

Examining the Effectiveness of Teacher Feedback on
Student Learning Outcomes through a Student Engagement Model

By

Heather Sorella

11039397

A Thesis Submitted to
the Université de Sherbrooke,
in Partial Fulfillment of the Requirements for
the Degree of Master's of Education

August 2018

© Heather Sorella, 2018

Evaluator's Page

Abstract

College instructors spend significant amounts of time constructing feedback for their students, either through written comments or verbal consultations. Unfortunately, for many students, feedback seems to have little or no impact (Sadler, 1989). In order to increase the strength of formative feedback, students need to understand the meaning of formative feedback statements. They also need to identify particular aspects of their work that need attention. This action research study first explored how a sample of college (Cégep¹) Fashion Design students studying in the Fashion Design Program at LaSalle College, in Montreal, Québec understood and used the formative feedback they received from their teachers. It tested the usefulness of an intervention strategy, initially proposed by Murtagh and Baker (2009), designed to involve students in a reflective assessment of formative feedback. Quantitative results did not indicate a significant difference between control and treatment groups' post-assessment scores, which might be due to significant a priori group differences. Qualitative results provided support for the intervention in terms of increasing self-reflection and goal setting among treatment group participants. Therefore, this study provided support for Murtagh and Baker's (2009) intervention strategy as applied to a particular sample of Quebec Cégep students.

Keywords: formative feedback; characteristics of feedback; formative assessment; goal-setting; learning outcomes; reflection; self-regulation; student engagement; summative assessment

¹Cégep is a French acronym, *Collège d'enseignement général et professionnel* (College of general and professional studies). Cégeps are frequently referred to as "colleges" in Quebec. Students who complete their Cégep program are awarded a DEC (*Diplôme d'études collégiales*) or an AEC (*Attestation d'études collégiales*)

Résumé

Le sujet de la rétroaction est important dans l'éducation et est un problème qui touche aussi bien les élèves que les enseignants. S'il est correctement administré, la rétroaction peut aider à perfectionner les compétences d'auto-évaluation et de réflexion chez les élèves et les enseignants. Dans le domaine de l'éducation, la rétroaction est souvent utilisée comme outil pour informer les étudiants de leur état d'apprentissage et de leur performance quant aux objectifs et aux normes (Nicol et Macfarlane-Dick, 2006). Idéalement, les élèves interagissent avec le sujet et les commentaires. Si les élèves utilisent la rétroaction pour participer activement à leur apprentissage, ils peuvent mieux définir leurs objectifs et prendre contrôle de leur apprentissage. Ce processus devrait transformer les étudiants en individus intrinsèquement motivés et qui prennent en charge leur propre pensée, motivation et comportement pendant l'apprentissage (Pintrich & De Groot, 1990).

Cette étude de recherche-action mettait l'accent sur l'utilisation de la rétroaction et sur le rôle qu'elle peut jouer auprès d'une population spécifique d'étudiants en Design de Mode au Collège Lasalle, situé à Montréal, Québec. À travers une réplique de l'étude de Murtagh et Baker (2009) intitulée «Rétroaction : réponses des étudiants aux commentaires écrits par les tuteurs» dans un Cégep québécois, cette étude a examiné l'utilisation d'une stratégie d'intervention. L'étude a regardé l'impact de l'intervention sur les résultats d'apprentissage et visait trois objectifs principaux. Premièrement, elle visait à établir mieux comprendre les perceptions actuelles des étudiants et de leur utilisation de la rétroaction par rapport à leurs objectifs d'apprentissage. Cette étape a révélé ce que les élèves considèrent comme les forces et les faiblesses des commentaires offerts par les enseignants et comment ces commentaires pourraient être améliorés. Deuxièmement, une stratégie d'intervention a été mise en place pour que les étudiants du groupe de traitement soient invités à réfléchir sur les leçons apprises en relation avec leurs résultats d'apprentissage. L'impact de cette intervention a été mesuré en comparant les résultats d'un deuxième travail à un premier devoir où les participants du groupe témoin ont reçu de la rétroaction. Troisièmement, plusieurs modèles du rôle joué par la rétroaction par rapport aux résultats d'apprentissage des élèves ont été développés par une revue de la littérature. L'impact de la loi d'effet de Thorndike (1913) a été examiné par rapport aux premières formulations du rôle de la rétroaction. En outre, les modèles liés aux processus que les étudiants éprouvent lorsqu'ils interagissent avec les commentaires ont été articulés. Cela comprenait le modèle en cinq étapes de la pleine conscience décrit par Bangert-Drowns et al. (1991) qui ont démontré comment engager les élèves dans un processus de rétroaction reflétant les résultats d'apprentissage.

En résumé, l'objectif général était de répondre à la principale question de recherche suivante: est-ce que la réflexion des élèves sur la rétroaction, suite à une intervention, a un impact sur les résultats d'apprentissage? Cette étude a mesuré l'effet sur les résultats d'apprentissage, la variable dépendante, à travers la mise en œuvre d'une intervention de rétroaction, la variable indépendante. De plus, la présente étude visait à appro-

fondir, au moyen de questionnaires pré et post-questionnaires, la perception des élèves quant aux commentaires des enseignants.

Mots clés: rétroaction formative ; caractéristiques de rétroaction ; l'évaluation formative; établissement d'objectifs; les résultats d'apprentissage; réflexion; autorégulation; engagement étudiant; l'évaluation sommative

Table of Contents

Abstract	3
Résumé.....	4
List of Tables	9
List of Figures	10
Acknowledgements	11
Introduction.....	12
CHAPTER ONE: PROBLEM STATEMENT	13
CHAPTER TWO: CONCEPTUAL FRAMEWORK.....	18
CHAPTER THREE: LITERATURE REVIEW	21
3.1 Empirical Studies: The Impact of Formative Feedback on Learning Outcomes.....	21
3.2 Characteristics of Student and Teacher that Affect Feedback.....	22
3.3 Models of Feedback	26
3.3.1 Performance Model.....	27
3.3.2 Process Model.....	27
CHAPTER FOUR: METHODOLOGY.....	31
4.1 Research Questions and Hypotheses	31
4.1.1 Main Research Question:	31
4.1.2 Secondary Research Questions:	32
4.2 Participants	33
4.3 Research Design.....	33

4.4	Instruments	36
4.4.1	Description of Specific Instruments.....	37
4.4.2	How Instruments Contributed to Data Collection.....	38
4.5	Ethical Considerations and Responsibilities of the Participants	39
4.5.1	Responsibilities to Sponsors of Research	41
CHAPTER FIVE: RESULTS		42
5.1	Main Research Question	44
5.1.1	Quantitative Data Analyses.....	44
5.2	Secondary Research Questions.....	48
5.2.1	Secondary Research Question #1: What are students' perceptions of teacher formative feedback?	48
5.2.2	Secondary Research Question #2: What do students perceive as helpful or unhelpful feedback?.....	52
5.2.3	Secondary Research Question #3: Do students understand the formative feedback they receive from teachers?	55
5.2.4	Secondary Research Question #4: From the student's perspective, how can the value of teacher formative feedback be enhanced?.....	57
5.2.5	Secondary Research Question #5.....	58
5.3	The Intervention	58
5.4	Focus Group Conversation.....	60
CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS.....		66
6.1	Discussion	66
6.2	Limitations of the Study	72
6.3	Recommendations and Future Research	73
REFERENCES.....		77
APPENDIX 1: ETHICS COMMITTEE APPLICATION FORM		82

APPENDIX 2: ETHICS COMMITTEE APPROVAL FORM.....	86
APPENDIX 3: LASALLE COLLEGE CONSENT FORM.....	87
APPENDIX 4: PARTICIPANT CONSENT FORM.....	88
APPENDIX 5: PARTICIPATION DETAILS.....	89
APPENDIX 6 A: PRE-QUESTIONNAIRE (OPEN-ENDED).....	90
APPENDIX 6 B: PRE-QUESTIONNAIRE (SURVEY).....	92
APPENDIX 7 A: POST-QUESTIONNAIRE (CONTROL GROUP).....	94
APPENDIX 7 B: POST-QUESTIONNAIRE (TREATMENT GROUP).....	95
APPENDIX 8: INTERVENTION PROTOCOL.....	97
APPENDIX 9: FORMATIVE ASSESSMENT.....	98
APPENDIX 10: SUMMATIVE EVALUATION.....	101
APPENDIX 11: INTERVIEW PROTOCOL.....	104
APPENDIX 12: LIST OF FOCUS GROUP QUESTIONS.....	105
APPENDIX 13: RAW DATA TREATMENT GROUP.....	106
APPENDIX 14: RAW DATA CONTROL GROUP.....	107

List of Tables

Table 1 - Timeline for Research Procedure	36
Table 2 - Sources of Support for Main and Secondary Research Questions	38
Table 3 - Variation in Treatment Group Gain Scores between Formative & Summative Assessments (based on Murtagh & Baker, 2009).....	46
Table 4 - Variation in Control Group Gain Scores between Formative & Summative Assessments (based on Murtagh & Baker, 2009)	46
Table 5 - Comparison of Raw Scores Grades on the Formative and Summative Assessments	46
Table 6 - Between-Group Differences	47
Table 7 - Students' Perceptions of Teacher Feedback (Pre-questionnaire data)	49
Table 8 - How Students Respond and Act upon Written Teacher Feedback (Pre-questionnaire results)	51
Table 9 - Focus Group Responses (Control Group).....	62
Table 10 - Focus Group Responses (Treatment Group)	63

List of Figures

Figure 1- Adapted Linear Approach to Assessment and Learning (Murtagh & Baker, 2009, p.23)	19
Figure 2 - Gain Scores.....	45

Acknowledgements

Firstly, I would like to acknowledge Dr. Susan Kerwin-Boudreau who helped me realize that I had the potential and strength to complete a Master's thesis. Her continuous encouragement made me find my inner voice.

Secondly, I would also like to thank LaSalle College for providing the opportunity to be part of the MTP program, which made me a better teacher.

Finally, I must express my very profound gratitude to my daughter and husband without whom this accomplishment would not have been possible.

Introduction

In the research on learning, feedback has been identified with knowledge of results. For example, Kulhavy (1977) defined feedback as “any of the numerous procedures that are used to tell a learner if an instructional response is right or wrong”. According to Black & Wiliam (1998), there are two main functions of feedback: directive and facilitative. Directive feedback tells the student what needs to be fixed or revised. Facilitative feedback provides comments and suggestions to help guide students in their own revisions and conceptualizations. There are many aspects of feedback, for example, formative feedback defined as “information communicated to the learner that is intended to modify his or her thinking or behaviour to improve learning. It should be nonevaluative, supportive, timely and specific” (Shute, 2008, p.153). The main goal of formative feedback is to increase student knowledge, skills and understanding in some content area or general skill (e.g., problem solving). Feedback specificity is defined as the level of performance presented in the feedback message (Goodman, Wood, & Hendrickx, 2004). Specific feedback, compared to formative feedback, is more directive and provides information about particular details on how to improve the answers rather than indicating whether the student’s work is correct or not (Bangert-Drowns, Kulik, Kulik, & Morgan, 1991).

Although the impact of feedback on student learning remains undisputed, the mere provision of feedback does not necessarily lead to improvement, a fact that is well known to teachers in all sectors of education, including higher education (Crisp, 2007). Given that feedback has the potential to improve student learning outcomes, a significant concern contemporary teachers’ face is whether or not students consult and understand the feedback they receive (Higgins, Hartley & Skeleton, 2001). How might formative feedback be constructed and transmitted to engage students and help them reflect on their goals?

CHAPTER ONE: PROBLEM STATEMENT

The main purpose of feedback is to confirm or change the student's knowledge as represented by answers to practice or test questions (Mory, 2004). However, students have expressed dissatisfaction with the helpfulness of lecturers' feedback (Hounsell, McCune, Hounsell, & Litjens, (2008). College instructors spend significant amounts of time carefully constructing feedback and then transmitting it to their students, usually through written comments or verbal consultations. Although the central role that feedback plays in effective learning remains undisputed (Sadler, 1989), issues surrounding how feedback might best be used to impact learning remains topics of interest. Three prominent areas of research include: to what extent do students consult the feedback they receive; how might feedback be made more useful to increase students' comprehension; and are there models of feedback that maximize student involvement to achieve learning goals (Mory, 2004).

Kulhavy (1977) described feedback as "any communication or procedure that is given to inform a learner of the accuracy of response, usually to an instructional question" (p.211). According to Sadler (1989), feedback is viewed as a means of providing students with information on learning goals, an approximation of how closely they have achieved these goals, and how to bridge the gap. Although many researchers refer to feedback in a generic sense, others distinguish among feedback, formative feedback and assessment, and feedback and a summative assessment. In the literature, formative feedback is intrinsically linked to the process of assessment, and, in particular, formative assessment (Black & William, 1998). In the current study, students received both teacher written feedback and a grade on the formative assessment component. This was done in order to measure gain scores between a formative and a summative assessment that was administered four weeks later. In contrast to a formative assessment, Black & William (2006) define summative assessments as tests which "provide ways of eliciting evidence of student achievement, and used appropriately, can promote feedback that moves learning forward" (p.5). In this study, the summative assessment was a mid-term assessment

that was administered four weeks after the formative assessment and, contrary to regular practice, was not the final semester evaluation. This was done in order to measure the immediate impact of formative feedback on a similar, subsequent summative assignment through a comparison of gain scores. As well, the rather brief time period between the formative and summative assessment was meant to eliminate potential extraneous variables that might influence results.

College instructors complain that while they spend hours preparing feedback, students do not pay attention to it, other than how it relates to their grade. This perception is supported not only by anecdotal evidence but also in the literature. Wojtas (1998) found that some students were concerned only with their mark and not with the feedback aimed at self-reflection or improving their understanding of the subject matter.

This study examined how third-year, fifth-semester, Fashion Design students in the Fashion Design Program at LaSalle College respond to formative feedback. In the Fashion Design Program, students are assigned grades based on the final product they submit. Based on informal discussions with former students before undertaking this project, students tend to perceive grades as an indicator of performance and an extension of their abilities. Typically, they did not question why they received a particular grade but instead focused on how they could improve their grade.

Although teachers, including those at LaSalle College, often complain about students not using the feedback they provide, researchers have shown that students also have expressed dissatisfaction with the quality of lecturers' feedback (Hounsell, McCune, Hounsell, & Litjens, 2008). Students assert a need for meaningful and constructive feedback (Higgins, Hartley, & Skelton, 2001) to serve as a guide to their learning (Duffield & Spencer, 2002). However, complaints about feedback range from its lack of specificity to difficulty comprehending the message (Murtagh & Baker, 2009, p. 22). If misunderstandings exist and students are not able to make sense of feedback, its primary purpose is thwarted and it will not advance learning

(Gibbs & Simpson, 2004). This misunderstanding may also contribute to lecturers failing to recognize the students' perspective (Gibbs & Simpson, 2004). An assessment of students' current perceptions of the strengths and weaknesses of formative feedback would shed light on this issue within this particular sample of Quebec Cégep Fashion Design students.

Over the past two decades, Biggs (1999), among others, has described a shift within higher education from a teacher-driven model to one that involves the learner playing an active role in the construction of knowledge. If, in fact, the primary purpose of feedback is to enable learners to gauge their current performance and move towards learning goals, efforts must be made to develop strategies to increase student involvement. Murtagh and Baker (2009) proposed that by actively engaging students in the feedback process, comprehension and ownership of learning goals will increase. Their results demonstrated that subsequent outcome scores did increase, although the authors maintain that this finding on its own does not reveal the complete picture of how students perceived the intervention. For example, the authors did not compare the impact of the intervention with a group of students who did not receive the intervention. As well, they did not probe students' post-intervention perceptions. The inclusion of a control group, as well as a post-intervention questionnaire to further probe students' perceptions, might provide answers to some of these questions. Additionally, it would prove interesting to test this model within a particular sample in the Quebec Cégep system.

