The Intersection between Instructor Expectations and Student Interpretations of Academic Skills

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Abstract

Numerous studies exist on how and to what extent course instructors in higher education are embedding or directly teaching writing, learning and information literacy skills in their courses (Cilliers, 2012; Crosthwaite et al., 2006; Mager & Spronken-Smith, 2014). Yet, disparity within the literature demonstrates that there is no consistent approach to the scaffolded development of these necessary skills within courses, programs, disciplines, or across disciplines. This study sought to explore the skills expectations of instructors and whether students are capable of identifying or articulating the academic skills they are required to develop in to succeed in third-year undergraduate university courses. We discovered a discrepancy rate of approximately 63% between instructor and student responses when exploring differences in instructor expectations and student interpretations of academic skills indicated on course outlines. Data from this study suggests that instructors and students do not always share the same understanding of the skills required to complete course work and to be successful in assessments. With the support of learning, writing, and research specialists, instructors can embed academic skill development in the curriculum.

Il existe de nombreuses études sur la manière dont les instructeurs de l'enseignement supérieur intègrent dans leurs cours ou enseignent directement la rédaction et la littératie informationnelle, et dans quelle mesure ils le font (Cilliers, 2012; Crosthwaite et al, 2006; Mager & Spronken-Smith, 2014). Pourtant, la disparité révélée dans la recherche prouve qu'il n'existe pas d'approche uniforme au développement échafaudé de ces compétences nécessaires au sein des cours, des programmes, des disciplines ou entre les disciplines. Cette étude a cherché à explorer les attentes des instructeurs en matière de compétences et à déterminer si les étudiants et les étudiantes sont capables d'identifier ou d'articuler les compétences académiques qu'ils et elles doivent acquérir afin de réussir dans les cours de troisième année universitaire au niveau du premier cycle. Nous avons découvert un taux de divergence d'environ 63 % entre les réponses des instructeurs et celles des étudiants, lorsque nous avons exploré les différences entre les attentes des instructeurs et la manière dont les étudiants et les étudiantes interprètent les compétences académiques indiquées dans les descriptions de cours. Les données de cette étude suggèrent que les instructeurs et les étudiants ne partagent pas toujours la même compréhension des compétences nécessaires pour compléter le travail des cours et pour réussir dans leurs travaux de cours. Avec le soutien de spécialistes en apprentissage, en rédaction et en recherche, les instructeurs peuvent intégrer le développement de compétences dans leurs programmes de cours.

As reflected by the movement in higher education to develop and assess learning outcomes, there exists a demand to demonstrate the competencies, or graduate attributes, a university education will provide. These competencies include skill sets required to succeed in academic pursuits, such as writing, learning, and information literacy skills. Some instructors assume that students already possess these skills or that students will gain them outside of the classroom, while others intentionally work to develop these skills (Brancato et al., 2016; Fallows & Steven, 2000; Kardash, 2000; Mager & Spronken-Smith, 2014). Numerous studies exist on how and to what extent instructors are embedding or directly teaching these skills in their courses (Cilliers, 2012; Crosthwaite et al., 2006; Mager & Spronken-Smith, 2014). Disparity within the literature demonstrates an inconsistent approach to the development and communication of these skills within courses, and, as a result, a potential misunderstanding between students and instructors exists.

How and to what extent instructors communicate their expectations around these skill sets to students are varied and can be dependent on individual instructional styles. McGuinness (2006) found that when instructors do communicate their skill expectations to students, it is often limited and "fails to provide sufficiently clear guidelines for the students, in terms of the level of mastery they are expected to reach" (p. 580). Regardless of their communication of skill expectations, instructors still require students to demonstrate these skills in assessments. Through this study, we sought to explore the skills expectations of instructors and whether students are capable of identifying or articulating the academic skills they are required to develop. Consistent use of structures and processes are necessary in creating a learning environment that enables students to understand course goals (Ottewill et al., 2005). Research conducted by Meyer et al. (1990) recognizes the variability of individual responses based on student perception and the relationship between perception and learning outcome while highlighting that learning outcomes might be improved through perceptual awareness of the learning context. Research by Trigwell and Prosser (1991) highlights qualitative differences in learning outcomes which provides another factor that influences how students describe their course. In recognizing the importance of perception, our aim is to contribute to learning outcome research by identifying the differences between instructor expectations and student interpretations of academic skill performance (these differences are later referred to as discrepancy scenarios in this paper).

The specific objectives of this research are (a) to identify the gap between the learning, writing and information literacy skills instructors expect students to possess before a course and which of these skills students think they actually possess when they enter the course; (b) to identify which skills students seek to develop based on their interpretations of instructors' expectations, and where students believe they are developing these skills; and (c) to evaluate, across multiple disciplines, students' ability to articulate and identify the skills necessary for particular third-year courses before and after taking these courses.

Method

Process

This research was conducted using a mixed methods approach and was composed of three online surveys. The University's Research Ethics Board reviewed and approved all procedures. Mager and Spronken-Smith (2014) stated that student identification and articulation of skills are more likely in upper-year undergraduate courses. In this study third-year (3000-level)

undergraduate courses were selected with the recognition that students from their second and fourth year of study may also be enrolled in third-year courses.

Of the University's seven colleges (or faculties), we selected courses situated across six. Of the 281 third-year courses that were offered, 24 (8.5%) instructors accepted the invitation to participate, providing a representation of third-year courses across science, social science, arts, and humanities disciplines.

This study required instructors and students to determine the skills necessary for successful performance in their respective courses. In order to make that determination, instructors and students were provided with a comprehensive list of skill sets. To create this skill list, we employed thematic analysis, an approach that requires explicit and continued dialogue among a research team when determining themes within qualitative data (Braun & Clarke, 2006). We reviewed the learning outcomes and assignment expectations listed within the course syllabi of the 24 courses. The learning outcomes section of many syllabi directly indicated some of the skills students would require or develop throughout the course, while, from the assignment section, the skills students would need to complete assessments were inferred. This inference involved a measure of latent thematic analysis in that we interpreted "underlying ideas, assumptions and conceptualizations" about required skills within the course syllabi (Braun & Clarke, 2006, p. 84). Common themes were found among the syllabi and were cross-referenced with the writing, learning, and information literacy competencies identified by the American Association of Colleges and Universities (AAUC) and the institutional learning outcomes (Rhodes, 2009). As a result, we compiled a master list of 33 skill items (11 writing, 11 learning, and 11 information literacy) that represented an intersection between course syllabi, the competencies highlighted by AAUC and institution's learning outcomes, and our own expertise. The skill lists are presented in Appendix A.

Three online surveys were developed. The first survey (the instructor survey) was sent to the instructors of the participating courses. They were asked to review the master skill list and, for each of the 33 skills, select one of four possible responses (see Table 1).

Table 1
Sample Question from the Instructor Survey

Question	Option 1	Option 2	Option 3	Option 4
Present a clear message, using appropriate language in oral presentations and class discussions	Students are expected to come into the course with this skill	The skill will be taught during course time (instructor or other)	This skill must be developed by the student outside of class time	Students do not need this skill for my course

The second survey (the first student survey) was administered to the students in the 24 courses during the first two weeks of the academic semester. Students were asked to select their course code (i.e., PSYC 3000) which opened the syllabus for the course. Students were asked to review the course syllabus before moving on to the survey questions. Students were prompted to reflect on the skills they thought they needed to have or develop in order to be successful in the course. Each of the 33 skill items from the master skill list were presented with four possible responses; students were required to select one of the responses (see Table 2).

