# Exploring Task Understanding in Self-regulated Learning: Task Understanding as a Predictor of Academic Success in Undergraduate Students

by

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B. A., University of Victoria, 2003

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## ABSTRACT

Understanding what to do and how to complete academic tasks is an essential yet complicated academic activity. However, this area has been under-examined. The purpose of this study is to investigate students' understanding of academic tasks with qualitative and quantitative approaches. Ninety-eight students participated in this study. First, the study explored the kinds of tasks students identified as challenging, the disciplines in which these tasks were situated, the types of structures these tasks had, and challenges found in students' task analysis activity. Second, the study examined the relationships between students' task understanding and academic performance. The findings indicated that although students struggled with various tasks, they struggled even more when tasks became less pre-scribed. The results also showed that task understanding was statistically significantly co-related to academic performance and task understanding, particularly, implicit aspect of task understanding, predicted students' academic performance. The findings supported Hadwin's (2006) model of task understanding.

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# Chapter One: Introduction

*Overview*

When students enter school, they soon encounter tasks and assignments that are assigned by their teachers. As part of students' life, they spend significant amount of time on these academic tasks. Academic tasks are the products that students are expected to formulate by recognizing or reproducing information learned, applying learned information to solve or analyze problems and create something new, and making judgments based on learned information, including the thinking processes that they are expected to use for the products (Doyle, 1983). Students who struggled with academic tasks in the first year of university were more likely to drop out from a postsecondary institution (Statistics Canada, 2007). Even if students continued their school, many individuals have difficulties in adjusting to academic demands in secondary and post-secondary school and realize that they need particular studying strategies for academic success (e.g., Dembo & Eaton, 2000; Pressley, Yokoi, van Meter, Van Etten, & Freebern, 1997). Particularly, academic demands increase both quantitatively and qualitatively in colleges and universities (Thomas & Rohwer, 1987).

Students who dropped out of secondary and post-secondary institutions due to their academic difficulties or who struggle with academic tasks in school may not know what effective study skills are, when to use these strategies, and how to adjust ineffective strategies (Dembo & Eaton, 2000; Cleary & Zimmerman, 2004; Zimmerman, 2000). Thus, these students may lack the ability to self-regulate their learning. Self-regulated Learning (SRL) refers to as the process in which learners develop the ability to plan, regulate, monitor, and adjust own learning strategies and affective states when necessary (Schunk & Zimmerman, 1997; Zimmerman, 1989). Without academic self-regulation skills, students are likely to experience academic failure or drop out of school (Graham, 1991).

The ability to self-regulate own learning experience has been identified as a critical factor in academic success (e.g., Paterson, 1996; Pintrich & De Groot, 1990). For example, Pintrich and De Groot found higher levels of SRL skills were related to higher level of academic performance among seventh and eighth graders in science and English classes. Paterson also reported Grade 12 students in SRL enhanced instructional practice class performed statistically significantly higher on achievement scores than students in traditional instructional practices class. Further, Hwang and Vrongistinos (2002) found high achieving students in teacher education programs statistically significantly more often used metacognitive strategies, including planning their studying, monitoring their progress, and evaluating their products, than low achieving students. As a result, in order to enhance students' SRL skills, interventions and programs to promote SRL were developed and found to be fairly successful (Simpson, Hynd, Nist, & Burrell, 1997).

In these programs and interventions, however, target SRL skills appear to vary. For example, in Azevedo and Cromley's (2004) study, SRL skills training was based on Pintrich's (2000) model and provided skills such as setting goals and making plans, monitoring students' learning process and motivational state, selecting studying strategies, controlling context, and managing their time. Nietfeld and Scharw (2002) provided a training that specifically targets for the improvement of self-monitoring while solving mathematical problems. In Butler's (1994) Strategic Content Learning (SCL) approach, tutors were taught how to assist students with analyzing tasks, goal-setting, planning, selecting strategies, and monitoring. This approach considered understanding task demands as an integral first step.

The importance of task understanding in SRL for academic success has been pointed out by several researchers (e.g., Butler, 1992; Butler & Cartier, 2004; Hadwin, 2000, 2006; Jamieson-Noel, 2004). Butler and Winne (1995) emphasize that task interpretation is critical because students' interpretation of a task description affects their goal setting, which in turn, affects students' choice of study strategies in the next strategy selection phase. Winne and

Hadwin (1998) also point out understanding tasks is central in executing effective SRL. Despite its importance, emergent research suggests that many students may have misconceptions about task requirements, know very little about task demands, misinterpret task instructions and instructional cues, and lack awareness of the importance of task understanding (e.g., Butler, 1994; Butler & Cartier, 2004; Jamieson-Noel; Pressley et al., 1997; Thomas & Rohwer, 1987; Winne & Marx, 1982). Further, little empirical research had been conducted to investigate task understanding as a distinct construct. Accordingly, very little is known about what types of academic tasks students struggle with, as well as how students understand these tasks. The lack of research may suggest that task understanding may be assumed to occur in a similar way among different individuals.

Although understanding academic tasks seems to be a simple activity, it is, in fact, complicated and difficult. What make it so difficult to understand an academic task? Hadwin (2006) explains that in order to understand a task, students must decipher information about explicit task instructions and criteria, implicit task information, and socio-contextual cues about the task. According to Hadwin, these multiple layers of information about a task make task-understanding difficult as students are expected to move beyond the explicit information about a task to infer what to do from based upon many ambiguous cues and implied beliefs in the task instructions. As a result, this nature of tasks often allows misunderstanding of a task between students and instructors to occur. Moreover, Simpson and Nist (2000) discuss that academic tasks are specific to its content, as well as instructors and context. They explain that different instructors who assign the same task may have different expectations and understanding about how the task should be completed. Butler and Cartier (2004) also pointed out that task analysis is difficult because teachers also bring in their own interpretations and beliefs. Thus, students must not only be aware of the actual task requirements, but also what each instructor brings to the task, such as their own task perception and beliefs.

Further, in deciphering academic tasks, Hadwin (2006) suggests understanding socio-contextual aspect is important. Socio-contextual aspect includes discipline specific beliefs about knowledge and learning. Students' beliefs function as a filter to interpret the features and nuances of tasks, which influences students' learning strategy selection (Thomas & Rohwer, 1987). Some of these beliefs are known as epistemological beliefs about knowledge and learning. Epistemological beliefs are one's beliefs about knowing and how these beliefs influence the process of thinking and reasoning (Hofer & Pintrich, 1997). Students' task understanding is influenced by students' beliefs about knowledge and learning, and is related to academic achievement (Hofer & Pintrich). Beginning with studies on epistemological development by Perry (1970), research about epistemological beliefs provided support for the relationships between epistemological beliefs and students' academic performance and study strategies (e.g., Schommer, 1990, 1993; Schommer, Clalvert, Gariglietti, & Bajaj, 1997; Schommer, Crouse, & Rhodes, 1992).

These studies focused on students' personal epistemological beliefs and not on instructor's beliefs. To date, only a paucity of studies had investigated students' understanding of their instructor's beliefs. Among these studies (Hadwin, Oshige, Miller, Fior, & Tupper, 2008; Oshige, Hadwin, Fior, Tupper, & Miller, 2007), understanding their instructor's beliefs was found to be a strong predictor of students' academic performance. However, these studies investigated explicit, implicit, and socio-contextual aspects of task understanding of one particular task. Moreover, these explicit and implicit aspects were mainly qualitatively studied. Although emerging evidence suggests the importance of task understanding in academic success, no studies appear to have examined how overall task understanding contributes to students' academic success. To what extent is task understanding is important for students to be academically successful? To address this gap in the literature and pursue the overarching research question, this thesis study explores three aspects of task understanding across various tasks and students academic performance.

# Chapter Two: Literature Review

*Overview of Chapter Two*

Figuring out what to do to complete academic tasks is an essential first step in academic success. However, students may not realize the importance of this step and start a task by setting goals that do not match with what the task was intended and choosing strategies that are not effective and efficient. This chapter reviews previous research surrounding task understanding as a potential predictor of academic success. First, models and theories of self-regulated learning and task understanding are reviewed. Then, research about how task understanding is related to academic performance is discussed.

*Centrality of Task Understanding in Models of Self-regulated Learning*

As the research provides evidence that self-regulated learning is a strong predictor of students' academic success (e.g., Hwang & Vrongistinos, 2002; Paterson, 1996; Pintrich & De Groot, 1990), a number of theories and models have emerged. Among these theories and models, this review focuses on four models and theories that acknowledge understanding academic tasks in self-regulated learning, as well as academic performance.

*Pintrich's (2000) framework of self-regulated learning.* Pintrich (2000) developed a four-phase framework of SRL with relation to four areas to self-regulate own learning. These areas for self-regulation include: (a) cognition, (b) motivation and affect, (c) behaviour, and (d) context. Within each area, learners go through four phases of self-regulation, including (a) forethought, planning, and activation, (b) monitoring, (c) control, and (d) reaction and reflection. These areas and phases do not necessarily occur in a linear manner and could occur simultaneously and interactively as a learner progresses with a task.

In the area of the regulation of cognition, learners begin working on a task by setting specific learning goals. Forethought and planning in this area involves with activating prior knowledge about a task at hand and relevant learning strategies. In monitoring phase, learners become aware of and monitor their cognition. During this phase, learners use *judgments of learning* (JOLs), where they become aware that they do not understand a task, and may experience the *feeling of knowing* (FOK), which can occur when learners attempt to recall but fail to recall. In control phase, learners change their cognition or continue, as a result of monitoring. In the reaction and reflection phase, learners make judgments, evaluations, and attributions of their learning (Pintrich, 2000).

In motivational and affective self-regulation, learners plan and activate their motivation based on their perception of their ability (efficacy) and task difficulty, as well as their perception of value of the task and personal interests. In monitoring phase, learners monitor their level of motivation and affective state. This monitoring is “an important prelude” (Pintrich, 2000, p.464) for the next phase. In control phase, learners attempt to use different strategies to control their motivation and affect toward a task. Using positive self-talk is one example for controlling their motivation and affect. In reaction and reflection phase, learners may have emotional reactions to the completed task (e.g., happy) and reflect on the reason for the success or failure of task completion (i.e., make attributions).

In behavioural self-regulation, learners attempt to regulate their overt learning behaviours. In forethought, planning, and activation phase, they may engage in time allocation for their studying. In monitoring phase, learners monitor their studying behaviours against their plans. They also become aware if they are on track or they need more time and efforts to complete a task. In control phase, learners control their studying behaviour by increasing time and efforts for the task or decreasing them when they see the task too difficult. In reaction and reflection phase, there may not be reflection on learning behaviour per se because reflection is “a more cognitive process” (Pintrich, 2000, p.469). However, learners may reflect on their ineffective time management behaviour (e.g., procrastination) and make changes for the future studying activities.

In contextual self-regulation, learners also attempt to monitor, control, and reflect on their learning environment. In forethought, planning, and activation phase, learners activate their knowledge about their learning context (e.g., classrooms), such as classroom norms for a task completion and nature of a task (e.g., task format, criteria, procedure) and classroom climate. Learners, then, monitor how the task progresses and what contextual features the classroom provides. In this phase, learners become aware of or monitor classroom rules, grading, task requirements, and teacher's behaviours. In control phase, learners attempt to control their context. Negotiating task requirements with their instructors is one way, as well as managing learning environment by staying away from distractions is another. In reaction and reflection phase, learners evaluate the task, based on their feelings (e.g., enjoyment) or cognitive criteria (e.g., acquiring target ability, Pintrich, 2000).

In this model, the emphasis is on goals and motivations. Task understanding is present only in contextual and motivational regulation of learning. Task understanding in contextual regulation appears as a form of perceptions of a task, where learners activate general knowledge about a task (e.g., nature, format, criteria, grading, etc). According to Pintrich (2000), these perceptions are contextual because the focus is "outward, away from the individual's own cognition and motivation, toward the tasks and contexts" (p.469). Task understanding also appears as a form of judging task difficulty and activating task value and students' interests as part of motivation regulation. Understanding tasks is acknowledged in this model; however, it is considered as what learners bring to tasks and contexts as a prior knowledge.

*Zimmerman's (1989) socio-cognitive model of self-regulated learning.* Zimmerman's (1989, 2000) social cognitive model of SRL claims that personal, environmental, and behavioural agencies are the core components of self-regulation (Zimmerman, 2000). Each component influences each other through triadic feedback loops in a cyclical manner

(Zimmerman, 2000). Thus, students' self-regulated strategy is reflected in their behaviour, which influences environmental sources, such as students' teacher's evaluation. The teacher's comments on students' behaviour or the products of the behaviour affect students' evaluation of the strategy, which leads them to use a different strategy or be content with a current method. Further, students' behaviour influences their self-processing system, in which students self-monitor or self-evaluate their behavioural outcome (Zimmerman, 1989).

With these three distinct core structures, learners become self-regulated through three phases: (a) forethought, (b) performance or volitional control, and (c) self-reflection phases (Zimmerman, 2000). Forethought phase consists of two intertwined categories, including tasks analysis and self-motivational beliefs. Task analysis involves goal setting and strategic planning for a task. Learners set a goal and plan their learning strategies as part of task analysis. In doing so, self-motivational beliefs about the goal, such as self-efficacy, outcome expectations, intrinsic value, and goal orientation, are a key determinant.

In performance or volitional control phase, learners control their performance on a task while observing their own strategy-use. To execute self-control, there are four strategies, including self-instruction (e.g., talk aloud method), imagery (e.g., forming a mental picture of performance), attention focusing (e.g., screening out distractions), and task strategies (e.g., breaking down a task into small pieces). To execute self-observation (the second type of performance or volitional control), learners can do so by using self-recording their performance or emotional reactions to a task or self-experimentation, where learners systematically vary and experiment with the task in which they engage (Zimmerman, 2000).

In self-refection phase, learners evaluate their performance by themselves and adjust the previous strategy based on the self-evaluation. Self-reflection phase has two processes: self-judgment and self-reaction. In self-judgment, learners evaluate their performance by comparing it to goals they set in the first phase and make attribution of the outcome.

Zimmerman (2000) points out that this attribution judgment is “pivotal to self-reflection” (p.22) in maintaining their motivations. Self-reaction has two forms, including self-satisfaction and adaptive inference, and they are closely linked to self-judgment. Self-satisfaction is determined by the level of satisfaction of the performance, which influences one’s motivation. Adaptive inferences are what learners decide about their self-regulatory strategies use (e.g., modify goals, use different study tactics).

Similar to Pintrich’s (2000) model, Zimmerman’s (1989; 2000) model focuses on goal setting and beliefs about one’s ability (e.g., self-efficacy). Although Zimmerman’s model includes task analysis in the first phase of forethought, this task analysis refers to setting specific learning outcomes and planning strategically to optimize learners’ performance. In later version of this model, Zimmerman (2004) refined this task analysis component in forethought phase by referring to “breaking an academic task into components and setting goals and planning strategies for their attainments” (p.142). Unlike Pintrich’s model, this model explicitly states that task analysis is one of the components in the first phase of SRL, while the main focus of the tasks analysis is on goal setting and planning.

*Butler and Winne’s (1995) model of self-regulated learning.* Butler and Winne’s (1995) model proposes that SRL involves recursive phases of interpreting a task, setting goals, enacting tactics and strategies, monitoring these processes, and evaluating learner’s performance. This model also suggests that learner’s knowledge, including domain knowledge, task knowledge, and strategy knowledge, and beliefs about knowledge (i.e., epistemological beliefs) and motivations, are the base to interpret the nature and requirements of a task. According to this model, learners construct their interpretation of a task based on their knowledge and beliefs. They, then, set goals based on their task interpretation. Learners attempt to meet the goals they set by enacting tactics and strategies they chose. This enactment generates cognitive, affective, and behavioural products (e.g., outcome, reactions).

During these processes, learners monitor their performance, through which their products are updated. These updated products produce internal feedback, which, in turn, serves as the foundation for refining their task interpretation. The refinement of their task interpretation leads to modifying their goals, as well as subsequent SRL phases. Further, during or after their performance, if learners receive external feedback, this leads them to reexamine their task interpretation, which affects other phases of SRL, accordingly.

In Butler and Winne's (1995) model, task understanding functions as the foundation of other SRL phases. Thus, if learners mis-interpret task requirements and its nature, their SRL process becomes astray (Butler & Cartier, 2004). In this sense, understanding a task is the central in this model. In task interpretation, this model also suggests that learner's epistemological beliefs are important because beliefs filter external feedback (Butler & Winne). For example, if learners believe learning is quick, they may decide to ignore the feedback and choose superficial learning strategies that requires very little time. Contrary to Pintrich's (2000) model and Zimmerman's (1989) model, Butler and Winner's model of SRL place an emphasis on task interpretation in SRL process. Task interpretation in this model differs from goal setting and refers to deciphering task requirements, which is generated based on students' prior knowledge (e.g., academic knowledge) and beliefs.

*Winne and Hadwin's (1998) four phase model of self-regulated learning.* Winne and Hadwin's (1998) model of SRL consists of four phases: (a) task definition, (b) goal setting and planning, (c) strategy enactment, and (d) evaluation and metacognitive adaptation . In task definition phase, learners interpret task procedures, parameters, and context while incorporating current and previous knowledge of the task, context, and self into their understanding of the task. In goal setting and planning phase, they set goals and plan what strategies to use, based on their understanding of a task. In strategy enactment phase, they carry out the strategies that they planned and engage in learning activity. These strategies are constantly monitored and finely tuned with the difficulty of the task. In evaluation and metacognitive adaptation phase, learners evaluate the outcomes, their strategies, and the whole learning process and make a final adjustment according to their evaluation of the learning episode. These phases do not necessarily occur in sequence; some phases may be skipped while some phases may be repeated. They are also recursive, by that they mean that "the results of engagement in any particular phase can feed into metacognitive monitoring that occurs in any previous or subsequent phase" (Winne & Hadwin, 2008, p.298).

Winne's and Hadwin's (1998) model also provides COPES cognitive typology within each phase. It is this cognitive structure through which learners complete each phase and move onto next phase. These cognitive processes are Conditions, Operations, Products, Evaluation, and Standards (COPES). Conditions refer to conditions (as in IF in IF-THEN rules) that influence how learners engage in a task and consist of task conditions (external) and cognitive conditions (internal). Task conditions include resources, instructional cues (e.g., teacher's influence), time (e.g., time constraint), and social context (e.g., classroom climate, learning environment). Cognitive conditions include beliefs about knowledge, motivation, and knowledge about a specific domain, tasks, and studying strategies. In the task definition phase, for example, these features affect learners' construction of their interpretation of a task.

Operations refer to cognitive processes, tactics, and strategies that learners engage. Winne (2001) proposes these processes as search, monitor, assemble, rehearse, and translate (SMART) cognitive operations. These processes are "what students do to work on tasks" (Winne & Hadwin, 2008, p.302). Accordingly, in defining a task, learners search for relevant information to a task, monitor this process, assemble necessary information to construct their representation of a task, rehearse defining a task if necessary, and translate a task into their own interpretation of task.

Products are outcomes created as a result of operations. Thus, learners' representation of a task is the product of the first phase of task definition. Evaluations refer to internal or external feedback about products that is generated as learners move in and out of each phase. Learners evaluate their own understanding of a task by comparing it with peers or grading (external) or with their previous experience and knowledge about a task (internal). To evaluate learners' cognitive processes, they use standards. Standards refer to criteria against which learners' products are monitored. Accordingly, learner's past experiences with the task and their peer's understanding of the same task can serve as their standards.

Different from Pintrich's (2000) and Zimmerman's (1898) models but similar to Butler and Winne's (1995) model, Winne and Hadwin's (1998) model clearly separates the process of task understanding from that of goal setting and planning. The model views task definition phase as integral in SRL and explicates SRL process with relation to cognitive architecture (COPES) that learners use. The model provides a detailed description of the cognitive processes that underlie each phase (Greene & Azevedo, 2007). This differentiation of Task Definition phase from Goal-setting and Planning phase and establishment of the cognitive structure are what makes this model unique and particularly promising to advance research in SRL (Greene & Azevedo). Accordingly, this model serves as the overarching model of SRL for this thesis study.

### *Model of Task Understanding*

In addition to Winne and Hadwin's (1998) four phase model of SRL, Hadwin (2006) elaborates on the first phase of task definition and proposes a model of task understanding.

*Hadwin's (2006) model of task understanding.* Hadwin (2006) suggests that academic tasks are difficult to understand because they are layered with explicit, implicit, and socio-contextual information (see figure 1) and deeply embedded in discipline specific thinking and presentation genres. Task descriptions are often not well described and use simple language for which students have diverse interpretations. Accordingly, to decipher the assigned task, students need to understand three aspects of the assignment: explicit, implicit, and socio-contextual features of the task. Explicit features of a task are usually described in the assignment instructions and include: (a) criteria, (b) grading, (c) standards, and (d) language. Criteria refer to things to be included in the final product of an assignment. For example, when an assignment is writing a research paper, the instruction might indicate what the paper should include, such as its topic, the format that should be followed, and the style of writing (APA, MLA, etc). Grading refers to instructor's evaluation of the assigned task and is often reflected in numerical or letter scales. Standards are what numerical or letter grades represent. Task instructions often state how much the assignment weighs with relation to the course grades. For example, if students who are taking a language course are assigned to give an oral presentation, knowing pronunciation in their presentation is worth more than the content of their presentation would influence their preparation and study skills, as well as their evaluation of their presentation. As these features are often explicitly written out in the instruction, students can refer to the assignment description to understand what they are overtly asked to do.

Implicit task features include things such as (a) the purpose of the assignment, (b) the effective strategies for the assignment, (c) relevant course constructs or the way this task connects with other aspects of a course or instruction, (d) timing, (e) connection to available resources to complete the task, and (f) a picture of a top quality task. The purpose of the assignment refers to understanding of why an instructor assigns the task at hand. Even though students may have complete understanding of the assignment description, failure to understand the purpose of the task might lead the student astray. For instance, in writing an experimental report, knowing whether an instructor assigned the task to have students focus on report writing or to have students focus on an actual experiment procedure might influence students' performance. The effective strategies mean learning and studying skills that are effective to complete the specific task. If students were to write a chapter quiz, understanding core chapter concepts by making connections among them would be a more effective strategy than merely memorizing definition of terms. Timing refers to the specific point in time when the particular task is assigned. Thinking about why the task was assigned at that point, but not later during the course and why the task follows rather than precedes a specific unit or a lecture, provides students with instructional cues as to where to look for relevant information and what to be included in the task. Connection means how the task relates to the course, course objectives, and course concepts for the task completion. Understanding the resources that students are expected to use for the final product of the task would also enhance students' understanding of what the task is about (Hadwin, 2006).

Socio-contextual task features include (a) students' or instructor's beliefs about knowledge, (b) disciplinary beliefs about genre, (c) beliefs about ability to complete the task, and (e) value placed on shared learning and goal orientation. Students or instructor's beliefs about knowledge and learning is also known as epistemological beliefs (Hofer & Pintrich, 1997). Disciplinary beliefs about genre refer to what is valued in the academic discipline to which students belong. Students' beliefs and perceptions about their ability to complete the task are self-efficacy (Bandura, 1986) and refer to the level of confidence students have for the task at hand. Value placed on shared learning and goal orientation refers to instructor's value about socially-shared learning experience and goal orientation. Developing awareness of the socio-contextual features of the task involve accurately understanding what is valued in this discipline and classroom (Hadwin, 2006).

Hadwin's (2006) model of task understanding provides a further description of the first phase of task definition of Winne and Hadwin's (1998) model of SRL. As reviewed earlier, only a few models view task understanding as the central in SRL process. Further, to date, only Hadwin’s model of task understanding illustrates what components task understanding involves. Accordingly, this thesis study is guided by Hadwin’s model of task understanding. The following section reviews previous studies that have explored issues surrounding task understanding.

*Explicit and Implicit Aspects of Task Understanding*

There are a very few studies that investigated task understanding as a whole. Therefore, research about task understanding can be separated into two foci. One focus is students’ understanding of explicit and/or implicit features of tasks. In the literature, explicit and implicit aspects of task understanding were mainly researched in the forms of text decoding, students’ perceptions of tasks, or instructional practices.