According to Beaumont, O'Doherty, and Shannon (2008), students described feedback as a "system of guidance within a supportive relationship offering frequent opportunities for discussion of progress" (p.7). Further, students discuss how formative assessment and teacher scaffolding satisfy their expectations for higher grades. While student grades remain a final element of the feedback process, this research indicates that if feedback is to be effective, it should focus on the growth of knowledge and the achievement of student learning rather than on just how grades might be increased. The latter situation reinforces students' misunderstandings of

formative feedback solely as a means to a higher R score or GPA score. Increasing students' involvement with formative feedback might help to address this misconception and expand their understanding of the potential that feedback holds.

Ideally, in higher education, feedback might be used as a means to empower students (Nicol & Macfarlane-Dick, 2006). This sense of empowerment is based on the assumption that college students have developed deep learning processes (Biggs, 1999). The supposition that college students have developed deep learning processes is essential because it suggests that the student is cognitively prepared to both understand and use formative feedback to further their learning. Otherwise, the impact of formative feedback is diminished. Students, through the use of formative feedback, can be taught how to better apply their cognitive resources to increase student learning outcomes and metacognitive control. Livingston (2003) describes metacognition as "higher order thinking which involves active control over the cognitive processes engaged in learning" (p.2). According to Pintrich and Schrauben (1992), "monitoring of one's thinking and academic behaviour seems to be an essential aspect of metacognition" (p.161).

In spite of this, and in spite of the central role that feedback plays in the learning process, feedback is still conceptualized within the top-down, teacher-centered framework. Nicol and MacFarlane-Dick (2006) describe this as follows:

Teachers 'transmit' feedback messages to students about what is right or wrong in their academic work, about its strengths and weaknesses, and students use this information to make subsequent improvements. (p. 200)

The disconnect between current teacher-driven formative feedback processes and expectations about how students should be actively involved in the construction of their knowledge is apparent and suggests that this is an essential area for researchers to address.

Thus, the three areas of inquiry outlined at the beginning of the section above merit further investigation. First, teachers need more information on how students perceive and use formative feedback. Second, the elements of quality formative feedback from the students' perspective need to be identified. Finally, an intervention model in which students become active participants in the formative feedback process needs to be further explored.

Accordingly, the main goals of this action research study were to investigate how students consulted and interpreted formative feedback, what constitutes quality formative feedback, and if an intervention strategy designed to involve students in the formative feedback process would enhance student learning outcomes.

CHAPTER TWO: CONCEPTUAL FRAMEWORK

This chapter explores the research on learning and the importance of feedback and in particular, formative feedback. Black and Wiliam (2006), in their research on feedback and classroom formative assessment, concluded:

Thus, whilst we cannot argue that development of formative assessment is the only way, or even the best way, to open up a broader range of desirable changes in classroom learning, we can see that it may be peculiarly effective, in part because the quality of interactive feedback is a critical feature in determining the quality of learning activity, and is therefore a central feature of pedagogy. (p.100)

Although the impact of feedback on student learning remains undisputed, the mere provision of feedback does not necessarily lead to improvement, a fact that is well known to teachers in all sectors of education, including higher education (Crisp, 2007). Given that feedback has the potential to improve student learning outcomes, a significant concern teachers face is whether or not students consult and understand the feedback they receive (Higgins, Hartley & Skeleton, 2001). How might formative feedback be constructed and transmitted to engage students and help them reflect on their goals?

Svinicki and McKeachie (2013) state that “if properly administered, feedback can develop and perfect skills of self-assessment and reflection” (p.120). According to Hattie and Timperley (2007), “feedback is effective when it consists of information about progress, and/or about how to proceed” (p.89).

In education, feedback is often used as a tool to inform students on their present state of learning and performance related to goals and standards (Nicol & Macfarlane-Dick, 2006). If students use feedback to become actively involved in their learning, they can better define their goals and develop strategies to increase their

learning outcomes. This process should transform them into self-regulated, intrinsically motivated individuals who take charge of their thinking, motivation and behaviour during learning (Pintrich & De Groot, 1990).

This action research study focused on the use of formative feedback and the role it played in student learning outcomes through a replication and adaptation of the Murtagh and Baker's (2009) study entitled *Feedback and feed forward: Student responses to tutors' written comments on assignments* (see Figure 1 below). The participants in this fifteen-week study were third-year, fifth-semester Fashion Design students in the Fashion Design Program at LaSalle College. This study, like that of the original Murtagh and Baker (2009) study, examined the impact on future outcome scores of a face-to-face individual meeting with the teacher, otherwise known as the intervention, or the "adapted linear approach to assessment and learning" (see Figure 1 below). This study also examined students' perceptions of teacher written formative feedback. Furthermore, to discern the most effective elements of the feedback process models, including Nevin's (1999) analysis of Thorndike's (1913) *Law of Effect*, Biggs's (1999) *Three Common Theories of Teaching* and Bangert-Drowns, Kulik, Kulik, & Morgan's (1991) study, *The Five-Stage Model of Mindfulness*, were used to examine student involvement in the feedback process.

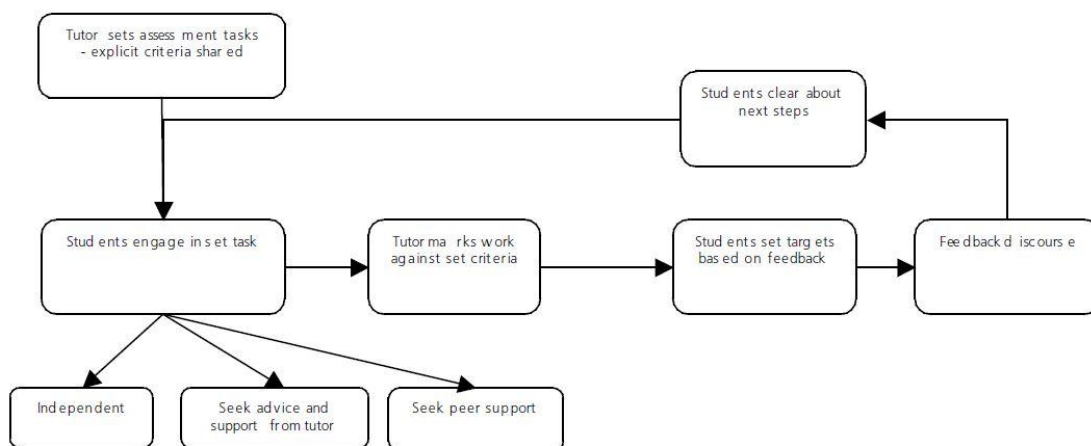


Figure 1- Adapted Linear Approach to Assessment and Learning (Murtagh & Baker, 2009, p.23)

This present study had two primary goals. First, it sought to establish a clear understanding of students' perceptions and their use of formative feedback in relation to their learning goals. Students' responses also revealed what they considered as the strengths and weaknesses of formative feedback and how this formative feedback could be improved. Second, an intervention strategy known as the "adapted linear approach to assessment and learning" proposed by Murtagh and Baker (2009) was implemented in which students in the treatment group were asked to reflect on formative feedback in comparison to their learning outcomes. The impact of this intervention was measured in a subsequent assignment and was compared to the results obtained from control group participants.

In summary, the present study explores the perceptions of third-year, fifth-semester Fashion Design students in the Fashion Design Program at LaSalle College regarding formative feedback, and investigates the impact of an intervention strategy, i.e., an individual face-to-face meeting with the teacher, designed to improve students' use of this formative feedback. As a replication of the Murtagh and Baker's (2009) study, this research examines the effect of a reflective intervention strategy on future gain scores in a subsequent summative assessment. The current study also extends the original Murtagh & Baker's (2009) research in two ways. First, this study includes both a treatment group (reflective intervention) and a control group (no intervention). Second, this study includes a post-intervention questionnaire that seeks to further discern, through an exploration of students' perceptions, the influence of the reflective intervention strategy on future learning outcomes. The overall aim is to answer the following main research question: Does student reflection on teacher formative feedback, as a result of an intervention, have an impact on their learning outcomes as measured in a subsequent assessment, known as the summative assessment? This study measures the effects on student learning outcomes, the dependent variable, through the implementation of a formative feedback intervention, the independent variable. As well, this study seeks to further probe, through pre- and post-questionnaires, students' perceptions of teacher written formative feedback.

CHAPTER THREE: LITERATURE REVIEW

This chapter examines the key concepts and theories linked to the literature on formative feedback and student learning outcomes. Formative feedback is first defined, and its impact on formative assessment is explored through various empirical studies. Student and teacher characteristics that influence how formative feedback is understood and used are described. Finally, models that focus on both process and performance aspects of formative feedback are discussed and linked to the current study.

Sadler (1989) described the feedback process as varying from the "essentially passive with no immediate impact upon learning, to the delivery of extensive comments upon a draft that then requires the active involvement of the student for learning to progress, otherwise known as formative feedback" (p.120). The range of possibilities and effects associated with formative feedback also points out the necessity of contextualizing the setting when discussing its impact. This study examines the effectiveness of formative feedback on student learning outcomes, how students use the formative feedback they receive and how teachers can develop better methods of collaborating and delivering clear and concise formative feedback. Although grades are not usually associated with formative feedback, in this study grades were assigned, in order to measure the impact of formative feedback on a future, similar summative assignment.

3.1 Empirical Studies: The Impact of Formative Feedback on Learning Outcomes

A significant contribution to the topic of feedback has come from Hattie and Temperly's (2007) review. In their review, the authors classify feedback in four types: the first type is task-level feedback, which focuses on faults in the interpretation of the task or the outcome produced. The second is about the main process needed to understand/perform a task. The third focuses on the self-regulation

level and the fourth concerns issues of personal evaluations and affect, including such feedback features as praise and judgment.

Weaver's (2006) study explored the attitudes, beliefs and perceptions of students' written feedback with a view towards establishing whether, in practice, feedback does effect improvement in learning. Respondents confirmed that feedback containing constructive comments was necessary for improvement. When the respondents were asked to give a specific example, they perceived helpful feedback to have included both diagnosis and guidance. Lea and Street's (2000) qualitative study, *Student writing and staff feedback in higher education* examined students' interpretations of feedback comments. The authors determined that students often interpret tutor comments differently than what was intended. Maclellan (2001) suggested that improvement in learning occurs when students perceive feedback as enabling learning, and not just as a judgment on their level of achievement. As well, Wojtas (1998) claimed that many students improved their work once they understood the purpose of both feedback and assessment criteria. It would appear that feedback within the framework of formative assessment holds great potential, but teachers need guidance on what to avoid and what to focus on to provide quality feedback.

It is generally accepted that constructive feedback is essential for improving performance, how this process unfolds also has to be understood. Within higher education, Hounsell and Hounsell (2007) claim that feedback can enhance learning in three significant ways: by accelerating learning, by optimizing the quality of what is learned, and by raising individual and collective attainment. Models related to the feedback process will be described in a later section of this chapter.

3.2 Characteristics of Student and Teacher that Affect Feedback

The learner and the teacher figure significantly in how formative feedback is both constructed and understood. A student's previous experience (Marton, Säljö, & Ramsden, 1992) and their intellectual maturity (Perry, 1970) play a significant role in their approach to learning and, consequently, the extent to which they can engage

with teacher formative feedback. Marton et al., (1992) argued that students in the initial stages of their university life bring with them their own beliefs regarding learning derived from their previous experiences, usually their schooling. These conceptions are divided into six categories of learning. The first three conceptions, referred to as “reproductive”, are seen as a learner lacking an understanding and meaning consisting of: a) learning as increasing one’s knowledge; b) learning as memorizing and reproduction; c) learning as applying. The last three conceptions, where the learner begins to change as a person, is referred to as “transformative”, this is where the learner is more concerned with understanding and meaning (Marton & Säljö, 1976a, 1976b; Säljö, 1979). The key point the authors express is that conceptions are not permanent and can change from reproductive to transformative as students develop through university (Perry, 1970; Marton, Säljö, & Ramsden, 1992). The change will take place when the student is made to understand that his/her learning at university can result in his/her change as a person (Marton, Säljö, & Ramsden, 1992). The assumption is that as the student moves towards a more transformative conception of learning, teacher feedback is increasingly viewed as a means of promoting deeper understanding and meaning.

Perry (1970), in his classic model of intellectual development in college students, also described stages students experience in their learning process. Perry outlined four stages of mental and moral development: dualism, multiplicity, relativism and commitment. The first stage, “dualism”, states that every problem is solvable, that students are to learn the right answers, and that one must obey authorities. The second stage, known as “multiplicity”, is where there are two types of problems: solvable and also problems that the answer is unknown. At this stage, students need to trust their inner voice. At the third stage, “relativism”, all solutions to problems must have reasons and be viewed within a specific context; everything is contextual. The final stage “commitment” is where there is an acceptance of uncertainty as part of life. During this stage, students use a combination of personal experience and evidence learned from external sources to arrive at conclusions. As

the learner progresses through these four stages of intellectual growth, feedback can assume an increasingly critical role in helping one to define personal values and commitment to life goals.

In order for formative feedback to enhance student learning outcomes, it is important for teachers to clarify students' perceptions and their interpretation of this feedback. Students who do not yet have an understanding of academic dialogue similar to that of their teachers will subsequently have difficulty understanding and using the formative feedback. As well, the teacher's level of academic dialogue and their response styles might vary and this will influence both the nature of their formative feedback and how students respond to formative feedback. Ivanis, Clark and Rimmershaw's (2000) analysis of feedback identified different teacher response styles and suggested they were dependent upon teachers' beliefs about their purpose in providing feedback. Research has also shown that some students actively use the feedback they receive while others lack motivation and understanding. Students' understanding and application of feedback is not an automatic response, but rather a skill that requires lecturers' investment to develop (Orsmond, Merry & Reiling, 2005). If students have not been prepared to connect with the feedback, they may show little evidence of development or intrinsic motivation to learn (Mutch, 2003). Lecturers need to ensure that feedback to students on assessed work is given in a way that broadens learning and assists improvements (Orsmond et al., 2005).

How might the role of the teacher in the delivery of formative feedback be further understood? Biggs's (1999) *Three Common Theories of Teaching* provides an interesting model that encompasses three different types of teacher-student environments that impact overall student learning outcomes. Since formative feedback is viewed as an inherent aspect of the teaching/learning process by several researchers including Black and William (1998), this theory can be interpreted within the context of formative feedback. The three levels of Biggs's theory are outlined below and subsequent links are made to feedback.

Level 1 of Biggs's (1999) theory views the teacher within a top-down, transmission of learning environment and the learner as a passive recipient of information. This level is further described as follows:

Level 1: Learning is primarily a direct result of individual differences between students. The purpose of teaching is to transmit information, usually by lecturing. This conception holds teaching constant, so that variability in student learning is accounted for by individual differences between students, which create a "blame-the-student" theory of teaching. (p.62)

The assumption is that feedback at this level would be delivered by the teacher within a "one-size –fits all" format with little regard for or knowledge of how individual students might understand and use formative feedback to further their learning goals. Hence, at this level it can neither be assumed that teachers have a deep understanding of the role of formative feedback or that this formative feedback will enhance learning outcomes.

Although the teacher at level 2 is more open to experimentation, including perhaps ways of delivering formative feedback and involving students in the feedback process, a deep understanding of the intersection between student learning activities and student learning outcomes is absent. Because student learning is not at the center at this level, the potential that formative feedback holds cannot be realized. Level 2 is further described below.

Level 2: Learning is primarily the result of appropriate teaching. The teacher who operates at Level 2 works at obtaining an armory of teaching skills. Traditional approaches to staff development often work on what the teacher does. Level 2 is also a deficit model; the "blame" this time is on the teacher. (p.62)

It is only at level 3 that a student-centered environment truly exists that is focused on enhancing learning outcomes. Not only is the learner actively engaged in the learning process, but both teacher and student work together to promote positive outcomes. The assumption is that the teacher adapts teaching and learning activities to meet individual student needs. The implication is that at this level, strategies, including how formative feedback is delivered and interpreted, are tailored to the individual learner. It is at this level where the full potential of feedback as a mechanism to promote student learning can be ascertained. A further description of level 3 is provided below.