Table 2
Sample Question from the First Student Survey

Question	Option 1	Option 2	Option 3	Option 4
Present a clear message, using appropriate language in oral presentations and class discussions	I already have this skill	I expect to be taught this skill during course time (instructor or other)	I expect to develop this skill outside of class time	I do not need this skill for this course

The final survey (the Second Student Survey) was administered to the students in the same 24 courses during the last two weeks of the academic semester. Students reviewed their course outline and reflected on the skills they had needed or had developed in order to be successful within the course. Each of the 33 skill items from the master skill list were presented with four possible responses (see Table 3).

Table 3
Sample Question from the Second Student Survey

Question	Option 1	Option 2	Option 3	Option 4
Present a clear message, using appropriate language in oral presentations and class discussions	I already had this skill before the course	I was taught this skill during course time (instructor or other)	I developed this skill outside of class time	I did not need this skill for this course

This survey also asked students to rank their confidence in applying their learning, writing and information literacy skills in future courses. Recognizing that students may not be able to associate particular skills to the larger categories of writing, learning or information literacy, examples from the master skill list were embedded within each question. Finally, students were asked to qualitatively respond to the statement "One skill I needed more help with in this course was...".

The instructor survey was sent via email; the two student surveys were administered during class time. Instructors were asked to leave the classroom and all responses were anonymous.

Data Analysis

A frequency analysis was conducted to find the most common instructor and student responses, with student surveys being compared to the Instructor Survey in order to determine what, if any, discrepancies (differences in perception of necessary skills) existed between course instructors and students. In total, 1,904 student surveys were collected. We assumed a shared understanding between an instructor and a student if they both selected the same interpretation of

when and where a skill was to be developed. For example, if a student selected "I already have this skill" and an instructor selected "Students are expected to come into the course with this skill," this would indicate a scenario of no discrepancy (they agree). When the student and instructor response differed, a scenario indicated a discrepancy. Students across 24 courses were surveyed twice on 33 skill items, for a total of 1,584 instances being evaluated for discrepancy (each skill in each course is referred to as an instance).

The two student surveys were analyzed separately to allow for comparison. Each of the 24 instances for every skill was categorized into one of 17 possible scenarios, resulting from coding the four possible instructor (see Table 1) and four possible student selections (see Tables 2 and 3), producing 16 possible scenarios: 4 scenarios of no discrepancy (11, 22, 33, 44), 12 scenarios of discrepancy (all other codes), and 1 scenario of an even distribution of student opinion (code 0) (see Table 4). Scenarios of no discrepancy indicate a match between the student response and the instructor response. An instance was only coded as a scenario of discrepancy or no discrepancy, as listed in Table 4, if it received a student response rate of over 50%. A 17th scenario (code 0) was created to code instances in which no scenario received a 50% or greater response rate, meaning that students' opinions were more evenly distributed.

Table 4
Discrepancy Scenarios based on Instructor and Student Options*

		Student Option 1	Student Option 2	Student Option 3	Student Option 4
Response Options		I already have this skill	I expect to be taught this skill during class time (instructor or other)	I expect to develop this skill outside of course time	I do not need this skill for this course
Instructor Option 1	Students are expected to come into the course with this skill	No Discrepancy Coded 11	Discrepancy Coded 21	Discrepancy Coded 31	Discrepancy Coded 41
Instructor Option 2	The skill will be taught during class time (instructor or other)	Discrepancy Coded 12	No Discrepancy Coded 22	Discrepancy Coded 32	Discrepancy Coded 42

Response Options		Student Option 1	Student Option 2	Student Option 3	Student Option 4
		I already have this skill	I expect to be taught this skill during class time (instructor or other)	I expect to develop this skill outside of course time	I do not need this skill for this course
Instructor Option 3	This skill must be developed by the student outside of class time	Discrepancy Coded 13	Discrepancy Coded 23	No Discrepancy Coded 33	Discrepancy Coded 43
Instructor Option 4	Students do not need this skill for my course	Discrepancy Coded 14	Discrepancy Coded 24	Discrepancy Coded 34	No Discrepancy Coded 44

Note: Code 0: an even distribution of student opinion. Student options are from the first student survey. The same coding applies to the second student survey.

The confidence ratings in the second student survey were analyzed by determining the percentage of responses in each of the five categories of the Likert scale (strongly disagree, disagree, neither agree or disagree, agree, strongly agree) for each of the three broad skill areas.

In order to analyze students' qualitative responses in the second student survey, word frequency analysis was conducted using Nvivo. As shown in Table 5, similar words were coded together; only the words with a weighted percentage greater than 1% are displayed.

Table 5
Word Frequency of Student Survey 2

Word	Count	Weighted	Similar Words*
writing	38	2.44	write, writing
time	36	2.31	time, timely, times
managing	30	1.93	managed, management, managing
class	23	1.48	class
using	23	1.48	use, used, useful, using
assignments	21	1.35	assignment, assignments
course	21	1.35	course, courses
understanding	21	1.35	understand, understanding
research	20	1.28	research, researching
studying	20	1.28	studies, study, studying
learning	19	1.22	learn, learned, learning
information	18	1.16	information
lecture	16	1.03	lecture, lectures

Note: Similar words are coded together by Nvivo.

Results and Discussion

Student Surveys

The first student survey provided 900 responses, representing 47% of potential respondents. In the second student survey, 30% or 566 students responded. Based on the frequency analysis, instructors across the 24 courses indicated that, out of the 33 skill sets, students were already expected to have 17 of those skills, 15 of the skills instructors would teach, and three of the skills were not required. Overall, students across the 24 courses indicated that, out of the 33 skill sets, 32 of those skills they already possessed, and one of the skills would not be required.

When analyzing the instances for discrepancy between the instructor survey and the first student survey (see Figure 1), 792 instances were evaluated with 514 (or 65%) indicating a discrepancy. A higher discrepancy percentage indicates a greater degree of disagreement between the instructor and the student, while a lower percentage indicates higher agreement. The most frequent point of agreement (31%) between instructor and student responses occurred when students selected "I already have this skill" (code 1), and instructors selected "Students are expected to come into the course with this skill" (code 1), indicating that instructors and students shared the expectation that they would come into the class with that skill. The most frequent point of disagreement (25%) between instructor and student responses occurred when students selected

"I already have this skill" (code 1), and instructors selected "This skill will be taught during class time" (code 2).

This discrepancy may suggest that students have already achieved a novice level of competence while the instructor plans to deepen the level of competency. This could indicate a misalignment between student perception of their competency and their actual competency in applying the skill. In 20% of instances (code 0), no option (of the four options) received more than 50% of responses from student surveys. While this could not be coded as a specific discrepancy scenario, it suggests an overall disagreement between student and instructor given that the majority of the student body did not have a common understanding of the expectation of the skill, how to demonstrate it or how it would be assessed in the course. This lack of understanding or clarity around skills expectations indicates a discrepancy between the faculty and student expectations.