*Task understanding as text decoding.* Identifying important points in task instructions is one of the features of explicit task understanding. Being able to select relevant information from written material is fundamental in understanding and learning the material (Mayer, 1987). One of the ways that task understanding has been investigated is as students’ ability to isolate information from texts according to different perspectives (i.e., awareness of task demands, Reynolds, Wade, Trathen, & Lapan, 1898). Studies in this area appear to use texts for students to identify important points in those texts. This aspect can be considered as ability to identify salient information in an instruction for a task and might be able to transferred to understanding task instructions. For example, Schellings, Van Hout-Wolters, and Vermunt’s (1996a) study investigated the effects of three different instructions on main point identification in 133 Grade 10 students. The study asked students to underline what parts were considered as important points from three perspectives, including the author of the biology text, an imaginary instructor, and their own. Generally, students more accurately identified what an instructor considered important study objectives than what the author considered as main points. However, the variability among students in underling important instructional points was reported to be large, as many students identified these instructional points as the text author's important points. That is, although students were congruent with what the teacher chose as important in the texts, many of them misunderstood the instructionally important points as the author's points. This finding implies some students are in tune with the teacher and the study objectives provided by the teacher, while others have rather vague understanding of the task instructions in the study. This study, however, did not examine the relation of this effect to academic performance.

In another study by Broekkamp, van Hout-Wolters, Rijlaarsdam, and van den Bergh's (2002), differences in task perceptions between 22 history instructors and 451 students in 11th grade were examined. In this study, both teachers and students were given a relatively long text with 16 sections in it and were asked to read it and rate each section according to the importance for a later test. The study found only a moderate congruency in important text identification among teachers and moderate correspondence between teachers and students. That is, large differences in perceiving what is important for a test (i.e., task demands) among teachers were found, as well as between teachers and students. The similar results were also reported by Schellings and van Hout-Wolters (1995). This study used a biology text for an imaginary test, in stead of history, to examine the perception differences between teachers and students in Grade 10. These studies focused on important idea units in a text for an upcoming test, not important information in a task instruction, per se.

These important idea unit identifications have also been examined with relation to students' academic performance. In Schellings, Van Hout-Wolters, & Vermunt (1996b) study, researchers compared characteristics of main point selection in texts, strategy use, beliefs about learning, and academic performance in 133 students in Grade 10 biology classes. Similar to the previous study (Schellings, Van Hout-Wolters, & Vermunt, 1996a), the students were asked to underline main points in biology texts according to what the text author considered as important, what their teachers considered important, and what interested them. Based on the portion and part of underlined points in texts, students were grouped into five, including explicative/educational group (the highest portion underlined in the teacher task), extensive (highest portion underlined across tasks), linguistics (highest portion underlined in the author task), restrictive (lowest portion underlined across tasks), and adaptive (highest portion underlined according to each perspective properly across tasks). The results showed students who were adaptive to each instruction had the highest biology grade among other groups. These students also reported to view learning as acquiring useful knowledge, while students in other groups (e.g., linguistics) reported to view learning as memorizing. These findings also imply that it is likely that when students' understanding of task instruction corresponds to their teachers, these students would perform better in academic setting. However, these are only suggestive and not directly examined using actual instruction for a task, rather than a task itself (e.g., text).

The research in this area shows variabilities in interpreting texts between and among teachers and students. It appears that students who are able to select important information according to what others view as important are also higher academic achievers. However, these studies did not directly examine how students understood the task instruction. Rather, they examined how students decoded text and identified important points in texts, and how those perceptions were different or similar to their instructors. These tasks were also in a de-contextualized setting. In other words, the tasks were not provided as actual academic tasks in class or a learning setting. The reports of variabilities in assessing task demands among instructors can also correspond to Simpson and Nist's (1997) claim that task instructional cues also differ depending on instructors' individual interpretations. Hadwin (2006) also suggests understanding a task requires what others such as instructors bring to the context. Thus, being able to identify what is considered as important for a task (e.g., test) from teacher's perspectives is significant. In essence, these studies examined one feature of explicit task understanding, which is things that are important in the task of reading paragraphs for a test. In Hadwin's model of task understanding, this feature can be referred to as important criteria to be included in the task.

*Students' perceptions of academic tasks.* In the area of instructional design, the research has focused on the relationship between instructions and students' learning, in the hope that effective instructions improve students' learning (Luyten, Lowyck, & Turelinckx, 2001). For example, Wong, Wong, and LeMare (2001) conducted two experiments examining the effects of explicitly stated task instructions and vaguely stated task instructions on texts comprehension and memory (free recall of texts) between children with and without learning disabilities. The explicitly stated task instructions included specific directions in reading, such as refer to comprehension questions provided before passages and read them carefully for a later free recall tests. Vaguely stated instructions simply asked children to read the passages carefully. In both experiments, their results showed children with and without learning disabilities in explicit instruction conditions performed better in comprehension and recall tests than those in control groups, although children without learning disabilities performed better than children with disabilities. The researchers suggest teachers use specific instructions for students' optimal learning and articulate the specific learning objectives in the tasks they provide. However, such studies are based on the assumption that instructions and instructional environment are directly related to students' learning (Winne & Marx, 1982).

Since possible cognitive mediation in the relationship was pointed out (e.g., Winne & Marx, 1982), research has focused on the mediating factors between instructions and students' learning. One of the possible mediating factors is suggested as students' perception of academic tasks (Luyten, et al., 2001). Luyten et al. explored the role of students' task perception in learning as a possible mediating factor. Since this study was the first study in this literature (Luyten et al.), they conducted an exploratory study with 149 first year undergraduate students. Students were first instructed to write an essay about a chapter of their history course. Before they began the task, they were provided with an open-ended questionnaire with questions about: (a) what they thought the task was about and (b) how they were planning to complete the task. After writing an essay, students were asked to write down what kinds of learning activities they actually performed during the essay writing. Their qualitative analysis produced 11 categories (not mutually exclusive) for the kinds of students' task perception, varying from the surface level processing (e.g., focused on the term, *essay*) to deep level processing (e.g., connecting the task with the course). This study also examined the association between students' task perception and their planned and executed writing activities. Students' planned and actual learning activities were also classified according to the level of processing. The study reported that students whose task perceptions belong to the same class were more likely to have used the planned and actual learning activities that fall under the same class. However, through the lens of Hadwin's (2006) model of task understanding, this study mainly explored an explicit feature with relation to implicit task understanding (e.g., connections between concepts), in particular, description of a task.

In addition to Luyten et al.'s (2001) study, Jamieson-Noel (2004) further explored how students develop and refine their task perception over time in 58 undergraduate students. This study used the same questionnaire in Luyten et al's study with some modification in wording. The task used in this study was a more complex task (i.e., design project). Themes that emerged were categorized using Winne and Hadwin's (1998) model of SRL. The study found that 96% of students (51 students) listed comments related to task conditions when the task was assigned. Task conditions are any external influences that are related to task, including learning context, time, instructional cues, and resources (Winne & Hadwin). When students were provided with the task instruction and task perception questions, 49% of students listed only a few points and the description was at a surface level. Only 9% of the students showed deep descriptions with detail, indicating these students had great depth and breadth of understanding of the task. The study also reported that task understanding developed at several points over time. Although this study contributed to the literature by providing a rich picture of how task understanding develops over time and provided evidence of the first phase of Winne and Hadwin's model, the features of task understanding that were explored were mainly explicit aspect of task understanding. As such, these studies explored the levels of students' understanding of task instructions and whether their understanding occurs at a surface level or deep level. Accordingly, these studies did not specifically instruct students to analyze tasks at a deep level but relied on their spontaneous analysis.

*Task understanding in SRL skills training.* Task understanding has also been explored as part of metacognition. Many studies by Butler (e.g., 1992; 1994; 1995) reported a promising effect of Strategic Content Learning (SCL) approach on students' performance. SCL is a training program where teachers or tutors learn how to assist their students to strategically regulate their studying by collaboratively creating individualized strategies that are specific to a task (Butler, 1994). With a trained SCL tutor, first, students are assisted to analyze task demands (what the requirements for the task are) and task criteria (what a good task looks like) about a task they choose from a course. This aspect is emphasized in this approach because Butler and Winne's (1995) model suggest interpreting a task is critical for effective goal planning and strategy choice (Butler, 1998). At each session, students are supported to self-regulate their studying by their SCL tutor.

Extending from previous studies (Butler, 1994; 1995), Butler (1998) investigated the effect of the Strategic Content Learning (SCL) approach on academic performance, metacognition, self-efficacy, attribution styles, and intervention transfer in 30 postsecondary students with Learning Disabilities, ranging in age from 19 to 48 years old. In this study, students' metacognition, self-efficacy, attribution styles, and strategy use before and after intervention period were measured by questionnaires and interview. The study found general increase in academic performance, metacognition (use of self-regulated strategies), and self-efficacy, and change in attribution styles for more positive ones. The results also showed 26 students used task-specific strategies in other settings and 24 students reported using acquired strategies in different tasks. In this study, task understanding was measured as one of four metacognitive dimensions (i.e., task description), and the metacognitive dimension was concerning students' perception of task requirements. This dimension corresponds to features of Hadwin's (2006) explicit task understanding. Further, studies in this area are mainly conducted in one population (e.g., students with learning disabilities) but not in other population.

Since SCL approach has been successful in promoting SRL strategies in students with learning disabilities, the approach started to be applied as instructional practices. Butler, Beckingham, and Lauscher (2005) reported how use of SCL approach as instructional practices could enhance students' performance in mathematics in three Grade 8 students. In their study, these students' learning assistants were introduced to SCL principles to co-construct instructional practices with the researchers. The cross-case comparison showed the instructors implemented SCL principles in assisting students' mathematical problem solving, paid attention to students' task interpretation, guided students' problem solving process by strategic questioning (scaffolding), and engaged in collaborative problem solving with their students. As a result, students' performance in mathematics improved. As in other studies, although this intervention was derived from Butler and Winne's (1995) model of SRL and this study illustrated instructors' awareness of the importance of task understanding in instructional practices was important, task understanding itself was not the focus of the study nor investigated from three aspects, suggested by Hadwin (2006).

Although task analysis is considered as the first fundamental step in SCL approach (Butler, 1994; 1995), it has been examined as part of SCL approach intervention effect and not studied separately. Moreover, only a few explicit and implicit features were examined in these studies (e.g., task requirements, picture of a good task). Further, these studies have not been examined among students without learning disabilities who struggle with academic tasks. Although Butler (1998) emphasizes that the first step of task analysis is fundamental in this approach, the unique contribution of task analysis in students' academic success remains unclear.

*Socio-contextual Aspect of Task Understanding*

Another focus that research about task understanding has been conducted is beliefs and values in socio-contextual aspect of task understanding. Compared to research about explicit and implicit aspects of task understanding, beliefs and values about knowledge have been researched fairly well as epistemological beliefs and increasingly investigated with relation to students' academic performance and their strategy choice as part of SRL. In this literature, studies appear to have looked at (a) relationship between students' epistemological beliefs and academic performance, (b) relationship among teacher's epistemological beliefs, student's epistemological beliefs, and academic performance, and (c) relationship between students' flexibility in epistemological beliefs and academic performance.

*Student's epistemological beliefs and academic performance.* As a review about epistemological beliefs points out that students' epistemological beliefs play an important part in their academic performance (Buehl & Alexander, 2001), research in this field consistently supports the associations between students' epistemological beliefs and their academic performance (e.g., Cano & Cardelle-Elawar, 2004; Dahl, Bals, & Turi, 2005; Schommer, 1990; 1993; Schommer et al., 1997; Schommer et al.,1992; Schommer-Aikins, Duell, & Hutter, 2005). In the study conducted by Schommer (1990), students' epistemological beliefs and the relationship between these beliefs and students' reading comprehension were investigated. In the first part of experiment, a factor analysis of Epistemological questionnaire (63 items) was conducted. There were 266 students in post-secondary education. Four factors were identified, including Innate Ability (ability to learn is innate), Simple Knowledge (Knowledge is discrete and unambiguous), Quick Learning (Learning is quick or not at all), and Certain Knowledge (Knowledge is certain). In the second part of experiment, 86 junior college students read a passage without a conclusion and were asked to complete the passage, based on what they have read, as well as write a mastery test (mastery orientation test). The study found the more the students believed in Quick Learning, the more likely they were to write oversimplified conclusions, performed poorly on mastery test, and report overconfidence on their test. Students who believed in Certain Knowledge were more likely to write absolute conclusions.

Further, Schommer (1993) examined the structure of epistemological beliefs among over 1,000 high school students and the association among epistemological beliefs, gender, and their academic performance. The results showed boys were more likely to believe in quick learning and fixed ability and students who did not believe in quick learning earned high GPA. This study was followed by Schommer et al.'s (1997) longitudinal study. In their study, 69 students were randomly selected from the previous study to examine the development of epistemological beliefs. Consistent to Schommer's (1993) study, this study also found that students who did not believe in Quick Learning obtained higher GPA.

Cano and Cardelle-Elawar (2004) examined how conceptions of learning and epistemological beliefs were related to academic performance in 1,200 secondary students. This study, using qualitative method, described students' conceptions of learning. Conceptions of learning were referred to as how students conceptualize and make sense of learning in general, and these concepts are gained through students' past experiences. The study also investigated the relationship among conceptions of learning, epistemological beliefs, and academic performance. Their regression findings indicated that Quick Learning ("Learning is quick") was the largest predictor of students' academic performance at the end of the school year. As such, research about students' personal epistemological beliefs consistently provided evidence of the association between epistemological beliefs and academic performance. However, research in this area focused on students' own epistemological beliefs, rather than students' understanding of their instructor's beliefs.

*Instructor's epistemological beliefs, students' epistemological beliefs, and academic performance.* As many strong supports for the relationship between students' epistemological beliefs and academic performance have been provided, the research began examining the associations among instructor's epistemological beliefs, students' epistemological beliefs, and academic performance. Muis and Foy (2008) examined how teachers' domain specific beliefs about knowledge and learning (beliefs about mathematics learning) affect students' beliefs and how students' beliefs about knowledge and learning affect their goal orientation, self-efficacy, and mathematics performance in 131 Grade 4 and 5 elementary school students. The study used a path analysis to find out the relations among these variables. The results showed students' self-efficacy mediated the associations between goal orientation and students' mathematics' performance. There was a positive correlation between teachers' and students' beliefs about the need for effort to learn mathematics ("Knowledge is learned"). This study also found that teachers' beliefs predicted students' beliefs and their mathematics performance. The researchers pointed out that learning context (e.g., teachers' beliefs) influences students' own beliefs, which, in turn, influences students' academic performance. In this study, students' beliefs were investigated with relation to their teacher's beliefs. However, the focus is still on students' own beliefs with relation to their performance.

*Flexibility in epistemological beliefs and academic performance.* In addition to the relation of students' own epistemological beliefs to academic performance and teachers' epistemological beliefs as an indirect influence for students' performance, students' flexibility in epistemological beliefs also appears to contribute to their academic success. For example, Simpson and Nist (1997) explored a history instructor's and 10 students' perception about the course and the exams and beliefs about knowledge and learning and compared how congruent to their instructor students' perceptions were among students with high, low, and improved grades. The study summarized the themes appeared during the interview among each student in each grade group. Overall, students with high grades in the course were congruent with their instructor's task demands, understanding of the course, and beliefs. Students with improved grades from the first test to the second displayed an increased attunement in their perceptions with the instructor's over time. Students with low grades were persistent with their own perceptions about what they believed the course was about, which was carried on from the classes they took in high school, and beliefs about learning history. These beliefs also affected the students' essay exam preparation strategies. Students with high or improved grades prepared for essay exams by actually writing essays based on what the instructor provided as studying guides and attended review sessions offered by the instructor, whereas students with low grades did so by memorizing historical facts in details and missed most sessions. Students with low grades were also reported to be inflexible in their beliefs, and even though some of these students showed congruency in their understanding of tasks, they chose not to follow this understanding because their beliefs about learning and the course contradicted to their task understanding. These students discarded the task requirements that were attuned with their instructor and chose to what was consistent to their beliefs. This inflexibility in their beliefs about learning and history might have been one of the factors that affected their performance in the course.

Flexibility in epistemological beliefs was also explored in a different way. Basing on

Hadwin's (2006) model, the study by Oshige et al. (2007) described how an instructor's and students' three levels of task understanding changed over time, as well as summarized the similarities and differences in instructor's and students' task understandings. The study also examined how the students' attunement in instructor's epistemological beliefs was related to their academic performance in 54 university students and the course instructor. The qualitative analysis showed the instructor's task understanding evolved over time. It also revealed that students' task-understanding generally became more attuned with the teacher's task-understanding over time, although the average percentages of attunment in implicit and explicit aspect were reported to range from approximately 19% to 50%. The results of the epistemological beliefs attunement showed students who were able to take their instructor's views about epistemology in Time 1 performed better on their course grades.

Hadwin et al. (2008) further examined the previous study quantitatively. In addition to the finding that students' accurate understanding of their instructor's beliefs predicted their academic performance, this study also found that students who were incongruent with their instructor in the type of thinking that the task involved students to do (a feature of implicit task understanding) performed poorly in the course. Unlike other studies, these studies investigated students' understanding of their instructor's beliefs, rather than students' own beliefs. Further, although these studies were the first to explore explicit, implicit, and socio-contextual features in one study, most features in explicit and implicit aspects were not included in their quantitative analysis. These studies were also investigated with only one instructor and with one type of tasks. Accordingly, a question remains if each aspect is related to academic performance or to what extent task understanding contributes to students' academic achievement. To address this gap in the literature, this thesis study explores aspects of task understanding across various tasks that are assigned in the classroom environment and students' academic performance.

*Statement of the Problem*

Research suggests that task understanding is an important part in students' academic success, yet students may have incomplete task understandings. To date, little is known about the kinds of academic tasks undergraduate students find challenging, the structural characteristics these tasks have, and the kinds of difficulties students have in understanding these tasks. In addition, the literature lacks empirical work as to students' understanding of academic tasks that were assigned in actual undergraduate courses and how their levels of understanding are related to academic performance. Further, the field lacks sophisticated methods for collecting and measuring data about the completeness of task understanding.

*Purpose of the Study*

The purpose of this mixed method thesis study is threefold: (a) describes students' understanding of actual academic tasks in real-life undergraduate courses, (b) examines how students' task understanding is related to their academic performance, and (c) explores measures and techniques for assessing explicit, implicit, and socio-contextual aspects of task understanding.

*Research Questions*

This study was guided by the following qualitative and quantitative questions.

Qualitative research questions:

1. What kinds of academic tasks do undergraduate students at the University of Victoria identify as a challenging task or problematic for their course?
2. In which disciplines are these tasks situated?
3. What kinds of structural characteristics do these tasks have?
4. What specific challenges in students' task analysis assignments emerge?

Quantitative research questions:

1. How does students' task analysis quality relate to their academic performance?

2. Do the scores on Explicit and Implicit aspects of task understanding, as well as overall task understanding predict academic performance?

*Hypotheses*

The hypotheses for the quantitative research questions were created:

1. There will be positive relationships between students' task understanding (Explicit, Implicit, and overall task analysis quality scores) and their academic performance.
2. The scores on Explicit, Implicit, and overall task analysis quality will predict academic performance.

*Definition of Terms*

The following definitions are offered to ensure proper interpretation of the terminology used in the study:

1. Academic task: The products that students are expected to formulate by recognizing or reproducing information learned, applying learned information to solve or analyze problems and create something new, and making judgments based on learned information, as well as the thinking processes that they are expected to use for the products (Doyle, 1983).
2. Task Understanding: Interpretation of an academic task by analyzing task requirements and rationale behind them, activating prior knowledge about the task, content, context, and self, and constructing personal reflection of the interpretation (Hadwin, 2006).
3. Task perceptions: The products or outcomes that are generated through the phase of understanding a task (Winne & Hadwin, 1998).
4. Task Analysis Quality: The extent to which students' task understanding is complete, based on criteria of Explicit, Implicit, and Socio-contextual features of a task suggested by Hadwin (2006). It also refers to general ability to analyze a

task, based on these specific task understanding components.

5. Epistemological belief: One's beliefs about knowing and how these beliefs influence the process of thinking and reasoning (Hofer & Pintrich, 1997).
6. Academic performance: Instructor's evaluation of students' academic tasks. Specifically, in this study, it refers to students' final grade for ED-D101 without Task Analysis assignment grade, Grade Point (GP) of a course from which students' task analysis assignment came, and cumulative Grade Point Average (GPA) after ED-D 101 course.

*Delimitation of the Study*

The following limitations were imposed by the researcher:

1. The study was limited to undergraduate students who enrolled in Learning Strategies for University Success (ED-D101), offered in the Fall and Spring semesters during 2007-2008 school year by the Department of Educational Psychology and Leadership Studies at the University of Victoria, BC.
2. The study was limited to the following variables: Explicit task understanding, Implicit task understanding, total Task Analysis Quality (total of Explicit, Implicit, and Socio-contextual aspects), ED-D101 course grade without task analysis assignment grade, final grade point for the target course, and cumulative GPA.
3. The study was limited to data collected from September 2007 to March 2008.
4. All variables, conditions, or populations not specified in the study were considered beyond the scope of investigation.

*Assumptions*

The following assumptions were expected to be present in this study:

1. Students who participated in the study provided accurate information

concerning their own Task Analysis and Task Analysis reflection after the interview they held with their instructor.

2. Instructors who students interviewed provided students with accurate information concerning Task Analysis questions.

# Chapter Three: Method

*Overview of Chapter Three*

This chapter describes research methodology and research design selected for the study. Characteristics of participants, research procedure, coding methods, and research designs are discussed in detail.

*Participants*

Consenting participants included 105 undergraduate students (45 males, 60 females) enrolled in the fall or spring semesters of a graded, credit bearing course, titled ED-D101: Learning Strategies for University Success at the University of Victoria in British Columbia. Six students' data were excluded from analysis due to incomplete data sets. One additional participant was removed from the data due to outlier scores that influence the skewness and kurtosis of the dependent measures. Closer examination of the data indicated the participant had not completed all course assignments and not fully engaged in the course. Participants included in the data analysis were 98 students (41 males, 57 females). Demographics are provided in tables 1 and 2. Independent Samples t-test comparing students in the fall and spring semesters revealed statistically significant differences in participants' age and number of years in school ($t(96) = -2.32$, $p < .05$ and $t(96) = -3.38$, $p < .01$, respectively) but no difference in their entrance grades ($t(78) = .85$, *n.s*), ED-D course grade ($t(96) = -.28$, *n.s)*, Target course GP($t(91) = .51$, *n.s*), and Cumulative GPA ($t(96) = -.33$, *n.s*). Data were combined for the remainder of the analyses because these students represent the target undergraduate population for this research.

Table 1. Number of Participated Students in Each Faculty

| Semesters | Total | Fall | Spring |
|---|---|---|---|
| Humanities | 14 | 9 | 5 |
| Social Sciences | 55 | 27 | 28 |
| Sciences | 18 | 13 | 5 |
| Fine Arts | 5 | 5 | 0 |
| Education | 3 | 0 | 3 |
| Human and Social Development | 1 | 1 | 0 |
| Business | 2 | 0 | 2 |
| Total | 98 | 55 | 43 |

Table 2. Summary of Demographic Information and Comparison between Fall and Spring

| | Total (*n* = 98) | | | Fall (*n* = 55) | | | Spring (*n* = 43) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *Min-Max* | *M* | *SD* | *Min-Max* | *M* | *SD* | *Min-Max* | *t* | *p* |
| Age | 19.16 | 2.23 | 17-33 | 18.71 | 1.51 | 17-26 | 19.74 | 2.84 | 17-33 | -2.32* | .02 |
| Years in school | 1.34 | .57 | 1-3 | 1.18 | .48 | 1-3 | 1.56 | .63 | 1-3 | -3.38** | .001 |
| Entrance grades† | 80.63 | 5.75 | 69.5 - 93.87 | 81.10 | 6.14 | 69.5 - 93.87 | 79.97 | 5.17 | 70.75 - 92.5 | .85 | .40 |
| ED-D grades | 63.41 | 8.42 | 41.5-81.05 | 63.2 | 9.28 | 41.5-81.05 | 63.67 | 7.28 | 47-76.5 | -.28 | .78 |
| Target course GP† | 5.16 | 1.99 | 0-9 | 5.26 | 2.06 | 0-9 | 5.05 | 1.93 | 0-9 | .51 | .61 |
| GPA | 5.18 | 1.54 | 1.33 -8.2 | 5.13 | 1.59 | 1.33-8.13 | 5.24 | 1.49 | 1.5-8.2 | -.33 | .74 |

*: $p < .05$, **: $p < .01$

†: Due to unavailability of the data, *n* for Entrance grade and Targeted course PG differed from the number of participants (For Entrance grade: *n* = 80 for total, including *n* = 49 for Fall and *n* = 31 for Spring; for Targeted course GP: *n* = 93 for total, including *n* = 50 for Fall and *n* = 43 for Spring).