Level 3: The Level 3 teacher focuses on “what the student does, on what learning is or is not going on”. Getting students to understand requires that they undertake the appropriate learning activities. This is where Level 3 student-centered theory of teaching departs from the other models. It’s not what teachers do; it’s what students’ do that is the important thing”. (pp. 62- 63)

3.3 Models of Feedback

In addition to empirical studies on formative feedback and learning outcomes, researchers have conceptualized models of feedback that focus on both performance and process elements. Performance models focus on the product or what the student produces, and highlight how formative feedback is often delivered in a mechanical fashion, by stating what is wrong or correct and how to proceed. A process model, on the other hand, focuses on the cognitive elements that are involved in the student’s understanding and interpretation of formative feedback. This might include how students read, interpret and use formative feedback to promote learning goals.

3.3.1 Performance Model

An example of a performance-driven model is Thorndike's (1913) *Law of Effect*. According to Kulhavy & Wagner (1993), this model explains how "a response followed by a 'satisfying state of affairs' is likely to be repeated and increases the likelihood of learning" (p.5). The view of formative feedback as information emphasizes the role that the learner has in learning, with the ability to adapt his or her responses according to information in the feedback and thus correct his or her errors (Mory, 2004, p.746). According to Nevin (1999), the "stimulus-response bond is generated by reinforcement" (p. 447). The author describes how a positive result, such as a good mark and positive teacher feedback will spur the student to address necessary changes and move forward. Student satisfaction is the end product. On the other hand, if a student receives a weaker reinforcer, in the form of less positive feedback, or negative feedback, a negative effect will result. If the student has not been given information on how to make changes, they may very well not be motivated to continue (p. 447), and learning is compromised. While product models provide insight into how formative feedback can influence behavior and learning goals, the role of the learner and the cognitive processes that are involved are absent. An examination of process models can provide some understanding of this omission.

3.3.2 Process Model

Bangert-Drowns et al. (1991) have described one of the several models that focus on the process or the cognitive flow that students experience when faced with formative feedback. The authors examined forty research studies on feedback using meta-analysis techniques. Variables such as the type of feedback, the timing of feedback, and the error rates regarding their respective effect sizes were explored. This widely cited analysis described both behavioural and cognitive operations that occur in learning. The basic idea is that "to direct behaviour, a learner needs to be able to monitor physical changes brought about by behaviour" (p. 214). Most of the variables Bangert-Drowns et al. (1991) analysed were taken from text-based

feedback, which they organized into a Five-Stage Model. Bangert-Drowns et al.'s (1991) *Five-Stage Model* considers the cognitive and reflective processes students explore as they go through a feedback cycle (Salomon & Globerson, 1987). Often defined as "mindfulness", this reflective process engages students in understanding the meaning of the tasks involved (Dempsey et al., p.38). The first stage of the feedback process takes into account the 'current state' of the student. For example, the level of interest, affinity for goal setting, the degree of self-efficacy and prior knowledge is taken into account at the onset of the feedback cycle. The second stage consists of retrieving information located in memory. Cognitive mechanisms are activated by a question and the goal of this stage is for the student to retrieve prior knowledge. Once the student answers the question with some degree of certainty, the student will feel confident with the potential response feedback at this third stage of knowledge revival. The fourth stage has the student evaluate and reflect on the response to the feedback. If the student receives confirmation that the response was correct, the student will feel more confident. This stage also reinforces that the student understood the question. However, if the student does not receive a confirmation of having provided a correct response, the student will likely want to explore why his response was not correct because he has been involved in the feedback process. The final stage of the feedback cycle consists of adjustments. At this point, the student who engaged in a reflective attempt to retrieve the answer, either by responding correctly or incorrectly, will be satisfied with the outcome. The student will try to use the feedback cycle to further reflect or might not go through the feedback loop again. The final stage identifies two different types of students. A student who is intrinsically motivated and has set goals to continue will progress. A student who shows no interest and is not involved in setting goals because he did not embark on the *Five-Stage* process, will not be motivated to proceed again through the feedback cycle.

The main conclusion from Bangert-Drowns et al.'s (1991) meta-analysis and subsequent five-cycle model is that "feedback can promote learning if it is received

mindfully” (Shute, 2010, p.174). Conversely, feedback can inhibit learning if it encourages mindlessness, as when the answers are made available before learners begin their memory search, or if the feedback message does not match students’ cognitive needs (e.g., too easy, too complicated, too vague). This theory provides an overview of the process students might experience as they become involved in the feedback loop. Concepts derived from this theory including self-efficacy, intrinsic motivation and self-reflection present useful constructs that can help to guide the researcher during the intervention process.

Another process model was elaborated by Murtagh and Baker (2009). The authors developed an intervention strategy that focused on the implementation of a formative feedback discussion. The aim of their action research was first to investigate student perceptions across a range of formative feedback strategies. At the onset of the study, the authors reflected on the assessment and feedback processes throughout a degree program and realised that the main techniques related to assessment and feedback were linear; that is, they were initiated by a teacher and delivered to a student. Based on this linear approach, student engagement was minimal and was limited to an individual student who, having engaged in the set task might choose to seek support from tutors or peers. The likelihood, however, was that most students would choose to work independently. The linear model, as described by the authors, predicted that there were no specific opportunities to engage students in self and peer assessment and, upon receipt of written feedback, no formal opportunities for students to reflect on the feedback.

Murtagh and Baker (2009) realized the limitations of the linear model, as it was not centered on student engagement and self-reflection. With a goal to improve their practice, they developed an open-ended questionnaire based on monitoring and identifying student perceptions of different feedback strategies that had been used across their program. Their goal was to examine what students perceived to be the main strengths and challenges in this regard. A content analysis of the data revealed some themes related to how students understood and used feedback. The data, in

summary, indicated that students welcomed written feedback that they could act upon and that served to improve their practice. However, the results also indicated that not all written feedback was useful or informative. These findings led Murtagh and Baker to develop a specific intervention strategy whereby students were required to engage with the feedback actively, set targets and become involved in a feedback discourse with tutors. The results of the Murtagh and Baker study showed improved gain scores linked to the intervention reflection on feedback and led the authors to propose an alternative model which they referred to as “the adapted linear approach” (p.23). The authors pointed out, however, that gain scores were only one indicator of success and recommended more work to decipher the processes that led to improved learning outcomes.

The current study replicated and extended the original Murtagh and Baker (2009) study in several ways. First, by replicating their original intervention strategy, it assessed the validity of the adapted linear model within the context of a particular sample of Quebec Cégep students. Second, the current study extended the original work by including both treatment (intervention) and control (no intervention) conditions. Through the inclusion of post-assessment questionnaires and interviews, the author explored how the intervention strategy impacted self-knowledge and the approach to learning among treatment group subjects. Finally, data collected from questionnaires and interviews with both the treatment and control group participants provided the researcher with valuable insider knowledge related to teacher feedback that might lead to improved teacher practice.

CHAPTER FOUR: METHODOLOGY

This action research study examines perceptions of and the use of formative feedback by third-year, fifth-semester Fashion Design students in the Fashion Design Program at LaSalle College. It also measures the impact of an intervention strategy designed to enhance students' use of formative feedback. This study uses a quasi-experimental approach, as students were grouped based on course schedules. Using a mixed methods research design, including both quantitative and qualitative methods, the study examines whether a particular intervention strategy results in improved learning outcomes. It also explores the impact of the intervention on students' self-regulation and reflective learning. Based on a replication and an extension of a formative feedback intervention model, as outlined by Murtagh and Baker (2009), this study examines how student engagement with formative feedback impacts the learning process.

4.1 Research Questions and Hypotheses

The *variables* are:

Independent Variable (I.V.): Formative feedback intervention

Dependent Variable (D.V.): Student learning outcomes on a summative assessment

4.1.1 Main Research Question:

Does student reflection on teacher formative feedback, delivered in a face-to-face fashion (intervention), have an impact on student learning outcomes?

Hypothesis (H1): Student reflection, as a result of discussing the formative feedback during a face-to-face individualized meeting with the teacher, has an impact on student learning outcomes in a subsequent assignment which is referred to as a summative assessment for the purpose of this study.

4.1.2 Secondary Research Questions:

- 1) What are students' perceptions of teacher formative feedback?

Hypothesis (H2): Students perceive teacher formative feedback as an opportunity to improve their knowledge and develop the necessary skills.

- 2) What do students perceive as helpful or unhelpful formative feedback?

Hypothesis (H3): Students perceive formative feedback as helpful when it addresses gaps in knowledge and understanding.

- 3) Do students understand the formative feedback they receive from teachers?

Hypothesis (H4): Students understand the formative feedback they receive in writing, orally, a combination of two when the formative feedback is clear, concise and focuses on the task.

- 4) From the student's perspective, how can the value of teacher formative feedback be enhanced?

Hypothesis (H5): The value of teacher formative feedback can be enhanced when feedback is constructive and situated within the context of learning outcomes and assessment criteria, which in turn guides students on how to improve their performance.

- 5) Is the adapted linear model, as proposed by Murtagh and Baker (2009), valid within the sample of Cégep students in the Fashion Design Program at LaSalle College? Will this intervention strategy, which focuses on students' reflection on formative feedback, impact their self-knowledge and approach to learning? If so, how?

Hypothesis (H6): Murtagh and Baker's (2009) adapted linear approach will exert a positive impact on a sample of Cégep students in the Fashion Design Program at LaSalle College. The intervention strategy which encourages the

use and understanding of teacher formative feedback will enhance reflective thinking, self-knowledge and the students' approach to learning.

4.2 Participants

As part of the action research study, a quasi-experiment was conducted at LaSalle College in the Fall of 2017. The participants consisted of two groups of third-year, fifth-semester Fashion Design students in the Fashion Design Program. Ideally, the first step would have been to establish equality in background and academic achievement between the two groups. Because this study took place in an academic distinction, prior student grades were not available. Students were assigned to one of two sections of the same course based on their schedule, for a pre-study total sample of 60 students. However, due to low registration, incomplete consent forms and not participating in the formative assessment, only 50 fifty students were included in the final analysis. The two sections were arbitrarily designed as control and treatment group by the teacher/researcher. Both groups were primarily female (92%) and male (8%). This composition represents the norm in the Fashion Design Program at LaSalle College. Because the students had no prior contact with the teacher/researcher, no bias on the part of the teacher/researcher or students was anticipated. Further, it was assumed at the outset of the study that differences such as grades, prior knowledge of the subject matter and interest in the course material between the two groups would be minimal.

4.3 Research Design

Data collection, including both quantitative and qualitative methods, proceeded in a specific sequence and time frame. For the quantitative research section, 60 third-year, fifth-semester Fashion Design students in the Fashion Design Program were divided into two groups (treatment group A with an intervention and control group B without the intervention). The same course including content, assessments and formative feedback on the assessments was taught to both groups by the same teacher/researcher. An alternate teacher administered the formative

assessments (see Appendix 9). For the purpose of this study, the formative assessments were graded in order to measure the impact of formative feedback in a subsequent assessment. Both groups were given teacher written formative feedback and a mark and the formative assessments were returned to the students. The teacher written formative feedback was intended to prepare all students for an upcoming summative assessment. As a follow-up to the formative feedback, treatment group participants met face-to-face with the teacher/researcher for approximately ten minutes. Before the meeting, the students were asked by the teacher/researcher to review three questions (see Appendix 8). These questions were based on the written formative feedback the students had received on their formative assessment. A summative mid-term assessment (see Appendix 10) was administered to all students four weeks after the formative assessment.

For the collection of qualitative data, the following steps were followed: on the first day of class, an alternate teacher administered a pre-questionnaire to all students (see Appendices 6A and 6B). The purpose of the pre-questionnaire was to investigate students' perceptions of teacher formative feedback including the main strengths and weaknesses of teacher formative feedback. An open-ended pre-questionnaire (6A) was administered to the students. They were asked five open-ended questions concerning teacher formative feedback, the pre-questionnaire also provided a clear definition of the word "feedback" (see Appendix 6A). After the pre-questionnaires were completed and collected, each student was asked to complete a second pre-questionnaire which consisted of ten survey questions (a Likert scale from strongly disagree (1) to strongly agree (5)) related to teacher formative feedback. Four weeks after the pre-questionnaires, the students received their first assessments, the formative assessment, which was later graded and returned to the students with written formative feedback. Four weeks later, the students had the summative assessment. Upon completion of correcting and grading the summative assessments, the teacher/researcher returned the assessments with a grade and formative feedback. After return of the summative assessments, both groups were administered a post-

questionnaire in week ten of the semester. The control group was asked to respond to four survey questions and one open-ended question (see Appendix 7A). The treatment group was asked to respond to seven survey questions and four open-ended questions (see Appendix 7B). The following week, two students from each group were selected. The selection was based on: to perform “well” was to have an increase in gain scores, between the formative to the summative assessments, of above 50% and an “average” performance was an increase of above 20%. The protocol for the focus group conversations can be seen in Appendix 11.

Before the data collection was completed, the teacher/researcher suggested that if students in the control group had questions on the teacher written formative feedback that was provided on the formative or summative assessment, they could meet with the teacher during the teacher’s office hours. By mid-November, all data collection was completed, and none of the students from the control group had scheduled any time to meet with the teacher. Table 1 below summarizes how this procedure unfolded.

Table 1 - Timeline for Research Procedure

Start dates	Treatment group	Control group
Aug. 28, 2017	Pre-questionnaires	Pre-questionnaires
Oct. 2, 2017	Formative assessment	Formative assessment
Oct.10-20, 2017	Meeting with the teacher (Intervention/I.V.)	No meeting with the teacher
Oct. 23, 2017	Summative evaluation	Summative evaluation
Nov. 6, 2017	Post-questionnaire	Post-questionnaire
Nov. 13, 2017	Focus group	Focus group

4.4 Instruments

To operationalize the independent variable of formative feedback intervention, the teacher/researcher administered the same formative assessment to both groups. Individual written formative feedback was provided to all students. As part of their assessment, each student in the treatment group met with the teacher for an individual face-to-face, ten-minute meeting to review the formative feedback and discuss three questions, provided beforehand, that were designed to increase student reflection on the task (see Appendix 8). Following a lapse of four weeks, the summative assessments were administered to both groups and, once corrected, formative feedback was provided to both groups. Post-questionnaires tailored to their experience with formative feedback were administered to the control group (see Appendix 7A) and the treatment group (see Appendix 7B).

The dependent variable (i.e., student learning outcomes) was operationalized by comparing grades on the summative assessment with those from the formative assessment. Comparative findings are represented on a bar graph (see Figure 2, p.45 below). The scores appear in Appendices 13 (Treatment Group- Raw Data) and Appendix 14 (Control Group- Raw Data).

Qualitative data provided from the pre- and post-questionnaires, the open-ended questions, and the focused interviews were collected and coded. Central themes were extracted for each research question and further elaborated through examples from the data. These themes were also used to verify the reliability and validity of the adapted linear approach as outlined by Murtagh and Baker (2009).

4.4.1 Description of Specific Instruments

On the first day of class, students in both groups were asked to complete a pre-questionnaire consisting of five open-ended questions (see 6A) followed by ten survey questions (see Appendix 6B). This data provided the teacher/researcher with preliminary information concerning students' perceptions of formative feedback. After the summative assessment, students in the control group were administered a post-questionnaire (see Appendix 7A) to rate the effectiveness of the teacher written formative feedback and their use of the formative feedback. The treatment group also received a post-questionnaire (see Appendix 7B), which asked students to rate the effectiveness of the intervention and its impact on their learning outcomes. To further explore students' understanding and use of formative feedback, a focused interview with two members of each of the treatment and control groups took place after the formative and summative data had been collected. Interview questions (see Appendix 12) were presented and discussed by two members selected from each group.