Figure 1
Instance Analysis of the First Student Survey
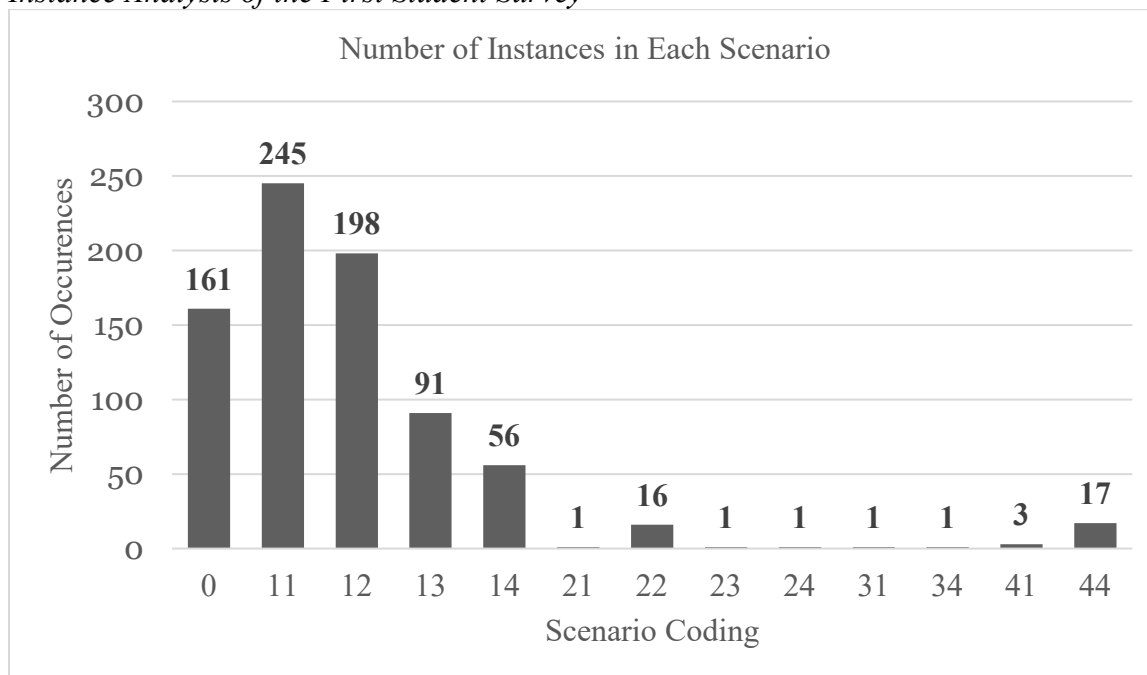
When comparing the instructor survey to the second student survey (see Figure 2), 491 (or 62%) of instances indicated a discrepancy. The most frequent point of agreement between instructor and student responses occurred when students selected "I already have this skill," and instructors selected "Students are expected to come into the course with this skill." The most frequent point of disagreement between instructor and student responses occurred when students selected "I already have this skill," and instructors selected "This skill will be taught during class time." These results mirror those in the first student survey, indicating that students may have practiced or established some degree of skill in particular areas; however, they may not recognize that these skills can and will be further developed. At this point, we should acknowledge that survey design did not provide an option directly indicating that the skill could be improved during class time.

Figure 2
Instance Analysis of the Second Student Survey
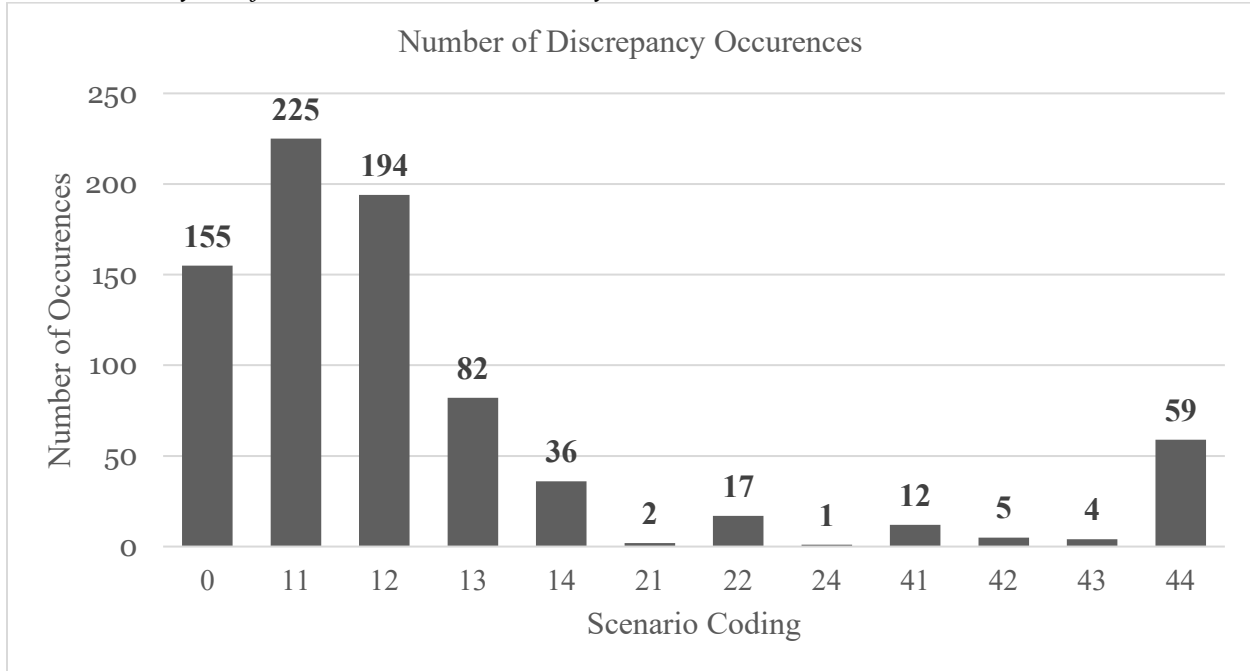
Little changes were observed between the first and second student survey in the instances of discrepancy (Table 6). Courses were categorized into either Social Science and Humanities courses or Science courses in order to explore differences across disciplines.

Table 6
Discrepancy Occurrence within Social Science and Humanities and Science

Discrepancy Occurrence	Social Science and Humanities (%)	Science (%)
Survey 1	61	68
Survey 2	58	65
Percentage of Change	- 3	-3

In addition, this study explored the differences in the instances of discrepancy across the broad skill areas. The surveyed skills were divided into information literacy, learning and writing skills. When analyzing the results by skill area, the overall discrepancy within information literacy skills was 58%, learning skills was 69% and writing skills was 63% (Table 7).

Table 7

General Distribution of Skills Analysis by Skill Area

Discrepancy Occurrence	Information Literacy (%)	Learning Skills (%)	Writing Skills (%)	Total (%)
Survey 1	60	72	63	65
Survey 2	56	66	64	62
Total	58	69	63	63

Instances of Discrepancy by Skill Area

When analyzing the results of individual skills, the instances of discrepancy were divided by survey. Each of the three skill areas assessed 11 specific items (33 total). See Appendix B for complete results; only the highest and lowest instances of discrepancy across both surveys within each broad skill area are presented here (see Table 8).