*Course and Task Context*

ED-D101: Learning Strategies for University Success is a 13-week graded, credit-bearing course open for undergraduate university students across campus. Course grades comprise quizzes, lab activities, and four major assignments. The Task Analysis assignment was the target activity for this research. Task Analysis assignment was consisted of three parts: (1) student's analysis of a course task (Part 1), (2) student's report of an interview with their course instructor who assigned the task (Part 2), and (3) student's self-evaluation of their analysis of a course task by comparing with their interview results (Part 3).

*Description of Instruments*

*Demographic Information.* Demographic information was limited to data collected by institutional planning and statistics. It included information about: age, sex, number of years of study, faculty, entering high school grade or GPA, grades and GPA at the end of each semester, and cumulative GPA of all semesters since the beginning of their study. For the actual task analysis assignment for the spring semester, but not for the fall semester, students also provided information about the target undergraduate course such as the name of the course task, course number, course name, and course instructor.

*Task Analysis Assignment.* The Task Analysis assignment was based on Task Analyzer (Hadwin & Jamieson-Noel, 2004). The Task Analysis assignment consisted of three parts (see Table 3 and Appendix A and B). *Part 1* assessed student's understanding of a task or assignment in another undergraduate course. *Part 2* reported student findings on an interview with course instructor for the task analyzed in Part 1. *Part 3* included student's self-evaluation of their analysis of a course task by comparing Part 1 and 2 responses. Data from Part 1 and 3 were used for this thesis study. Part 2 data was excluded because: (a) instructor consent to examine reports of the interviews was not obtained, and (b) student reporting of instructor interviews varied greatly in terms of detail and accuracy. In deciding which task to analyze, students were instructed to: (a) choose an academic task from one of their courses other than ED-D101, and (b) select a task they found to be challenging, or a task that requires effort to "figure out."

Part 1 of the Task Analysis assignment included 9 open-ended for the fall and 10 for the spring and 7 close-ended questions for both semesters. Questions were designed to tap into three aspects of task understanding, including Explicit, Implicit, and Socio-contextual aspects of the task.

*Explicit aspect of a task.* Five open-ended questions addressing explicit aspects of a task included: (a) What is the task? Provide a brief description of the task, including the task instructions (Describe), (b) List the important criteria in order to complete the task (Criteria), and (c) Make a summary list of key instructions, words, and statements from the assignment description, syllabus, or class notes (Key Information). The Key Information question was used only for the spring semester. The two other questions were provided as a set of questions. After choosing a term(s) that would be important to complete the task from the list provided, students were asked to explain what the term they chose means in their own words. The list of terms included Apply, Remember, Understand, Analyze, Evaluate, and Create for the kind of thinking that would be important to the task (Thinking) and Metacognitive, Procedural, Conceptual, and Factual for the kind of knowledge that would be important to the task (Knowledge). Choosing the applicable terms were closed-questions and were considered to tap into socio-contextual aspect.

*Implicit aspect of a task.* At the implicit level, students were asked about (a) the purpose of the task (Why), (b) the kind of resources needed for the task completion (Resources), (c) the kind of course concepts to be used for the task completion (Concepts), and (d) the description of an excellent task (Top Quality). Based on reviews of typical undergraduate assignments, it was assumed that these aspects of the task were more implicit, or not described explicitly for students in assignment descriptions or instructor instructions. All of the questions were open-ended.

*Socio-contextual aspect of a task.* Socio-contextual measures included students' perception of their instructor's beliefs about knowledge and used Epistemological Beliefs Inventory for Students, revised from Shraw, Bendixen, and Dunkel' (2002) EBI. Students were asked to rate each statement according to their instructor's perspectives on the scale of 0 (strongly agree) to 5 (strongly disagree).

Part 2 of the assignment required students to interview the course instructor who assigned the target task, using the questions in the Task Analysis assignment. All questions, except questions about the task description and about student's confidence level of understanding, paralleled those completed by students in Part 1. Thus, the Part 2 of the Task Analysis assignment consisted of interviewing the instructor for the target task about key information in the assignment description (Key Information), the kind of thinking and knowledge that are important in the task (Thinking and Knowledge, respectively) and its meaning of the term they chose, the purpose of the task in their course (Why), the important criteria for the task (Criteria), the kind of resources needed for the task completion (Resources), the course concepts needed for the task completion (Course Concepts), the description of an excellent task (Excellent), and their instructor's EBI. Similar to Part 1, Key Information question was asked only for the spring semester. After the interview, students were instructed to fill out the interview result in the Task Analysis assignment. This part was excluded from the analysis.

Part 3 of the Task Analysis assignment, required students to review, compare, and reflect upon Part 1 and 2 data with a goal of self-evaluating the completeness and accuracy of their original task understanding. First, students were asked to report their correlation coefficiency (*r*) that was obtained by entering their prediction of instructor's EBI and their instructor's own EBI. The *r* was automatically calculated for students when they enter both. Students were asked to rate their understanding of the explicit, implicit, and socio-contextual features of the task on the scale of 0 (not confident at all) to 10 (completely confident) and explain how and why their understanding of these features was similar or different from their instructor's understanding by comparing their original interpretation of the task with their report of instructor's interpretation of the task. It also asked students to reflect on their overall understanding of the task whether their task understanding and their self-confidence in completing the task have improved after having completed this Task Analysis assignment.

Table 3. Overview of Task Analysis assignment

| | Part 1<br>Student's original understanding of a task | Part 2 (excluded for analysis)<br>Instructor's understanding of a task | Part 3<br>Student's reflection of their understanding |
|---|---|---|---|
| Summary of TA instruction | Students analyze a task of their choice by answering the following questions. | Students interview their instructor by using the questions and report their interview about instructor's understanding. | Students compare and reflect their understanding of a task. |
| Explicit | Describe<br>Criteria<br>Type of thinking<br>Type of knowledge<br>(Key Information*) | Parallel questions | Compare student's overall Explicit understanding with instructor's |
| Implicit | Purpose<br>Resources<br>Course Concepts<br>Top Quality | Parallel questions | Compare student's overall Implicit understanding with instructor's and reflect their understanding |
| Socio-contextual | Predict their instructor's beliefs about knowledge and learning, using EBI | Instructor's own beliefs, using EBI | Report correlation coefficient<br>Reflect overall Socio-contextual understanding |

* Key Information was included only in Spring semester and merged with Describe data in coding.

*Variables*

*Task analysis quality.* Task Analysis Quality (TAQ) is defined as the extent to which students' Task Understanding is complete, based on specific components suggested by Hadwin's (2006) model of task understanding. It measured students' general Task Understanding ability. The TAQ was consisted of Explicit, Implicit, and Socio-contextual scores. Explicit and Implicit scores were generated using coding criteria. Importantly, quality was judged based on the completeness of student responses, rather than accuracy of task understanding, which is measured by comparisons with instructor responses. Coding criteria for Explicit and Implicit were outlined in Appendix E.

*Scoring Explicit, Implicit, and TAQ.* After all data were coded and assigned a score of 0 to 2 on each Explicit and Implicit question, scores on Describe, Thinking, Knowledge, and Criteria were summed as students' Explicit scores, and scores on Why, Concepts, Resources, and Excellent were summed as their Implicit scores. The total scores for Explicit and Implicit aspects ranged from 0 to 8, respectively. For Socio-contextual aspect, the self-reported inter-rater reliability correlation coefficiency (*r*) that was reported in Part 3 was used. This self-reported *r* was categorized according to Cohen's effect sizes (Cohen & Marion, 1994). When the student-reported *r* was lower than .35, a score of 0 was given, representing poor attunement. When the *r* was equal to or higher than .35 and lower than .65, a score of 1 was given, representing medium attunement. The *r* that was equal to or higher than .65 was given a score of 2, representing high attunement. Thus, the scores of Socio-contextual aspect ranged from 0 to 2. The total TAQ scores ranged from 0 to 18, accordingly. While it is possible that students could have tampered with the *r*-value produced in the provided Excel spreadsheet, it was expected that this tampering was less likely the case because: (a) the reported *r*-values varied greatly across students ($-.08 < r < 1$), (b) they were reasonably normally distributed ($M = .56$, $SD = .23$, kurtosis = -.23, skewness = -.60), and (c) student's explanations of their *r*-values in their Part 3 reflection indicated that many of them did not really understand what the *r*-value represented. However, this *r* was an indirect measure of attunment because it was reported by the students. The results should be interpreted with caution.

*Academic performance.* Academic performance was measured by: (a) students' total grade for ED-D101 course excluding their Task Analysis grade (out of 80), (b) 9-point grade point (GP) for the target course from which student's task-analyzed task came, and (c) 9-point Grade Point Average since they took ED-D101 course (cumulative GPA after ED-D101). The GP for the target course was retrieved from the institutional data. The cumulative GPA after ED-D101 was calculated based on GP for all courses taken since students took ED-D101. Thus, for the fall semester, GPs for all courses taken in the fall and spring semesters were used for the calculation, and for the spring semester, GPs for the spring semester were used. These measures for academic performance may not be the perfect measures; however, they are often used for students to evaluate and adjust their learning in university and for university to assess students' academic level.

*Recruitment Procedures*

Recruitment procedures were the same for each semester. The course instructor described the larger project, which contained the current thesis study. After the explanation and an opportunity for students to ask questions, the instructional team left the classroom. Research assistants answered questions regarding the study, distributed the consent forms, and collected them. Students were instructed to return the consent form whether it was signed or not. The instructor and lab instructors did not know who agreed to participate in the study until final grades were submitted. Copies of the consent forms were distributed electronically. Students were reminded about the study at the end of the course. They were reminded that they could contact the research assistants if they wanted to participate or withdraw from the study at that point.

*Research Design*

The type of design used for this study was a mix methods design. This method was chosen because the data used were derived from open-ended questions. Thus, the data were summarized using qualitative analyses. Then, drawing on content analysis of open-ended questions, a correlational design was used to examine the relationship between task analysis ability and academic performance. In using content analysis, measures of task-understanding were also generated.

# Chapter Four: Findings

*Overview of Chapter Four*

This chapter reports the qualitative and quantitative analyses conducted in this study. Content analysis was used to summarize and describe (1) the kind of academic tasks undergraduate students identified as challenging for their course, (2) the kind of courses and disciplines in which these tasks were situated, (3) the level of structure (ill-defined task to well-defined tasks) characterizing these tasks have, and (4) the kinds of challenges in their tasks analysis assignment identified by the researcher.

Pearson correlation was used to examine the relationship of students' task understanding (Explicit, Implicit, and Total Task Analysis Quality scores) and academic performance (ED-D101 course grade, target course GP, and cumulative GPA after ED-D101). Second, to investigate task understanding aspects as predictors of academic success, a standard multiple regression analysis was used. Total Explicit and Implicit scores were entered as predictor variables, when any statistically significant relationship was detected in the correlational analysis. Third, total TAQ score was examined if overall task understanding ability would predict academic performance. Lastly, additional analyses were conducted to examine unique contribution of task understanding to the prediction after controlling the contribution of students' Entrance grade by using a hierarchical regression.

*What Kinds of Academic Tasks Do Students Find Challenging?*

*Coding the types of academic tasks.* Task Analysis assignment for the fall semester did not ask students to provide the name of the tasks they analyzed. For the spring semester data tasks were labeled but student generated labels for tasks were not used consistently (e.g., "quiz" was listed as the task, while its description indicated "chapter questions" that gave students grades). Therefore, categorizing task type was the first stage of analysis.

Task type coding involved three procedures. First, 10 data sets were reviewed. The researcher highlighted the parts where students wrote the actual name of their assignment or any indication of the task characteristics in their responses in Part 1 and 3 of their Task Analysis assignments and kept notes of each task characteristics. Based on these 10 data sets, the researcher's experience as an academic assistant, and the course instructor's experiences, three main and seven specific task categories were identified for further coding: (1) Exams consisting of quizzes (e.g., chapter quizzes) and exams (e.g., midterm, final); (2) Papers consisting of: narrative/expository essays, research papers, experimental reports, and short written assignments; and (3) Other projects such as group paper, interview report, group lab report, and paragraph analysis exercise. All tasks were coded using those seven categories. Throughout, words representing task characteristics were highlighted, and brief task summaries, as well as researcher's notes, were written. This process was taken for two reasons: (a) to maintain the consistency and confirm the similarities in each category and (b) to capture newly emerging categories, if any. When a new commonality emerged (i.e., when a common characteristics were seen in more than three tasks), an asterisk mark was placed beside the task type code to indicate a possible new category for a later review. Three iterative cycles of coding were conducted to refine the coding scheme and identify distinct categories of tasks with minimal overlap or redundancy.

Table 4 presents final coding criteria for each task type, summaries, and examples.

Table 4. Coding Criteria for Task Types, Number of Tasks in Each Type, and Examples

| Task types | Characteristics | Tasks (n = 98) | Examples |
|---|---|---|---|
| Exams: | | | |
| (a) Quizzes | Tests on a small section or a chapter<br>Usually provided a small section of a class time to complete it | 3 | Vocabulary quiz, chapter comprehension test |
| (b) Exams | Tests that cover many chapters and usually has significantly high weight on a final grade<br>Tasks that evaluate student's knowledge about covered materials up to a certain time of a course.<br>Usually provided a class time to complete the task. | 12 | Midterm exams, final exams |
| Essays: | | | |
| (a) Narrative & Expository essays | Written assignments that discuss student's opinion about a provided topic.<br>The assignments also require students to follow specific writing genre (e.g., Persuasive, Cause and effect, Compare/Contrast, Narrative)<br>The content tends to be introspective, subjective, and qualitative<br>The evidence to support their opinion can be originated from their own insights, or external sources, such as scholarly journal articles. | 9 | Persuasive essays, compare/contrast essays, personal reflections |
| (b) Research papers | Written assignments that involves database searching activities.<br>Researching is required part of this assignment in order to discuss a topic provided or topic of student's choice.<br>Involves with presenting what the field or literature says about the topic<br>Form their opinion according to these findings<br>Synthesis of journal articles or studies<br>Objective in a sense that students need to support their opinions by providing evidence from external sources, such as scholarly articles.<br>Also known as literature review | 17 | Write a research paper about …. |
| (c) Experimental reports | Written assignments that involve conducting an experiment and writing a report about the experiment | 5 | science lab reports, intervention reports, observational report |

| | | | |
|---|---|---|---|
| (d) Analysis papers | Written assignments that require students to decompose a provided material (e.g., story, poem, book, film, art, a case report), based on targeted concepts and provide their interpretation of a piece.<br>The content tends to be introspective, subjective, and qualitative<br>The evidence to support their interpretation comes from the material itself or the targeted concepts. | 19 | Poem analysis, book analysis, film analysis, art analysis, play analysis |
| Group projects | Assignments that require students to work with their peers. | 6 | Group presentation, collaborative paper, group database creation |
| Other individual projects | Assignments that did not fall under above categories<br>Some of them were combined with a different task | 15 | art work, business letter, interview report, intervention creation, translation, poem analysis presentation, article critique and discussion questions, poster, pamphlet |
| Chapter questions | Assignments that consist of a series of questions to solve or answer. | 12 | Problems sets, chapter concept questions |

*Summary of challenging tasks identified.* Table 4 shows that students found a wide array of tasks challenging. This variety indicates no particular tasks were more difficult than others. However, a closer look at its distribution between first year and upper year students displayed certain patterns (see Table 5). First, Narrative/Expository essays were listed only by the first year students. Although students might have engaged in writing essays in a high school, shifting in writing from high school level to university level seemed to pose new challenges for freshmen. Further, challenges with essay writing occurred across courses and subject areas and were not confined to courses about writing. This trend might suggest that students struggled with writing in the disciplines more than structuring writing generally.

Research papers were most frequently listed as a challenging academic task by first year students. However, a much smaller number of upper year students listed research papers as challenging, suggesting that either: (a) fewer research papers were assigned in upper year courses, or more likely (b) students became more comfortable with these types of assignments in later years.

Analysis papers were almost equally chosen by both first year and upper year students. The kind of materials to be analyzed varied and included poems, plays, short stories, films, books, journal articles, art work, case study, and physical skills (e.g., sports). Thus, these tasks came from various disciplines. Some analysis-related tasks were assigned in a form of group work, individual presentations, and critiques. When these other forms of analysis were included, this task appeared to be the one that students listed the most.

Finally, chapter questions were indentified as challenging by 9 first year students and 3 upper year students. Students who analyzed this task responded that the task instruction was “clearly stated” (Participant 58) and “in the course syllabus” (Participant 16, 38).Thus, the task instruction (e.g., figuring out what the final product should look like) might not be difficult, but the task content (e.g., what concepts to use in what problem) might be.

Table 5. Summary of Listed Tasks by First Year and Upper Year in School

| | 1st year | 2nd year and up | Total |
|---|---|---|---|
| Quiz | 1 | 2 | 3 |
| Exams | 8 | 4 | 12 |
| Narrative/Expository essays | 9 | 0 | 9 |
| Research papers | 13 | 4 | 17 |
| Experimental reports | 3 | 2 | 5 |
| Analysis papers | 12 | 7 | 19 |
| Group Projects | 4 | 2 | 6 |
| Individual projects | 10 | 5 | 15 |
| Chapter Questions | 9 | 3 | 12 |
| Total | 69 | 29 | 98 |

*How Were Challenging Tasks Distributed Across Disciplines?*

*Identifying target courses.* For the spring semester, students were asked to provide the name of the task on which they chose to do task analysis and the name of the course from which the task was chosen. Accordingly, these data were used for the identification. In the fall semester, the Task Analysis assignment did not ask students to report the name of the task or the course from which the task was chosen. When it was difficult to identify the course from students' responses in their Task Analysis assignments, the course was labeled "Not Applicable." In all other instances, course names were identified using two steps. First, general name of tasks and its courses were identified from students' responses in Part 1 and 3 of their Task Analysis assignments and task type assigned in the previous categorization. When students stated the name of the course in their Task Analysis assignments, that name was used for the second step. In other instances, parts that indicated the course characteristics were marked to identify the specific course names later. When the names of the tasks and courses had multiple possibilities, all possible tasks and courses were listed. Second, based on the general names of tasks and courses that were determined at the first step, students' academic records were used to identify the specific course numbers and names. When more than two possible corresponding courses existed, the marked parts at the first step were compared with the course description in the academic calendar in order to confirm the best matching course in which students task-analyzed task were situated.

*Discipline areas reflected in task analysis assignment.* Table 6 summarizes the range of courses from which students' Task Analysis assignments originated, the faculties and departments to which these courses belong, and the frequency of tasks categorized under each discipline. The distribution of challenges across courses was not aligned with the overall demographics of the students. A higher percentage of students came from Social Sciences, while many humanities tasks were listed. These tasks were mostly in the first year level. This figure may be interpreted as that many courses that students are required to take in the first year for their program were in Humanities. For example, courses in which students learn about academic writing skills would be one of the common courses that students take during the first year, before taking any other courses.

Table 6. Disciplines and Courses in which Students' Task-Analyzed Tasks Were Situated

| Faculties and Departments | Tasks Analyzed (n = 98) | Sample courses |
|---|---|---|
| **Humanities:** | **42** | |
| English | 20 | University Writing,<br>Poetry and Short Fiction,<br>Academic Reading and Writing,<br>Drama and the Novel,<br>Technical Communications: Written and Verbal* |
| Germanic and Slavic Studies | 1 | German for Beginners: II |
| Greek and Roman Studies | 2 | Greek and Roman Mythology* |
| Hispanic and Italian Studies | 2 | Spanish for Beginners: I,<br>Advanced Composition, Translation, and Stylistics: I* |
| History | 10 | Introduction to 20th Century World History,<br>History of Canada,<br>History in Modern Europe* |
| Pacific and Asian Studies | 2 | Chinese Culture I*, Contemporary Chinese Literature and Culture* |
| Philosophy | 2 | Introduction to Philosophy,<br>Applied Logics* |
| Women's Studies | 3 | Introduction to Women's Studies |
| **Science:** | **14** | |
| Biology | 8 | General Biology I & II,<br>Modern Biology,<br>Principles of Genetics*,<br>Biology of Marine Invertebrate*,<br>Animal Behaviour*, |

| | | |
|---|---|---|
| | | Conservation Biology*, Survey of Invertebrate* |
| Chemistry | 1 | Fundamentals of Chemistry |
| Mathematics and Statistics | 5 | Calculus I, Calculus for Students in the Social and Biological Science, Finite Mathematics |
| **Social Science:** | **18** | |
| Anthropology | 1 | Introduction to Anthropology |
| Economics | 5 | Principles of Microeconomics, The Economy and the Environment, Managerial Economics* |
| Geography | 1 | Geography of Canada* |
| Political Science | 2 | Introduction to Political Theory, Canadian Government |
| Psychology | 7 | Introductory Psychology: Biological and Cognitive Emphasis, Health Psychology* |
| Sociology | 2 | Introduction to Sociology |
| **Business:** | **2** | |
| Commerce | 2 | Organizational Behaviour*, Business English and Communications* |
| **Engineering:** | **3** | |
| Computer Science | 3 | Elementary Computing, Computers and Information Processing |
| **Education:** | **4** | |
| Art Education | 1 | Printmaking* |
| Physical Education | 3 | Interdisciplinary study of Physical Activities, Human Wellness, and Potential, Volleyball, Active Health* |
| **Fine Arts:** | **7** | |
| History in Art | 4 | Introduction to History in Art, Introduction to Film Studies* |
| Theatre | 1 | Introduction to Theatre |
| Writing | 2 | Introduction to professional non-fiction, Journalism* |
| **Human & Social Development:** | **3** | |
| Child and Youth Care | 2 | Introduction to Professional Child and Youth Care Practice Introduction to Families: Issues, Patterns, and Processes |
| Health Information Science | 1 | Organizational Behaviour and Change Management* |
| **Interdisciplinary Program:** | **1** | |
| Canadian Studies | 1 | Introduction to Canadian Culture |
| **Not Applicable** | **4** | Not enough information provided by students about what the course was |

*: The courses are upper level (200 and above).

*What Were the Structural Characteristics of These Academic Tasks?*

*Coding task structures.* Coding for task structures started with dichotomous categories (i.e., Well-structured and Ill-structured tasks). These categories were loosely derived from Kitchener's (1983) definition of well-structured tasks as those for which the elements necessary for solutions are knowable and known and ill-structured problems as those for which there is no single or unequivocal solution.

Students' responses in Part 1 and 3 of their Task Analysis assignments were used to determine the level of structure for a given task. First, 10 data were coded using dichotomous category. After this dichotomous coding, these data were reviewed to refine the category. According to Frederiksen (1984), well-structured and ill-structured task cognition is on a continuum, rather than dichotomy. This continuum nature of task structures was adopted. Four categories were created, including (a) well-structured, (b) moderately well-structured, (c) moderately ill-structured, and (d) ill-structured. In order to determine the specific coding criteria for these categories, the coder continued to mark any indication of well-structured and ill-structured tasks, along with coder's notes.