Student responses from the pre- and post-questionnaires, the open-ended questions and the focused interviews were analyzed to assess the usefulness of the adapted linear approach to assessment and learning, as outlined by Murtagh and Baker (2009, p. 23), as well as to gain further insight into students' understanding and use of formative feedback. Interviews and focused conversations were audio-recorded, and the teacher/researcher tracked significant themes that emerged by noting these either during the meeting with the student and immediately thereafter.

4.4.2 How Instruments Contributed to Data Collection

Table 2 illustrates where answers are found for the main research question and each of the secondary research questions. The following set of abbreviations was used:

Pre-Questionnaire=PreQ; Post-Questionnaire=PoQ; Likert=L; Open-Ended=OE; Teacher Interview=TI; Focused Conversation=FC

Table 2 - Sources of Support for Main and Secondary Research Questions

Research Questions	Support
Main Research Question	
Does student reflection on teacher formative feedback, delivered in a face-to face fashion (the intervention), have an impact on student learning outcomes?	PreQ, OE1, L1, PoQ, OE2, L2, TI, FC
Secondary research questions	
1) What are students' perceptions of teacher formative feedback?	PreQ, OE1, L1, PoQ, OE2, L2, FC
2) What do students perceive as helpful or unhelpful formative feedback?	PreQ, OE1, L1, PoQ, OE2, L2, FC
3) Do students understand the formative feedback they receive from teachers?	PreQ, OE1, L1, PoQ, OE2 L2, TI, FC
4) From the student's perspective, how can the value of teacher formative feedback be enhanced?	PreQ, OE1, L1, PoQ, OE2, L2, FC
5) Is the adapted linear model, as proposed by Murtagh and Baker (2009), valid within the sample of Cégep students in the Fashion Design Program at LaSalle College? Will this intervention strategy, which focuses on students' reflection on formative feedback, impact their self-knowledge and approach to learning? If so, how?	PreQ, OE1, L1, PoQ, OE2, L2, TI, FC

4.5 Ethical Considerations and Responsibilities of the Participants

This research was carried out under the guidelines provided by the British Educational Research Association (BERA, 2011) with the intention of respecting both the participants and the information they shared with the teacher/researcher. The participants in this research study were third- year, fifth- semester Fashion Design students in the Fashion Design Program at LaSalle College. On the first day of class, the teacher/researcher briefly explained that she was researching students' perceptions of teacher feedback. Students were informed that participation in the study was voluntary and the teacher/researcher would not know who had or had not signed the consent forms (see Appendix 4). In order to reduce the possibility of experimenter bias, the teacher/researcher left the classroom for 30 minutes. An alternate teacher, who had no knowledge of the study, then distributed the consent forms (see Appendix 4). The alternate teacher placed the completed consent forms in a sealed envelope.

The pre-questionnaires were then distributed to both groups by the alternate teacher (see Appendices 6A & 6B). The students were asked to fill in their names and student numbers in the top right- hand section of the first page. As well, given the nature of this student group (i.e., mainly ESL students whose first language was not English), a precise definition of feedback was presented on the pre-questionnaire (see Appendix 6A). Once the students had completed the pre-questionnaires, the alternate teacher collected them and placed them in a separate envelope and sealed the envelope. When the teacher/researcher returned to the classroom, the alternate teacher gave her both sealed envelopes. The teacher/researcher met with her supervisor a few days later and handed over the sealed envelopes. The supervisor subsequently cut off the student names and numbers, coded the consent forms and pre-questionnaires, and returned the envelopes for both groups to the teacher/researcher. This guaranteed anonymity for the students. A few weeks later, post-questionnaires were distributed by the teacher/researcher because an alternate teacher was not available at this time and the teacher/researcher acknowledges this as a potential methodological flaw. Although the teacher/researcher was present in class and distributed the post-

questionnaires, in order to increase confidentiality, she asked a student to collect the post-questionnaires, to seal the envelope, and to deposit it on her desk. The same procedure, as detailed above for the pre-questionnaires, was followed for the post-questionnaires. The teacher/researcher gave the sealed envelopes to her supervisor who then removed student names and numbers, coded each form, and then returned them to the teacher/researcher.

The participants in this research study were third-year, fifth-semester Fashion Design students in the Fashion Design Program registered in the Fall 2017 semester. Two groups of students, a treatment group and a control group, were administered the same formative and summative assessments, and after each assessment, each group was provided teacher written formative feedback. The evaluation policy, in the Fashion Design Program at LaSalle College, requires teachers to provide students with a copy of any graded assessment. Since the goal of this study was to measure gain scores between a formative and a summative assessment, students received teacher written formative feedback and grades for both assessments and these assessments were returned to the students. While correcting, the teacher/researcher was aware of which group each student belonged to (i.e. control or treatment group), and she acknowledges this as a methodological flaw. The same assessment and formative feedback procedure was followed for all students, including those who had not given their consent to participate in this research study, or had not correctly completed the consent form. The teacher/researcher was not aware of this distinction during the semester, and the supervisor eliminated incomplete students' data in the final analysis. As part of their formative assessment, each member of the treatment group met face-to-face with the teacher/researcher to discuss the formative feedback. Throughout the study, no distinction was made amongst students regarding age, gender, sexuality, nationality or disability to ensure fairness for all participants. Confidentiality and anonymity were guaranteed for all participants as the data was pooled and analysed by group. Additionally, all data was stored in the researcher's private home. Datasheets and questionnaires will be destroyed five years after the completion date, that is, in June 2023.

4.5.1 Responsibilities to Sponsors of Research

LaSalle College gave the researcher full approval for the research conducted with students from the College (see Appendix 3). Since LaSalle College did not have an ethics committee, both the ethics application form and consent form were completed and sent, on May 18, 2017, to the Ethics Committee at the University of Sherbrooke for verification and approval. The University of Sherbrooke approved this study on August 3, 2017. The approval form appears in Appendix 2.

CHAPTER FIVE: RESULTS

This study examined students' perceptions of formative feedback. It also measured the impact of an intervention strategy by way of a replication of the adapted linear model proposed by Murtagh and Baker (2009). Through a mixed methods research design, this report investigated whether or not a particular intervention strategy would result in improved learning outcomes, self-regulation and reflective learning. The participants in the study were third-year, fifth-semester Fashion Design students in the Fashion Design Program at LaSalle College. Students were non-randomly assigned to two different groups (a control and treatment group) based on the students' course scheduling. Each group received pre- and post-questionnaires, and the same formative and summative assessments. Two students from each group participated in a focused, post-study conversation.

Quantitative data, through a comparison of mean scores, was collected to answer the main research question: Does student reflection on teacher formative feedback, delivered in a face-to-face fashion (the intervention), have an impact on student learning outcomes? Student learning outcomes were measured by evaluating changes in gain scores between a formative and a summative assessment. As well, means were calculated to assess between-group differences across time on several Likert scales, measuring pre- and post- survey items. This data helped to answer the five secondary research questions listed below. Furthermore, a qualitative analysis, as outlined by Morehouse and Maykut (2002), was used to extract significant themes that emerged from students' responses to open-ended questions. This analysis also helped to answer the following five secondary research questions:

1. What are students' perceptions of teacher formative feedback?
2. What do students perceive as helpful or unhelpful formative feedback?
3. Do students understand the formative feedback they receive from teachers?

4. From the student's perspective, how can the value of teacher formative feedback be enhanced?
5. Is the adapted linear model, as proposed by Murtagh and Baker (2009), valid within the sample of Cégep students in the Fashion Design Program at LaSalle College? Will this intervention strategy, which focuses on students' reflection on formative feedback, impact their self-knowledge and approach to learning? If so, how?

During the process of data analysis, the quantitative element of the mixed methods research design was limited to the differences in gain scores between groups and responses to some of the closed survey questions. Because responses from both groups were similar, the teacher/researcher questioned whether or not she would be able to discern any impact the intervention might have on student learning outcomes and on self-reflection. In contrast, an examination of the qualitative data, from the pre- and post-open-ended survey questions and from students' reflective comments made during meetings with treatment group participants and during focus groups, revealed a significant impact of teacher formative feedback on student perspectives and reflective thinking.

In the following section, the process of collecting the data and of analysing the quantitative and qualitative findings will be described. To do so, the main research question, followed by each of the five secondary research questions will be explained. Throughout this analysis, the teacher/researcher comments on the personal journeys the students experienced as they discussed their understanding of teacher formative feedback, the impact that teacher formative feedback had on their learning tasks, and the effect of teacher formative feedback on their self-esteem and personal growth.

5.1 Main Research Question

5.1.1 Quantitative Data Analyses

A comparison of gain scores between formative and summative assessments for both the treatment and the control group was used to answer the main research question: Does student reflection on teacher formative feedback, delivered in a face-to-face fashion (the intervention), have an impact on student learning outcomes?

The procedure used to assess potential differences in outcome scores between both groups is briefly reviewed below and significant findings are presented.

A formative assessment (see Appendix 9) was administered to the students in the fourth week of the semester. This assessment was formulated as an essay exam used to gauge student learning over the first four weeks of the course. Treatment group participants also met with the teacher one week later for a ten-minute, face-to-face interview based on a specific protocol (see Appendix 8). Once the students in the control group received the teacher written formative feedback on their formative assessment, they were told they could meet with the teacher in or out of class time if they had any questions on the written formative feedback. Four weeks later, the summative assessment, also an essay exam which was graded (see Appendix 10), was given to both groups as the course midterm evaluation.

Results from the summative assessments showed that a majority of the students in both groups had improved. The increase in gain scores between the formative and summative assessments suggested that teacher written formative feedback had exerted a positive impact on performance. This data, which compares the raw scores on the formative and summative assessments, is presented in Table 4 (p.46) and outlined in Appendices 13 and 14. The data is also presented in Figure 2 below.

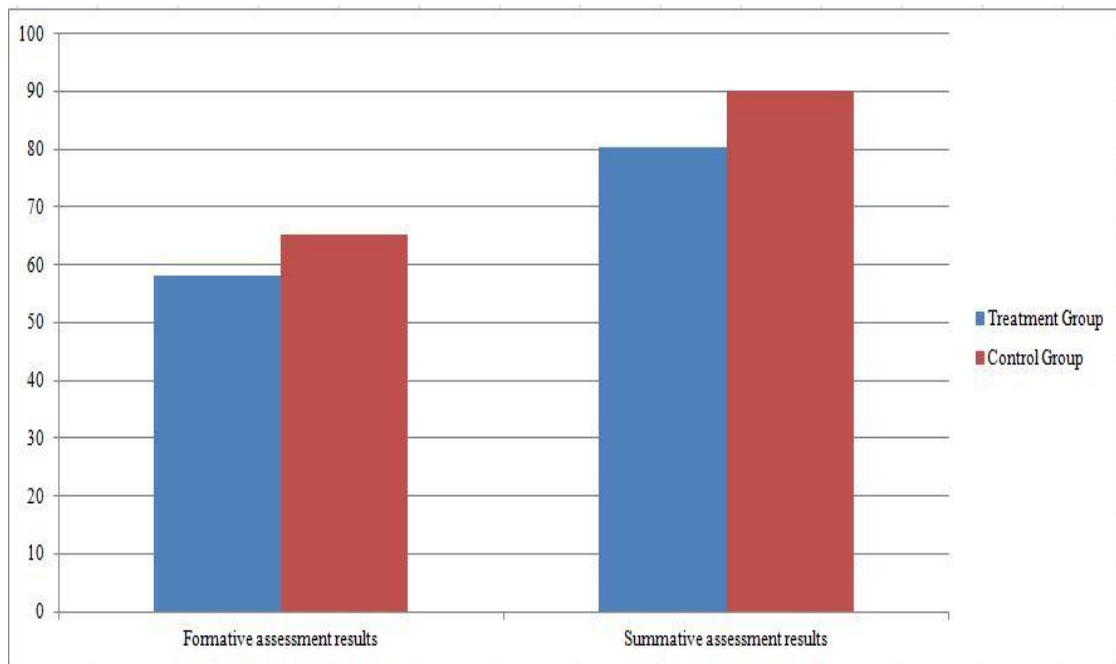


Figure 2 - Gain Scores

The improvement in gain scores achieved by both groups is evident in Tables 3 & 4 below, which compares outcome scores. Both groups were provided teacher written formative feedback, and in addition the treatment group also received a face-to-face individual meeting, the intervention, with the teacher/researcher to discuss the formative feedback. At first glance, students in the treatment group had a higher percentage of participants with an increase of more than 10 %, as compared to the control group students.

Table 3 - Variation in Treatment Group Gain Scores between Formative & Summative Assessments (based on Murtagh & Baker, 2009)

	An increase of more than 10%	An increase of 0 to 10%	Same mark achieved	Lower mark achieved	Total
Number of students	17	1	0	5	23
Percentage	73.92%	4.34%	0%	21.74%	100%

Table 4 - Variation in Control Group Gain Scores between Formative & Summative Assessments (based on Murtagh & Baker, 2009)

	An increase of more than 10%	An increase of 0 to 10%	Same mark achieved	Lower mark achieved	Total
Number of students	18	3	0	6	27
Percentage	66.67%	11.11%	0%	22.22%	100 %

However, a comparison of gain scores from the formative to the summative assessment for treatment and control group participants did not reveal a statistically significant difference (see Table 5 below).

Table 5 - Comparison of Raw Scores Grades on the Formative and Summative Assessments

Group	Formative Assessment	Summative Assessment	% Increase/Decrease
Treatment	58.13	80.26	+38.07%
Control	65.22	90.26	+38.39%

In response to the lack of a significant difference between the two groups, the first step the teacher/researcher did was to consult a pedagogical advisor in order to re-examine the content validity of all items on the formative and summative exams. Upon review, the advisor judged that the exams items were valid and measured what they claimed to measure. Further, the teacher/researcher explored whether or not a priori group differences might partially account for significant differences in outcome scores. Initially, the assumption was that both groups in this quasi-experimental study, with students assigned to either the control or treatment group based on their course schedules, would be equal in academic achievement and ability. As previously mentioned, the teacher/researcher requested pre-course grades, but the grades were unavailable due to issues of student confidentiality. However at the outset, between-group differences were apparent. Table 6 below indicates some of these differences.

Table 6 - Between-Group Differences

	Treatment Group	Control Group
Number of students at the onset of the project	26	34
Number of students after signature of consent form	23	27
Second language students	3	11
Absenteeism	5%	12%
Formative Assessment Average	58%	72%

The lower scores obtained by the treatment group in the formative assessment are noteworthy and may partially account for the lack of significance in the summative outcome scores. Also noteworthy are some of the distinctions exhibited by control group participants. In spite of the higher scores they obtained on the formative assessment, control group participants demonstrated a higher rate of absenteeism and this group included a larger number of second language students. This raises the

question of whether or not all students are equally in need of an individual face-to-face formative feedback intervention, as hypothesized in the current study.

5.2 Secondary Research Questions

In contrast to the lack of significant differences in gain scores that emerged from the quantitative data above, an examination of qualitative data, carried out by extracting key findings and themes from pre- and post- questionnaires and from one-on-one meetings and interviews with students, revealed distinctions that provided responses to the five secondary research questions. These findings are discussed below.

5.2.1 Secondary Research Question #1: What are students' perceptions of teacher formative feedback?

Pre-Questionnaire Data

A quantitative analysis of the mean scores for the ten survey items in the pre-questionnaire survey on a five-point Likert scale (see Appendix 6B) was performed. The results revealed that students in both the treatment and control groups were in general agreement with statements such as: feedback motivates me to study, teachers who provide feedback care about what students think, feedback tells me how I need to improve my performance in a subject, I deserve feedback when I put effort in my assignments, and feedback tells me what the teacher's expectations are. Table 7 below displays students' means scores on a Likert scale from 1 (strongly disagree) to 5 (strongly agree).

