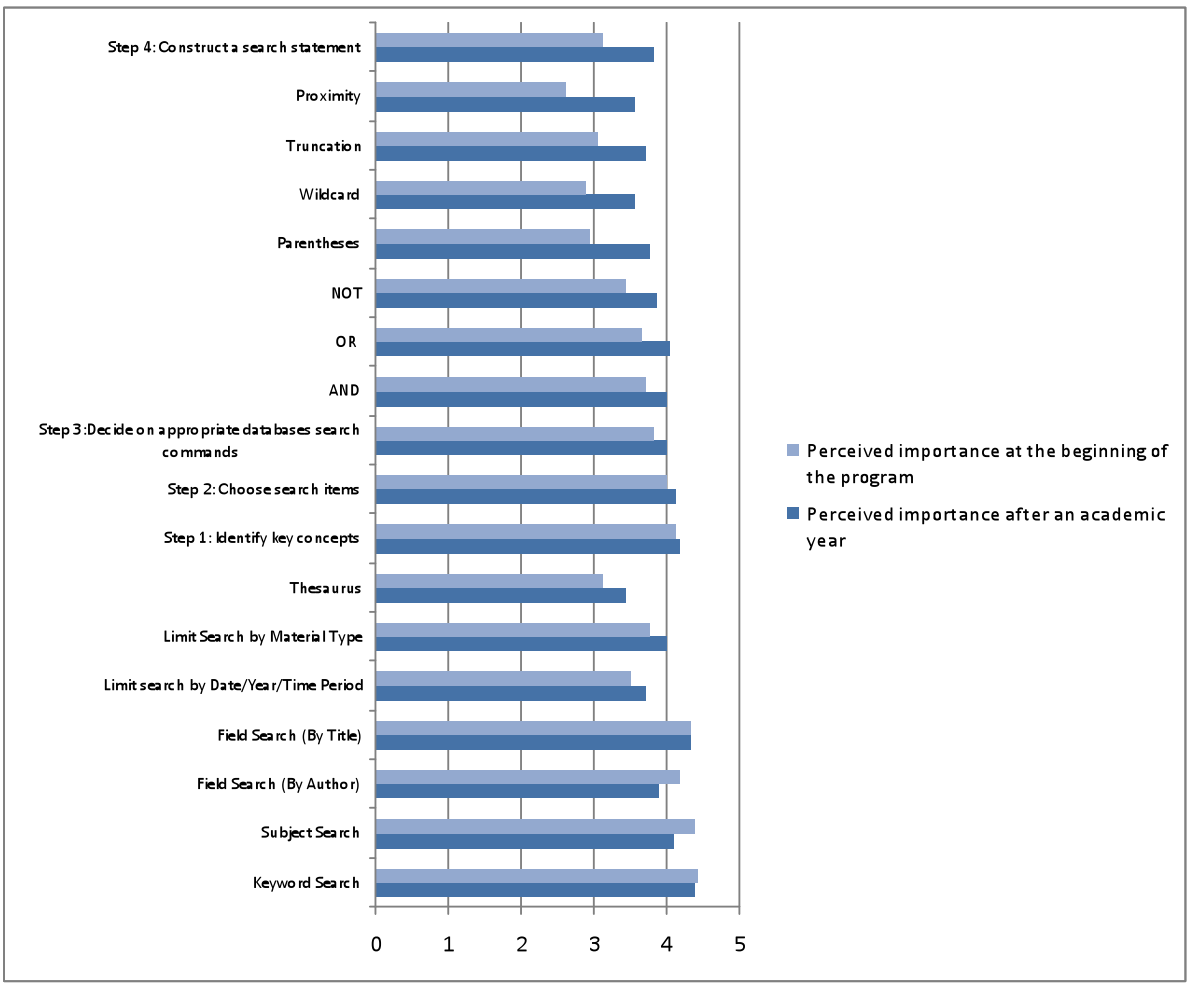


Figure 2e: Students' perceived importance with various information search knowledge and skills

Notes:

1. 0= Don't know, 1= Not important, 2= A little important, 3= Somewhat important, 4= Important, 5= Very important
2. Students were asked to rate their perceived importance on the above items at two points of their study (September 2009 and May 2010).

Figure 2d and Figure 2e show the mean values of students' perceived familiarity and perceived importance with various information search knowledge and skills at the beginning of the program and after an academic year. All items recorded a mean rating of >3 after an academic year. In other words, the students generally perceive these items to be at least somewhat familiar and somewhat important after going through an academic year. However, more trainings and interventions will need to be conducted by the lecturers in order to elevate students' familiarity with the items so that they may further appreciate the usefulness of these various information search knowledge and skills.

**Course Level Learning Outcomes**

Two courses (KM and ED) were incorporated into the study of course level learning outcomes in this study. The learning outcomes statements were developed and identified by the respective course instructors or lecturers before each course started.

**Knowledge Management (KM)**

Table 3: Students' perceived attainment on the KM course learning outcomes

| *Knowledge Management Course Learning Outcomes* | *Rating at the beginning of the program* | *Rating after 1 year of the program* | *t statistic* | *p value* |
|---|---|---|---|---|
| | *Mean (SD)* | *Mean (SD)* | | |
| I am familiar with the key KM theories and issues related to KM | 2.10 (0.83) | 2.76 (0.89) | -2.870 | .009* |
| I know how to use KM tools such as Wikis and PowerKM | 1.86 (1.15) | 3.00 (0.44) | -4.544 | .000* |
| I can articualte and comprehend how KM is actually implemented in various industries and organizations | 1.86 (1.06) | 3.00 (0.44) | -4.725 | .000* |
| I can analyze a KM-related business case | 1.95 (0.92) | 2.62 (1.20) | -2.000 | .059 |

Note:

1. * indicates $p < .05$
2. 0= I don't know, 1= Strongly disagree, 2= Disagree, 3= Agree, 4= Strongly agree
3. Students were asked to rate their perceived attainment on the above learning outcomes at two points of Semester two (January 2010 and May 2010).