Before the second iteration of coding, these notes were reviewed to refine the coding criteria. The review generated two levels of task structure: instruction level and content level. Well-structured and ill-structured instructions were determined by the degree of specificity, concreteness, and inference from student description of the task instruction. When an instruction appeared specific and concrete, the task was coded as Well-structured task. When an instruction appeared to expect students to infer what to do from it, the task was coded as Ill-structured task. Similarly, well-structured and ill-structured task content was determined by the degree of specificity, concreteness, and figuring out in terms of cognitive engagement. When a task appeared to provide students with pre-determined procedure to reach a final product (e.g., providing specific steps to write a research paper), the task was categorized as having well-structured components in it. When a task appeared to have students determine how to reach a final product, the task was categorized as having ill-structured components in it. This 2 by 2 categorization procedure was used for coding task structures. Table 6 summarizes final coding criteria for each level, number of tasks categorized under each structural characteristics, and example tasks.

Coding task structures was an additional analysis that emerged during coding task types, its disciplines, and Task Analysis Quality. Its necessity arose in order to (a) increase the accuracy of coding task types and its disciplines because the Task Analysis assignment did not ask students to provide this information, leading the researcher to infer from students' description, (b) further provide a rich picture of where students' struggles lie in various academic tasks, and (c) create accurate coding criteria for Task Analysis Quality, in particular, the purpose of the task because its target learning objectives would greatly differ from assigning well-structured tasks to ill-structured tasks. Further, it should be noted that these data were reported by students; thus, it is students' interpretation of an assigned task that was used to categorize. Because students' description of the task may differ from what instructors actually intended to assign, it is possible that the tasks were not accurately categorized.

*Summary and findings of task structures.* Table 7 shows that only 3 tasks were categorized as Well-structured, and 14 were as Moderately well-structured. Most tasks were characterized as having ill-structured, indicating that students perceive those tasks as challenging to understand.

Table 7. Coding Criteria of Task Structures, Number of Tasks in Each Task Structure, and Examples of Tasks

| | Characteristics | | Tasks | |
|---|---|---|---|---|
| Task structure | Task Instruction Level | Task Content Level | (n = 98) | Examples |
| Well-structured task | Specific and concrete instruction.<br>Framework of a task is explicitly written out in the instruction. | The task (or questions in the task) has only one correct answer, and there is a specific and guaranteed procedure to reach the final solution. | 3 | Vocabulary test, remembering experimental procedure |
| Moderately Well-structured task | Specific and concrete instruction.<br>Framework of a task is explicitly written out in the instruction. | To solve problems or answer questions in the task, students are expected to infer what concept(s) to use from learning materials.<br>More than one correct answers or more than one correct ways to reach the final solution can exist.<br>These processes are not written out in the instruction. | 14 | Mathematics problem sets for a chapter,<br>chapter concepts questions |
| Moderately Ill-structured task | The instruction of a task contains many discipline specific terms, concepts, and genre which students are expected to know what they mean (e.g., “portfolio,” “MLA style,” “persuasive essay,” etc) It also uses language that allows multiple interpretations (e.g., “analyze,” “understand”).<br><br>Students are usually expected to infer the framework of the task from the instruction, although the instruction may provide the framework as scaffolding. | In order to complete the task, students are expected to infer what concepts, procedures, and resources to use.<br><br>More than one appropriate procedure to reach the final product can exist, and students are expected to make a decision as to how to solve the problem on their own. However, the instruction also provides specific and concrete steps or scaffolding to reach a final product. The examples of scaffolding are providing a sample procedure to reach a final product, directing students to search for particular resources, and listing specific concepts, theories, principles to be used. | 26 | Studying for a midterm exam, where an explicitly written, concrete study questions are provided to students.<br><br>Analysis paper, where specific concepts, theories, or formulae to be used for their analysis are explicitly written in the instruction |
| Ill-structured task | The instruction of a task contains many discipline specific terms, concepts, and genre which students are expected to know what they mean. It also uses language that allows multiple interpretations.<br><br>Students are expected to infer the framework of the task from the instruction or have internalized what an instructor refers to. No scaffolding (specific and concrete steps or procedures) to reach a solution is provided. | In order to complete the task, students are expected to infer what concepts, procedures, and resources to use.<br><br>There can be more than one appropriate procedure to reach the final product, and students are expected to make a decision as to how to solve the problem on their own.<br><br>No specific and concrete steps or scaffolding to reach a final product is provided, and students are expected to infer what they are. | 55 | Studying for an exam, where only the areas that the exam covers are provided to students<br><br>Research paper, where students are asked to develop a topic, research about it, and write about it, on their own |

The distribution of task structures by task types is shown in Table 8. A large proportion of the ill-structured tasks were also categorized as essays, papers, or reports. This distribution is not surprising since essays and term papers are often less prescribed, leaving room for interpretation and choice regarding both the process and the product. Overall, tasks that require students to make inferences and decisions about what concepts to use and how to proceed a task posed challenges for these undergraduate students. Importantly, these tasks are powerful tools for students to deepen conceptual understandings, think critically about topics and issues, and construct meaning in their disciplines because of the nature of the tasks. In essence, these tasks are the kinds of authentic tasks that would be recommended to prepare for students for academic and professional pursuits.

Table 8. Detailed Distribution of Task Structures in Each Task Type

| | | Task Structures | | | |
|---|---|---|---|---|---|
| Task Types | Tasks Analyzed | Well-structured | Moderately Well-structured | Moderately Ill-structured | Ill-structured |
| Exams: | | | | | |
| Quizzes | 3 | 2 | | 1 | |
| Exams | 12 | | | 5 | 7 |
| Essays: | | | | | |
| Narrative/Expository essays | 9 | | | 2 | 7 |
| Research papers | 17 | | | | 17 |
| Experimental reports | 5 | | 1 | 1 | 3 |
| Analysis papers | 19 | | | 9 | 10 |
| Group projects | 6 | | | 1 | 5 |
| Other individual projects | 15 | | 2 | 7 | 6 |
| Chapter questions | 12 | 1 | 11 | | |
| Total (n = 98) | 98 | 3 | 14 | 26 | 55 |

*What Specific Challenges in Students' Task Analysis Assignments Emerged?*

*Finding themes in struggling task analysis assignments.* To identify patterns of weaknesses in task understanding competency, these characteristics were summarized according to themes. Three sources were used to create the summarizing keys: (a) coder's notes taken during Task Type coding, identification of target courses, Task Structure coding, and Task Analysis Quality coding, (b) coding criteria for Task Analysis Quality, and (c) students' responses in their Task Analysis assignments. In coding Task Analysis Quality, a score of 0, 1, or 2 was assigned to students' responses to each Task Analysis question, depending on the level of analysis quality. For this summary, the coding criteria and responses that received 0 or 1 in Task Analysis Quality coding (the detailed procedure for TAQ coding is described below) were used as the main data to categorize, and reflection part (Part 3) in students' Task Analysis assignments as supplementary data. These data were coded for existence of concepts, rather than frequency of concepts as in the other coding. From responses that received 0 or 1, reviewing TAQ coding criteria and corresponding students' responses generated five salient themes. From students' reflection data, two main themes arose. For this data set, their responses were, first, categorized into four groups, depending on the level of mastery of each aspect of task understanding. The mastery was judged based on whether students' reflections showed understanding of each aspect and used specific examples to support their understanding. Further, responses that showed important realization, such as "I did not understand the big picture of why I was being asked to do this assignment" (Participant 12) and "I can now see how valuable it is to really be on track with defining words properly, according to their intended meaning for the target area" (Participant 13) were marked in red. Responses that showed important realization but appeared in an inaccurate reflection (e.g., responses such as "I realize that the assignment it meant to teach my peers…" appear in Socio-contextual reflection) were marked in blue. This process was for confirming that students missed certain points of analysis in their original task understanding. Although these realizations could be interpreted as students' ability to modify and adjust their understanding, the classification was excluded for this study. However, this coding might be useful in the future study to examine how students regulate their task understanding. The final categories included seven salient difficulties in students' Task Analysis activity. The key themes and corresponding example quotes are presented in Table 9.

*Specific challenges in students' task analysis assignments.* A total of seven main challenges were identified. These challenges included: (a) misunderstanding questions, (b) lack of specific and concrete analysis, (c) structural and mechanical focus in task analysis, (d) lack of connection with a broader context, (e) externalized responsibility in learning, (f) inaccurate understanding of epistemological beliefs, and (g) difficulty in taking instructor's perspectives of beliefs.

*(a) Misinterpreted questions.* Looking across TAQ coding criteria and corresponding students' responses showed that Task Analysis questions were not accurately interpreted, or tasks were not analyzed from different angles; accordingly, their responses tended to wander. This pattern was seen across questions, regardless of tasks. Responses tended to touch on part of questions but miss essential points in answering them. For example, students wrote the purpose of a task in the question about describing the task, or vice versa. Often students defined terms or concepts using the term itself rather than their own explanation. These responses possibly reflect their ambiguous or biased understandings of the task, as well as lack of skills to express their understanding in a way that a question asks.

*(b) Lack of specific and concrete analysis.* Weak responses in their Task Analysis assignment often lacked specificity and concreteness in their explanation. This pattern was, again, seen across questions. Although these answers did not miss an essential point, they were expressed using general and broad terms and were not anchored to the task students analyzed. Accordingly, the responses tended to be vague. These vague responses reflect, although students might have some idea about what the task is, their understanding is not thorough nor complete enough to explain it in concrete terms and specific to the task.

*(c) Focusing on mechanical aspect of a task.* Responses receiving 0 or 1 in Task Analysis Quality coding were also characterized by heavy focus on structural and mechanical

part in their task analysis. This characteristic was often seen in the questions, *What do you see as the most important criteria for this task?, What makes an excellent (A+) version of this task?*, and *Why has the instructor assigned this?* These responses emphasized the importance of structure and mechanics in a task, as well as neatness in its presentation, and listed grammar, punctuation, and citation as its task criteria and high quality task.

*(d) Lack of connection between a current task and a bigger picture.* This trend was salient in responses to the question, *Why has the instructor assigned this? In other words, what do you see as the main purpose of this task in your course?* Students struggled with understanding instructors' intentions in assigning academic tasks, even with well-structured tasks such as Chapter questions. Accordingly, the reasons were often presented only at the surface level and rather superficial. Some students could not see how the assigned task was connected to a bigger picture until they interviewed their professor. Thus, in their reflection part, they tended to report that they realized the task was more than just answering questions.

*(e) Lack of sense of responsibility as a learner.* Students' responses in the question, *Why has the instructor assigned this?* also showed that some students attributed the purpose of the task to external factors. These responses often contained words indicating the task was not for self-learning but for someone else. Responses indicated that the task was assigned to demonstrate their competence, rather than to develop the target abilities and knowledge. Although these reasons might hold some truth in some courses and contexts, this kind of reasoning reflects the lack of students' locus of control in learning; it is more external than internal. Further, some responses expressed lack of sense of learning responsibility more directly by indicating that a task was assigned for the instructors to know how to modify their teaching. This type of reasoning also appeared in students' reflection part.

*(f) Inaccurate socio-contextual understanding.* Reviewing students' reflection of socio-contextual understanding showed that their understanding of epistemological beliefs

was particularly weak. Although the accuracy of understanding of each aspect was not the focus of this study, it was apparent that many students had difficulties with understanding epistemological beliefs. Students tended to over-estimate their level of understanding of their instructor's epistemological beliefs, did not understand its importance in learning, or completely misunderstood socio-contextual aspects of a task. These characteristics indicate that understanding what epistemological beliefs are and how the beliefs might influence instructional practice, as well as their learning, was very difficult for students.

*(g) Difficulties in taking instructor's perspectives of epistemological beliefs.* Reviewing students' reflections about socio-contextual understanding revealed that taking their instructor's perspectives in terms of their epistemological beliefs was challenging. In the EBI questionnaire used in the task analysis assignment, the questions were explicitly instructed students to consider their instructor's beliefs, not their own beliefs. Even though each question started with "I think my professor believes …," students who struggled with taking their instructor's perspectives answered their own epistemological beliefs to these questions. As a result, in their socio-contextual reflection, their own beliefs were compared with their instructor's beliefs.

Table 9. Sample Quotes for Identified Challenges in Students' Task Analysis

| Identified Challenges & Task Analysis questions | Sample Quotes from students' responses | Task type |
|---|---|---|
| **Misinterpreted questions** | | |
| Describe the task | The task is to "Provide an incentive to become familiar with some of the sections of the textbook that you will be expected to know for the first exam." | Chapter questions |
| Explain the term you chose | Chose *Create* as an important kind of thinking<br>"I am assigned to create an argument for or against a particular subject." | Persuasive essay |
| Why | "The purpose of this task is to write an essay. You have to understand these professionals roles and responsibilities, be able to compare and contrast them, and think of technology that could aid them to have quicker and better patient care." | Observational essay |
| **Lack of specific and concrete analysis (vague answers)** | | |
| Resources | "books, journal articles, internet sites, anything that will help them understand the real life event." | Analysis paper (Film) |
| Course concepts | "Communication concepts" "Business concepts" | Research paper(Group) |
| **Focusing on mechanical and structural aspect of a task** | | |
| Criteria | "3 paragraphs, 500-600 words, Proper essay form, Typed, Notes in margins from discussion" | Article critique |
| Excellent | A 4-6 page write-up consisting of a title, abstract, introduction, methods, results, tables and graphs, discussion and cited literature. These sections should include all data taken from the lab properly displayed and three pieces of reference journals supporting the lab. | Experimental report |
| Why | "I must learn how to write a proper research essay. I must be able to research use primary and secondary sources. I must learn how to do proper footnotes and bibliographies." | Research paper-History |
| **Lack of connection with a bigger picture (superficial reasoning)** | | |
| Why | "To apply the theories and laws learned in the lectures to the problems in our assignment." | Chapter questions |

| | | |
|---|---|---|
| | "The purpose of this task [is] to help with your research skills as well as show your familiarity with the library. Also it's purpose is to show you how different fields work." | Research & analysis paper |
| Reflection about students' implicit, socio-contextual task understanding, and overall change in understanding | "I didn't connect the course concepts to the real life model" and "My professor would like us to know more about how math applies to the real life." | Exam |
| | "Before writing the [Task Analysis] assignment [I] have no idea why I am asked to do it. …The next time I pick up a task, I would think about why I am doing, the purpose of doing it for future career. … I am learning not just for midterms." | |
| Reflection about overall change in understanding | "It isn't just "read this question, then scan the text for the term and write out the meaning." You have to figure out how each of these different subjects in psychology … goes in with the bigger picture." | Chapter questions |
| | "My task understanding has changed, because I realized that even straight-forward assignments such as ones you get in Math can have a deeper meaning as to what the professor wants you to take with you after completing it." | Chapter questions |
| **Externalized responsibility in learning** | | |
| Why | The professor "has assigned this paper as a way to test her students on their applied knowledge and understanding of the course's main focus; it is also assigned to help her see how students can portray their own researched topic in an understandable, intelligent manner…." | Research paper |
| | "I believe there are a few reasons why a prof [sic] would assign a midterm exam, and its important to note that not all the reasons are for the student I think…. Its so the professor can find out what topics need extra coverage either through them or through TA time in lab" | Exam |
| | "The main purpose of this task in my course is for the professor to test us and know how well we have understood the material, presumably this is so he can monitor his only teaching, as well as to ask the TAs to go over what we haven't grasped yet, to ensure that we do understand it." | Exam |
| Reflection | "In choosing a topic I need to be aware of what the professor believes so I don't choose a topic that offends him or that he doesn't agree with. This will not earn me a very good mark from him." | Research paper |

| | | |
|---|---|---|
| | "… I think I have a general grasp for the socio-culture beliefs in this course. This is important for success in this task because we are doing an in class essay and it would help to be able to write in a way that pleases the instructor…." | Exam |
| **Inaccurate socio-contextual understanding** | | |
| Reflection about students' socio-contextual task understanding | "… I do not think that her beliefs are that important because even with our midterms and other assignments, we are given lots of freedom and expression. As long as we take a firm stand on something, and back it up with whatever we want, then this seems to be what she is looking for." | Research paper |
| | "Not truly positive on what this is asking, however, I feel that since I had a good knowledge of both implicit and explicit expectations, I must have a decent understanding of the broader context and beliefs…." | Analysis presentation |
| | "Broader context and beliefs refers to the culture, beliefs, and background. We have similar culture and beliefs, so we may have similar idea with the same question." | Chapter questions |
| **Lack of perspective taking skills in epistemological beliefs** | | |
| Reflection | "We both have similar beliefs of what learning abilities you are born with and what you aquire [sic] as you grow older…." | Chapter questions |
| | "We had some different opinions towards learning, such as if nature or nurture plays the most important part. We did agree though, that most things are easier than the professor makes them sound…." | Analysis paper |
| | " The purpose of the task was to develop an understanding, reflection on the course material and demonstrate what I have learned about values and frame work practice throughout the course. We shared some similarities but as a whole, my personal beliefs differed greatly from those of my instructor." | Chapter questions |

*Exploring Task Analysis Quality in terms of Explicit and Implicit dimensions*

*Coding Explicit and Implicit data for TAQ.* Coding criteria were developed for each task analysis question. Sets of these coding criteria were created in two ways: (a) deductively by drawing from a priori criteria, and (b) inductively by revising and adapting a priori criteria to be more sensitive to differences in student responses. The a priori criteria for each Explicit and Implicit question were derived from a grading rubric used in ED-D101, Hadwin's (2006) model of Task Understanding, and previous studies (e.g., Hadwin et al, 2008; Oshige et al., 2007), as well as the researcher's personal experience as an academic assistant and interview with the course instructor for ED-D101. For each Explicit and Implicit question, a score of 2 was given when student's explanation was good, a score of 1 was given when some of their explanation was good but missed some key pieces of information, and a score of 0 was given when their explanation was poor. Total Explicit scores consisted of scores on Describe, Thinking, Knowledge, and Criteria. Data of Key Information were merged with those of Describe in coding because only the data from the spring semester were available and both Describe and Key Information asked students to provide the description of the task. Total Implicit scores consisted of scores on Why, Concepts, Resources, and Excellent questions. Both total scores varied from 0 to 8.

Using a priori criteria, 10 data sets were coded to evaluate the validity of these coding criteria and revise the pre-determined coding criteria. Once revised, the next 10 to 20 data sets were coded using the revised criteria, and then these revised criteria were reviewed to ensure the validity and accuracy of capturing the quality of each score. This revise-code-revise process was repeated until all responses for a question were coded. Once all responses were coded and coding criteria were refined, responses were coded a final time. It should be noted that coding of a new question started with a different participant from the previous participant. That is, for Describe question, coding started from Participant 1 and second and third coding also started from the same participant; however, for Criteria question, coding started from Participant 12 and second and third coding also started from this participant. This step was taken to avoid the first 10 participants' datasets being a test set. The general explanation, coding criteria, and examples for each score for each TAQ question were outlined in the Appendix E.

*Inter-rater reliability check.* To check the reliability of this coding, every $10^{th}$ case was chosen from the data set, and a total of 10 cases (approximately 10 percent of the entire dataset) were coded by a second coder. The coder was a graduate student who has taken an upper level statistics and received a coding training by the researcher. After the training session, the second coder conducted a practice coding with using one student's dataset from each semester to ensure the coding and scoring procedure. Inter-coder reliability was conducted using percentage agreement for each Explicit and Implicit question and inter-rater reliability analysis for total Explicit, Implicit, TAQ scores. The average percentage agreement for total Explicit score was 82.5% (Describe = 100%, Criteria = 80%, Thinking = 80%, Knowledge = 70%), and for total Implicit score was 87.5% (Why = 80%, Resources = 100%, Concepts = 80%, Excellent = 90%). Any disagreements in coding and scoring results were resolved by discussion, leading the percentage agreement for both Explicit and Implicit scores to reach 100%. The Pearson correlation $r$ between the two raters was .83 for total Explicit ($p < .01$), .92 for total Implicit, and .96 for TAQ ($ps < .001$).

*Descriptive Statistics*

Descriptive statistics were summarized in Table 10. Because the sample consisted of students across two semesters, their scores on all measures were compared. Independent sample t-test showed marginal differences between Fall and Spring semesters on total Explicit score ($t(96) = -1.95$, $p < .06$, $d = .39$), statistically significant differences on total Implicit score ($t(96) = -2.41$, $p < .05$, $d = .48$) and Total TAQ score ($t(93) = -3.2$, $p < .01$, $d$

= .63). Cohen (1988) suggests that .20 is a small, .50 is a medium, and .80 is a large effect size. Accordingly, this test produced a small effect size for Explicit, a medium for Implicit, and medium to large for Total TAQ scores. Across aspects of task-understanding, students in Spring semester scored significantly higher than those in Fall. Students may develop task understanding given that second semester students have had more experience with university level academic tasks.

Table 10. Descriptive statistics and Independent sample t-test for IVs

| | Total (n = 98) | | | Fall (n = 55) | | | Spring (n = 43) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *M* | *SD* | *Min-Max* | *M* | *SD* | *Min-Max* | *M* | *SD* | *Min-Max* | *t* | *p* |
| Explicit | 4.17 | 1.96 | 0-8 | 3.84 | 2.15 | 0-8 | 4.6 | 1.62 | 2-8 | -1.95 | .054 |
| Implicit | 4.02 | 1.66 | 1-8 | 3.67 | 1.69 | 1-8 | 4.47 | 1.51 | 2-8 | -2.41 * | .02 |
| Total TAQ† | 9.38 | 3.25 | 2-16 | 8.47 | 3.36 | 2-16 | 10.52 | 2.74 | 6-16 | -3.2 ** | .002 |

*: p < .05, **: p < .01, †: for Total, *n* = 95; for Fall, *n* = 53; for Spring, *n* = 42

*Were TAQ Scores Related to Academic Performance?*

It was hypothesized that Task Analysis Quality scores would be related to students' academic performance. Overall, results supported this hypothesis. All Task Analysis Quality scores (Explicit, Implicit, and total TAQ scores) were statistically significantly correlated to all academic performance measures (ED-D101 grade, target course GP, and cumulative GPA), except the correlation between total Explicit and ED-D101 grade (see Table 11). Statistically significant correlations varied from .28 to .46 ($p < .01$ to .001). Accordingly, the higher students scored on Explicit aspects, the higher grades both on the course in which their Task Analysis assignment resided and cumulative GPA. Similarly, higher scores on Implicit aspects and Total TAQ, were associated with higher performance in ED-D101, the target course, and cumulative GPA. Further, students' entrance grades were statistically significantly correlated to all academic performance measures: ED-D grade ($r = .28$, $p < .05$), target course GP ($r = .38$, $p < .01$), and cumulative GPA ($r = .50$, $p < .001$).

Table 11. Correlation Coefficient Between Variables (n = 98)

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1.Age | - | .50*** | .23* | .10 | .01 | .04 | .11 | .13 | .07 |
| 2.Years in school | | - | .29** | .21* | .11 | .17 | .15 | .17 | .22* |
| 3.Entrance Grade | | | - | .25* | .01 | .24* | .28* | .38** | .50*** |
| 4.Total Explicit | | | | - | .34** | .83*** | .14 | .28** | .31** |
| 5.Total Implicit | | | | | - | .77*** | .33** | .34** | .43*** |
| 6.Total TAQ | | | | | | - | .31** | .42*** | .46*** |
| 7.ED-D Grade | | | | | | | - | .60** | .73*** |
| 8.Target GP | | | | | | | | - | .74*** |
| 9.Cumulative GPA | | | | | | | | | - |

*: $p < .05$, **: $p < .01$, ***: $p < .001$ (all 2-tailed)

In the previous descriptive statistics comparison between Fall and Spring students, Spring students were found to score higher than Fall students in all TAQ scores. Thus, the correlation patterns were also statistically compared between these semesters (see Table 12). To compare, values (differences in correlation coefficients between Fall and Spring) were calculated by the procedure suggested by Pallant (2007) and varied from 0 to 1.45. Palllant suggests that values that are less than 1.96 are not statistically significant. Accordingly, no statistically significant differences were detected, and Fall and Spring semester data was merged into one data set for the remainder of the analyses.