Table 7 - Students' Perceptions of Teacher Feedback (Pre-questionnaire data)

Results	Control Group	Treatment Group
Feedback is an explanation of the grade I received.	3.96	4.24
Feedback is an evaluation of my strengths and weaknesses.	4.22	3.88
Feedback motivates me to study.	3.89	3.86
Teachers who provide feedback care about what students think.	4.18	4.28
Feedback explains my grade for an assignment.	4.03	4.12
Feedback tells me I need to improve my performance in a subject.	4.11	4.08
I deserve feedback when I put an effort in my assignments.	4.51	4.52
When I receive a lot of feedback I feel encouraged.	4.07	3.72
Feedback tells me what the teacher's expectations are.	4.33	4.32
Feedback is my individual contact with the teacher.	4.00	4.12

In addition to the above general agreement, some notable differences between the treatment and control groups appear in these preliminary survey results. Students in the treatment group reported that they preferred receiving a direct explanation in the formative feedback that was tied to their grades. In contrast, students in the control group perceived teacher written formative feedback more frequently as a tool to identify their strengths and weaknesses and stated that they felt encouraged when they received more feedback. This suggests that students in the control group were initially more inclined to reflect on formative feedback, providing further support for additional between-group differences that may have been present at the outset or does this conclude that some students might need more individual formative feedback than others?

Additional support for secondary research question #1 was obtained through an analysis of responses to question two in the pre-questionnaire. Based on one multiple choice question, students were asked: In general, how do you respond to the feedback you receive from your teacher on an assignment (see Appendix 6A). Between-group differences began to emerge from this question. Results showed that 32% of treatment group students skim the feedback quickly in contrast to 17.85% of control group participants.

Furthermore, 53.57% of control group subjects answered that they reflected on teacher feedback and how it might help them improve, compared to 42.85% in the treatment group. As well, 28.57% of control group students expressed that in general, they liked meeting with their teacher to review feedback compared with 16% from the treatment group. These findings indicate that students in the control group reportedly responded to and acted on written teacher formative feedback to a greater extent, as compared to those in the treatment group (see Table 8 below). These distinctions provided further evidence of early between-group differences and suggested that control group participants may have been more predisposed at the outset to benefit from teacher written formative feedback.

Table 8 - How Students Respond and Act upon Written Teacher Feedback (Pre-questionnaire results)

Results (Multiple Choice)	Control Group	Treatment Group
I read it once quickly.	17.85	32
I ignore it and just look at the mark I received.	0	0
I study it carefully to see how I might improve next time on an assignment.	53.57	42.85
I like to meet with my teacher to go over the feedback.	28.57	16
I learn a lot from feedback.	25	25
I do not learn a lot from feedback.	0	0

Post-Intervention, Post-Questionnaire Data

Post-intervention data provided evidence (see Appendix 8) that when students in the treatment group were asked if they read the teacher’s written feedback (see Question # 1), all of the students responded that they did indeed review the feedback and reflected on the comments provided. Question #2 asked the students in the treatment group if there were key issues in the feedback that were unclear and needed clarification. For most of the students the responses were that they did not have any questions however surprisingly that they realized what their errors were. Others responded that they did not understand the questions. These responses provided the researcher with further evidence that a lack of comprehension due to language issues could have had an impact on the formative assessment. The last question # 3, asked the students what were the next steps. This question was developed to gauge student reflection. Responses consisted of “study more, reread the written feedback and use the feedback to go over notes”. These findings were in contrast to the pre-intervention

treatment group data that emerged and suggested that even when weaker students were shown how to use formative feedback and encouraged to link formative feedback to learning goals, student reflection increased. Treatment group perceptions are further elaborated in the section below.

In summary, the intervention appeared to have had an effect on treatment group participants as reflected in the post-questionnaires for both groups. This reinforced the hypothesis that students' perceptions of formative feedback were positive when students took the time to read and reflect on the formative feedback they received. The treatment group, through the use of the intervention, expressed that they did review the formative feedback when the teacher communicated directly with them and showed them how to interpret the formative feedback. Both groups responded that their perceptions of teacher formative feedback had changed when the formative feedback was focused on the students' tasks and clear and concise explanations were provided.

5.2.2 Secondary Research Question #2: What do students perceive as helpful or unhelpful feedback?

Pre-Questionnaire Data

Students' open-ended responses to questions three and four from the pre-questionnaire (see Appendix 6A) were used to answer secondary research question #2: What do students perceive as helpful or unhelpful feedback?

When students were asked what they perceived as helpful or unhelpful feedback, common themes materialized from both groups. First, students in both groups defined feedback as being helpful when it provided clear and concise explanations and suggested solutions. Secondly, students valued open communication between students and teacher. Students stated that feedback was unhelpful when teachers did not explain why they deducted marks on assignments and when feedback was used as a tool to criticize instead of to recommend strategies to find correct answers.

Below are a few examples from both groups:

Student 6131: “Feedback is helpful when it is precise and refers to concrete examples of how to improve in the future. I don’t like feedback which is judging me”.

Student 6138: “Feedback is helpful when it is precise. Unhelpful when the teacher makes decisions on changes with no explanation”.

Student 6212: “Useful feedback is detailed comments on things we can improve and examples where I can improve. Unhelpful is red marks on the page without any explanations or little abbreviations which no one understands”.

Student 6235: “Useful feedback is giving constructive criticism. While unhelpful feedback is a lack of clarification, hurtful statements such as “You should know this, go figure it out yourself”.

Post-Questionnaire Data

Both groups were asked to respond to the same open-ended questions (see Appendices 7A & 7B) at the end of the study. Students were asked the following question: What might have helped make written feedback on the formative assessment more effective? Both groups emphasized that useful written feedback from the teacher should point out errors and provide an outline on how to correct errors. There was some rather limited mention of the role of student reflection in this process.

Below are a few examples of students’ responses:

Student 6160 (C.G.): “Evaluation grid attached at the end of the assessment to show how to correct mistakes”.

Student 6166 (CG.): “Tell students what they can improve on to answer questions”.

Student 6213 (T.G.): “Some of the written feedback on the formative exam wasn’t overly specific. Pointing out specific points and how to improve is very helpful”.

Student 6220 (T.G.) “The teacher should take the time to write the feedback with more details not just a few words. Tell the student where they did well and how the student can do better. Tell the students where they made the mistakes, how to fix the mistakes and how the student can prevent making the same mistake again”.

Students in the treatment group were provided with three additional questions (see Appendix 7B). Question two asked, “Was the meeting with your teacher to discuss the feedback useful? How?” The responses were similar as all of the students said that the feedback was clearer when they had a one-on-one individual meeting with the teacher. Question three asked, “Did it help you in the summative assignment?” This question provided more evidence that the intervention was helpful. Students in the treatment group began to change their perspective on feedback and its usefulness. The responses to this question indicated that the students used the feedback to review, organize and reflect on teacher feedback.

Below are a few examples:

Student 6214: “Yes it did. I know how to organize and do an exam in a coherent way and not mix everything up”.

Student 6215: “Having the feedback on the formative before the midterm was highly helpful. I know what the teacher was expecting when asking questions”.

Question four asked treatment group students: “How might a future meeting to discuss feedback be improved? Respondents answered that feedback is helpful and reflective when both the teacher and student spend the time to go through the feedback.

Below are a few examples:

Student 6211: “I believe one on one meeting helped a lot in the most effective manner and I appreciate teachers who do that”.

Student 6214: “Students need more time with a teacher when it comes to feedback. I find it helpful if teachers take it seriously”.

In summary, responses from both groups provided answers to the second research question that feedback was helpful and productive if it provided students with a clear explanation of what they needed to do, concrete steps for carrying out the task and potential strategies for solving problems if one might arise. Students also emphasized

that feedback comments should be framed according to what the students should do, rather than what they should not do (Carr, 2011). The results answered the second secondary research questions that students perceived feedback as helpful when it addressed gaps in their knowledge and comprehension and unhelpful when written feedback was too vague, lacked guidance, and focused on the negative.

5.2.3 Secondary Research Question #3: Do students understand the formative feedback they receive from teachers?

Because many students in the Fashion Design Program at LaSalle College do not report English as their first language, efforts were made when constructing questions for both pre- and post-questionnaires, to use clear and concise wording. The researcher remained conscious of this lurking variable throughout the study. The following section reviews responses from both groups on pre-questionnaire data, post-questionnaire data and focus group data in an attempt to answer the secondary research question #3.

Pre-Questionnaire Data

On the first day of class, both groups were administered an open-ended pre-questionnaire (Appendix 6A) which asked “In general, do you understand the feedback you receive from your teachers? Are you able to act on this feedback? How”? Common themes which surfaced for both groups were that feedback was particularly relevant when it helped them review the mistakes they had made and also clarified some of the problems they had with the questions on assignments or course material.

Below are some examples for both groups:

Student 6169: “Understand the feedback when it pertains to a concept I have challenges with. Feedback cannot be acted upon if it is not clear”.

Student 6179: “Going through work a second time and doing correction of work”.

Student 6221: “Feedback helps me go back to see where I went wrong and helps me not make the error again”.

Student 6222: “I appreciate the feedback because it helps with my learning and improves the process “.

Post-Questionnaire /Focus Group Data

At the end of the study, two students were selected from each group to participate in an informal post-study conversation: one who had obtained an average gain score on the summative assessment and one who had demonstrated a substantial increase in performance. It should be noted that students whose grades had decreased were not included in the informal conversation since this study was trying to identify increases due to the intervention. Future research can be done to explore why students grades might decrease with the implementation of the intervention. Students in the informal focus group were asked (see Appendix 12) “Was the teacher written feedback clear and easy to understand”? The students in the control group found the feedback specific to their errors was easy to understand. The students in the treatment group, who had participated in the intervention, answered differently. One remarked that verbal feedback was easy to understand yet found the written feedback hard to read due to the teacher’s handwriting. The second student in the treatment group said the feedback was easy to read.

Below are a few examples of student comments (*student initials are provided to ensure student anonymity):

Student B.C.*: “Verbal feedback was clear, not written feedback due to handwriting. (Treatment Group)

Student A.C.*: “Feedback was clear to understand. The teacher gave good explanations on my mistakes”. (Control Group)

In summary, responses from the informal focus group conversations and the pre-questionnaire questions confirm the secondary research question that students understand written feedback when it is stated clearly, is concise, provides clear explanations and focuses on the task.

5.2.4 Secondary Research Question #4: From the student’s perspective, how can the value of teacher formative feedback be enhanced?

Once the study was completed, students were selected from both groups and responses were collected from an informal focus group conversation to answer the fourth secondary research question.

Post-Questionnaire /Focus Group Data

According to Weaver (2006), “students assign a value to formative feedback when they perceive the feedback to be useful” (p.5). After the study was completed, students from both groups who were interviewed, in an informal focus group conversation, and were asked “Has the value of teacher feedback changed for you? Why? Or why not?” Students from both groups expressed that the teacher feedback helped them improve their grades by reflecting on the feedback received and developing the skills to find solutions independently. Students also remarked that the teacher worked with them to clearly understand the use of feedback.

Below is an example from each group (*student initials are provided to provide student anonymity):

Student C.W. *: “The feedback made me realize how I can get better grades and understand the material better”. (Control Group)

Student J.S. *: “Teacher feedback made me review my work, and I appreciated that the teacher answered my questions and made me understand where I was doing wrong. (Treatment Group)

In summary, students perceive formative feedback as valuable when formative feedback was constructive and situated within their learning outcomes and evaluation criteria. This, in turn, guides students in developing strategies to improve their performance. This data provides support the fourth secondary research question.

5.2.5 Secondary Research Question #5

The fifth and final secondary research question asked: Is the adapted linear model as proposed by Murtagh and Baker (2009) valid within the sample of Cégep students in the Fashion Design Program at LaSalle College? Will this intervention strategy, which focuses on students' reflection on formative feedback, impact their self-knowledge and approach to learning? If so, how? A detailed synopsis of the treatment group's intervention process is briefly reviewed here and supporting results are provided.

5.3 The Intervention

Between the formative and summative assessments, the treatment group participated in an intervention. This intervention, like the one Murtagh and Baker (2009) used in their study, was designed to provide feedback to students that was personalized, and aimed at providing them with information to feed forward into their final summative assignment. After the formative assessments were returned with written formative feedback, students were given a detailed intervention protocol (see Appendix 8). This intervention protocol document was administered one week before the in-person meetings so that students could answer three questions and be ready to discuss these questions during the scheduled meeting with their teacher. Student responses to the one-on-one intervention suggested that the intervention did indeed have a positive impact on self-reflection, self-knowledge and new approaches to learning.

The first intervention question asked if the reading and reflecting on the written feedback was helpful, If so, how? If not, why? Students responded that the process of interpreting and reflecting in preparation for and during the individual meeting with their teacher provided them with the opportunity to re-examine the feedback and develop questions for the interview.

Below are a few examples:

Student C: “Yes. Written feedback was clear and helped clarify errors student which I thought I did not know on formative.”

Student D: “Yes. Feedback was specific. Helped with reflecting”

Student E: “Feedback was clear. “Liked specific comments made issues clearer”.

The second intervention question asked the students if there were any critical issues in the written feedback that were unclear and needed clarification. The students’ responses indicated that the written feedback was clear however the teacher’s handwriting could have been more precise.

Student F: Handwriting needs to be clearer. Words on written feedback are too tricky to understand.

Student G: Feedback was clear, but the teacher’s handwriting was unclear.

The last intervention question asked the students what the next steps were. Students’ responses included the following strategies: reviewing questions, focusing on answering the questions clearly, rereading assessment questions and studying more.

This data suggests that the intervention did have an impact on students’ reflective thinking and their use of learning strategies. As previously outlined (see Table 7) at the outset of the study students in the treatment group did not show much evidence of or interest in reflecting on their errors and only wanted the teacher to provide answers to their errors. The intervention, during which students were presented with the opportunity to reflect, appears to signal a shift on the part of students from expecting the teacher to provide the answer, to searching for the answers themselves.

Below are a few examples of learning strategies they cited:

Student H: “Study more and read the question fully”.

Student I: “Study harder. Focus on the exam and pay attention.

Student J: “Need to focus on answering questions directly. Reread questions and answer what is being asked and then apply”.

Student K: “Go over formative and read class notes and feedback comments”.

By rereading and reflecting on the intervention protocol questions, students in the treatment group responded unanimously that the intervention helped them clarify their errors and gave them a focus and direction on how to answer the questions for the summative assessment. This evidence of reflective thinking is noteworthy and in contrast to pre-questionnaire responses. All the students responded that they had to study, review notes and focus on the questions. Further indications of reflective thinking emerged when students were asked to reflect on “next steps”. Below are a few examples:

Student 6218: “The meeting with my teacher gave me a better impression about the feedback. It motivated me to read the feedback carefully.

Student 6250: “Usually feedback is more general however discussing it with the teacher made things clearer”.

Student 6253: “I got to understand more the goal of the course and the expectations of the teacher which made the course somehow more interesting because I felt important, like my opinion mattered”.

In summary, the intervention exerted a positive impact on the current sample of Fashion Design students at LaSalle College. It encouraged their use and understanding of teacher formative feedback, which in turn enhanced reflective thinking, self-knowledge and their approach to learning. The results supported the final secondary research question that Murtagh and Baker’s (2009) adapted linear approach exerted a positive impact on a sample of third-year, fifth-semester Fashion Design students in the Fashion Design Program at LaSalle College. The intervention strategy encouraged the use and understanding of teacher formative feedback which, in turn, enhanced reflective thinking that impacted self-knowledge and the students’ approach to learning.

5.4 Focus Group Conversation

The final set of qualitative data in the study was obtained from an informal conversation with students from both groups, at the end of the study. Two students

were selected from each group: one that had received an average gain score on the summative assessment, and the other who had achieved a substantial increase in performance. The objective for the focus group activity was to provide an opportunity for students from both groups to talk about the full impact of the formative feedback experience.