Table 8

The Highest and Lowest Discrepancies by Skill Area

Skill Area	Highest	Lowest
Information Literacy (I)	96% (Survey 1) Develop a personal profile in the community using appropriate personal networks and digital technologies (I11)	25% (Surveys 1 and 2) Meet standards of conduct for academic integrity. (I7)
Learning (L)	92% (Survey 1) Identify multiple approaches for solving problems and implement or recommend solutions in course work or assignments (L5)	38% (Surveys 1 and 2) Apply time management skills and strategies to manage multiple deadlines (L9)
Writing (W)	92% (Survey 1) Select a writing structure and format based on the type of assignment' (W9)	42% (Both surveys) Use correct grammatical forms, sentence construction and punctuation in written tasks'(W6)

Skills with the highest level of discrepancy are typically skills that students either struggle to understand as they are more nuanced, and students may not be as frequently exposed to these skills. For example, "Develop a personal profile in the community using appropriate personal

networks and digital technologies" (IL11) is not a skill that all students will be explicitly exposed to. However, the skills with the lowest levels of discrepancy are those that are frequently discussed. For example, "Meet standards of conduct for academic integrity" (IL7) is a skill that students are often required to demonstrate competency in early on in their degree program and is continually reinforced.

Discrepancy Scenarios by Skill Area

Specific discrepancy scenarios were explored that occurred within individual skills across both student surveys. This data reveals the manner in which students and instructors disagreed, or the type of discrepancy that occurred. Four scenarios are discussed here (see Appendix C for full results).

Information Literacy Skills. The skill "Use appropriate data management software and techniques to manage data" (see Figure 4) was coded most frequently as 12 and 14 (see Figure 1) in the first student survey. These discrepancy scenarios represent the difference between the student response "I already have this skill" (code 1) with the instructor response of either "The skill will be taught during class time" (code 2) or "This skill is not required for this course" (code 4).

Figure 4
IL8 Scenario Coding in Student Survey 1
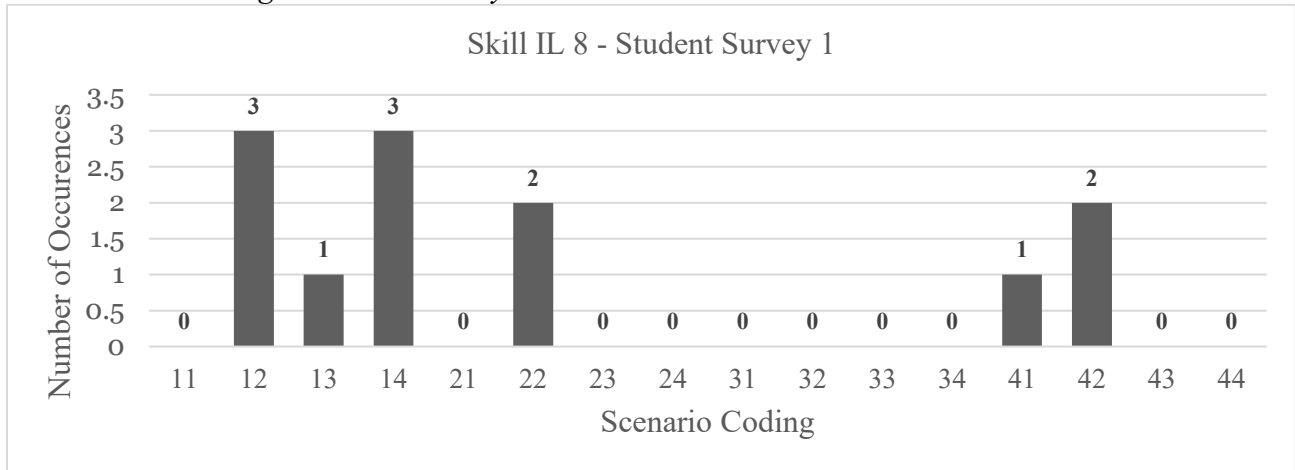
Based on our experiences working with students, we assume the discrepancy within this skill could be the result of a lack of student understanding at the third-year level of the term "data management software." This finding is also a result of the limitations in survey design wherein students may know that they do not require the skill for the course but selected "I already have this skill," thus resulting in a statistical discrepancy where an actual discrepancy may not exist. Finally, this finding may indicate that students struggle to understand or may not thoroughly read their course outline.

Learning Skills. In the first student survey, the skill "Identify multiple approaches for solving problems and implement or recommend solutions in course work or assignments" (see Figure 5) had the highest discrepancy within the learning skill category. The discrepancy scenario with the highest number of instances had the code 12, representing the disagreement between the student response "I already have this skill" and the instructor response "The skill will be taught

during class time." When examining the results from the second student survey, the same learning skill (see Figure 6) retained the highest discrepancy within this skill category with the instances of the discrepancy scenario coded 12 increasing from 37.5% in the first student survey to 58.5% in the second student survey.