Table 12. Correlation Coefficients Between Variables in Fall and Spring

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| 1.Entrance Grade | | | | | | | |
| Fall | - | .36* | .10 | .37* | .35* | .41** | .55*** |
| Spring | | .03 | -.10 | .10 | .13 | .28 | .40* |
| 2.Total Explicit | | | | | | | |
| Fall | | - | | | .14 | .26 | .34* |
| Spring | | | | | .14 | .35* | .25 |
| 3.Total Implicit | | | | | | | |
| Fall | | | - | | .27 | .34* | .44** |
| Spring | | | | | .46** | .40** | .43** |
| 4.Total TAQ | | | | | | | |
| Fall | | | | - | .29* | .42** | .51*** |
| Spring | | | | | .38* | .51** | .42** |
| 5. ED-D grade | | | | | - | | |
| 6.Target course GP | | | | | | - | |
| 7.Cumulative GPA | | | | | | | - |

*: $p < .05$, **: $p < .01$, ***: $p < .001$ (all 2-tailed)

*Does TAQ Predict Students' Academic Performance?*

It was hypothesized that Task Analysis Quality would predict students' academic performance. Findings generally supported this hypothesis. Based on the correlation reported above, Explicit, Implicit, total TAQ, ED-D grade, target course GP, and cumulative GPA were entered into the equations. This question was examined by (a) standard regression for Explicit and Implicit scores on ED-D grade, Target course GP, and cumulative GPA and (b) standard regression for Total TAQ score on ED-D grades, target course GP, and GPA.

*Do Explicit and Implicit measures of Task Understanding predict academic performance?* This question was explored in two main ways including examining: (1) the size of the overall relationship between Task Understanding (Explicit and Implicit) and each academic performance measure and (2) the proportion of variability uniquely contributed by each independent variable. A standard multiple regression was used between each academic performance measure as the dependent variable and Explicit and Implicit scores as independent variables. All Analyses were performed using SPSS REGRESSION and SPSS FREQUENCIES to evaluate the assumption.

Table 13 shows the summary of regression analyses for all three academic performance scores as the dependent variable and total Explicit and Implicit scores as the predictor variables. Multiple regression analyses indicated that the sizes of the relationship were .33 for ED-D course grade, .39 for target course GP, and .46 for cumulative GPA. All equations statistically differed from zero, $F$ (2, 95) = 5.82 ($p$ < .01), $F$ (2, 90) = 7.97 ($p$ < .01), and $F$ (2, 95) = 12.76 ($p$ < .001), respectively. When both explicit and implicit task understandings were entered into the regression equation, only implicit task understanding accounted for significant variability in ED-D 101 course grade ($sr^2$ = .09), target course GP ($sr^2$ = .07) and cumulative GPA ($sr^2$ = .12). Explicit and Implicit task understanding jointly contributed another .02 in shared variability in ED-D 101 grade, .08 in target course GP, and .09 in cumulative GPA. No independent contribution of explicit aspect was found in any performance measure. These results show that having high implicit task understanding was a strong predictor of students' academic performance.

*Does total TAQ score predict academic performance?* Table 14 summarizes the results from regression analyses for ED-D course grade, target course GP, and cumulative GPA as the dependent variable and overall task understanding ability as a predictor. Standard multiple regression analyses indicated all regression equations were statistically significant, $F$ (1, 93) = 9.69 ($p < .01$), $F$ (1, 88) = 18.44 ($p < .001$), and $F$ (1, 93) = 25.54 ($p < .001$), respectively. When overall Task Analysis Quality was entered into the regression equation, TAQ accounted for significant variability in all academic performance measures. In addition to the previous regression analyses results, high overall task understanding ability also predicted students' academic performance.

Table 13. Summary of Multiple Regression Analysis for TAQ Variables Predicting ED-D course grades, Target course GP, and Cumulative GPA

| | ED-D course grades ($n$ = 98) | | | | | Target course GP ($n$ = 92) | | | | | Cumulative GPA ($n$ = 98) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | $B$ | $SE$ | $\beta$ | $p$ | $R/R^2$ | $B$ | $SE$ | $\beta$ | $p$ | $R/R^2$ | $B$ | $SE$ | $\beta$ | $p$ | $R/R^2$ |
| TAQ | | | | | .33/.11** | | | | | .39/.15** | | | | | .46/.21*** |
| Constant | 56.33*** | 2.42 | | .000 | | 2.91*** | .60 | | .000 | | 3.22*** | .42 | | .000 | |
| Explicit | .14 | .44 | .03 | .75 | | .19 | .10 | .19 | .07 | | .14 | .08 | .18 | .07 | |
| Implicit | 1.62** | .53 | .32 | .003 | | .35** | .13 | .29 | .006 | | .34*** | .09 | .37 | .000 | |

adjusted $R^2$ = .09 for ED-D course grade, .13 for Target course GP, .20 for Cumulative GPA, **: $p < .01$, ***: $p < .001$

Table 14. Summary of Multiple Regression Analysis for Total TAQ Variable Predicting ED-D grades, Target course GP, and Cumulative GPA

| | ED-D course grades ($n$ = 95) | | | | | Target course GP ($n$ = 90) | | | | | Cumulative GPA ($n$ = 95) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | $B$ | $SE$ | $\beta$ | $P$ | $R/R^2$ | $B$ | $SE$ | $\beta$ | $p$ | $R/R^2$ | $B$ | $SE$ | $\beta$ | $p$ | $R/R^2$ |
| Total TAQ | | | | | .31/.09** | | | | | .42/.17*** | | | | | .46/.22*** |
| Constant | 55.82*** | 2.56 | | .000 | | 2.63*** | .63 | | .000 | | 3.07*** | .44 | | .000 | |
| Total TAQ | .80** | .26 | .31 | .002 | | .27*** | .06 | .42 | .000 | | .22*** | .04 | .46 | .000 | |

adjusted $R^2$ = .09 for ED-D grade, .16 for Targeted GP, and .21 for Cumulative GPA, *: $p < .05$, **: $p < .01$,***: $p < .001$

*Does Task Analysis Quality Significantly Add to Prediction of Academic Performance after Differences in Students' Entrance Grade Have Been Statistically Partialled out?*

The correlational findings showed that students' entrance grade was statistically significantly related to all three dependent variables (see Table 7). Although the regression analyses revealed task understanding ability predicted academic performance, it remained unclear if these predictor variables uniquely contributed to the prediction. In order to determine this point, hierarchical regression analyses were conducted to detect any unique contribution of Explicit and Implicit scores or total TAQ scores on three dependent variables.

*Do Explicit and Implicit scores significantly add to prediction of academic performance after differences in students' entrance grade have been statistically partialled out?* The regression results for ED-D course grade, target course GP, and cumulative GPA are presented in Table 14. Multiple regression analyses showed that overall regression models for all academic performances were significant, $F(1, 78) = 6.74$, $p < .05$, for ED-D grade, $F(1, 74) = 12.20$, $p < .01$, for target course GP, and $F(1, 78) = 26.10$, $p < .001$, for cumulative GPA. After students' entrance grade was controlled for, the models for all academic performance measures were significant at Step 2, $F(2, 77) = 9.55$ for ED-D grade, $F(2, 73) = 10.59$ for target course GP, and $F(2, 77) = 27.94$ for cumulative GPA ($ps < .001$). In all performance measure, Entrance grade accounted for its variability (8% for ED-D grade, 14% for target course GP, and 25% for cumulative GPA). When explicit and implicit task understanding was entered for the second step, these values increased. For ED-D grade, implicit task understanding was a slightly stronger predictor than students' entrance grade. For target course GP and cumulative GPA, students' entrance grade was a slightly stronger predictor than implicit task understanding. Explicit task understanding did not statistically significantly contribute to the prediction of any academic performance. These results suggest that implicit task understanding independently contributes to students' academic performances, along with their entrance grade.

*Does total TAQ scores significantly add to prediction of academic performance after differences in students' entrance grade have been statistically eliminated?* Table 15 summarizes the regression results for three academic performance measures. Multiple regression analyses showed statistically significant differences in all models and steps. For ED-D grade, at the end of Step 1, it was $F(1, 75) = 6.05$, $p < .05$, as well as at Step 2, $F(2, 74) = 6.20$, $p < .01$. For target course GP, it was $F(1, 71) = 11.89$, $p < .01$, and at Step 2, $F(2, 70) = 10.13$, $p < .001$. For cumulative GPA, it was $F(1, 75) = 25.58$ and at Step 2 $F(2, 74) = 21.68$ ($ps < .001$). In ED-D grade, when overall task understanding ability was entered for the second step, students' entrance grade became no longer a significant contributor to the prediction. However, in target course GP and cumulative GPA, when these TAQ was entered in the equation, entrance grade remained as a significant contributor. These results indicate that in ED-D grade, overall task understanding was the only predictor. In target course GP and cumulative GPA, students' entrance grade was a slightly stronger predictor than overall task understanding. This pattern of results also suggests that overall task understanding ability was a unique contributor to the prediction of all academic performance.

Table 15. Summary of Hierarchical Regression Models for Predicting ED-D grades, Target course GP, and Cumulative GPA

| | ED-D course grades (*n* = 80) | | | | | Target course GP (*n* = 76) | | | | | Cumulative GPA (*n* = 80) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | *B* | *SE* | *β* | *p* | $R^2/\Delta R^2$ | *B* | *SE* | *β* | *p* | $R^2/\Delta R^2$ | *B* | *SE* | *β* | *p* | $R^2/\Delta R^2$ |
| Step 1 | | | | | .08* | | | | | .14** | | | | | .25*** |
| Constant | 30.39** | 12.76 | | .02 | | -4.91 | 2.89 | | .09 | | -4.91* | 1.99 | | .02 | |
| Entrance grade | .41* | .16 | .28 | .011 | | .13** | .04 | .38 | .001 | | .13*** | .03 | .50 | .000 | |
| Step 2 | | | | | .20/.12** | | | | | .23/.08** | | | | | .42/.17*** |
| Constant | 23.66 | 12.15 | | .06 | | -6.5* | 2.83 | | .02 | | -6.3** | 1.78 | | .001 | |
| Entrance grade | .40** | .15 | .28 | .008 | | .13*** | .03 | .38 | .000 | | .12*** | .02 | .50 | .000 | |
| Implicit | 1.75** | .52 | .35 | .001 | | .35** | .12 | .29 | .007 | | .36*** | .08 | .41 | .000 | |

For Step 2: ED-D grade: adjusted $R^2$ = .18; Target course GP: adjusted $R^2$ = .20; Cumulative GPA: adjusted $R^2$ = .41
* $p < .05$, ** $p < .01$, *** $p < .001$

Table 16. Summary of Hierarchical Regression Models for Predicting ED-D grades, Target course GP, and Cumulative GPA

| | ED-D course grades (*n* = 77) | | | | | Target course GP (*n* = 73) | | | | | Cumulative GPA (*n* = 77) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Variable | *B* | *SE* | *β* | *p* | $R^2/\Delta R^2$ | *B* | *SE* | *β* | *p* | $R^2/\Delta R^2$ | *B* | *SE* | *β* | *p* | $R^2/\Delta R^2$ |
| Step 1 | | | | | .08* | | | | | .14** | | | | | .25*** |
| Constant | 31.27* | 13.08 | | .02 | | -5.02 | 2.97 | | .10 | | -5.07* | 2.03 | | .02 | |
| Entrance grade | .40* | .16 | .27 | .02 | | .13** | .04 | .38 | .001 | | .13*** | .03 | .50 | .000 | |
| Step 2 | | | | | .14/.07* | | | | | .22/.08** | | | | | .37/.12*** |
| Constant | 32.00* | 12.67 | | .01 | | -5.12 | 2.85 | | .08 | | -4.91* | 1.88 | | .011 | |
| Entrance grade | .31 | .16 | .21 | .07 | | .11** | .04 | .32 | .005 | | .11*** | .02 | .42 | .000 | |
| Total TAQ | .71* | .29 | .27 | .02 | | .19** | .07 | .29 | .009 | | .16*** | .04 | .35 | .000 | |

For Step 2: ED-D grade: adjusted $R^2$ = .12; Target course GP: adjusted $R^2$ = .20; Cumulative GPA: adjusted $R^2$ = .35
* $p < .05$, ** $p < .01$, *** $p < .001$

# Chapter Five: Discussion

*Overview of Chapter Five*

This chapter discusses the findings from the qualitative and quantitative analyses reported in Chapter Four. First, the chapter summarizes the overall findings. Second, the main findings are further discussed according to overarching research questions. Third, practical and theoretical implications are presented. To conclude, the chapter discusses limitations of the study and provides suggestions for future study.

*Task Understanding and Academic Performance.*

This thesis study explored students' understandings of academic tasks and its relationship with academic performance. Findings from qualitative analysis provided a general picture: students tended to struggle with less prescribed tasks across a range of tasks and disciplines. Predominant task analysis challenges included difficulty in analyzing tasks beyond the surface level, such as implicit and socio-contextual aspects of tasks. The results from quantitative analysis indicated a positive relationship between task understanding and academic performance. Findings supported the hypothesis that task analysis quality would predict academic performance.

This study supported the models of self-regulated learning that emphasize the importance of task understanding in academic success. Correlational analyses indicated that higher levels of task understanding were associated with higher academic performance. Higher university entrance grades were also associated with higher academic performance measures. This result was in congruent with the literature in which prior academic knowledge (e.g., entrance grades) is correlated with academic performance in post-secondary education (e.g., Lin & Humphreys, 1977; McKenzie & Schweitzer, 2001; Reisig & DeJong, 2005; Ting, 2000). Further, the regression analyses revealed that overall task understanding, as well as implicit task understanding, predicted students' academic performance. Explicit task understanding was not a significant predictor. Across three academic performance measures, the same patterns of results were found. In looking across academic performance measures, task understanding accounted for the most variability in cumulative GPA. Findings provided evidence that having better task understanding at the implicit level (e.g., purpose of the task, course concepts to be included, resources to be used, picture of a top quality task, etc) plays a significant part in students' academic success, particularly in students' overall grade. Importantly, this pattern remained the same even after controlling for students' entrance grade. This finding is particularly exciting because it may indicate that high implicit understanding of tasks may compensate for low entrance grades (or prior academic knowledge).

Among all regression analyses, when overall task understanding scores (consisting of Explicit, Implicit, and Socio-contextual scores) was entered into the equation, entrance grade was no longer a significant contributor to variability in ED-D101 course grade. ED-D course grade was originally included as one measure of academic performance; however, the grade might also be considered to be an indirect measure of students' self-regulated learning competence since each grades activity targets one or more facets of self-regulation and is designed to help students develop self-regulatory competence (A. Hadwin, personal communication, April 26, 2009). This study found a positive correlation between ED-D grade and target course GP ($r$ = .06, $p$ < .01). Accordingly, this result would add another support for the previous research about an association between SRL skills and academic performance (e.g., Cleary & Zimmerman, 2004; Hwang & Vrongistinos, 2002; Paterson, 1996; Pintrich & De Groot, 1990). The regression results reported in this study would also make sense since task understanding skills are part of self-regulated learning. Interestingly, students' entrance grades were found to be positively correlated with explicit task understanding ($r = .25$, $p < .05$) but not correlated with implicit task understanding ($r = .01$, *n.s.*). This finding may suggest that students who have performed well in high school have developed skills and strategies for understanding the explicit aspect of academic tasks. Contrary to past research that consistently reports relationships between entrance grade and academic success (e.g., Lin & Humphreys, 1977; McKenzie & Schweitzer, 2001; Reisig & DeJong, 2005; Ting, 2000), findings from this thesis study may suggest that developing skills and strategies for understanding implicit aspects of academic tasks may mediate the relationship between entrance grade (indirect measure of prior knowledge) and academic performance.

Somewhat unexpectedly, comparison in task analysis quality scores between Fall and Spring semesters produced significant differences. Students in Spring semester scored marginally higher on explicit task understanding score and statistically significantly higher on implicit task understanding and total task understanding scores. Accordingly, Spring students showed better task understanding than Fall students. One of the possible reasons for the differences might be in revisions in the instrument for Spring semester. Two questions, (a) *What is the task? Provide a brief description including the task instructions* and (b) *Make a summary list of key instructions, words and statements from the assignment description, syllabus or class notes* were merged and treated as one question that asks students to describe the task in Spring semester. This merge might have contributed to higher score in Spring semester than Fall semester. However, combining data occurred only in Describe question, which composes Explicit scores. Because the score difference in Explicit aspect was marginal, the combined data were likely to affect the difference between Fall and Spring TAQ scores. Secondly, although this study did not include semester as a predictor of academic performance, these differences might mean that students can learn to develop more complete and sophisticated understandings of tasks after taking courses even for one semester. This possibility is intriguing because it may indicate that some students are able to pick up subtle cues even after one semester and adjust learning strategies. It could also indicate that implicit task understanding is skills they can acquire. These indications open up possible interventions for students who struggle with academic tasks. Future study should explore this possibility.

*Struggles with Task Understanding*

Summarizing the kinds of challenging tasks and their structures revealed that a surprising number of students listed chapter questions as difficult. The task structure was a well-structured task. Well-structured tasks are characterized by having a specific and concrete instruction to follow. Accordingly, it would be safe to think that figuring out what to do was not a major challenge. That is, in chapter questions, questions students are expected to answer are written in a specific and concrete manner. Further, because these questions are often specific to an assigned chapter, the answers or accurate procedure to reach a correct answer are often explicated in the chapter. Even though these concrete cues were provided, students still listed this task as challenging. This listing may indicate that internalizing newly learned concepts and how to use these concepts fluently in an appropriate place might be more difficult for the first year students than expected. In other words, despite the simplicity of understanding the instruction, the level of cognitive engagement might be what students struggle with academic tasks. Further, the summary of Task Understanding difficulties indicated that struggling students had difficulties connecting a current task with a bigger picture. After an interview with their professor, many students reported that they learned why chapter questions were assigned and how this task was connected with their course and future career. This realization is significant because consistent with the theory of SRL posits that perceptions of the bigger context or purpose of a task is paramount for understanding the task (e.g., Butler & Winne, 1995; Winne & Hadwin, 1998; 2008), this study found that having deep understanding at implicit level was a strong predictor of academic performance. The fact that students had difficulty extrapolating the intention of assigned chapter questions might also be another reason why students listed this task as challenging. Future follow-up interview study should be conducted.

*Epistemological Beliefs in Task Understanding.*

Identifying students' struggles in their task analysis assignments framed indicators that students have unclear and incomplete task understanding. Some of these indicators were related to epistemological beliefs, such as externalized responsibility in learning, inaccurate understanding of socio-contextual aspects, and difficulties in understanding beliefs from instructor's perspectives.

*Sense of responsibility as a learner.* An interesting finding in this study was that some students attributed the purpose of the task to external factors, such as instructors and a course requirement. These students reported the task was assigned so that instructors could monitor student learning and adjust their teaching accordingly. Rather than viewing academic tasks as orchestrated opportunities to facilitate learning or as formative feedback for students, students tended to view academic tasks as formative feedback for instructors or academic obligations (something that they have to do for the program). This finding is a concern since models of SRL suggest students' perception about learning plays an important role as it influences their choice of study strategies (e.g., Pintrich, 2000; Schunk 1994; Winne & Hadwin, 1998; Zimmerman, 2000). Students' beliefs function as a filter to interpret the features and nuances of tasks, which influences students' learning strategy selection (Thomas & Rohwer, 1987). In the study that examined the effect of students' cognitions about learning on their study strategies, Ferla, Valcke, and Schuyten (2009) found students' strategy choices differed depending on their cognitions about learning. Of these cognitions, the study identified one of the four types of learners was helpless students. This type of students was more likely to choose memorization as study strategies and view their instructors as responsible for students' learning.

Further, this externalized responsibility in learning might be one component of epistemological beliefs. In developing epistemological beliefs questionnaire, Schommer et al. (1992) found four factors in epistemological beliefs, including externally controlled learning, simple knowledge, quick learning, and certain knowledge, although Schommer (1993) later changed externally controlled learning to fixed ability. According to Schommer et al. (1992), externally controlled learning was characterized by lack of control in learning and lack of attribution of success to one's efforts. These characteristics are congruent with the finding in this thesis study. Simpson and Nist (1997) also identified students with low academic performance viewed that their professors were responsible for students' knowledge acquisition. Thus, when students perceive the purpose of academic tasks as purely for grading or for professors to assess how well they are teaching course concepts, it may signal weak task understanding, poor performance in a course, and a lack of perceived control of their own learning. This finding warrants future research.

*Understanding epistemological beliefs and their importance for task understanding.* Students' self-assessments and self-reflection about the task understanding revealed that understanding and interpreting socio-contextual aspects of tasks was particularly challenging. Hadwin's (2006) model of task understanding suggests understanding beliefs and values in a discipline is part of deciphering academic tasks. Accordingly, understanding this aspect is integral. Research about epistemological beliefs strongly suggests the relationships between epistemological beliefs and students' academic performance and study strategies (e.g., Schommer, 1990, 1993; Schommer et al, 1992, 1997). Furthermore, Muis and Foy's (2008) study found having similar epistemological beliefs with their teachers was related to students' performance level in mathematics. Such findings support a claim that if students lack the awareness of their own epistemological beliefs, and of how their beliefs are close to their instructors' beliefs, they will be likely to misunderstand an academic task and choose ineffective strategies (Simpson & Nist, 2000).

*Understanding epistemological beliefs from instructor's perspectives.* In addition to students' awareness of their own beliefs and the correspondence between their beliefs to those of instructors, a student's ability to take the instructor's perspectives on epistemological beliefs might also contribute to students' academic success. Research suggests flexibility in students' beliefs about tasks (e.g., Hadwin et al., 2008; Oshige et al., 2007; Simpson & Nist, 1997) played an important part in students' academic success.

This flexibility and adaptability might be attributed to students' ability to take the perspective of others. Selman's (1980) model of social perspective taking suggests as children grow up, they develop the ability to take multiple perspectives, including self, immediate others, and socio-cultural beliefs, as well as multiple possibilities and consequences of an event. Thus, students may be able to take their instructors' views about epistemological beliefs, while holding their own beliefs. Beliefs position students in certain perspective to interpret cues, such as instructional cues. If, as Donald (1994) states, instructors in different disciplines have different beliefs about knowledge and learning, then students who can take the perspectives of their particular course instructors and complete a task with those beliefs in mind may be more successful in interpreting the task, and in turn, successful in the course.

Students need to be flexible in their own beliefs about learning to be academically successful (Simpson & Nist, 1997). This flexibility may become particularly important in the first year of university and college because students are likely to take various courses across disciplines during that year. Research indicates that the predominant beliefs about learning and knowledge held across disciplines vary (e.g., Donald, 1994). Thus, although having similar beliefs with their instructors helps students with being on the same page about tasks (Muis & Foy, 2008), being able to interpret a task from their instructor's perspective might be necessary to juggle different kinds of courses with different instructors in university. In this sense, studies by Oshige et al. (2007) and Hadwin et al. (2008) provided important evidence. Although this thesis study was only able to examine epistemological beliefs as part of total task analysis quality, the fact that total task analysis quality was a strong predictor might be due in part of the addition of this aspect in the score. Future research should pursue the unique contribution of students' own epistemological beliefs and their ability to understand instructor's epistemological beliefs for their academic performance.

*Measuring Task Understanding.*

This thesis study laid a foundation for measuring the completeness of Task Understanding by creating a scoring system based on Explicit, Implicit, and Socio-contextual aspects. In scoring Task Analysis Quality, composite scores were made by summing total Explicit, total Implicit, and Socio-contextual scores. However, in retrospect, this simple summation might not have reflected the completeness of Task Understanding well because no particular evidence suggests that Explicit and Implicit aspects play a larger role than

Socio-contextual aspect in Task Understanding. Accordingly, future study should use the average scores in each aspect to create composite scores and measure overall completeness of Task Understanding.