Data obtained from both treatment and control group participants indicate many similarities (see Tables 9 & 10 below). For example, both groups maintained that when they reflected on teacher feedback, they were able to understand their errors and could make the necessary changes. Further, treatment group participants discussed the value of feedback as being useful and promoting reflective thinking. The two students from the treatment group stated that having the time set aside to meet with the teacher to discuss the written feedback gave them ownership of their work. The one-on-one time spent with the teacher enhanced student reflection as developed strategies and goal setting techniques with the teacher. Even though the control group participants did not partake in the intervention, ongoing contact with the teacher, both in and out of class, encouraged students to ask questions about their work. Students responded positively to the ease and openness of the teacher, which they described as an asset to their learning. This suggests that teacher characteristics can impact how formative feedback is received and interpreted. Students from the treatment group felt that being able to discuss questions in an informal open atmosphere with the teacher during the intervention was an asset.

Tables 9 & 10 below present a detailed synthesis of responses collected during the informal focus conversation with both control and treatment group participants. As mentioned above, students were selected based on two criterion: First, those who had had a significant increase in gain scores from the formative to the summative assessments and second, those with an average improvement in gain scores. As well, participation in the informal focus group was voluntary. Tables 9 and 10, synthesize students' responses during the interview (see Appendix 12). Students from both groups were asked the same Question #1 "Was the teacher feedback clear

and easy to understand?” All of the students expressed that the formative feedback was clear and easy to understand. General questions followed for control group participants (see Questions 2 to 5 in Table 9) and due to the one-on-one intervention more specific questions were posed to the treatment group participants (see Questions 2 to 6 in Table 10). Due to issues of confidentiality, student initials are indicated on each table.

Table 9 - Focus Group Responses (Control Group)

Student ID	Student C.W.	Student A.C.
Formative assessment grade	66%	70%
Summative evaluation grade	100%	90%
1. Was the teacher written feedback clear and easy to understand?	The feedback was specific to the mistakes I made.	Feedback was clear to understand. Teacher gave good explanations on my mistakes.
2. Were there any unanswered questions?	No.	No.
3. Did you schedule a time to see the teacher during her office hours for explanations on the written feedback you received?	No. If I had any questions I asked the teacher after or before class.	No. Teacher was available during class time.
4. Did your grades increase when you reflected on your new answers? If so, what different approach did you use?	My grades increased because I reviewed my mistakes and found the right answers.	I reviewed my notes and mistakes.
5. Will you use this new approach in your future	Yes.	Yes.

studies?		
----------	--	--

Table 10 - Focus Group Responses (Treatment Group)

Student ID	Student B.C.	Student J.S.
Formative assessment grade	66%	63%
Summative evaluation grade	87%	97%
1. Was the teacher feedback clear and easy to understand?	Verbal feedback was clear, not written due to handwriting.	Very.
2. Were there issues with the teacher feedback you did not discuss with the teacher during the meeting?	No. Everything was covered	No.
3. Did you find the one-on-one meeting useful?	Very. I like the personal approach. I felt comfortable asking questions.	I liked being able to speak to the teacher and getting to know her.
4. Did the one-on-one meeting with teacher make you reflect on your original answers? Did you make any changes?	Yes. I reviewed my notes after the meeting. Teacher was clear.	Yes. Reviewed where I went wrong.
5. Did your grades increase when you reflected on your new answers? If so, what different approach did you use?	Yes. The feedback made me think about the answers which helped me understand my mistakes.	Yes. Made me look back and see where I could make changes. Used examples to answer the next test.

6. Will you use this new approach in your future studies?	Yes.	Yes.
---	------	------

In summary, these results provide an in-depth analysis of the impact of an intervention on several indices including student outcome scores as well as their reflective thinking. Even though quantitative data did not show a significant difference in gain scores between the treatment and control groups, qualitative data provided answers for all of the five secondary research questions.

Three final points are noteworthy. First, participants often mentioned the importance of the time they spent with the teacher. This suggests that student learning outcomes can be increased if there is a synergy between the student and the teacher. Both groups of students agreed that formative feedback was most effective when it focused on the task and concise explanations were provided. If teachers want students to become independent learners, teachers need to understand the potential of formative feedback and be able to explain how to use formative feedback correctly. Data from this study can provide teachers with answers to some of these questions.

Second, these results highlight the potential of formative feedback to enhance reflective thinking. Students in the treatment group were vocal when asked if the intervention made them reflect on the teacher's written formative feedback. They stated that the intervention encouraged them to use and understand formative feedback, which enhanced reflective thinking, which in turn impacted self-knowledge and new approaches to learning. These remarks became evident through data collected during the intervention and the informal focus group conversations. Students suggested that if formative feedback was clear and the teacher was open and approachable, students would take the time to read the formative feedback and meet with the teacher if they had questions. For students to reflect and use the formative feedback teachers provide, they need to connect with the formative feedback by

understanding and knowing how to use formative feedback as a tool to increase knowledge and self-reflection.

Finally, results for the control group participants on the pre-questionnaires as well as their scores on the formative and summative assessments suggest that these students may have been more predisposed to respond to the teacher's formative feedback in a mindful way. This raises the question of whether an individual face-to-face intervention as suggested by Murtagh and Baker is essential for all students.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

This study explored students' perceptions of teacher written formative feedback and assessed the efficacy of an intervention to improve the use of formative feedback. The role of the intervention was to engage students in the formative feedback process and in doing so, primarily to observe potential changes in overall grades as well as other indices including reflective thinking, self-knowledge and approach to learning. This action research consisted of a replication of the Murtagh and Baker's (2009) study entitled "Feedback and feed forward: Student responses to tutors' written comments on assignments" within the context of third-year, fifth-semester Fashion Design students in the Fashion Design Program at LaSalle College. Although Murtagh and Baker's (2009) adapted linear approach intervention strategy did not lead to significant changes in outcome scores for treatment group participants in the current study, it did demonstrate enhanced reflective thinking among these students. This appears to have occurred in response to encouraging these students to decode teacher written formative feedback. The results of this study also demonstrate the power of formative feedback and raise the question of whether all students are equally in need of an intervention such as that proposed by Murtagh and Baker.

6.1 Discussion

Both the current study and Murtagh and Baker's (2009) study investigated if an intervention strategy would have an effect on student learning outcomes. However, the current study differed from that of the Murtagh and Baker's study as it was expanded to include two groups: one group which received a formative feedback intervention and another group which did not. As well, different student populations were used: Murtagh and Baker's study examined graduating university students in a professional education program, while the current study investigated college students in a technical program, Fashion Design, many of whom were second-language speakers. The intervention strategy in Murtagh and Baker's study focused on the

implementation of a formative feedback discourse opportunity whereby tutorials with the teacher took place and its impact was assessed in a subsequent assignment. Whereas Murtagh and Baker's intervention appeared to have a positive impact on outcome scores, the authors were quick to point out that marks alone do not tell the whole story and can sometimes be used to demotivate students. The current study went beyond outcome scores to include pre- and post-questionnaires, as well as interviews which explored the impact of engaging with formative feedback on students' reflective thinking, self-esteem and motivation. It also chronicled the power of formative feedback and how it was delivered to students.

Quantitative data did not show a statistically significant difference in gain scores between control and treatment group participants. Although it had been hypothesized that the treatment group participants would outperform the control group participants as a result of the intervention, this did not occur. Unanticipated distinctions between the two groups that began to emerge at the onset might partly explain these results. For example, on the first day of class, when the teacher/researcher briefly explained the purpose of the research study to control group participants, they responded positively and enthusiastically to the idea. A subsequent analysis of their pre-questionnaire data revealed that these students were more inclined to reflect on formative feedback. In contrast, treatment group participants appeared more disengaged and detached on the first day of class. A number of students asked if they would receive extra marks for participating in the research project. A subsequent analysis of treatment group pre-questionnaire data revealed that a majority of these students viewed feedback as a tool to identify errors and provide answers. These findings are similar to Wojtas (1998) who stated that some students were concerned only with their mark and not with feedback aimed at self-reflection or improving the subject matter. Duncan (2007) also noted that students often show little interest in the written or oral advice offered to them. These preliminary findings suggest that not all students are predisposed to view formative feedback in the same way, and teachers should be aware of these distinctions among their students. As

well, the importance of establishing closely matched groups at the outset of a study in order to measure the impact of an intervention is also apparent.

In spite of the lack of a significant difference in quantitative outcome scores, qualitative data, that provided answers to the main and secondary research questions, provided support for the intervention among treatment group participants. The individual meeting with the teacher appeared to operate as a turning point for students in the treatment group. The interaction between student and teacher led to more open communication, as it provided a safe and nonjudgmental space for students to discuss how they might improve learning outcomes. Following the meeting, the teacher noted that the level of in-class participation increased among treatment group participants, as did their involvement in learning. Wojtas (1998) claimed that many students improved their work once they understood the purpose of feedback and assessment criteria. Perry (1970) also stated that students pass through different stages in their learning. The teacher written formative feedback provided on the formative assessment and the face-to-face individual meeting appeared to accelerate the students' perceptions of their own learning. Students in the treatment group, as evidenced in pre-questionnaire data, began as dualistic learners who wanted to know the answers to their mistakes. In response to discussions with their teacher during and after the intervention, these students showed signs of intellectual growth, as they began to trust their responses. It would appear that formative feedback within the framework of formative assessment holds great potential for all learners, but teachers need guidance on what to avoid and what to focus on to provide quality formative feedback that is linked to increased motivation and student involvement in the learning task. According to Black and Wiliam (2009), feedback should be provided to move learners forward.

The power of formative feedback to increase learning outcomes emerged at several points in the findings. For example, when control group students were asked in the post-questionnaire if teacher written feedback had an impact on their learning outcomes, they stated that the feedback was helpful and many used the teacher's

comments to review their notes for the summative assessment. Others said that the formative feedback made them look up answers on how to correct the errors they made. The inclusion of a post-questionnaire with both groups provided extensive feedback on their perceptions of how the overall formative feedback process might be improved. This data clearly showed that students' self-reflection increased as they began to view formative feedback as an ongoing aspect of the learning process.

Most significantly, students began to feel in charge of their work, a phenomenon Nicol & Macfarlane-Dick (2006) described as the active involvement of the learner. These findings are also reflected in Bangert-Drowns et al.'s (1991) meta-analysis and subsequent five-cycle model of feedback that demonstrated that feedback can promote learning if it is received mindfully. Conversely, Bangert-Browns et al. (1991) remind us that feedback can inhibit learning if it encourages mindlessness, for instance, when answers are made available before learners begin their memory search, or if the feedback message does not match students' cognitive needs (e.g., too easy, too complicated, too vague). However, as students were given the opportunity to reflect on the meaning of formative feedback either through face-to-face individual meetings with the teacher or using the formative feedback to review their errors, the students began to view formative feedback as a tool for engagement and empowerment for achieving their learning outcomes.

As previously mentioned, when analyzing the results, a priori differences between the treatment and control groups became evident at the start of the study. As the semester progressed, students in both groups became more receptive to formative feedback, either through teacher written feedback on their assessments or ongoing in-class discussions, and students in both groups showed increasing signs of assuming ownership of their work. For many students and teachers in the Fashion Design Program, feedback consists of correcting mistakes and providing solutions. This corrective method in which the teacher outlines how to fix the problem is in contrast to formative feedback, which guides students to solve problems and find solutions. Biggs (1999) suggests that involving students in the feedback process can deepen

understanding and enhance learning. Many students described the time they spent with their teacher as a pivotal contributor to understanding their role in the feedback process, which in turn allowed them to engage in goal setting more actively. Biggs describes this as “a student-centered environment truly focused on enhancing learning outcomes. Not only is the learner actively engaged in the learning process, but both teacher and student work together to promote positive outcomes” (p 62). Similarly, Bangert-Drowns et al. (1991) refer to this change in behaviour as mindfulness. The reflective process engages students in understanding the meaning of the tasks involved (Dempsey et al., p.38). The change will take place when the student is made to understand that learning can result in personal transformation (Marton, Säljö, & Ramsden, 1992). For many of the students in both groups, changes in their behaviour, in terms of accountability and responsibility towards their learning outcomes, was evident.

Interestingly, at the onset of the study, the students in the control group appeared to respond more positively to the teacher’s written formative feedback and they welcomed opportunities to reflect on the formative feedback. This would suggest that formative feedback, particularly with students who may be experiencing academic challenges, should be clear and focused on the learning task. As well, teachers need to be able to differentiate among students who require individual teacher attention and those who are able to understand and use teacher written formative feedback on their own. Students want meaningful and constructive written feedback (Higgins, Hartley, & Skeleton, 2001) to serve as a guide for their learning (Duffield & Spencer, 2002). However, the literature on feedback emphasizes that students are often displeased with the feedback they receive: it lacks specific advice to improve (Higgins et al., 2001), is difficult to interpret (Chanock, 2000) or has a potentially negative impact on students’ egos (Carless, 2006). The results of this study provide insight into how a specific sample of Cégep students perceive and use formative feedback. This data can serve as an important resource for teachers and students alike. Participants in the treatment group described the face-to-face meeting

with the teacher as beneficial because they could discuss their mistakes. However, the students stated that such an intervention would be more beneficial in a core course, where they could use the formative feedback to increase their knowledge and grades more effectively. Students also reported a significant amount of redundancy with another course taken during the same semester. Since LaSalle College is a private college with a small sample of Fashion Design students, expanding the sample to include students from other Fashion schools in both the private and public sectors would increase the generalizability of the findings within this particular population of Cégep students. Furthermore, expanding the sample to include students from other Cégep programs would further address the inability to generalize findings, by exploring students' perceptions on the role of formative feedback with the Quebec Cégep milieu.

In this study, students remarked that they were sometimes unsure of comments teachers included in their formative feedback. Inevitably, this lack of comprehension can lead to a devaluating of teacher formative feedback by students. Weaver's (2006) study that explored students' perceptions of written feedback showed that although feedback was valued, students believed that tutor comments could be more helpful. Her results indicated that students may need advice in understanding and using feedback before they can successfully engage with it. Lea and Street's (2000) qualitative study, which examined students' interpretation of feedback comments, determined that students often interpret tutor comments differently than what was intended. The authors argued that comments containing unclear statements and imperatives caused difficulty in interpretation, which confused or upset students, and the opportunity for learning was thus lost. These findings were echoed in the current study. Students reported that formative feedback was unhelpful when teachers did not explain why they deducted marks on assignments and when feedback was used as a tool to criticize instead of recommending strategies to find correct answers. Keeping these suggestions in mind may help to improve communication between teacher and student, and as Weaver's (2006) study has

shown, result in a more student-centered approach to learning and teaching. Although feedback is often referred to as a single entity in the literature, its myriad effects on the process, product and person are apparent, suggesting that it should more appropriately be considered on a continuum (Mory, 2004). This suggests that teachers need to carefully examine their feedback protocol, just as they might their other instructional practices. Improving one's formative feedback protocol, as shown in the current study, can lead to significant gains in student development.

6.2 Limitations of the Study

This study has many limitations that affected the results. The first limitation was that of a small sample size. Although 75 Fashion Design students in the Fashion Design Program at LaSalle College were expected to take part in the study, only 50 students participated. The pre-study forecast of participants decreased from 75 to 50 students based on two factors. One factor was a decrease in student registration, from 75 to 60 students, and the other a decrease due to students not signing the consent forms or writing the formative exam. Since this sample size was small and limited to a specific group of students, it was not possible to generalize the findings. However the rich qualitative data that was collected enabled the researcher to particularize the findings within this sample of Fashion Design students in the Fashion Design Program. If the study were to be replicated with a similar sample, similar data would likely emerge. Second, the teacher/researcher had no prior knowledge of the students' academic backgrounds. Without this information, equanimity between the two groups was difficult to establish. Third, a small number of methodological flaws emerged during the research process. For example, the teacher/researcher knew which group each student belonged to when assessing students' work. A final limitation of this study was the brief time frame of four weeks between the formative and summative assessments. The full impact of the formative feedback was not realized, as there was insufficient time to practice and apply the feedback. Although purposely designed to eliminate extraneous variables, a more valid indicator might have been a true summative assessment at the end of the semester.