Figure 5
L5 Scenario Coding in Student Survey 1
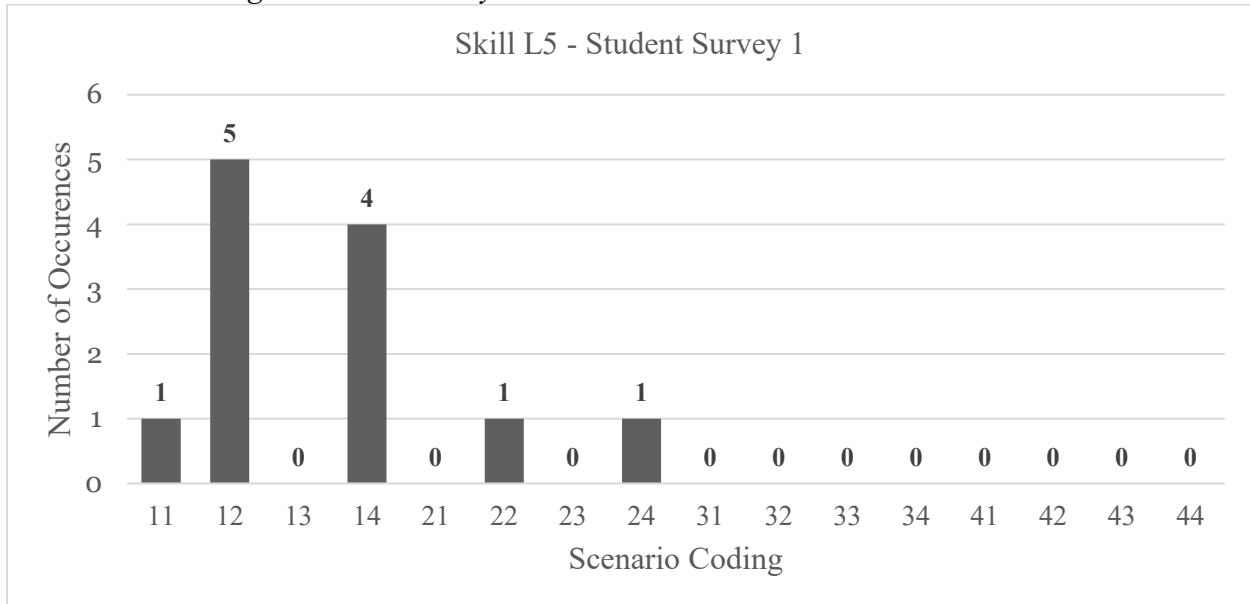
Figure 6
L5 Scenario Coding in Student Survey 2
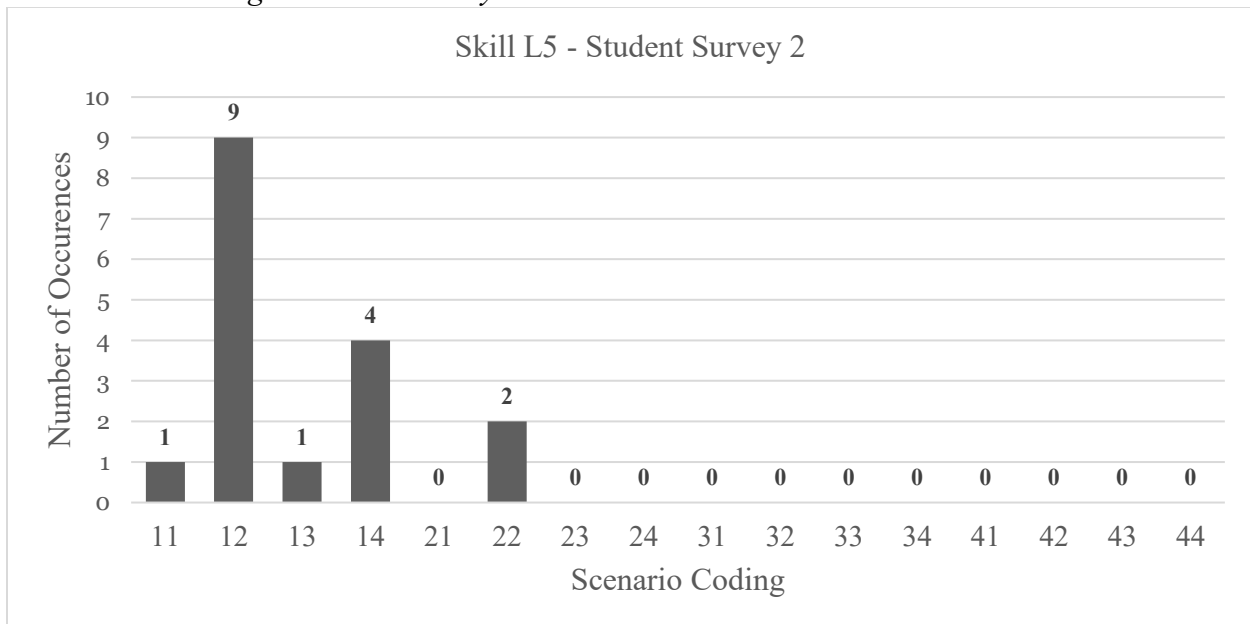
The skill represents problem solving which is typically not an explicitly stated skill as it is implied or embedded within assessments; however, 50% of instructors indicated that they would

teach it during class time. This highlights the importance of making complex skills, like problem-solving, more concrete, transparent and transferrable for students at the start of a course.

Writing Skills. In the first student survey, the skill "Select a writing structure and format based on the type of assignment" (see Figure 7) had the highest discrepancy within the category of writing skills. The discrepancy scenario with the highest number of instances had the code 12, which represented the disagreement between the student response "I already have this skill" and the instructor response "The skill will be taught during class time."

Figure 7
W9 Scenario Coding in Student Survey 1

Skill W9 - Student Survey 1
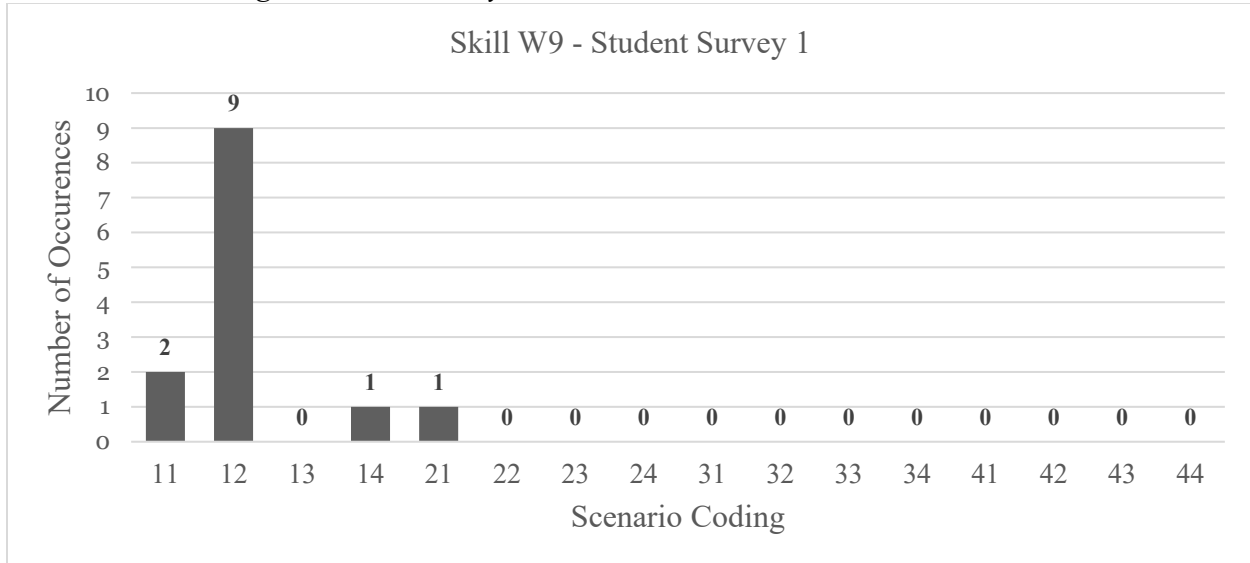
This disagreement may result from a belief amongst third year students that they already know or have been taught how to write within their discipline. It may also indicate that students do not understand the nuances between discipline-specific assignments or they lack understanding of how skills are intended to progress or deepen throughout their degree.

Confidence Ratings

In the second student survey, additional questions asked students to rate their confidence within the three broad skill areas. Students consistently indicated high levels of confidence in using these skills in the future. When asked to respond to a statement about their confidence in using each broad skill area, the majority of students selected agree or strongly agree (see Table 9).

Table 9

Confidence Ratings from Second Student Survey

Confidence Rating	Learning (%)	Writing (%)	Information Literacy (%)
Strongly Disagree	2.08	2.40	2.08
Disagree	0.64	1.28	1.92
Neither Agree nor Disagree	5.77	11.22	9.92
Agree	53.69	55.62	52.96
Strongly Agree	37.82	29.49	33.12

These results are contradictory to students' qualitative responses (presented in the following section) as many students indicated lack of confidence and a need for further skill development in the specific skills listed in the surveys. This occurs most frequently with learning skills, specifically time management and group work. Drawing a connection between confidence ratings and qualitative responses is not possible as we cannot know if those students who indicated high levels of confidence are the same as those who contributed qualitative responses that indicate a lack of confidence. Although we cannot make this correlation, literature supports this finding. For example, Kruger and Dunning (1999) conducted a study that compared people's estimation of their own skill level with their actual performance of that skill in exam-like situations. The results show that people "grossly overestimated their test performance and ability" (p. 1121). Kruger and Dunning associated this overestimation of skill with deficits in metacognitive ability. Kruger and Dunning's findings may partially explain what our study identified as student over-confidence. Not all students at the third-year level may possess the self-reflective ability to accurately self-evaluate their own academic skills.