Further, developing coding criteria for Explicit and Implicit aspects required enormous amount of time. Using the coding criteria developed by this study will facilitate the coding procedure in the future study. In using these criteria, its further refinement would be important to improve the reliability. Administration time had also been another issue with conducting the Task Analysis instrument. Based on the summary of task analysis difficulties, the completeness of Task Understanding might be able to be measured by a few questions, including *Describe the task* (Explicit) and *Explain why the task was assigned* (Implicit). This possibility should be investigated in the future study.

The coding criteria for this study are designed to measure the completeness of Task Understanding, rather than the accuracy of Task Understanding. The completeness of Task Understanding is general ability to analyze a task. The accuracy of Task Understanding should be coded using instructor's interpretation of a task because different instructors may interpret the same task differently (e.g., Donald, 1994; Simpson & Nist, 2000). Accordingly, whether students' understanding of a task is accurate or not would depend on how close their understanding is to their instructor's understanding. The coding procedure in Oshige et al.'s (2007) and Hadwin et al.'s (2008) studies was designed to tap into the accuracy.

*Practical and Theoretical Implications.*

*Practical implication of this study.* This study offers a number of implications for instructional practices. First, the qualitative findings suggest that both well-structured and ill-structured tasks posed different challenges for learners. For well-structured tasks such as chapter questions, having a discussion about the intention of the task with students appeared to deepen their task understanding by helping them connect the task with broader course objectives and future career. Many students who analyzed well-structured tasks reported that having an interview with their professor led them to realize the underlining purpose of the task that once looked a rote task to them. Moreover, the significance of understanding the task at an implicit level was evinced by the regression results. Accordingly, even sharing the purpose of the task might be helpful in developing better task understanding, which, in turn, correlates with academic success. Instructors might also prompt students to brainstorm about the task purpose before introducing the instructor perspective. This would provide students with an opportunity to practice and self-evaluate their analysis of academic tasks.

Ill-structured tasks are also the kinds of tasks that serve as powerful tools to develop task analysis ability, as well as SRL skills. These tasks contain room for various interpretations. However, providing skilful scaffolding may assist students in acquiring task understanding skills to create the kind of structure needed for a particular task on their own eventually. The scaffolding could vary from task structure level to deep task understanding level. That is, as an expert, modelling how to reach the final product (e.g., providing a research procedure) may be one way to scaffold the task at a task structure level. To enhance students' task understanding, asking students questions that tap into implicit aspect of the task or quizzing students about the implicit aspect of the task may be effective. Future research should examine the effectiveness of specific interventions designed to improve task understanding. Further, having students ask each other questions about explicit, implicit, and socio-contextual aspect of task understanding might promote shared-regulation of learning and co-construction of implicit understanding. The task analysis questions used in this thesis study may serve as a useful guide for student-student and student-teacher tasks discussions.

Based on quantitative findings, instructors may be warranted in taking time to encourage students to examine a task before they start because having a good understanding of implicit task features contributes to academic performance, even above and beyond their entering grades. Although students' entrance grades may relate to performance, findings from this study suggest that students who develop skills to analyze academic tasks can improve performance. Since implicit task understanding involves discussions about why tasks are assigned and how they fit with learning objectives, course concepts, and contexts in the course, instructors may be advised to open assignment discussions beyond interpretations of the explicit details about tasks. One contribution of this study is that I have identified specific university tasks and documented the kinds of challenges students encounter with those tasks. This information may be useful in designing and researching future interventions for improving task understanding.

Although explicit task understanding did not predict students' academic performance in this study, it was correlated with academic performance and should not be ignored. According to Hadwin (2006), explicit task understanding includes knowing task criteria, standards, description, and language used in task instructions. In this thesis study, summary of the kind of tasks analyzed and disciplines showed analysis papers came from various disciplines. The term, *analysis*, would mean different activities in different disciplines. Knowing discipline specific language used in a task is an important part in understanding what the task is. If students used the same meaning of the word across tasks to analyze a material, they would be much more likely to misunderstand the task. This variety in tasks and courses signifies the importance of understanding the languages used in each discipline when students tackle with a new analysis task in a different discipline. It would be important to make sure students know what terms, such as *analyze*, mean in a particular discipline.

*Theoretical implications of this study.* This study provided further empirical support for Hadwin's (2006) model of Task Understanding. Although socio-contextual aspects of task understanding was included as part of total task analysis quality and not examined per se, the qualitative analysis of task analysis difficulty revealed students struggled with understanding socio-contextual layer of tasks. Considering what is not stated on the instruction was important, it is likely that socio-contextual would also contribute to high academic performance. Both implicit and socio-contextual aspects are similar in a sense that they are both invisible and need to infer from outer surface of a task and go deep in order to develop the understanding. Socio-contextual task understanding is even more embedded in a broader context of the course and discipline; thus, understanding how beliefs about knowledge and learning are intertwined with the assigned task would require more conscious efforts. Previous studies (e.g., Hadwin et al., 2008) found understanding instructor's epistemological beliefs predicted students' academic performance. Future study should examine whether and how these three aspects would predict students' academic performance.

*Limitations of This Study.*

This study had a number of limitations. First, all data were collected through self-report. Self-report data are subject to social desirability and rely on respondent's accurate report. Obtaining actual instructions, along with student's report about their task understanding, would improve the accuracy and reliability in coding. Second, categorizing task types and structures used students' description and interpretation of a task. Accordingly, it would be possible that what students interpreted as their task and what instructors actually assigned might differ; thus, the category might not reflect accurate representations. To illustrate, some students described tasks as well-structured in the initial task analysis (Part 1) but, after interviewing their professor, realized the task had ill-structured elements in it (students thought chapter questions were just answering questions where answers are in chapter but realized to answer questions, they had to really reflect and think about their opinion). In coding, although what they realized after interview was used for a judgment, some students might have not realized even after the interview. To accurately categorize tasks, the future study should use actual assignment instructions that were provided by students' course instructor.

Third, identifying target courses also relied on students' accurate description of the task to assign the best matching target course for both identifying courses and obtaining target course grades. Accordingly, it is possible that identified courses and target course grades were not one from which students' task analysis assignment came. In this sense, the findings should be interpreted with caution. Future study should ask students to provide the specific name of the task, as well as the actual instruction.

Fourth, the sample size was small for regression analyses. Tabachnick and Fidell (2007) suggest the sample size be equal or more than 74 for testing the multiple correlation ($N \geq 50 + 8m$, where m is the number of IVs) and 107 for testing individual predictors ($N \geq 104 + m$). In this study, the sample size varied from 73 to 98. Accordingly, this study should be replicated with larger sample size to determine if implicit task understanding would predict academic performance.

Fifth, correlational analyses showed all aspects of task understanding were related to cumulative GPA after ED-D101 course. However, the cumulative GPA used for this study was collected at the end of the year they took ED-D101 course. In order to determine if students' task understanding competence would continue to be related to cumulative GPA, future study should follow up their GPA and examine the relationship between task understanding and academic performance.

Sixth, this study was unable to examine the possible unique role of socio-contextual aspects of task understanding in academic performance due to ethical dilemma. As a result, socio-contextual task understanding was embedded in overall task understanding competence. To measure this aspect without invading ethical issues would be a challenge yet crucial to develop effective interventions for struggling students. As discussed above, being able to understand instructor's epistemological beliefs was a strong predictor of students' academic performance (Hadwin et al., 2008; Oshige et al., 2007). Unique contribution of socio-contextual understanding to students' academic performance, along with explicit and implicit task understanding, should be examined in the future research.

Seventh, this study did not include students' beliefs about knowledge and their ability and motivation in socio-contextual aspect of task understanding. In Hadwin's (2006) model of task understanding, as well as Winne and Hadwin's (1998) model of SRL, students' epistemological beliefs, self-efficacy, and motivation (e.g., goal orientation) are suggested to be part of understanding tasks. Future research should examine these features.

Lastly,, this study did not compare task understanding between high and low performers. Examining how task understanding would differ and change among students with different levels of academic achievement would contribute to further understanding of the first phase of SRL. In Simpson and Nist's (1997) study, it was found that low, improved, and high performers showed different patterns in their perceptions of the task and course. It would be informative to compare task understanding between them by dividing this sample into two (e.g., median split) or three as in Simpson and Nist's study. The data from instructors also should be obtained in order to refine even finer and more accurate coding criteria for Task Understanding. The way to research this includes through obtaining a consent form from the course instructor to indicate their participation or providing the coding criteria used in this study as a guide for them to analyze the task or for researchers to use as an interview scheme. The latter would also help create instruments to quantitatively measure attunement in Explicit and Implicit understanding (how closely students' understandings were as to their instructor's; hence, measuring the accuracy of task understanding).

*Conclusion and Suggestions for Future Studies.*

Although this thesis study had a number of limitations, it should be emphasized that this study made a significant contribution to researching Task Understanding. To further advance the knowledge of this field, a few suggestions for future studies can be made. First, the future study should call for instructor participants. This would allow the study to use the actual instructions for tasks, from which the coding criteria for task types, its disciplines, and task analysis quality could be made with higher accuracy. Instructor's participation further contributes to researching the accuracy of students' task understanding, along with the completeness of their understanding, because instructors' interpretation of an assigned task would serve as the base information from which coding for the accuracy of task understanding could be made. In this study, the completeness of students' task understanding was the focus and was measured by generic criteria created by the researcher. Using both measures of accuracy and completeness of task understanding would provide a more accurate representation of this construct.

Second, previous studies reported the importance of students' accurate understanding of their instructor's epistemological beliefs in academic success (Hadwin et al., 2008; Oshige et al., 2007). Accordingly, the future study should investigate the unique contribution of Explicit, Implicit, and Socio-contextual aspects to students' performance with a larger sample size than the current thesis study. In measuring socio-contextual aspect, it would also be important to include other features of this aspect, such as students' own epistemological beliefs, self-efficacy, and motivation.

Third, this study should also be replicated with using cumulative GPA at the end of each school year. This type of follow-up study would contribute to further understanding this construct with relation to academic performance. It would also be helpful to conduct a follow-up interview with students who were high, average, and low academic achievers about their task understanding competence. Further, in scoring Task Analysis Quality, simple summation of Explicit and Implicit scores were used. Since no particular evidence suggests which aspect weighs more than the other, using average scores in each aspect would have been more accurate measure of the three aspects. Future study should use this scoring.

Lastly, in this study, recursive nature of SRL was not examined. Accordingly, in summarizing Task Analysis Quality difficulties, students' realizations after an interview with their professor were excluded from task understanding measure. These realizations can be considered as indicators that students modified their understanding and adjusted it accordingly in Task Understanding phase. Although some realizations appeared in an inaccurate reflection section, giving a score to these realizations could have created a measure of monitoring and adaptation in the first phase of SRL. Future study should investigate this recursive nature in task understanding by using this scoring system. As such, these further studies would further contribute to deciphering this seemingly simple construct of task understanding.

References

Azevedo, R., & Cromley, J. G. (2004). Does training on self-regulated learning facilitate students' learning with hypermedia? *Journal of Educational Psychology, 96*, 523-535.

Broekkamp, H., van Hout-Wolters, B. H. A. M., Rijlaarsdam, G., & van den Bergh, H. (2002). Importance in instructional text: Teachers' and students' perceptions of task demands. *Journal of Educational Psychology, 94*, 260-271.

Buehl, M. M., & Alexander, P. A. (2001). Beliefs about academic knowledge. *Educational Psychology Review, 13*, 385-418.

Butler, D. L. (1992). Promoting strategic learning by learning disabled adults and adolescents. *Exceptionality Education Canada, 2*, 109-128.

Butler, D. L. (1994). From learning strategies to strategic learning: Promoting self-regulated learning by postsecondary students with learning disabilities. *Canadian Journal of Special Education, 4*, 69-101.

Butler, D. L. (1995). Promoting strategic learning by postsecondary students with learning disabilities. *Journal of Learning Disabilities,28*, 170-190.

Butler, D. L. (1998). The strategic content learning approach to promoting self-regulated learning: A report of three studies. *Journal of Educational Psychology, 90*, 682-697.

Butler, D. L., Beckingham, B., & Lauscher, H. J. N. (2005). Promoting strategic learning by eighth-grade students struggling in mathematics: A report of three case studies. *Learning Disabilities Practice, 20*, 156-174.

Butler D. L., & Cartier, S. C. (2004). Promoting effective task interpretation as an important work habit: A key to successful teaching and learning. *The Teachers College Record, 106,* 1729-1758.

Butler, D. L., & Winne, P. H. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research, 65*, 245-281

Cano, F., & Cardelle-Elawar, M. (2004). An integrated analysis of secondary school students' conceptions and belief about learning. *European Journal of Psychology of Education, 19*, 167-187.

Cleary, T. J., & Zimmerman, B. J. (2004). Self-regulation empowerment program: A school-based program to enhance self-regulated and self-motivated cycles of student learning. *Psychology in the Schools, 41*, 537-550.

Cohen, J. (1988). *Statistical power analysis for the behavioural sciences.* Hillsdale, NJ: Erlbaum.

Cohen, L., & Marion, L. (1994). *Research methods in education* (4th ed.). London and New York: Routledge.

Dahl, T. I., Bals, M., & Turi, A. L. (2005). Are students' beliefs about knowledge and learning associated with their reported use of learning strategies? *British Journal of Educational Psychology, 75*, 257-273.

Dembo, M. H. & Eaton, M. M. (2000). Self-regulation of academic learning in middle-level schools. *The Elementary School Journal, 100,* 473-490.

Donald, J. G. (1994). Science students' learning: Ethnographic studies in three disciplines. In P. R. Pintrich, D. R. Brown, & C. E. Weinstein (Eds.), *Student motivation, cognition, and learning* (pp. 79-112). Hillsdale, NJ: Erlbaum.

Doyle, W. (1983). Academic work. *Review of Educational Research, 53*, 159-199.

Ferla, J., Valcke, M., & Schuyten, G. (2009). Student models of learning and their impact on study strategies. *Studies in Higher Education*, *34.* 185-202.

Frederiksen, N. (1984). Implications of cognitive theory for instruction in problem-solving.

*Review of Educational Research, 54,* 363-407.

Graham, S. (1991). A review of attribution theory in achievement contexts. *Educational Psychology Review, 3,* 5-39.

Greene, F. A., & Azevedo, R. (2007). A theoretical review of Winne and Hadwin's model of self-regulated learning: New perspectives and directions. *Review of Educational Research, 77,* 334-371.

Hadwin, A. F. (2000). *Building a case for self-regulating as a socially constructed phenomenon.* Unpublished doctoral dissertation, Simon Fraser University, Burnaby, BC, Canada.

Hadwin, A. F. (2006). Do your students really understand your assignment? *LTC Currents Newsletter, II (3),* 1-9.

Hadwin, F., & Jamieson-Noel, D. (2004). *Task Analyzer*. Victoria, British Columbia, Canada: University of Victoria.

Hadwin, A. F., Oshige, M., Miller, M., Fior, M., and Tupper, K. (2008, March). *Examining the agreement between student and instructor task perceptions in a complex engineering design task.* Poster presented at the annual meeting of the American Educational Research Association. New York.

Hofer, B. K., & Pintrich, P. (1997). The development of epistemological theories: Beliefs about knowledge and knowing and their relation to learning. *Review of Educational Research, 67,* 88-140.

Hwang, Y. S., & Vrongistinos, K. (2002). Elementary in-service teachers' self-regulated learning strategies related to their academic achievement. *Journal of Instructional Psychology, 29,* 147-154.

Jamieson-Noel, D. (2004). *Exploring task definition as a facet of self-regulated learning.*

Unpublished doctoral dissertation, Simon Fraser University, Burnaby, BC, Canada.

Kitchener, K. S. (1983). Cognition, metacognition, and epistemic cognition. *Human Development*, *26*, 222-232.

Lin, P. C., & Humphreys, L. G. (1977). Predictions of academic performance in graduate and professional school. *Applied Psychological Measurement*, *1*, 249-257.

Luyten, L., Lowyck, J., & Tuerlinckx, F. (2001). Task perception as a mediating variable: A contribution to the validation of instructional knowledge. *British Journal of Educational Psychology*, *71*, 203-223.

Mayer, R. E. (1987). Instructional variables that influence cognitive processing during reading. In B. K. Britton & S. M. Glynn (Eds.), *Executive control processes in reading* (pp. 201-216). Hillsdale, NJ: Earlbaum.

McKenzie, K., & Schweitzer, R. (2001). Who succeeds at university? Factors predicting academic performance in first year Australian university students. *Higher Education Research & Development, 20,* 21-33.

Muis, K., & Foy, M. (June, 2008). *The effects of teachers' beliefs on elementary students' beliefs, motivation, and achievement in mathematics.* Paper presented at the annual meeting of the Canadian Society for the Study of Education, Vancouver, British Columbia, Canada.

Nietfeld, J. L., & Schraw, G. (2002). The effect of knowledge and strategy training on monitoring accuracy. *Journal of Educational Research, 95*, 131-143.

Oshige, M., Hadwin, A. F., Fior, M., Tupper, M., & Miller, M. (2007, May). *Why do students fail to understand the task assigned?: Examining how attuned students are with a teacher across three levels of task-understanding.* Paper presented at the annual meeting of the Canadian Society for the Study of Education. Saskatoon, SK, Canada.

Pallant, J. (2007). *SPSS survival manual: A step-by-step guide to data analysis using SPSS Windows (version 15)*, 3rd edition. Crows Nest, Australia: Allen & Unwin.

Paterson, C. C. (1996). Self-regulated learning and academic achievement of senior biology students. *Australian Science Teachers Journal, 42*, 48-52.

Perry, W. G. (1970). *Forms of intellectual and ethical development in the college years: A scheme.* New York: Holt, Renehart and Winston.

Pintrich, P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp. 451-502). Burlington, MA: Elsevier Academic Press.

Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology, 82*, 33-40.

Pressley, M., Yokoi, L., van Meter, P., van Etten, S., & Freebern, G. (1997). Some of the reasons why preparing for exams is so hard: What can be done to make it easier? *Educational Psychology Review, 9*, 1-38.

Reisig, M. D., & DeJong, C. (2005). Using GRE scores and prior GPA to predict academic performance among criminal justice graduate students. *Journal of Criminal Justice Education*, *16*, 37-59.

Reynolds, R. E., Wade, S. E., Trathen, W., & Lapan, R. (1898). The selective attention strategy and prose learning. In C. B. McCormick, G. E. Miller, & M. Pressley (Eds.), *Cognitive strategy research: From basic research to educational applications* (pp. 159-190). New York: Springer-Verlag.

Schellings, G. L. M., & Van Hout-Wolters, B. H. A. M. (1995). Main points in an instruction text, as identified by students and by their teachers. *Reading Research Quarterly, 30*, 742-757.

Schellings, G. L. M., Van Hout-Wolters, B. H. A. M., & Vermunt, J. D. (1996a). Selection of main points in instructional texts: Influences of task demands. *Journal of Literacy Research, 28*, 355-378.

Schellings, G. L. M., Van Hout-Wolters, B. H. A. M., & Vermunt, J. D. (1996b). Individual differences in adapting to three different tasks of selecting information from texts. *Contemporary Educational Psychology, 21*, 423-446.

Schommer, M. (1990). Effects of beliefs about the nature of knowledge on comprehension. *Journal of Educational Psychology, 82*, 498-504.

Schommer, M. (1993). Epistemological development and academic performance among secondary students. *Journal of Educational Psychology, 85*, 406-411.

Schommer, M., Calvert, C., Gariglietti, G., & Bajaj. A. (1997). The development of epistemological beliefs among secondary students: A longitudinal study. *Journal of Educational Psychology, 89*, 37-40.

Schommer, M., Crouse, A., & Rhodes, N. (1992). Epistemological beliefs and mathematical text comprehension: Believing it is simple does not make it so. *Journal of Educational Psychology, 84*, 435-443.

Schommer-Aikins, M., Duell, O. K., & Hutter, R. (2005). Epistemological beliefs, mathematical problem-solving beliefs, and academic performance of middle school students. *The Elementary School Journal, 105*, 289-304.

Schraw, G., Bendixen, L. D., & Dunkle, M. E. (2002). Development and validation of the Epistemic Belief Inventory (EBI). In B. K. Hofer & P. R. Pintrich, (Eds.), *Personal epistemology: The psychology of beliefs about knowledge and knowing* (pp.261-275). Mahwah, NJ: Lawrence Erlbaum Associates.

Schunk, D. H. (1994). Self-regulation of self-efficacy and attributions in academic settings. In D. H. Schunk & B. J. Zimmerman (Eds.), *Self-regulation of learning and performance: Issues and educational applications* (pp.75-99). Hillsdale, NJ: Erlbaum.

Schunk, D. H., & Zimmerman, B. J. (1997). Social origins of self-regulatory competence. *Educational Psychologist, 32*, 195-208.

Selman, R. L. (1980). *The growth of interpersonal understanding: Developmental and clinical analyses*. New York: Academic Press.

Simpson, M. L., Hynd, C. R., Nist, S. L., & Burrell, K. I. (1997). College academic assistant programs and practices. *Educational Psychology Review, 9*, 39-87.

Simpson, M. L., & Nist, S. L. (1997). Perspectives on learning history: A case study. *Journal of Literacy Research*, *29*, 363-395.

Simpson, M. L., & Nist, S. L. (2000). An update on strategic learning: It's more than textbook reading strategies. *Journal of Adolescent and Adult Literacy, 43,* 528-541.

Statistics Canada (2007). *Youth in transition survey (YITS).* Retrieved June 4, 2008, from http://www.statcan.ca/english/sdds/document/4435_D10_T9_V3_E.pdf

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.). Boston: Pearson Education.

Thomas, J. W., & Rohwer, W. D. (1987). Grade-level and course-specific differences in academic studying: Summary. *Contemporary Educational Psychology, 12,* 381-385.

Ting, S. M. R. (2000). Predicting Asian Americans' academic performance in the first year of college: An approach combining SAT scores and noncognitive variables. *Journal of Colleges Student Development, 41,* 442-449.

Winne, P. H. (2001). Self-regulated learning viewed from models of information processing. In B.

J. Zimmerman and D. H. Schunk (Ed.), *Self-regulated learning and academic achievement: Theoretical perspectives* (2nd ed., pp.153-189). Mahwah, NJ: Erlbaum.

Winne, P. H., & Hadwin, A. F. (1998). Studying as self-regulated engagement in learning. In D. Hacker, J. Dunlosky, & A. Graesser (Eds.), *Metacognition in educational theory and practice* (pp.277-304). Mahwah, NJ: Lawrence Erlbaum.

Winne, P. H., & Hadwin, A. F. (2008). The weave of motivation and self-regulated learning. In D. H. Schunk & B. J. Zimmerman (Eds.), *Motivation and self-regulated learning: Theory, research, and applications* (pp.297-314). New York: Lawrence Erlbaum.

Winne, P. H., & Marx, R. W. (1982). Students' and teachers' view of thinking processes for classroom learning. *The Elementary School Journal, 82*, 492-518.