6.3 Recommendations and Future Research

This study aimed to explore the power of teacher formative feedback on student learning outcomes. This study was a replication of Murtagh and Baker's (2009) research, but also extended their work by including a control and a treatment group. This study contributed to the literature on students' perceptions of formative feedback and the power of formative feedback on academic achievement and personal growth, in particular how Fashion Design students in the Fashion Design Program at LaSalle College view and use formative feedback.

This study did not have complete support for the intervention due to a lack of sufficient quantitative data. The quantitative data did not provide statistically significant differences in gain scores between both groups, yet qualitative data did show that the face-to-face communication between the teacher and student can yield a positive effect on reflection and goal setting skills with certain students. In their conclusion, Murtagh and Baker (2009) stated:

Our intentions in developing the programme have, by and large, been met and the outcomes in the first year have been promising. We made a good start on the task of developing a community of practice in the assessment process and in developing students as self-regulated learners and we hope to build on this success. (p.28)

Four major themes did emerge from the qualitative data. First, the importance of clear, directed teacher formative feedback has emerged from the findings. Students perceive formative feedback to be valuable when the teacher provided clear and concise formative feedback, and they could use the formative feedback to find solutions to their questions. Second, these findings emphasized the importance of providing formative feedback within a safe, supportive environment as iterated by Beaumont, O'Doherty, and Shannon (2008) who describe feedback as a "system of guidance within a supportive relationship offering frequent opportunities for discussion of progress"(p.7). It is only within the context of this supportive environment that students can take full advantage of the formative feedback process.

Third, the initial state of the learner, including their degree of interest, goal orientation, degree of self-efficacy and prior relevant knowledge (Bangert-Drowns et al., 1991), emerged in this study as a critical factor that influenced how formative feedback was perceived and interpreted. Thus, formative feedback can promote learning, but only if it is received mindfully and teachers have ensured that learners have reached an adequate level of readiness to use formative feedback effectively. Fourth and finally, research on the topic of formative feedback has not adequately explored the effect of negative and misinterpreted feedback on self-esteem. Boud (1995) stated that “poorly written feedback might be taken personally by students, leading to defensiveness and loss of self-confidence” (p.43). Many students in this study stated that they considered leaving the program, in large part due to the lack of confidence and decreased self-efficacy that resulted from critical teacher feedback. The impact of such formative feedback on student learning outcomes, goal setting and self-efficacy needs to be further explored.

What has also transpired from the findings and for future research are ways that both teacher and student can use formative feedback more effectively. Teachers need to provide formative feedback that is clear and task-related. This formative feedback should also build confidence among students and encourage them to reflect and flourish as independent learners. Students need to use formative feedback as a tool to establish a sense of ownership over their learning outcomes. Data from this study has shown that when students consulted teacher written formative feedback, new perceptions emerged which led to increased reflection and goal setting and enhanced overall learning outcomes.

In a follow-up study, I would further explore the impact of formative feedback in core courses and with students from other Quebec Cégeps, both private and public. I would investigate the impact of this type of intervention on both gain scores and on self-reflection. I would continue to track students’ perceptions of the role and utility of teacher written formative feedback in the context of students in a pre-university program compared to students in a technical program. A larger sample size and more

carefully matched groups at the outset would have helped diminish these between-group differences. A pre-test, to gauge levels of knowledge, would have facilitated the development of proper instruments for the data collection process especially for the quantitative data. Also, an effective pre-test might be able to differentiate between deep and surface learners.

Further, to reduce flaws in the methodology process and increase reliability, an alternate teacher could collect and code the formative and summative assessments so as to remove information on student identification. This would decrease experimenter bias on the part of the teacher/researcher when assessing student work. Second, several methods could be used in order to match groups more equitably at the outset of the study. For example, a pre-test could be administered. One such example is the Kember et al. (2000) *Reflection Questionnaire*. This questionnaire outlines four levels of reflective thinking: habitual action, understanding, reflection, and critical reflection, and might be used to differentiate students and more effectively match groups at the outset. Another pre-test which could be administered to students is the pre-questionnaire provided in this study. Based on Rowe and Woods's (2009) student feedback questionnaire, it examines students' perceptions of teacher feedback. A final recommendation would be for teachers to review Perry's (1970) model of intellectual development and the four stages of mental and moral growth students experience during their progression through college. A questionnaire based on this model might help to identify the student's current stage of intellectual development.

In conclusion, the primary objective of this study was to investigate if an intervention strategy would have an effect on student learning outcomes based on a replication of Murtagh and Baker's (2009) study. Results showed that the Murtagh and Baker's (2009) intervention, while effective for some students, is not a panacea for all students. Teachers need to be able to differentiate between students for whom teacher written formative feedback is sufficient, and those who need the face-to-face individual time with their teacher. As well, it sought to provide educators with

practical information on how to optimize the use of formative feedback to increase student learning outcomes, and for students to more effectively understand their role in the learning process.

REFERENCES

- Bangert-Drowns, R. L., Kulik, C.L., Kulik, J. A., & Morgan, M. (1991). The instructional effect of feedback in test-like events. *Review of Educational Research, 61*(2), 213–238.
- Beaumont, C., O’Doherty, M., & Shannon, L. (2008). Staff and student perceptions of feedback quality in the context of widening participation. Project Report. *Higher Education Academy, 1*, 1-71
- Biggs, J. (1999). What the student does: Teaching for enhanced learning. *Higher Education Research & Development, 18*(1), 57–75.
- Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: Principles, Policy & Practice, 5*(1), 7–74.
- Black, P., & Wiliam, D. (2006). Assessment for learning in the classroom. *Assessment and Learning, 9*–25.
- Black, P., & Wiliam, D. (2009). Developing the theory of formative assessment. *Educational Assessment, Evaluation and Accountability (Formerly: Journal of Personnel Evaluation in Education), 21*(1), 5.
- Boud, D. (1995). Assessment and learning: contradictory or complementary. *Assessment for Learning in Higher Education, 35*–48.
- British Educational Research Association (BERA) (2011) *Revised Ethical Guidelines for Educational Research*. Available from: <https://www.bera.ac.uk/researchers-resources/publications/bera-ethical-guidelines-for-educational-research-2011>
- Carr, J. (2011). Providing Effective Feedback. *Scholarly Works*. Paper 415.
- Carless, D. (2006). Differing perceptions in the feedback process. *Studies in Higher Education, 31*(2), 219–233.
- Chanock, K. (2000). Comments on Essays: do students understand what tutors write? *Teaching in Higher Education, 5*(1), 95–105.
- Crisp, B. R. (2007). Is it worth the effort? How feedback influences students’ subsequent submission of assessable work. *Assessment & Evaluation in Higher Education, 32*(5), 571–581.

- Dempsey, J., & Driscoll, M. & Swindell, (1993). Text-based feedback. *Interactive Instruction and Feedback*, 21–54.
- Duffield, K., & Spencer, J. (2002). A survey of medical students' views about the purposes and fairness of assessment. *Medical Education*, 36(9), 879–886.
- Duncan, N. (2007). “Feed-forward”: Improving students' use of tutors' comments. *Assessment & Evaluation in Higher Education*, 32(3), 271–283.
- Gibbs, G., & Simpson, C. (2004). Does your assessment support your students' learning. *Journal of Teaching and Learning in Higher Education*, 1(1), 3–31.
- Goodman, J. S., & Wood, R. E. (2004). Feedback specificity, learning opportunities, and learning. *Journal of Applied Psychology*, 89(5), 809.
- Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, 77(1), 81–112.
- Higgins, R., Hartley, P., & Skelton, A. (2001). Getting the message across: The problem of communicating assessment feedback. *Teaching in Higher Education*, 6(2), 269–274.
- Hounsell, D., & Hounsell, J. (2007). 7 Teaching learning environments in contemporary mass higher education. In *BJEP Monograph Series II, Number 4-Student Learning and University Teaching*, 91, 91-111. British Psychological Society.
- Hounsell, D., McCune, V., Hounsell, J., & Litjens, J. (2008). The quality of guidance and feedback to students. *Higher Education Research & Development*, 27(1), 55–67.
- Ivanis, R., Clark, R., & Rimmershaw, R. (2000). What am I supposed to make of this? The messages conveyed to students by tutors' written comments. In Lea, M. & Street, B. (2000) (Eds.) *Student writing in higher education: New contexts*: Buckingham, Open University Press
- Kember, D., Leung, D.Y., Jones, A., Loke, A. Y., McKay, J., Sinclair, K., Tse, H.; Wong, F., Wong, M. & Young, E. (2000). Development of a questionnaire to measure the level of reflective thinking. *Assessment & Evaluation in Higher Education*, 25(4), 381–395.
- Kulhavy, R. W. (1977). Feedback in written instruction. *Review of Educational Research*, 47(2), 211–232.

- Kulhavy, R. W., & Stock, W. A. (1989). Feedback in written instruction: The place of response certitude. *Educational Psychology Review*, 1(4), 279–308.
- Kulhavy, R. W., & Wager, W. (1993). Feedback in programmed instruction: Historical context and implications for practice. In J.V. Dempsey, J.V., & Sales, G.C. (Eds.) *Interactive Instruction and Feedback*, (pp.3-20). Englewood Cliffs, N.J: Educational Technology.
- Lea, M., & Street, B. (2000). Student writing and staff feedback in higher education. *Student Writing in Higher Education: New Contexts*, 32–46.
- Livingston, J. A. (2003). Metacognition: An Overview.
- Mackintosh, N. J. (1974). *The psychology of animal learning*. Academic Press.
- Maclellan, E. (2001). Assessment for learning: The differing perceptions of tutors and students. *Assessment & Evaluation in Higher Education*, 26(4), 307–318.
- Marton, F., & Säljö, R. (1976). On qualitative differences in learning: I—Outcome and process. *British Journal of Educational Psychology*, 46(1), 4–11.
- Marton, F., & Saljo, R. (1979). *Learning in the Learner's Perspective. III. Level of Difficulty Seen as a Relationship Between the Reader and the Text*. ERIC Clearinghouse.
- Marton, F., Säljö, R., & Ramsden, P. (1992). Evaluating the quality of higher education. *Learning to teach in higher education* (11), 217-247
- Morehouse, R. E., & Maykut, P. (2002). *Beginning qualitative research: A philosophical and practical guide*. Washington, DC: Falmer Press.
- Mory, E. H. (2004). Feedback research revisited. *Handbook of Research on Educational Communications and Technology*, 2, 745–783.
- Murtagh, L., & Baker, N. (2009). Feedback to feed forward: Student response to tutors' written comments on assignments. *Practitioner Research in Higher Education*, 3(1), 20–28.
- Mutch, A. (2003). Exploring the practice of feedback to students. *Active Learning in Higher Education*, 4(1), 24–38.

- Nicol, D. J., & Macfarlane-Dick, D. (2006). Formative assessment and self-regulated learning: A model and seven principles of good feedback practice. *Studies in Higher Education, 31*(2), 199–218.
- Orsmond, P., Merry, S., & Reiling, K. (2005). Biology students' utilization of tutors' formative feedback: a qualitative interview study. *Assessment & Evaluation in Higher Education, 30*(4), 369–386.
- Perry, W. G. (1970). *Forms of intellectual and ethical development in the college years: A scheme*. New York: Holt, Rinehart and Winston.
- Pintrich, P. R., & DeGroot, E. (1990). Quantitative and qualitative perspectives on student motivational beliefs and self-regulated learning (Vol. 128). Presented at the Annual Meeting of the American Educational Research Association, Boston, MA.
- Pintrich, P. R., & Schrauben, B. (1992). Students' motivational beliefs and their cognitive engagement in classroom academic tasks. *Student Perceptions in the Classroom, 7*, 149–183.
- Rowe, A. D., & Wood, L. N. (2009). Student perceptions and preferences for feedback. *Asian Social Science, 4*(3), 78.
- Sadler, D. R. (1989). Formative assessment and the design of instructional systems. *Instructional Science, 18*(2), 119–144.
- Sadler, D. R. (2010). Beyond feedback: Developing student capability in complex appraisal. *Assessment & Evaluation in Higher Education, 35*(5), 535–550.
- Salomon, G., & Globerson, T. (1987). Skill may not be enough: The role of mindfulness in learning and transfer. *International Journal of Educational Research, 11*(6), 623–637.
- Shute, V. J. (2008). Focus on formative feedback. *Review of Educational Research, 78*(1), 153–189.
- Svinicki, M. & McKeachie, W. (2013). *McKeachie's teaching tips*. Belmont, CA: Wadsworth
- Thorndike, E. L. (1913). *The psychology of learning* (Vol.2). New York: Columbia University Teachers' College,

Weaver, M. R. (2006). Do students value feedback? Student perceptions of tutors' written responses. *Assessment & Evaluation in Higher Education*, 31(3), 379–394.

Wojtas, O. (1998). Feedback? No, just give us the answers. *Times Higher Education Supplement*, 25(7).
<http://www.thesis.co.uk:80/tp/1/PRN/SEARCH/indexa.html>. September 25.

APPENDIX 1: ETHICS COMMITTEE APPLICATION FORM



Faculty of Education

Form for the ethical evaluation of projects

1. PROJECT COORDINATOR(S)

Student(s): Heather Sorella

Telephone number: 514-880-7735

Email: heather.sorella@collegelasalle.com

Study program:

Pedagogical activity:

Project director:

Registration semester of activity:

2. PROJECT DESCRIPTION

<p>Project title: Examining the effectiveness of teacher feedback on student learning outcomes through a student engagement model.</p>

Project funding:

None Source:

Is it an inter-college project?

Yes No

If yes, other colleges involved:

Date for beginning of data collection: August 28, 2017

Project summary

The research is based on an educational problem that concerns teachers and students alike, i.e., that of teacher feedback. Teachers often question whether or not, and if so, how students use the feedback they receive. They also wonder how this feedback might be enhanced. Students hold varying perceptions about teacher feedback.

When reviewing the literature there are many authors who believe that teacher feedback can enhance student learning outcomes while others believe students care only for the grades.

When questioning students on their perceptions many use the feedback they receive but believe that the feedback may be vague, useless to the subject matter and sometimes can be hurtful when teachers give negative feedback on them and their individual work and not on the task. My research will be based on gathering information on students' perceptions of teacher feedback and on testing a student engagement model where I will collect data on two groups of third year, 5th semester fashion design students.

3. ETHICAL ASPECTS

Balance between risks and benefits

What are the risks to participants?

There are no risks in this research. Students will have a choice in participating or not and if they do not want to participate, their grades will not be part of the final data results.

Is the project located below the threshold of minimal risk?¹.

Yes.

If there is a possibility of risk to participants, what measures will you take to mitigate these risks?

No risk.

How much time is required for participation?

The only additional time which is out of the context of the course will be the addition 10 minutes for the treatment group and the reflective questions they will need to discuss with the teacher. Additional time will be for two students from each group, treatment and control, to discuss how the teacher feedback impacted their student learning outcomes.

My hypothesis is that the treatment group which receives the teacher intervention should have better grades and be developing the skills in becoming self-regulated learners.

¹ *Minimal risk is present when the probability of occurrence and the level of possible risk or drawbacks are comparable to those encountered in the daily life of participants.*

For the research data, based on student perceptions, I would also like to build a teacher feedback model, where teachers have a guideline which will help them develop better skills in giving efficient and effective feedback to students.

What are the benefits to participants?

I believe that when teacher feedback is properly administered it enhances students meta cognitive skills by allowing students to reflect on the feedback and find solutions for the goals they can set for themselves.

Is there any monetary or other compensation for project participation such as for time spent or travel, etc.?