For the KM course, the students had shown very significant improvement ($p < .05$) in three out of the four learning outcomes examined. Students generally rated themselves that they have improved immensely in the theoretical knowledge, software techniques and applications in the subject course. On the other hand, the students have also gained improvement in their analytical ability in the course as indicated in the last learning outcome statement, though this improvement was not statistically significant. This result had shown that OBTL had brought about very explicit improvement in students' perceived attainment of course level learning outcomes.

**English in the Discipline (ED)**

Table 4: Students' perceived attainment on the ED course learning outcomes

| *"English in the Discipline" Course Learning Outcomes* | *Rating at the beginning of the program* | *Rating after 1 year of the program* | *t statistic* | *p value* |
|---|---|---|---|---|
| | *Mean (SD)* | *Mean (SD)* | | |
| I am familiar with the feature of good report writing | 2.43 (0.93) | 3.00 (0.32) | -2.677 | .015* |
| I can write an effective academic report | 2.33 (0.86) | 2.76 (0.70) | -2.257 | .035* |
| I can write accurate in-text citation and referencing | 2.33 (1.11) | 3.14 (0.57) | -3.179 | .005* |
| I can give an effective oral presentation | 2.65 (0.81) | 2.90 (0.72) | -1.157 | .262 |
| I can make an effective use of Powerpoint slides to support the presentation | 3.00 (0.77) | 3.14 (0.48) | -.767 | .452 |
| I can write more fluently and accurately when communicating my own ideas | 2.14 (1.15) | 2.62 (0.74) | -1.870 | .076 |

Note:

1. * indicates $p < .05$
2. 0= I don't know, 1= Strongly disagree, 2= Disagree, 3= Agree, 4= Strongly agree
3. Students were asked to rate their perceived attainment on the above learning outcomes at two points of Semester two (January 2010 and May 2010).

For the ED course, which was run in parallel with the KM course, students had shown improvement in all the learning outcomes, with three (1. I am familiar with the feature of good report writing; 2. I can write an effective academic report; 3. I can write accurate in-text citation and referencing) that are statistically significant ($p<.05$). Students perceived themselves to improve significantly and attain course level learning outcomes on mastering good report writing skills and good in-text citation and referencing skills, but did not perceive themselves to improve significantly in oral presentation, communication and the application of visual aids in their presentation as the improvements were relatively mild. Nevertheless, the overall perceived attainment of course level learning outcomes was encouraging and promising.

**Program Level Learning Outcomes**

Table 5: Students' perceived attainment on the BScIM program learning outcomes

| *BScIM Program Learning Outcome Categories* | *Rating at the beginning of the program* | *Rating after 1 year of the program* | *t statistic* | *p value* |
|---|---|---|---|---|
| | *Mean (SD)* | *Mean (SD)* | | |
| Critical intellectual inquiry & life-long learning | 2.60 (0.60) | 2.73 (0.65) | -.631 | .535 |
| Tackling novel situations & ill-defined problems | 2.54 (0.79) | 2.52 (0.71) | .075 | .941 |
| Critical self-reflection & greater understanding of others | 2.29 (0.89) | 2.52 (0.73) | -1.000 | .329 |
| Intercultural communication, multi-cultural understanding and global citizenship | 2.71 (0.57) | 2.32 (0.86) | 1.793 | .088 |
| Collaboration and communication | 2.89 (0.38) | 2.60 (0.60) | 1.846 | .080 |
| Leadership and advocacy for improvement of human condition | 2.65 (0.48) | 2.40 (0.71) | 1.142 | .267 |

Note:

1. 0= I don't know, 1= Strongly disagree, 2= Disagree, 3= Agree, 4= Strongly agree
2. Students were asked to rate their perceived attainment on the above learning outcomes at two points of their study (September 2009 and May 2010).

For the BScIM program level learning outcomes, there are six categories with each consisting of two to three learning outcomes statements. Students perceive themselves to have improved only in two out of the six categories after one academic year, and the improvements were not significant. These two categories are critical intellectual inquiry & life-long learning, as well as critical self-reflection & greater understanding of others. The other four categories have not shown improvement. The researchers will investigate the reasons why students have not improved in these four categories in a follow-up interview. One possible reason is that the students might not fully understand each of the learning outcome statement as they were mostly lengthy with complicated sentence phrases and structures. This will be investigated in details in the coming months, and the statements will be made more clearly if they are in fact not clear to the students.

**Conclusion and Implications**

Overall, applying Outcomes-based Teaching and Learning Framework in the BScIM Program seems to be successful. Students have achieved a satisfactory level of learning outcomes attainment for both generic academic learning outcomes– IM & technology skills and knowledge as well as information literacy after joining the program for one year. The students have also demonstrated a satisfactory level of course level learning outcomes for the KM

course and the ED course. However, students' perception of the program level learning outcomes attainment is not satisfactory since they perceived themselves to have improved in two out of six areas only.

A focus group interview and/or individual interviews will be conducted by the research team to understand the reasons why the students have not attained any improvement as anticipated in the program level learning outcomes. It is hoped that with this understanding more pragmatic instructional interventions can be introduced to help students attain the three levels of learning outcomes conceptualized in this study by the time they finish their program next year.

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