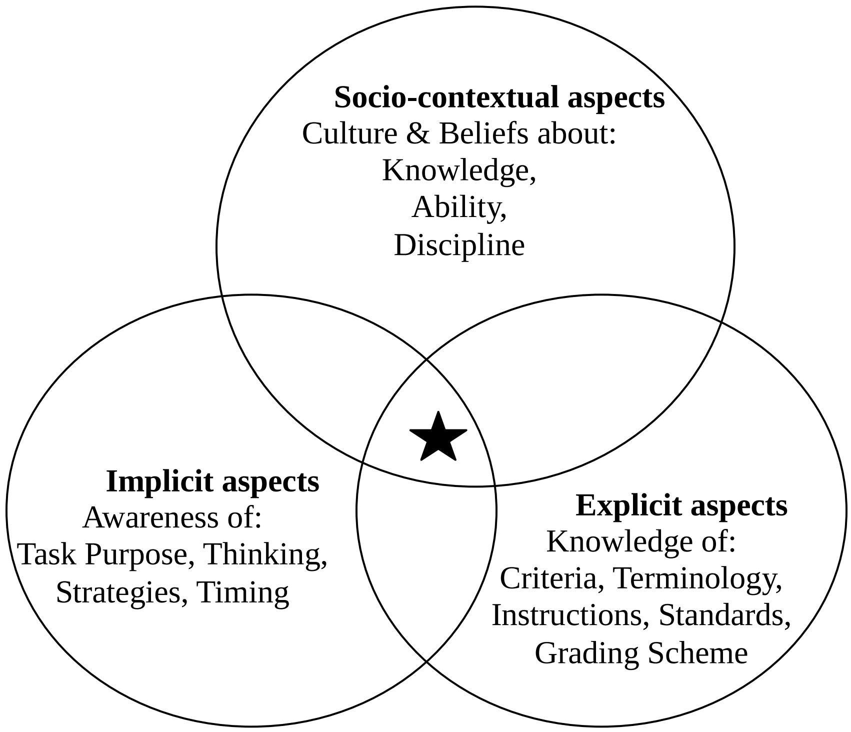
Wong, B. Y. L., Wong, R., & LeMare, L. (2001). The effects of knowledge of criterion task on comprehension and recall in normally achieving and learning disabled children. *Journal of Educational Research, 76*, 119-126

Zimmerman, B J. (1989). A social cognitive view of self-regulated academic learning. *Journal of Educational Psychology, 81*, 329-339.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. R. Pintrich, & M. Zeidner (Eds.), *Handbook of self-regulation* (pp.13-39). San Diego, CA: Academic Press.

Zimmerman, B. J. (2004). Sociocultural influence and students' development of academic self-regulation: A social-cognitive perspective. In. D. M. McInerney & S. Van Etten (Eds.), *Big theories revised: Vol 4. Research on sociocultural influences on motivation and learning* (pp.139-164). Greenwich, CT: Information Age Publishing.

Figure 1. Hadwin et al.'s (2008) model of Task Understanding



## Appendix A: Task Analysis Assignment Description

**Task Analysis Assignment (20 marks)**
Due: P1= Oct 1, P2 and P3= Oct 15
To Submit: Type in a word document, print and submit paper copy in your lab AND email a back up copy as an attachment to your lab instructor and Dr. Allyson Hadwin

**The purpose of this assignment** is to encourage you to critically examine a task that has been assigned in one of your other courses. You will be asked to articulate your perceptions of that task, and collect data to use in evaluating the accuracy and completeness of your task perceptions. In other words, this assignment requires you to grapple with the question "What is it I am supposed to do anyhow?"

**Related Learning Outcomes:**

- Explain what self-regulated learning is and how it contributes to your undergraduate learning.
- Use a model of self-regulated learning to critically analyze academic tasks that pose problems.
- Monitor and evaluate your understanding of academic tasks in your other courses
- Utilize strategies for improving your task understanding.
- Learn to interact with instructors or peers
- Develop awareness of the course and discipline contexts that bring meaning to academic tasks

**Description:**

***Part 1: What do you think this is about? (6 marks)*) DUE Oct 1**

1. Choose one academic task that has been assigned in one of your regular undergraduate courses (e.g., a reading, exam, assignment, lab activity, etc)
2. Complete the task analysis tool for students in the strategy library to think about explicit and implicit aspects of the course. Explicit aspects are things that are actually written down in the assignment. Implicit aspects are things that you are expected to infer about the assignment.
3. Estimate your instructor's Epistemological Beliefs by filling out the EBI in WebQuestionnaire

***Part 2: What does your instructor you think this is about? (6 marks)* DUE Oct 15**

1. Book an appointment with your instructor to discuss the task or assignment. Explain that your course instructor in ED-D101 has given you an assignment that requires you to compare your understanding of a course task or assignment with the instructor's representation of the same assignment. Offer to share your task analysis with the instructor if he or she is interested in seeing it.
2. Use the Task analysis tool for instructors to interview your course instructor about the task.
3. Ask the instructor each of the EBI for instructors questions on paper. When you get to your computer input the answers in WebQuestionnaire.

***Part 3: What have you learned about this task? (8 marks)* DUE Oct 15**

Answer the following questions:

1. How was your understanding of the explicit aspects of the course similar or different from the instructor's?
2. How was your understanding of the implicit aspects of the course similar or different from the instructor's?
3. How well correlated was your estimation of the teachers epistemological beliefs with the instructor's epistemological beliefs?
4. Reflect on what you have learned through this assignment? Has your task understanding changed and if so how? Has your confidence about your understanding changed?

Appendix B: Task Analysis assignment template (Spring)

## Task Analysis for Students

## Section 1

| | |
|---|---|
| Student Name: | |
| Lab Section: | |
| Task/Course Assignment: | |
| Course Number: | |
| Course Name: | |

**1.) What is the task? Provide a brief description including the task instructions.**

**2a) What kind of thinking is important in this task?**
(Please check the box that applies).

| | |
|---|---|
| Apply | |
| Remember | |
| Understand | |
| Analyze | |
| Evaluate | |
| Create | |

### 2b) Explain what that term means to you:

**2c) What kind of knowledge is important in this task?** (Please check the box that applies).

| | |
|---|---|
| **Metacognitive** (thinking, awareness, reflection) | |
| **Procedural** (methods, sequences, steps) | |
| **Conceptual** (models, theories, principles) | |
| **Factual** (terms, details, elements) | |

**2d) Explain what that term means to you:**

**3. Make a summary list of key instructions, words and statements from the assignment description, syllabus or class notes.**

**4. WHY has the instructor assigned this? In other words, what do you see as the main purpose of this task in your course?**

**5.**

| What do you see as the most important criteria for this task? | What resources do you hope students will draw upon to complete this task? | What course concepts do you expect students will draw on when completing this task |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**6. What makes an excellent (A+) version of this task?**

**7. What do you think your teacher values in terms of student learning and knowledge in this course?**

Complete the **EBI for students** available for download in Google Groups

**8a.) How confident are you that you understand the explicit aspects of this task?**
(Explicit means criteria, grading, terminology used to describe the task, etc.)

| *0* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| *Very Uncertain* | | | | | | | | | | *Very Certain* |

**8b.) How confident are you that you will understand the implicit aspects of this task?**
(Implicit means things like purpose, intent, how it fits in with course objectives, etc.)

| *0* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| *Very Uncertain* | | | | | | | | | | *Very Certain* |

**8c.) How confident are you that you will understand the context for this task?** (Context means things like how it fits with the course objectives, beliefs and values in the course and discipline, etc.)

| *0* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| *Very Uncertain* | | | | | | | | | | *Very Certain* |

**8d.)How confident are you can be successful in this task?**

| *0* | *1* | *2* | *3* | *4* | *5* | *6* | *7* | *8* | *9* | *10* |
|---|---|---|---|---|---|---|---|---|---|---|
| *Very Uncertain* | | | | | | | | | | *Very Certain* |

## Task Analysis Interview for Course Instructor:

## Section 2

| | |
|---|---|
| Student Name: | |
| Task/Course Assignment: | |
| Course Number: | |
| Instructor Name: | |
| Date Interviewed | |

**Please interview the course instructor for the above task.**

**In the interview:**

- Ask them the following questions.
- Ask them to complete the EBI for Teachers/instructors (available on google docs)

**1a) What kind of thinking do you think of as being important in this task?**
(Please check the box that applies)

| | |
|---|---|
| Apply | |
| Remember | |
| Understand | |
| Analyze | |
| Evaluate | |
| Create | |

**1b) Can you explain what you mean by that kind of thinking and how it applies to this task/assignment?**

| |
|---|
| |

**1c) What kind of knowledge do you think of as being important in this task?** (Please check the box that applies)

| | |
|---|---|
| **Metacognitive** (thinking, awareness, reflection) | |
| **Procedural** (methods, sequences, steps) | |
| **Conceptual** (models, theories, principles) | |
| **Factual** (terms, details, elements) | |

**2d) Can you explain what you mean by that kind of knowledge and how it applies to the assignment?**

| |
|---|
| |

**3. What would you identify as the things in the assignment description or task summary that are most important for students to attend to** (key instructions, words and statements from the assignment description, syllabus, or class notes):

| |
|---|
| |

**4. WHY has this assignment been given at this time? In other words, what do you see as the main purpose of this task in your course?**

| |
|---|
| |

**5. List responses to the following questions**

| What do you see as the most important criteria for this task? | What resources do you hope students will draw upon to complete this task? | What course concepts do you expect students will draw on when completing this task |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

**6. From past experience, what makes an excellent (A+) version of this task?**

| |
|---|
| |

**Student Name:** **Instructor Name:** **Date:**

**Task Analysis for Students**

**Section 3**

After comparing your task analysis, think about what you have learned from interviewing the teacher. Evaluate and reflect upon the following:

**1. Teacher & Student EBI comparison:**

a. Open a web browser (Internet Xxplorer, Netscape, Firefox, etc.)
b. Sign into Google Groups (www.groups.google.com)
c. Download the document "**Task Analysis Comparison Spreadsheet**" (in "Files") to your desktop
d. Enter your scores (yellow row) and your teacher's scores on the EBI Instructor Version (purple row). **The correlation is automatically calculated (red)**

**2. After comparing your EBI estimates to your teacher's, what is the correlation?**

**r =____**

(r ranges from -1.0 to 1.0. An r that is close to 1.0 means that your responses were similar to the teachers. An r that is close to -1.0 means your responses were opposite to the teachers. An r close to 0 means there was not a lot of consistency in how you answered the questions. )

**3a) After considering my instructor's responses, I believe my understanding of the <u>explicit features</u> of the task was accurate and complete.**

| ***0*** | | | | | | | | | | ***10*** |
|---|---|---|---|---|---|---|---|---|---|---|
| *Very inaccurate or incomplete* | | | | | | | | | | *Very accurate or complete* |

**3b) Explain: How was your understanding of the explicit aspects of the course similar or different from the instructor's? Why might this be important for your success in this task?**

| |
|---|
| |

**4a) My understanding of the <u>implicit features</u> of the task was accurate and complete.**

| ***0*** | | | | | | | | | | ***10*** |
|---|---|---|---|---|---|---|---|---|---|---|
| *Very inaccurate or incomplete* | | | | | | | | | | *Very accurate or complete* |

**4b) How was your understanding of the implicit aspects of the course similar or different from the instructor's? Why might this be important for your success in this task?**

| |
|---|
| |

**5a) My understanding of the <u>broader context and beliefs</u> associated with the task was accurate and complete.**

| ***0*** | | | | | | | | | | ***10*** |
|---|---|---|---|---|---|---|---|---|---|---|
| *Very inaccurate or incomplete* | | | | | | | | | | *Very accurate or complete* |

**5b) Explain: How was your understanding of the <u>broader context and beliefs</u> (socio cultural) aspects of the course similar or different from the instructor's? Why might this be important for your success in this task?**

| |
|---|
| |

**6) Reflect on your understanding of this task after having completed the task analysis. Has your task understanding changed and, if so, how? Has your confidence about your understanding change, and if so, how?**

| |
|---|
| |

# Appendix C: Course Syllabus

**University of Victoria**

*Faculty of Education*

**Department of Educational Psychology & Leadership Studies**

**Learning Strategies for University Success**

**ED-D101 / F01 (1.5 Units)**

Tuesday 1:30-3:00

ECS 125


| | |
|---|---|
| Instructor: | Dr. Allyson Hadwin |
| Office: | A461 |
| Office Hours: | Thursday 10am-12pm |
| Phone: | (250) 721-6347 |
| Fax: | (250) 721-6190 |
| E-mail: | Hadwin@uvic.ca |
| Web Site: | http://www.uvic.ca/learning101 |

Lab Instructors:

| | | | |
|---|---|---|---|
| Carmen Gress | clzgress@uvic.ca | Monday 8:30-10am | (MACD282) |
| Meghann Fior | mnfior@uvic.ca | Monday 2:30-4pm | (MACD282) |
| | | Tuesday 3:30-5pm | (MACD282) |
| Mariel Miller | marielmiller@gmail.com | Wednesday 6:30-8pm | (MACD282) |
| Allyson Hadwin | hadwin@uvic.ca | Thursday 8:30-10am | (MACD282) |

Technical Assistance with gStudy and webQuestionnaire

TBA


CALENDAR DESCRIPTION

This course supports undergraduate students to develop study skills and strategies for success in university courses. The course emphasizes applied assignments that help students to master reading; note taking, studying, time management, and assignment work in their current undergraduate courses. Students will apply theory to examine their own learning and experiment with new strategies for learning. Students will be required to use computers for course work and group projects.

TEXT/READING LIST

- Nist, S. L., & Holschuh, J. P. (2006). College success strategies (2nd Edition). New York, NY: Penguin Academics, Longmann Publishers.
- Learning kit materials provided as part of the course and delivered through gStudy (pre-release software)
- Empirical articles and activities accessed online

COURSE GOAL: BECOMING A SELF-REGULATED LEARNER

One of the goals of learning and study strategies courses is to provide opportunities for students to develop the skills, strategies, attitudes and behaviours necessary to become independent lifelong learners. Successful self-regulating students learn to direct, monitor, evaluate, mediate and adapt their own learning. Research findings suggest that self-regulation is a strong predictor of performance and is related to beliefs about success, motivation, and effort. Learning how to monitor and control the processes and behaviors associated with learning involves much more than learning sets of prescribed strategies, skills or methods for studying. Therefore this course focuses on providing opportunities for you to experiment with and improve upon your own learning. This is not a skills based course. Rather, our goal is to introduce you to the theory and practice of self-regulated learning and provide opportunities for you to apply what you are learning in the course to a range of study skills problems you encounter in your undergraduate courses. Activities in this course will provide opportunities for you to:

(a) receive feedback about your own learning;
(b) examine your strengths and weaknesses as learners;
(c) experience success through your own efforts and persistence;
(d) share and model for each other a range of learning strategies; and
(e) practice and receive feedback on your understanding of tasks, goal setting, planning, and reflective evaluation about learning processes across your undergraduate courses.

**LEARNING OBJECTIVES**

***Learning Strategies***

- Explain knowledge and understandings of learning strategies and why they work.
- Identify and justify study strategies that are useful for you.
- Generate and evaluate strategies for addressing studying problems you encounter.
- Apply and monitor the effectiveness of various learning strategies.
- Evaluate the effectiveness of strategies you have experimented with in your learning and adapt them for future use.
- Develop a customized repertoire of strategy information (descriptions, tools, and examples) you can draw from.
- Develop awareness of the course and discipline contexts that bring meaning to academic tasks.

***Self Regulated Learning and self-knowledge***

- Explain what self-regulated learning is and how it contributes to your undergraduate learning.
- Use a model of self-regulated learning to critically analyze academic tasks that pose problems.
- Monitor and evaluate your understanding of academic tasks in your other courses.
- Utilize strategies for improving your task understanding.
- Identify and reflect upon changes in your learning strategies, learning knowledge, beliefs and motivations.

***Learning processes and mechanisms***

- Explain how people process and remember information.
- Self-assess your own studying processes including notetaking, reading, time management, and writing.
- Learn to interact with instructors or peers.
- Learn to give feedback to peers.

COURSE EXPECTATIONS

- **You are expected to read the syllabus thoroughly.**
- **You must be enrolled in both the lecture section (1.5 hours) and a lab section (1.5 hours).**
- **You are expected to come to all class and lab sessions prepared (having completed readings and exercises).**
- **You must purchase the text for the course and bring it and any preparatory exercises to each class and lab.**
- Use of the computer is required in this course. The computer and computer software applications are integral for readings and assignments.
- You must download study kits from gStudy at the beginning of every study session and upload them at the end of every study or lab session. This is essential for preserving your work. If you do not do this, your work will be erased by the next user or you will not have access to it when you work in the lab or at home.

**ASSIGNMENT OVERVIEW**

| **Assignment** | **Marks allotted** | **Due Date:** |
|---|---|---|
| Task Analysis | 20 marks | Part 1= Oct 1, Part 2 & 3= Oct 15 |
| Problem Analysis | 20 marks | Oct 29 |
| Strategy Library | 20 marks | Part 1= Nov 5, Part 2= Nov 20 |
| Learning Portfolio | 30 marks | Nov 26 |
| Pop Quizzes | 10 marks | Scattered throughout course |

Notes:

(1) All assignments must be submitted electronically on Monday morning before 8:30 am. Therefore it would be wise to submit Sunday night. In many cases you will also be asked to print and bring a copy to your lab session. Electronic submission ensures that your paper does not get lost and protects against plagiarism.

(2) Please read carefully the instructions for submission in each assignment description. Some assignments are submitted using gStudy.

(3) You must abide by academic regulations as set out in the university calendar. You must observe standards of 'scholarly integrity,' especially with regards to plagiarism and cheating.

(4) Late assignments will be docked one full letter grade per day (e.g. A- down to B-). Because we all have "bad" days, we are providing you one opportunity to hand in an assignment "late" and still receive full credit if we receive it within 1 week. Please attach the pass included in the assignment package to the assignment when handing it in. THIS PASS CANNOT BE USED FOR ACTIVITIES COMPLETED IN CLASS OR FOR POP QUIZZES.

**COMMUNICATION AND CAMPUS RESOURCES**

If you have special needs or require special learning assistance, I encourage you to speak to me in person so we can create a positive learning environment for you.

**Resource Centre for Students with a Disability**
*Phone: 472-4947, Web: <www.rcsd.uvic.ca>, E-mail: inforcsd@uvic.ca*
Counselling Services **(personal, career, peer, and study skills counseling and courses)**
*Phone: 721-8341, Web: <www.coun.uvic.ca>*
**Student Transition Centre** (when you don't know, who to ask or where to find information or assistance)
http://web.uvic.ca/transition/, *Phone:* 472-4512

**IMPORTANT DATES**

| Week of | Class Topic | Lab Topic | Readings | Assignments Due |
|---|---|---|---|---|
| Sept 10 | Introduction to course<br>Motivation and Beliefs<br>Active learning | Intro to gStudy<br>PASS (P1) | Nist Chp 1, 2 | |
| Sept 17 | Research about study skills?<br>Self-regulated learning<br>Self-monitoring | MSLQ (P2)<br>Learning strengths & weaknesses | Hadwin (in press)?<br>Pintrich (1996?) | |
| Sept 24 | Task Understanding<br>Goal Setting and Planning | Task Analysis of an assignment | Nist Chp 5, 8 | |
| Oct 1 | Learning and Memory | SMART strategies | Nist Chp 3 | Task Analysis Part 1 |
| Oct 8 | Getting organized -regulating time | No formal lab<br>Drop in lab time[1] | Time planning kit<br>Nist Chp 4 | Take home lab activity tracking time use |
| Oct 15 | So what is the problem?<br>Figuring out what is going wrong? | Examining beliefs and motivations | Chp 7, 8 | Task Analysis Part 2-3 |
| Oct 22 | Reading for learning | Reading strategies | Reading Kit<br>Chp 11 | |
| Oct 29 | Rehearsing and Reviewing | Rehearsal and reviewing strategies | Chp 12, 13 | Problem Analysis |
| Nov 5 | Notetaking and learning from lectures | Notetaking strategies | Notetaking kit<br>Chp 14 | Strategy Library Part 1 |
| Nov 12 | **Reading Break** | | Exam prep Kit | |
| Nov 19 | Mastering Exams | Sharing strategies | Chp 17, 18 | Strategy Library Part 2 |
| Nov 26 (PQ) | Writing processes and strategies | Writing activity | Writing kit | |
| Dec 3 | Problem solving processes and strategies | Problem solving activity | Problem solving kit | Learning Portfolio |

**IMPORTANT UNIVERSITY DATES**

| | |
|---|---|
| Sept 18 | Last day for 100% reduction of tuition fees for first-term and full-year courses |
| Sept 21 | Last day for adding courses that begin in the first term |
| Sept 30 | Last day for paying first-term fees without penalty |
| Oct 8 | Thanksgiving |
| Oct 9 | Last day for 50% reduction of tuition fees. 100% of tuition fees will be assessed for courses dropped after this date. |
| Oct 31 | Last day for withdrawing from first-term courses without penalty of failure |
| Nov 12-13 | Reading break |

[1] Week of Oct 8 includes voluntary drop-in labs instead of required lab session (Tuesday to Thursday only). Feel free to drop into any lab session for assistance with: (a) assignments, (b) doing the correlations for the EBI for Task analysis Part 2, (c) using or modifying gStudy, (d) studying problems you are encountering in your other courses.

**Department Of Educational Psychology and Leadership Studies**
**Faculty of Education**
**Grading Policy**

NOTE: Any departure from this grading system must be submitted in writing to the Chair of the Department. Approval of the Chair must be obtained prior to the distribution of the course outline.

1. When numerical marking is used at the UDERGRADUATE or GRADUATE level, normally the following conversion from percentage to letter grades will be used:

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| A+ | > 95 | A- | 85-89 | B | 75-79 | C+ | 65-69 | D | 51-59 |
| A | 90-94 | B+ | 80-84 | B- | 70-74 | C | 60-64 | E or F | <50 |

2. In assigning grades at the UNDERGRADUATE level, the following guidelines should be followed.

Passing Grades

- A+ Outstanding scholarship and originality. Complete mastery of subject matter.
- A Excellent scholarship displaying strong knowledge, synthesis and application of concepts.
- A- Very good scholarship showing depth of knowledge and analytical ability.
- B+ Good scholarship, high knowledge level and good application of information.
- B Steady performance, not outstanding in knowledge or application.
- B- Good knowledge but some lack of understanding, ability, or background.
- C+ Satisfactory knowledge, limited application and demonstration of understanding.
- C Satisfactory knowledge, definite lack of some information, no application.
- D Marginally satisfactory (but not failure), noticeable gaps in knowledge and understanding.

Failing Grades

- E Failing grade: Conditional supplemental. (Note: UNDERGRADUATE ONLY: No supplementals offered in the Faculty of Graduate Studies)
- F Failing grade: No supplemental
- N Failing grade: Did not write examination or otherwise complete course requirements by the end of the term or session; no supplemental.

3. In assigning grades at the GRADUATE level, the following guidelines should be followed:

- A+ Unusually superior scholarship, incorporating originality. Complete mastery of subject matter.
- A Superior scholarship showing complete comprehension and synthesis of the subject matter.
- A- Excellent scholarship showing complete comprehension and sound application of information.
- B+ Very good scholarship showing sound comprehension and good application of information.
- B Satisfactory scholarship, some lack in comprehension and application of subject matter.
- B- Marginally graduate performance, noticeable gaps in knowledge or ability. Concerns about understanding and competency.
- <B- Unsatisfactory (i.e., student’s status must be reviewed by the supervisory committee of the student and a recommendation for continuation be made to the Dean).

Students must abide by academic regulations as set out in the university calendar. They must observe standards of 'scholarly integrity' especially with regards to plagiarism and cheating (see p. 31-32 of the 2004-2005 Calendar.

Appendix D: Consent Forms

# *Participant Consent Form*

**Department of Educational Psychology & Leadership Studies**

**Technology Integration and Evaluation Research Lab**

## Evaluating Student Learning and the ED-D101 Course

You are invited to participate in a study entitled *Evaluating Student Learning and the ED-D 101* course that is being conducted by Dr. Allyson Hadwin (Principal Investigator). Dr. Hadwin is a Faculty member in the department of Educational Psychology and Leadership Studies at the University of Victoria. This research is being funded by the Social Sciences and Humanities Research Council of Canada (SSHRC-INE grant), the University of Victoria (LTCDG), and the Canadian Foundation for Innovation (CFI-LOF).

**Purpose, Objectives, and Importance of Research**

This research project will examine: (a) how students who have taken ED-D101 compare with students who have not according to standard performance indicators collected by Institutional Planning and Analysis, (b) how students self-regulate their learning and use of strategies during the course. Research of this type is important because it will inform: (a) evidence based decision making regarding future offerings, expansion of the course, course content and course activities, and (b) advance theory and research in educational psychology by informing understandings about how students learn to strategically regulate their learning over time.