Qualitative Responses

In the second student survey, students were also asked to qualitatively report the skills they would have liked more help with throughout the course. Words were grouped by broad skill area (see Table 10). Writing skills were found to be most frequently mentioned by students. Students referred to this skill set using a variety of phrases such as "scientific writing" and "more writing strategies." For example, one student responded that they required more assistance with "structuring my thoughts more coherently in writing" while another student indicated that they needed help with "grammar. Don't know how to use commas."

This was of interest because it was contradictory to the results in the student surveys for the writing skill "Use correct grammatical forms, sentence construction and punctuation in written tasks" (see Figure 7). This skill had the lowest discrepancy within the category of writing skills, and had the codes 12 and 13. These codes represent the discrepancy between the student response "I already have this skill," with the instructor codes of either "This skill must be developed by students outside of class time" or "Students do not need this skill for this course." Students reported that they have grammar skills, but qualitatively indicate that they require further depth in understanding and practice in this skill.

Figure 10
W6 Scenario Coding in Student Survey 1
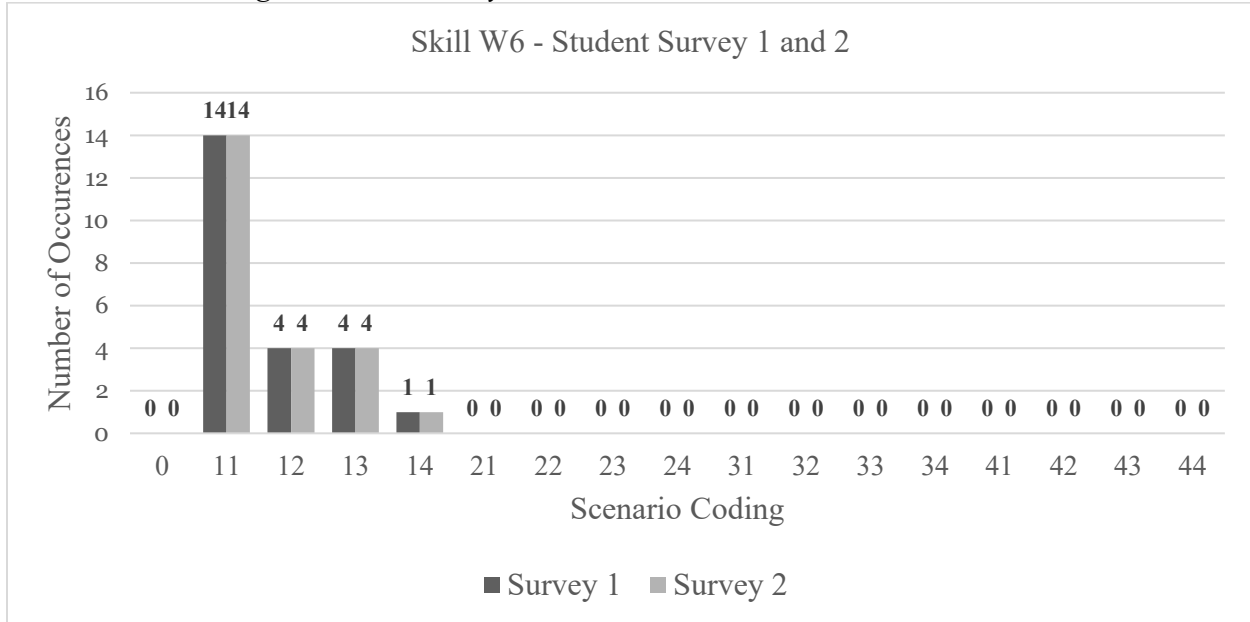
The second most frequently cited skill was time management, with one student writing that they needed help with "time management on the big projects and not feeling overwhelmed and getting stuck." Once again, these results are contradictory to the findings in the student surveys where the discrepancy between student and instructor responses was low, with 69.3% of students indicating that they have the time management skill. This could indicate that students perceive that they need time management for courses but are struggling to apply that skill to studying and assignment completion. Other learning-related skills were also commonly cited by students. Examples include "working more effectively in a group setting," "weekly study notes," and "understanding what they [instructors] wanted in assignments."

Information literacy skills were also cited by students. These most often related to the use of and the interpretation of research. For example, one student responded that they would like further assistance with "coming to conclusions when looking at controversial research."

Affective skills were frequently mentioned by students in their qualitative responses. Students commonly used words such as "concentration," and "confidence." For example, one student responded that further help was required in "motivation" to study, while another indicated "being more inquisitive and being more confident in asking questions in class" would help them be successful. This may highlight a disconnect between practical time management skills such as creating to do lists, and the personal aspects of time management, such as coordinating a group or confronting procrastination. The frequent mention of these skills demonstrates the importance of providing students with opportunities to discuss and engage in the development of affective skills. These skills are crucial for student success, are required across courses and disciplines, and are directly transferable to the workplace. Therefore we believe that students would potentially benefit from facilitated support in developing these skills during class time.

Table 10

Qualitative Themes in Second Student Survey

Themes	Meaning	Examples
Writing skills	Related to writing, formatting, organizing papers	• "We learned about data collection and analysis, but writing a proper results and discussion section." • "Trying to write out short answer questions in a shorter period of time in order to write out all ideas to get full marks" • "Writing short notes during the lecture movies to remember important, connecting topics from the lecture material."
Learning skills	Related to reading, interpretation, memorizing, presentation, and exam preparation	• "Weekly study notes being able to grasp the main concepts" • "Understanding what they wanted in the assignments and questions" • "Working more effectively in a group setting (time management, formulating essay so it flows between different ideas , etc.)"
Information literacy skills	Related to program specific techniques and information researching	• "Researching appropriate background articles for final project" • "Researching and applying appropriate information"
Affective skills	Related to motivation, concentration, patience, confidence, and socialization	• "Studying motivation" • "Being more inquisitive and being more confident in asking questions in class" • "Paying more attention during the 8:30 class."
Others	others	• nothing, N/A, complaint

Recommendations and Conclusions

The data from this research indicates a discrepancy rate of approximately 63% between instructor and student responses when exploring differences in instructor expectations and student interpretations of academic skills indicated on course outlines. This exploratory study suggests that instructors and students do not always share the same understanding of the skills required to complete course work and to be successful in assessments. Given that a clear understanding of the required skills assists in successfully completing assignments, as well as in one's ability to improve academic skills, it is important that instructors seek to clarify expectations and skill requirements.

Recommendation #1: Articulate Required Skills

It is recommended that instructors clearly articulate required skills in course outlines in class. In addition, additional resources could be provided support skill development with explicit explanation from the instructors about how the resources will assist in the development of the skills

required. By making academic skill requirements explicit in course outlines, instructors can make the skill development process more transparent. Instructors can encourage student awareness of broader transferable skills and develop students' metacognitive abilities. Students require explicit opportunities for reflection on skill development to allow for exploration of individual strengths and weaknesses, hopefully leading students to seek opportunities to improve their skills. Instructors can support this reflection through assignments, class discussions or assessment debriefs.

Recommendation #2: Build Awareness of Academic Supports

In addition, support resources such as tutorials, help guides, peer support programs, and consultations with academic support staff should be shared prominently and frequently with students at the time of need. Awareness of resources could also be increased by embedding support tools in the Learning Management System and explicitly connecting the resources to specific assignments where the skills must be applied.

Recommendation #3: Create Opportunities for Self-reflection and Feedback on Skill Development

A trend of high levels of student confidence persisted throughout our study, leading us to consider both why this occurs but also what might be done about it with the most common discrepancy occurring when students indicated they already had a particular skill and instructors indicated that the skill would be taught during course time. Providing structured opportunities for students to develop self-reflective abilities can assist both instructors and students in determining student skill level. We recommend that instructors develop a short assessment of the academic skills required for a course at the beginning of the semester, separate from course knowledge and content testing. By having students complete pre and post skill assessments, students might be better equipped to identify and reflect on their own confidence as it relates to their performance. Students may possess the skill at an introductory or even intermediate level but are unaware that skill acquisition is a scaffolded, ongoing developmental process. Instructors can gather evidence of skill level (through classroom activities, informal student feedback, or assessments) early in the semester to adjust their articulation of skills expectations to students. Providing instructor feedback to students on their skill development, not just their understanding of course content, is another important factor to aid students in their skill development. Students require clear guidance not only on how to successfully demonstrate skills, but also on how they might improve that skill.

Recommendation #4: Build Skill Development into the Curriculum

We recommend a curriculum-based approach to addressing student skill development needs through appropriate instruction and resource development. By recognizing when, where, and how skills should be developed throughout a four-year undergraduate curriculum, it will be increasingly possible to provide students with clear opportunities for skill development and to increase transparency around instructor expectations based on course level.

It is key that academic support staff such as librarians, educational developers, writing specialists, and learning specialists work with faculty to advocate for student development in a programmatic and scaffolded approach. Given the important relationship between academic

support staff and faculty, future research into how academic support staff can provide additional perspectives and be partners in Scholarship of Teaching and Learning research would be beneficial in building a path forward that creates a shared understanding of the needs of students.

A multidisciplinary approach to skill development research requires that these groups build awareness of disciplinary assumptions and generalizations to enable skill development research that benefits from a holistic understanding of student learning (learning, writing, and research). Skill-based support that is meaningfully connected to course curricula, paired with self-reflective opportunities for students along with explicitly stated and modelled expectations will have long-term benefits for students. Through this proposed process, students would have an increased opportunity to develop their metacognitive awareness and to communicate the skills they have acquired throughout their degree, better preparing them for workplace or further education.

In conclusion, this study suggests that instructors and students do not always share the same understanding of the skills required to complete course work and to be successful in assessments. As academic skills are needed for successful performance in assessments, it is important that faculty clearly articulate the skills needed and with the support of learning, writing, and research specialists, embed academic skill development in the curriculum.

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Appendix A

Skill Types, Skill IDs and Statements

Skill Type	Skill ID	Statement
Information Literacy	I1	Search a variety of resources (library databases) and source types (to find information).
Information Literacy	I2	Select relevant, current, academic and non-biased sources for use in my assignment(s)
Information Literacy	I3	Use effective search strategies, keywords and criteria to find appropriate information sources
Information Literacy	I4	Access full text information, both print and digital, and download online material and data
Information Literacy	I5	Cite printed and electronic sources using suitable and appropriate reference styles
Information Literacy	I6	Create appropriately formatted bibliographies / works cited
Information Literacy	I7	Meet standards of conduct for academic integrity (i.e. avoiding plagiarism)
Information Literacy	I8	Use appropriate data management software and techniques to manage data
Information Literacy	I9	Analyze and present data without misrepresentation
Information Literacy	I10	Use appropriate software (i.e., spreadsheet, technical, etc.)
Information Literacy	I11	Develop a personal profile in the community using appropriate personal networks and digital technologies (i.e., discussion lists, social networking sites, blogs, etc.)
Writing	W1	Develop a thesis or main argument in written tasks
Writing	W2	Use academic evidence to support your thesis or main argument in written tasks
Writing	W3	Paraphrase, quote and summarize academic sources in written tasks
Writing	W4	Develop introductions, body paragraphs and conclusions in written tasks

Skill Type	Skill ID	Statement
Writing	W5	Plan, manage, and divide writing process
Writing	W6	Use correct grammatical forms, sentence construction and punctuation in written tasks
Writing	W7	Use transitions to establish flow between ideas in written tasks
Writing	W8	Use appropriate language and tone based on assignment expectations (i.e. audience and purpose) in written tasks
Writing	W9	Select a writing structure and format based on the type of assignment (i.e. literature review, lab reports, critical review, research essay)
Writing	W10	Sequence ideas in logical order using paragraphs in written tasks
Writing	W11	Select and use academic or disciplinary vocabulary in written tasks
Learning	L1	Interpret sources and develop an opinion when presenting an argument
Learning	L2	Present a clear and consistent message, using appropriate language for audience needs in oral presentations and class discussions
Learning	L3	Work with group members to achieve group goals and complete a group/team project
Learning	L4	In group or team projects, offer alternative solutions that build on the ideas of others
Learning	L5	Identify multiple approaches for solving problems and implement or recommend solutions in course work or assignments
Learning	L6	Self-check understanding of course content by reviewing and monitoring learning
Learning	L7	Independently connect examples, facts or theories from more than one field of study or perspective
Learning	L8	Adapt studying and exam preparation techniques based on the type of assessment (i.e. multiple choice vs. essay answer)

Skill Type	Skill ID	Statement
Learning	L9	Apply time management skills and strategies (i.e. to-do lists and calendars) to manage multiple deadlines
Learning	L10	Use texts and lecture content to deepen understanding of course material and complete course assignments
Learning	L11	Use presentation techniques (i.e. good posture, eye contact, vocal expressiveness, and audience engagement) during oral presentations

Appendix B

Discrepancy by Skill: Student Survey 1

Skills	Discrepancy			
	No	Yes	No	Yes
I1	9	15	38%	63%
I2	9	15	38%	63%
I3	9	15	38%	63%
I4	15	9	63%	38%
I5	15	9	63%	38%
I6	14	10	58%	42%
I7	18	6	75%	25%
I8	4	20	17%	83%
I9	5	19	21%	79%
I10	6	18	25%	75%
I11	1	23	4%	96%
L1	8	16	33%	67%
L2	5	19	21%	79%
L3	4	20	17%	83%
L4	8	16	33%	67%
L5	2	22	8%	92%
L6	10	14	42%	58%
L7	5	19	21%	79%
L8	8	16	33%	67%
L9	15	9	63%	38%
L10	5	19	21%	79%
L11	5	19	21%	79%
W1	8	16	33%	67%
W2	4	20	17%	83%
W3	13	11	54%	46%
W4	13	11	54%	46%
W5	11	13	46%	54%
W6	14	10	58%	42%
W7	8	16	33%	67%
W8	3	21	13%	88%
W9	2	22	8%	92%
W10	14	10	58%	42%
W11	8	16	33%	67%
Total	278	514	35%	65%