**What does participation in this study involve**

You are being asked to participate in this study because you are enrolled in the course ED-D 101: Learning strategies for University success. All data examined in this research are part of your regular course activities. We are requesting permission only to analyze and review this data for research purposes after the course is completed and your final grades have been submitted. If you agree to voluntarily participate in this research, your participation will include allowing us to analyze for research purposes:

- information you produce as part of your regular course activities (e.g., self-assessment questionnaires, written assignments, computer based discussions)
- course based studying activities when using the gStudy software to complete course readings and assignments, provided you have agreed to have that information recorded when you first login to use the software

- institutionally collected performance indicators such as entering GPA, yearly GPA, exit surveys, will be examined for the entirety of your undergraduate degree. Data will be anonymized.

**Risks and Benefits**

There are no known or anticipated risks to participating in this research. By participating in this research, you will provide invaluable information that will be used to improve the course and its value for future undergraduate students. The potential benefit is that this course evaluation will lead to: (a) improving the course design, (b) making evidence-based decisions about the future of the course, and (c) improving our understandings about how students learn to self-regulate their learning over the course of a semester.

**Voluntary Participation**

Your participation in this research must be completely voluntary. If you do decide to participate, you may withdraw at the end of the course without any consequences. Consent forms will be made available in paper copy at the beginning of the course, and electronically at the end of the course. At the end of the course you can login in to either add consent that you did not provide at the beginning of the course, or withdraw consent. When you use the software for this course for the first time, you will be asked to indicate if it is ok to record your studying actions. This type of data is used in usability testing and for researching how students use the software to learn. If you do not consent to participate in the research study by signing this form, we will not access or use any logged data for research purposes. It may only be examined to make improvements to the software.

**Anonymity and Confidentiality**

Since data consists of course assignments and activities, they will be saved/recorded with identifying information (your name and student number). Therefore data will not be anonymous. However, we will protect confidentiality in the following ways: (1) Data will be summarized and stored in a spreadsheet that will identify participants by a random case number rather than name or student ID. (2) Data reported in publications and presentations will be: (a) summarized across students, or (b) presented using pseudonyms in cases where specific examples are used.

**Researcher's Relationship with Participants**

Dr. Hadwin is your course instructor so she will leave the room when you complete the consent forms. Consent forms will be placed in a sealed envelope and delivered directly to the Dean of Education's office where they will be kept until Dr. Hadwin has submitted your final course grades. Therefore, Dr. Hadwin will not know if you have or have not consented to participate in the research until she is no longer your course instructor.

**Analysis of Data and Dissemination of Results**

Data will be analyzed by Dr. Hadwin and collaborators on her research project. Findings from this study will be shared in academic publications and presentations, a web bulletin on the TIE website, graduate student thesis work, and reports to senior administrators and undergraduate instructors. Examples from student work will be used in future ED-D101 course offerings but all identifying information will be removed from those examples.

**Disposal of Data**

Data from this study will be kept for approximately 10 years as it is part of a longitudinal evaluation of the ED-D101 course and its influence on student performance at University. Paper based data will be stored in a locked filing cabinet in the TIE research lab (A210D MacLaurin) after which it will be shredded. Electronic data will be archived and stored anonymously on a password protected server accessible to the researchers. After approximately 10 years the electronic files will be erased.

**Contacts**

You may contact the following people if you have further questions, comments, concerns or wish to verify information about the study:

(1) During the course: Mika Oshige (mikao@uvic.ca), or Dr. Ted Riecken (deaneduc@uvic.ca )
(2) After the course: Dr. Allyson Hadwin (hadwin@uvic.ca)
(3) Human Research Ethics Office at the University of Victoria (250-472-4545 or ethics@uvic.ca).

Your signature below indicates that you understand the above conditions of participation in this study and that you have had the opportunity to have your questions answered by the researchers.

| ______________________ | ______________________ | ____________ |
|---|---|---|
| *Name of Participant* | *Signature* | *Date* |

I am willing to be contacted for a follow up interview after the completion of the course and can be contacted as follows:

Email: ______________________

Phone: ______________________

***A copy of this consent will be emailed to you and a paper copy will be taken by the researcher.***

Appendix E: Coding criteria for Explicit and Implicit questions.

a. **Explicit**: *Describe the task*

| Scores | General explanation | Coding checklist | Examples | Task |
|---|---|---|---|---|
| 2 | Good explanation.<br>Easy to understand what the task was, provides details, uses own words.<br>The description is specific to the targeted task and concrete. | When you read student's response, you can tell:<br><br>1) the type of a task (e.g., essays, exams, presentation, project)<br>2) its specific topic (what the task is on)<br>3) things they do with the topic (research, critique, analyze, apply, understand, remember, create, solve, evaluate)<br>4) its general procedure or main points in a final product (how to go about it, steps to take, what resources to use)<br>5) its subject (which area, discipline the task is from)<br>6) its style (format, technicality, mechanical)<br><br>For papers, if students' responses focus more on 3) & 4) than 6), that is a 2 because these responses indicate they understand what to do.<br><br>**For exams**, to get a 2, the response should identify:<br>a) It's an exam<br>b) what concepts are covered<br>c) what students HAVE to do with these concepts (e.g., say at least "understand the concepts")<br>d) exam structure, although this is not essential (50 multiple choices, 3 short answers, essay) | Research project on the historical, social, economic, environmental, and human health aspects of “white” products, in my groups case “wheat flour”. Creation of a group paper and the presentation of the main points in class. Marks based on quality of research, information presented, originality , analysis, and possible resolutions to the problem. Also the development of a timeline of major historical And geographical expansion relating to “wheat flour”. | Group Project |

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|---|---|---|---|---|
| 1 | Some good explanation but not quite enough.<br>The description is a little confusing or unclear.<br><br>You can visualize the task to some extent but it's not a clear picture.<br><br>OR You can picturize the task, but it seems to be copied and pasted directly without any re-wording or paraphrasing | Two or three points from the above list are identified.<br><br>OR student's description looks like copy and paste from the actual instruction (not in their own words)<br><br>If students' response focuses on mechanical and stylistic aspects only, the score will be a 1.<br><br>**For exams**, if students didn't describe c), then that's a 1. | Actively engage the world at large with literature and monitor the response<br><br>Submit a proposal before November 16, 2007<br><br>Encouraged to work in groups<br><br>1000 Word academic essay<br><br>Analyze the experience and explain goals<br><br>Relate to course work | Other projects |
| 0 | No clear explanation<br>No idea what the task is, or very difficult to visualize what the exact task is (i.e., multiple interpretation is possible.) | None or only one of the items on the list is identified, and the description if very vague.<br><br>OR the description lists the purpose of the task or it seems the “describe” question was misunderstood | The point of the task it to attempt to answers questions to the best of your ability. | Exam |

b. **Explicit**: Thinking (*Define the chosen term*)

| Scores | General explanation | Coding checklist | Examples | Task |
|---|---|---|---|---|
| 2 | Good explanation about what a "Thinking" term they chose means in a particular task.<br><br>Here, the accuracy of their choice is not evaluated. The ability to adjust the general meaning of a term to a task at hand is considered. (i.e., meaning -making, as opposed to one-size- fits-all approach to a task) | The student's response provides a definition with relation to the task of their choice.<br><br>The definitions are anchored to a task, so they are specific and concrete. | Analyze - To produce your own thoughts about a given subject. In this task, we read a story or poem and break it apart into its core elements, then reflect on those elements using the thoughts generated from the piece. | Analysis paper |
| 1 | Some explanation about a "Thinking" term. | It provides a dictionary definition (generic definition), rather than task-specific definition.<br><br>When multiple terms are listed, not all terms are defined with relation to a task. In this case, take the average score of the terms. | To analyze refers to going further into detail regarding a particular matter. To try and further your understanding. | Analysis paper |
| 0 | No clear explanation | a) Explaining the term by using the term<br>b) No explanation is provided<br>c) The response does not answer the question, "define the Thinking term they chose"<br>d) The definition they provided doesn't reflect the meaning of the term (wrong meaning)<br>e) The definition can refer to more than one term (vague) | Understand each of the questions being asked, and to apply my knowledge to answer those questions. | Chapter questions |

c. **Explicit**: Knowledge (*Define the chosen term*)

| Scores | General explanation | Coding checklist | Examples | Task |
|---|---|---|---|---|
| 2 | Good explanation about what a "Knowledge" term they chose means in a particular task.<br><br>Here, the accuracy of their choice is not evaluated. The ability to adjust the general meaning of a term to a task at hand is considered. (i.e., meaning -making, as opposed to one-size- fits-all approach to a task) | The student's response provides a definition with relation to the task of their choice<br><br>The definitions are anchored to a task, so they are specific and concrete. | Metacognitive: think about and understand the regions in Canada and how events affect them differently, why different places have different "issues". How a region's culture relates and interacts with its economic situation and environmental situation.<br><br>Factual: Understand the economic situation, cultural factors and geographic details of the place | Other project |
| 1 | Some explanation about a "Knowledge" term. | It provides a dictionary definition (generic definition), rather than task-specific definition.<br><br>When multiple terms are listed, not all terms are defined with relation to a task. In this case, take the average score of the terms. | It means that you must you understand the main concepts, being certain models, theories and principles to be successful in the study. | Exam |
| 0 | No clear explanation | a) Explaining the term by using the term<br>b) No explanation is provided<br>c) The response does not answer the question, "define the Knowledge term they chose"<br>d) The definition they provided doesn't reflect the meaning of the term (wrong meaning)<br>e) The definition can refer to more than one term (vague) | I need to understand the facts, details and elements of the historical events to accurately compare historical contemporary press accounts to later historical literature. | Research paper |

d. **Explicit**: Criteria (*What do you see as the most important criteria for this task?*)

| Scores | General explanation | Coding checklist | Examples | Task |
|---|---|---|---|---|
| 2 | Most of all important points to be included in a final product (grading criteria) are identified. The list is thorough enough and appears relevant to the task. If students fulfilled the points they listed, it's likely that they receive a B (or higher) range grade.<br><br>***Excerpts from a course calendar:***<br>B+/B/B- indicate "Very good, good and solid performance. Normally achieved by the largest number of students. These grades indicate a good grasp of the subject matter or excellent grasp in one area balanced with satisfactory grasp in the other area." | The list includes:<br>a) writing genre, format (structure of the task, overall picture of the task)<br>b) concepts (principles, theories, models) -what they are<br>c) thinking (apply, analyze, remember, understand, evaluate, create)-what they need to do with concepts<br>d) knowledge (procedural, metacognitive, facual, conceputal, relational) - what do they need to learn or develop<br>e) mechanics, technicality, appendices (e.g., references, drawings)<br>b, c, d, have higher weight, so if students listed only those, it's a 2, unless it's an English writing course. | 8 pgs, double spaced, typed, paginated<br><br>Use 4 resources (and additional ones, if desired)<br><br>Include a bibliography and footnotes<br><br>Recognize the main problem or question that motivates an author<br><br>Understand how the author's argument is constructed<br><br>Locate the context from which the author is writing<br><br>Detect all possible biases | Research paper |
| 1 | Some of the points are identified. The list is centred around mechanics and stylistics, although some conceptual aspects might be mentioned. | listed a few points OR<br><br>the list is vague (generic) | Chose 2 things to compare<br>Develop a thesis<br><br>Support your arguments<br><br>Use pieces from the text<br><br>Check from grammar/punctuation errors | Analysis paper |
| 0 | No or few points are listed. OR the list doesn't make sense (i.e., off-focus, not answering the question)<br><br>Only one point is listed. | No items or only one listed OR<br><br>not answering the question (answer is off, listing other things) | complete the assigned questions | Chapter questions |

f. **Implicit**: Why (*Why did your professor assign this task?*)
e.g., Chapter question

| Scores | General explanation | Coding checklist | Examples |
|---|---|---|---|
| 2 | Good explanation.<br>Explanation indicates a student is making **deeper connections** and seeing a **bigger picture** in explaining why the task was assigned. | Following items are possible reasons. At least 2 of them need to be listed to receive a 2. Any reasons that show a student makes deep connections to the course or show a student sees a bigger picture in a task is a worth 2:<br><br>a) To have a solid understanding of the concepts/formulae in a particular chapter for later complicated problems<br>b) ) To be fluent in retrieving/using concepts in a particular chapter (practice)<br>c) c) To build a foundational knowledge for **later more complicated concepts**<br>d) d) To be able to use (apply, analyze, critique, etc) these concepts **for later more complicated problems/questions**<br>**When students indicated words in bold, that would make their reasons a 2, even though only 1 reason is listed. This task is a well-structured task. So the future aspect is important to be indicated as a reason for this kind of task.** | For us to better understand the multiple formulas given in each unit, when to use them, and why to use them there. If we just figure out the formulas and how to use them, we will do good on the test, but if we learn why they are used that way, then we will actually remember them after the course is done with. |
| 1 | Some explanation - it's a little weak or vague<br>Explains the purpose at the surface level. | Only one reason is listed. OR<br><br>Reasons are vague and/or superficial.<br>The following reasons are considered rather superficial:<br>a) To do well on an exam<br>b) To have students read a chapter before lecture | To understand concepts in the textbook, both ones that are being covered at the time of assignment, and in chapters to be covered next. |
| 0 | No clear explanation OR Reasons are off (e.g.,mis-understood this question) | None of the items on the list is identified.<br><br>Reason(s) shows student's learning is placed on external benefits.<br>Examples:<br>a) So that an instructor will know how students are doing in a course to adjust their teaching materials or curriculum | To complete all the questions without reflecting back on the answers because they are not available. |

f. **Implicit**: Why (*Why did your professor assign this task?*)
e.g., Analysis paper

| Scores | General explanation | Coding checklist | Examples |
|---|---|---|---|
| 2 | Good explanation. Explanation indicates a student is making **deeper connections** and seeing a **bigger picture** in explaining why the task was assigned. | Following items are possible reasons. At least 2 of them need to be listed to receive a 2. Any reasons that show a student makes deep connections to the course or show a student sees a bigger picture in a task is a worth 2:<br><br>a) To deepen a knowledge of a material and/or self (reflection, own reaction to a material)<br>b) To develop better understanding of course concepts by analyzing a material<br>c) To develop the ability to interpret a material through the perspectives of course concepts (to be able to use the targeted concepts to interpret a provided material).<br>d) To develop the ability to de-construct what's presented based on targeted course concepts.<br>e) To develop skills to present these de-constructed materials along with one's interpretation in a way that a specific discipline accepts.<br>f) To develop the ability to present/express one's analytical insight/reflections in a discipline specific way.<br>g) To develop the ability to interpret a material (develop critical eyes) for the future work (e.g., later in the course, other courses, real work situation, etc).<br>h) To develop the skills to write analysis/critique papers for the future work (e.g., later in the course, other assignments, other courses, real work situation, academic career) | I think that the main reason the prof has assigned this is mainly to get students into art galleries and experiencing the art first hand. By writing this paper, it's an evaluation of how we are able to apply the material learned in class to the actual world of art. The main purpose is to have the students be able to connect the material from class to any kind of art seen anywhere. |

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| 1 | some explanation - it's a little weak or vague<br>Explains the purpose at the **surface** level.<br>Explains basic purpose only. | Only one reason is identified. OR<br>Reasons are too general or superficial (not making connections to the course objectives, the task is seen as temporal, disjointed, independent of the course).<br><br>(tips: the response would make you want to ask "yes, but why?" for further explanation)<br><br>Examples:<br>a) To be able to use analysis skills<br>b) To understand a material | I believe this assignment was assigned to help the students make sure that they have an understanding on the notion of "otherness" in films and society as this is an important aspect in the last half of the course. It is a opportunity for the students to put together everything they have learned from the course. |
| 0 | No clear explanation OR Reasons are off (e.g., listing the description of the task, rather than the purpose, misunderstood this question) | None of the items on the list are identified.<br><br>OR<br><br>Reason(s) shows student's learning is placed on external benefits.<br><br>Examples:<br>a) So that an instructor will know how students are doing in a course to adjust their teaching materials or curriculum (externally responsible in learning)<br><br>b) To test our ability to analyze | The purpose of this task is to thoroughly exam two plays and compare them in a essay so that we can discover the similarities and differences they have. Through this we examine how cultures and world views change as well as stay the same over time. |

g. **Implicit**: Resources (*What resources do you need to draw upon to complete the task?*)

| Scores | General explanation | Coding checklist | Examples | Task |
|---|---|---|---|---|
| 2 | The list is thorough, specific, and relevant (concrete) to the task .<br>The kinds of resources depend on tasks, so anything students should draw upon to complete a task and anything they can turn to in need of help should be listed. | More than **three** kinds of core resources that are specific, concrete, and relevant to the task are identified. It shows the variety of resources.<br>**General guidelines (need to be specific in student's list):**<br>**Narrative/Expository essays & Analysis papers**: textbook, lecture notes, handouts, experts, journal articles, any professional websites, targeted analysis materials (**for Analysis papers**)<br>**Research papers**: experts, librarians, books (grammar, academic), journal articles (primary, secondary), professional organizations' websites, handouts, lecture notes, textbooks<br>**Experimental reports**: textbooks, lab manual, lecture notes & lab notes, experts, other books & manuals, handouts, journal articles, data, professional organization's websites<br>**Exams**: lecture notes, textbooks, handouts, experts, past exams, study guides, professional organization's websites<br>**Quizzes & Chapter questions**: textbooks, lecture notes, handouts, experts, study guides, professional organization's websites<br>**Group projects**: textbooks, lecture notes, handouts, experts, other books & manuals, journal articles, professional organizations' websites, problem sets<br>**Individual projects**: textbooks, lecture notes, handouts, experts, other books, journal articles, professional organizations' websites | Corrigan's Textbook for Short Essay Writing<br><br>Bardwell Film Study Textbook<br><br>Thesaurus<br><br>University Writing Center<br><br>Lecture Notes from Class<br><br>Tutorials Notes and personal notes from home viewing. | Analysis paper |
| 1 | The list is vague, and not thorough, nor relevant to the task. | One or two specific and concrete resources are identified.<br>More than three items are listed, but they are vague (broad and general resources). | Class Notes<br><br>Internet<br><br>Classmates | Analysis paper |
| 0 | The list is not relevant to the task, or no items are listed, or students misunderstood the question | One or two resources are listed, but they are vague.<br>No resources are listed.<br>The participant is not answering the question (misunderstood the question). | Communication | Group project |

h. **Implicit**: Concepts (*What course concepts do you need to draw on when completing this task?*)

| Scores | General explanation | Coding checklist | Examples | Task |
|---|---|---|---|---|
| 2 | Good list - specific and concrete concepts that appear relevant to the task are listed | Any ones in below are listed:<br><br>a) specific and concrete course concepts relevant to the task<br>b) specific and concrete formulae to solve or answer<br>c) specific and concrete theories, principles, base knowledge to use to analyze, apply, evaluate, create etc<br><br>e.g., in case of Academic writing course, mechanical and stylistic aspects should be the focus of course concepts because that's what this course is about. So students should list, for example, effective thesis topic, sentence structures, MLA style, citation, etc.<br><br>I acknowledge the concepts students listed here might not be accurate concepts for a final product. To confirm the accuracy, their instructor's data are necessary. However, the point of coding the data is whether students are able to identify what seems to be important concepts (ability to isolate concepts). | [major topics taken from course outline]<br><br>Quantum numbers<br><br>Pauli Exclusion Principle<br><br>Hund's Rule<br><br>Periodic table<br><br>Ionization energy<br><br>Electron affinity<br><br>Nuclear charge<br><br>Orbitals<br><br>Electron configurations | Exam |
| 1 | Some list but might be vague or not thorough. | Listed related ideas (e.g., things to be included in a task, criteria, things that should be understood), rather than course concepts or listed vague concepts | Chapters, 4, 5, and 6 | Chapter questions |
| 0 | No clear list | Listed things other than course concepts or important ideas<br><br>OR<br><br>No list | Clarify<br><br>Adjust<br><br>Complete<br><br>Continue/maintain change | Group project |

i. **Implicit**: Excellent (*What makes an excellent (A+) version of this task?*)

| Scores | General explanation | Coding checklist | Examples | Task |
|---|---|---|---|---|
| 2 | Good explanation - Student's explanation indicates exceeding what is listed on a grading rubric (i.e., more than just meeting the task criteria) and shows the subtlety of A+ quality work (90-100%) by being anchored to a task. Accordingly, their explanation displays a coherent whole as a polished product, rather than a collection of separate pieces. The subtlety is something that is not written on the instruction but is essential to make the task complete and polished.<br><br>***Excerpts from course calendar:***<br>A+ indicates "Exceptional ... performance. Normally achieved by a minority of students. These grades indicate a student who is self-initiating, exceeds expectation and has an insightful grasp of the subject matter." | Student's response shows:<br><br>1) What would be on a grading rubric for the task they chose<br><br>From Criteria coding list, the list should identify:<br>(a) overall picture of the task<br>(b) concepts to be used<br>(c) kind of thinking - what they need to do with concepts,<br>(d) knowledge - what do they need to learn or develop<br>(e) mechanics, technicality<br><br>2) The A+ subtlety is expressed in specific and concrete terms (by anchoring to the task)<br>"self-initiating"<br>"exceeding instructor's expectation"<br>"showing an insightful grasp of a subject matter"<br>or any words that indicate "exceptionally high quality" work<br><br>Examples for **quizzes and exams (& chapter questions)**, it would look like:<br><br>Being able to make connections among concepts and extend that knowledge to the next level (e.g., predict, hypothesize)<br>Being able to answer conceptually complicated questions, or higher level questions, in short answers,<br>Being able to combine concepts to accurately choose an answer in higher level questions for multiple choice questions, etc | An excellent version of this task is one that has in depth and thoughtful evalutions of the historical review that they have chosen. The critical analysis must be defended by at least two scholarly and relevent sources that add to your agruments. These must be presented in a 3-4 page, logical, well written, and organized paper that | Analysis paper |
| 1 | Some explanation - Students' explanation describes the same as grading criteria (bones and meat) and does not pick up the subtlety of the A+ quality. Their explanation describes A-/B+/B range quality task (just meeting all grading criteria for a task), not A+ (above 90 or 95% grade | Student's response describes just a grading criteria<br><br>Student's response describes more than a grading criteria but the subtlety is explained by using only general terms.<br><br>Examples for **quizzes and exams (and some chapter questions**),<br>Being able to understand concepts and their relationships<br>Being able to apply course concepts | Correctly and accurately address the essay topic and writing a well organized essay. Answering the topic orginally but correctly, making | Analysis paper |

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|---|---|---|---|---|
| | level).<br><br>Sometimes, their explanation describes a A+ quality but the explanation is general, and not anchored to a task.<br><br>***Excerpts from course calendar:***<br>B+/B/B- indicate "Very good, good and solid performance. Normally achieved by the largest number of students. These grades indicate a good grasp of the subject matter or excellent grasp in one area balanced with satisfactory grasp in the other area." | | sure to answer all aspects of it. | |
| 0 | No clear explanation<br><br>Student's explanation focuses on mechanics and styles (structure). Students' explanation describes C or D range quality task.<br>Or their explanation is off track.<br><br>***Excerpts from course calendar:***<br>C+/C indicate "Satisfactory, or minimally satisfactory. These grades indicates a satisfactory performance and knowledge of the subject matter."<br><br>D indicates "Marginal performance. A student receiving this grade demonstrated a superficial grasp of the subject matter." | Student's explanation focuses on mechanics and styles of a final product, or only one fraction/component of the product (so it describes less than a (possible) grading rubric).<br><br>It is off track (students misunderstood the question)<br><br>No explanation is provided (unable to answer)<br><br>For **quizzes and exams (and some chapter questions)**,<br>Getting all questions right<br><br>This response doesn't describe what it takes to get all answers right. Getting all questions right is a result of meeting all criteria and going beyond its criteria. When students (i.e., their preparation for an exam) went beyond its criteria, they would be able to handle even the most conceptually complicated question. And THAT would give them an A+ result.<br>This might be another indicator of externalized focus of learning (academic entitlement), as students rely on others in evaluation of their work. | Concise<br><br>Clear<br><br>Well-organized<br><br>Well summarized<br><br>Well justified | Other project |