Discrepancy by Skill: Student Survey 2

Skills	Discrepancy			
	No	Yes	No	Yes
I1	11	13	46%	54%
I2	7	17	29%	71%
I3	8	16	33%	67%
I4	15	9	63%	38%
I5	11	13	46%	54%
I6	13	11	54%	46%
I7	18	6	75%	25%
I8	9	15	38%	63%
I9	5	19	21%	79%
I10	9	15	38%	63%
I11	10	14	42%	58%
L1	5	19	21%	79%
L2	4	20	17%	83%
L3	7	17	29%	71%
L4	11	13	46%	54%
L5	3	21	13%	88%
L6	11	13	46%	54%
L7	5	19	21%	79%
L8	8	16	33%	67%
L9	15	9	63%	38%
L10	7	17	29%	71%
L11	14	10	58%	42%
W1	9	15	38%	63%
W2	4	20	17%	83%
W3	9	15	38%	63%
W4	13	11	54%	46%
W5	10	14	42%	58%
W6	14	10	58%	42%
W7	9	15	38%	63%
W8	4	20	17%	83%
W9	4	20	17%	83%
W10	12	12	50%	50%
W11	7	17	29%	71%
Total	301	491	38%	62%

Appendix C

Instances by Scenario: Student Survey 1

Skill Code	\	Scenario Code																Total
	0	11	12	13	14	21	22	23	24	31	32	33	34	41	42	43	44	
I1	2	9	8	3	2	0	0	0	0	0	0	0	0	0	0	0	0	24
I2	1	8	9	4	1	0	0	0	0	0	0	0	0	0	0	0	1	24
I3	1	9	8	4	2	0	0	0	0	0	0	0	0	0	0	0	0	24
I4	0	15	4	2	3	0	0	0	0	0	0	0	0	0	0	0	0	24
I5	0	14	6	3	0	0	0	0	0	0	0	0	0	0	0	0	1	24
I6	1	13	5	2	2	0	0	0	0	0	0	0	0	0	0	0	1	24
I7	0	18	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	24
I8	12	0	3	1	3	0	2	0	0	0	0	0	0	1	0	0	2	24
I9	9	4	6	2	2	0	1	0	0	0	0	0	0	0	0	0	0	24
I10	9	1	3	0	5	0	4	1	0	0	0	0	0	0	0	0	1	24
I11	19	0	0	1	1	0	0	0	0	0	0	0	1	1	0	0	1	24
L1	6	6	6	3	1	0	1	0	0	0	0	0	0	0	0	0	1	24
L2	9	4	4	2	4	0	1	0	0	0	0	0	0	0	0	0	0	24
L3	2	3	9	3	5	0	0	0	0	0	0	0	0	1	0	0	1	24
L4	5	7	6	3	2	0	0	0	0	0	0	0	0	0	0	0	1	24
L5	13	1	5	0	3	0	1	0	1	0	0	0	0	0	0	0	0	24
L6	5	10	2	7	0	0	0	0	0	0	0	0	0	0	0	0	0	24
L7	13	1	5	0	1	0	4	0	0	0	0	0	0	0	0	0	0	24
L8	5	8	4	5	2	0	0	0	0	0	0	0	0	0	0	0	0	24
L9	0	15	1	6	1	0	0	0	0	1	0	0	0	0	0	0	0	24
L10	9	5	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
L11	7	2	5	2	5	0	1	0	0	0	0	0	0	0	0	0	2	24
W1	4	7	7	2	3	0	0	0	0	0	0	0	0	0	0	0	1	24
W2	3	4	13	3	1	0	0	0	0	0	0	0	0	0	0	0	0	24
W3	0	12	9	2	0	0	0	0	0	0	0	0	0	0	0	0	1	24
W4	2	12	4	4	1	0	0	0	0	0	0	0	0	0	0	0	1	24
W5	0	10	5	6	2	0	0	0	0	0	0	0	0	0	0	0	1	24
W6	1	14	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	24
W7	5	8	8	2	1	0	0	0	0	0	0	0	0	0	0	0	0	24
W8	3	3	12	5	1	0	0	0	0	0	0	0	0	0	0	0	0	24
W9	11	2	9	0	1	1	0	0	0	0	0	0	0	0	0	0	0	24
W10	0	13	5	5	0	0	0	0	0	0	0	0	0	0	0	0	1	24
W11	4	7	9	3	0	0	1	0	0	0	0	0	0	0	0	0	0	24
Total	161	245	198	91	56	1	16	1	1	1	0	0	1	3	0	0	17	792

Instances by Scenario: Student Survey 2

Skill Code	Scenario Code																	Total
	0	11	12	13	14	21	22	23	24	31	32	33	34	41	42	43	44	
I1	5	10	5	2	1	0	0	0	0	0	0	0	0	0	0	0	1	24
I2	4	6	9	3	1	0	0	0	0	0	0	0	0	0	0	0	1	24
I3	5	7	6	3	2	0	0	0	0	0	0	0	0	0	0	0	1	24
I4	1	15	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	24
I5	4	10	5	3	0	0	0	0	0	0	0	0	0	1	0	0	1	24
I6	3	12	5	1	1	0	0	0	0	0	0	0	0	1	0	0	1	24
I7	0	18	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	24
I8	5	0	4	0	3	0	2	0	0	0	0	0	0	2	0	1	7	24
I9	7	4	7	1	2	1	1	0	0	0	0	0	0	0	0	1	0	24
I10	6	2	4	0	4	0	2	0	0	0	0	0	0	1	0	0	5	24
I11	11	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	10	24
L1	7	4	8	3	1	0	0	0	0	0	0	0	0	0	0	0	1	24
L2	11	2	3	3	2	0	1	0	0	0	0	0	0	0	1	0	1	24
L3	4	2	7	2	1	0	1	0	0	0	0	0	0	2	1	0	4	24
L4	3	4	5	2	0	1	1	0	0	0	0	0	0	1	0	1	6	24
L5	7	1	9	1	4	0	2	0	0	0	0	0	0	0	0	0	0	24
L6	4	11	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	24
L7	10	2	6	1	2	0	3	0	0	0	0	0	0	0	0	0	0	24
L8	8	7	5	3	0	0	0	0	0	0	0	0	0	0	0	0	1	24
L9	1	15	1	6	1	0	0	0	0	0	0	0	0	0	0	0	0	24
L10	6	7	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	24
L11	2	2	6	1	0	0	1	0	0	0	0	0	0	1	0	0	11	24
W1	5	7	6	2	2	0	0	0	0	0	0	0	0	0	0	0	2	24
W2	5	3	11	3	0	0	0	0	0	0	0	0	0	0	1	0	1	24
W3	4	8	8	2	0	0	0	0	0	0	0	0	0	0	1	0	1	24
W4	3	12	3	4	1	0	0	0	0	0	0	0	0	0	0	0	1	24
W5	1	9	4	6	2	0	0	0	0	0	0	0	0	1	0	0	1	24
W6	1	14	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	24
W7	2	8	8	4	1	0	0	0	0	0	0	0	0	0	0	0	1	24
W8	4	2	10	5	1	0	2	0	0	0	0	0	0	0	0	0	0	24
W9	7	4	11	0	1	0	0	0	0	0	0	0	0	0	1	0	0	24
W10	2	11	5	5	0	0	0	0	0	0	0	0	0	0	0	0	1	24
W11	7	6	8	1	0	0	1	0	1	0	0	0	0	0	0	0	0	24
Total	155	225	194	82	36	2	17	0	1	0	0	0	0	12	5	4	59	792