Yes **No x**

If yes, justify, and specify the form of compensation:

Free and informed consent

Is the research **consensual** in nature?

Will consent of participating individuals be requested? Will they be aware that they are involved in a trial project in the context of a master's degree in college teaching (MEC) and aware of the type of project?

Yes x No

What are the measures taken to ensure the free and informed consent of all participants?

On the first day of class, I will explain to the students that they are part of a project which is based on how students perceive and use teacher feedback. I will explain all of the timeline of the project and advise them that they are free to participate or not in the research. Confidentiality and anonymity will be preserved in this research study.

How will participants for the project be recruited?

These students are third year, 5th semester students and will be part of the courses I will teach in Fall, 2017. The reason I asked for these two groups was because there will be no bias as I have never met the students before.

When will the consent forms be distributed and signed by the participants?

On the first day of class, August 28, 2017

Who will be handing out and collecting the consent forms?

I, Heather Sorella, the teacher and lead researcher, will be distributing the consent forms.

Does the project involve minors and/or legally incompetent individuals?

Yes **No x**

If yes, specify the precautions taken in this regard: Parental consent is required by law for the participation of minors.

Confidentiality of data

What measures will be taken to ensure **the confidential nature and anonymity of data**?

All documents will be kept at my personal residence where they cannot be seen by students or teachers.

Where will the data be stored? Will they be stored under lock and key? Will electronic files be password protected?

The physical data will be kept at my personal residence. It will be kept in a closet which is only used for private documents. Electronic data will be kept on the Cloud so not tampering of data will occur.

Who will have access to the data?

Heather Sorella

When will the raw data be destroyed (paper questionnaires, cassettes of interviews, etc.)?

In five years.

How will results be disseminated?

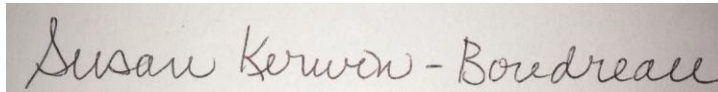
Through a third party company such as Shred-it.

4. COMMITMENT OF THE SUPERVISOR

As the Supervisor of this research project, I have reviewed the above ethical aspects of the project and have also reviewed the Consent Form. I attest that the information contained in these forms has been provided in good faith by

Name of the Supervisor: Susan Kerwin-Boudreau

Signature:



Date: May 18, 2017

APPENDIX 2: ETHICS COMMITTEE APPROVAL FORM



PERFORMA

ATTESTATION DE CONFORMITE ETHIQUE

LE SECTEUR PERFORMA-UNIVERSITÉ DE SHERBROOKE CERTIFIE AVOIR EXAMINÉ LE PROJET

DATE DU RAPPORT	NOM DU PROJET	NOM, PRENOM DE L'ÉTUDIANTE OU DE L'ÉTUDIANT
3 août 2017	Examining the effectiveness of teacher feedback on student learning outcomes through a student engagement model.	Heather Sorella

PROGRAMME

Maîtrise en enseignement au collégial (M.ed.)

ÉQUIPE DE DIRECTION DU PROJET D'ESSAI

	NOM	PRÉNOM
DIRECTRICE OU DIRECTEUR	Kerwin-Boudreau	Susan

PERFORMA ESTIME QUE LE PROJET PROPOSÉ EST CONFORME AUX PRINCIPES ÉTHIQUES ÉNONCÉS DANS LE DOCUMENT : *BALISES RELATIVES À UNE DEMANDE D'ATTESTATION FACULTAIRE DE CONFORMITÉ ÉTHIQUE*

CONFIRMATION DES INTERVENANTES ET INTERVENANTS

DIRECTRICE OU DIRECTEUR	Susan Kerwin-Boudreau
EVALUATRICE OU ÉVALUATEUR	Denyse Lemay
RESPONSABLE DE PROGRAMME	Sawsen Lakhhal

LA RESPONSABLE DE PROGRAMME

SIGNATURE	DATE
	03 août 2017
Sawsen Lakhhal, professeure, responsable de la maîtrise en enseignement au collégial- secteur anglophone	

*Prendre note qu'une certification éthique reçue du Secteur Performa ne peut remplacer une autorisation locale de procéder à la cueillette de données auprès de sujets humains dans un autre établissement. Cependant, la certification obtenue confirmera que le projet d'essai de maîtrise EST CONFORME AUX PRINCIPES ÉTHIQUES ÉNONCÉS DANS LE DOCUMENT : *BALISES RELATIVES À UNE DEMANDE D'ATTESTATION FACULTAIRE DE CONFORMITÉ ÉTHIQUE.**

APPENDIX 3: LASALLE COLLEGE CONSENT FORM

Consent and Approval of Project from LaSalle College



Montréal, le 21 novembre 2016

Madame, Monsieur,

La direction des études a analysé l'énoncé de recherche de Madame Heather Sorella intitulé « Feedback and Its Role in Student Achievement and Learning ». Nous approuvons donc la méthodologie présentée dans le document, puisqu'elle respecte le code d'éthique prévu dans le cadre de consultations auprès des étudiants du Collège.

Cordialement,
Mathieu Lépine

Mathieu Lépine
Directeur adjoint aux études

APPENDIX 4: PARTICIPANT CONSENT FORM

Examining the effectiveness of teacher feedback on student learning outcomes through a student engagement model.

PARTICIPATION CONSENT FORM

Name of participant: _____

Date: _____

Address: _____

E-mail address: _____

Telephone number: _____

I, the undersigned,

- Agree to participate in the research project entitled **Examining the effectiveness of teacher feedback on student learning outcomes through a student engagement model.**
- Understand the purpose of this study and know about the benefits and any inconveniences that may be involved.
- Understand that I am free to withdraw from this study for whatever reason and at any time without penalty or prejudice.
- Understand how confidentiality and anonymity will be maintained during this research project.
- Understand the anticipated uses of the data with respect to my dissertation, related publications and presentations.

Therefore, freely consent and voluntarily agree to participate in this study.

Signature: _____

APPENDIX 5: PARTICIPATION DETAILS

On the first day of the research project, students will be told the following:

- ✓ Students are part of a research project studying teacher feedback.
- ✓ Students will be advised that they are free to participate or not in the research study and participation is voluntary without penalty or prejudice.
- ✓ Students will be advised that the teacher/researcher will know the students as participants (coded numbers) and will have no knowledge of who participates or not including who has or has not signed consent forms.
- ✓ Students will be advised that all data collection results will be kept confidential and anonymous and will be part of a Master of Education thesis.

APPENDIX 6 A: PRE-QUESTIONNAIRE (OPEN-ENDED)

Student name: _____

Student number: _____

Pre Questionnaire

Feedback is defined as “helpful information or criticism given to someone to indicate what can be done to improve something (Merriam –Webster, 2001)

Answer the following questions:

1. In general, **do you understand** the feedback you receive from your teachers? Are you able to act on this feedback? How?

2. In general, **how do you respond** to the feedback you receive from your teacher on an assignment:

- A) I read it once-quickly
- B) I ignore it and just look at the mark I received
- C) I study it carefully to see how I might improve next time on an assignment
- D) I like to meet with my teacher to go over the feedback
- E) I learn a lot from feedback (agree or disagree?)

3. Give an example of feedback that is **helpful**. Explain why.

4. Give an example of feedback that is **not helpful**. Explain why.

5. Give an example of how teacher feedback might be improved.

APPENDIX 6 B: PRE-QUESTIONNAIRE (SURVEY)

Student name: _____

Student number: _____

Pre Questionnaire Perceptions of Feedback *

Indicate your **level of agreement/disagreement** with the following statements.

Question	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Feedback is an explanation of the grade I have received					
Feedback is an evaluation of my strengths and weaknesses					
Feedback motivates me to study					
Teachers who provide feedback care about what students think					
Feedback explains my grade for an assignment					
Feedback tells me I need to improve my performance in a subject					
I deserve feedback when I put					

effort in my assignments					
When I receive a lot of feedback I feel encouraged					
Feedback tells me what the teacher's expectations are					
Feedback is my individual contact with the teacher					

*Student feedback questionnaire- (Rowe & Woods, 2009)

APPENDIX 7 A: POST-QUESTIONNAIRE (CONTROL GROUP)

Student name: _____

Student number: _____

Post questionnaire

Indicate your **level of effectiveness** with the following statements concerning teacher feedback.

Question	Not effective at all	Slightly effective	Neutral	Effective	Highly effective
Written feedback on cover sheet is					
Comments on assignment are					
Highlighted rubric grid is					
No written feedback only oral comments					

Answer the following question:

What might have helped make written feedback on the formative assessment more effective?

APPENDIX 7 B: POST-QUESTIONNAIRE (TREATMENT GROUP)

Student name: _____

Student number: _____

Post- questionnaire

Indicate your **level of effectiveness** with the following statements concerning teacher feedback.

Question	Not effective at all	Slightly effective	Neutral	Effective	Highly effective
Written feedback on cover sheet is					
Comments on assignment are					
Highlighted rubric grid is					
No written feedback only oral comments					
Personal time allocated to reading feedback is					
One –to-one tutorials are					
Open communication with teacher is					

Answer the following questions:

1. What might have helped make written feedback more effective?

2. Was the meeting with your teacher to discuss the feedback useful? How?

3. Did it help you in the summative assignment?

4. How might a future meeting to discuss feedback be improved?

APPENDIX 8: INTERVENTION PROTOCOL

Question level

Questions to prepare	Student comments	Teacher comments
Was the reading and reflecting on the written feedback helpful? If so, how? If not, why?		
Are there any key issues in the written feedback that were unclear and need clarification?		
What are the next steps?		

Procedural level (interview will be tape-recorded by interviewer)

- ✓ Length of interview: **10-15 minutes**, Location: **Teacher's office**
- ✓ At individual meeting, student will be told that all discussions between the teacher ((interviewer) and student (interviewee) will be confidential.
- ✓ Interviewer will continue interview by asking interviewee "tell me about your experience with teacher feedback". This phrase will keep the question general enough that the interviewee can take the question in several directions and leave the interview with ideas, impressions and concepts which the interviewer may not have thought of to emerge from the data. (skills in developing reflective thinking)
- ✓ Next, three open-ended questions will be asked (see above).
- ✓ Finally, interviewee will be told that they if they have additional questions they can discuss with teacher in class. (encourage self-regulation)

*(Jacob & Furgerson, 2012)

APPENDIX 9: FORMATIVE ASSESSMENT

Course Identification

Name of Program – Codes	FASHION DESIGN – 571.A0 and NTC.0Q
Course title:	BUYING AND SELLING OF PRODUCTS AND SERVICES
Course number:	571-KPY-03
Group:	02646-02648
Teacher’s name:	Heather Sorella
Duration:	3 periods (150 minutes)
Semester:	Fall 2017

Student Identification

Name: _____ Student number: _____

Date: _____ Result: _____

Standard of the Evaluated Competency: To buy and sell products and services - 00TQ

Statement of the evaluated competencies – Codes

Ability to buy and sell products and services

Evaluated elements of the competencies

To determine the needs of the targeted clientele

To establish the demands and inform suppliers

To propose a product

To negotiate an agreement

Quality of language (Maximum for the *quality of language*)

(0.5 points per error – maximum 20 errors)

For a total of 10 points.

PART 1: To determine the needs of the targeted clientele.

(25 marks)

1A) Shifts in consumers' behaviour have posed challenges for the retail sector. Increased use of smart phones, health and environment concerns and technological innovations are main areas of change that will impact retail business. Rise in income of consumers, their younger profiles and growing access to the internet are identified as driving forces for the shift.

As a retailer, explain and provide examples of these key areas of change in consumer behaviour. Also, considering the above changes, what measures would you take to stay in business?

PART 2: To establish the demands and inform suppliers

(3 questions worth 25 marks total)

2A) When customers have contact or interaction with a product, they formulate an evaluation of their experience. List and explain the categories of satisfaction.

2B) One of the most important aspects of a buyers' job is knowing how to price merchandise effectively. Identify why it is important and list and explain some factors which affect retail pricing.

2C) Define how the process of consumption and give an example.

PART 3: To propose a product

(3 questions worth 25 marks total)

3A) Building a consumer profile is one of the most significant aspects of marketing. Identify why building a consumer profile is important and list and explain the steps involved.

3B) As a fashion buyer for Le Chateau, you have been asked to put together a dress collection for Fall 2018. Explain what motivates your Le Chateau client to buy (psychographic, personal and social aspects).

3C) Relationship marketing is an important factor in the current marketplace. Give an example of how relationship marketing can increase sales.

PART 4: To negotiate an agreement

(2 questions worth 25 marks total)

4A) Buyers are constantly negotiating with suppliers. It is considered one of the most important aspects in the buying process. Explain what can be done to change consumers' perceptions of quality and the price they choose to pay.

4B) As a buyer, have just been informed that your foreign supplier had shipped your company knit tops which were produced by a manufacturer which uses child labour. Explain how this problem could impact your company. Explain some ways which a buyer should be both ethically and socially responsibility.

APPENDIX 10: SUMMATIVE EVALUATION

Midterm Evaluation: 30%

Course Identification

Name of Program – Codes	FASHION DESIGN – 571.A0 and NTC.0Q
Course title:	BUYING AND SELLING OF PRODUCTS AND SERVICES
Course number:	571-KPY-03
Group:	02646-02648
Teacher's name:	Heather Sorella
Duration:	3 periods (150 minutes)
Semester:	Fall 2017

Student Identification

Name: _____ Student number: _____

Date: _____ Result: _____

Standard of the Evaluated Competency:

Ability to buy and sell products and services - 00TQ

Evaluated elements of the competencies

To determine the needs of the targeted clientele

To establish the demands and inform suppliers

To propose a product

To negotiate an agreement

Quality of language (Maximum for the *quality of language*

(0.5 points per error – maximum 20 errors)

For a total of 10 points.

Instructions

Class notes are not allowed and students may not use the dictionary.

No break is allowed during this exam. Students are not allowed to exit the examination room before half of the allotted time has passed. Once a student has exited the classroom, he/she may not re-enter (IPEL – Article 5.12.4).

The teacher will not answer questions during the exam.

Students must remain silent during the exam.

It is the teacher's responsibility to identify language errors. If such errors are found, teachers may deduct up to 20% of the final grade (IPEL – Article 5.7).

Plagiarism, attempts at plagiarism or complicity in plagiarism during an evaluation worth 20% or more of the final grade results in a mark of zero (0) for that course (IPEL – Article 5.16).

Please write clearly.

SHORT ESSAY QUESTIONS (100 marks)

Explain how relationship marketing can increase a retailer's sales.(10 marks)

Explain the buying influences which make consumers shop. (20 marks)

Explain how retail prices affect consumer buying choices. (10 marks)

As a retail buyer, explain the process of consumption and provide an example. (20 marks)

Describe the different stages in the consumer lifecycle and give an example. (20 pts.)

Motivation is an important factor for consumers when deciding to purchase an item. Give an example of a rational and an emotional buy for the consumer. (20 pts.)

APPENDIX 11: INTERVIEW PROTOCOL

Focus Conversation Interview Protocol

Students selected to participate in the focused conversation will be advised a week prior to the meeting. Students will be asked if they want to discuss their feedback experiences and the selection process will be choosing two students from each group, one who performed well and one who performed in the average range.

Procedural level (interview will be tape-recorded by interviewer)

- ✓ Length in interview time: **20-25 minutes**, Location: **Teacher's office**
- ✓ At individual meeting, student will be told that all discussions between the teacher ((interviewer) and student (interviewee) will be confidential.
- ✓ Interviewer will ask interviewee “tell me about your experience with teacher feedback”. This phrase will keep the question general enough that the interviewee can take the question in several directions and leave the interview with ideas, impressions and concepts which the interviewer may not have thought of to emerge from the data. (skills in developing reflective thinking)
- ✓ Next, six open-ended questions will be asked (see Appendix 12). These questions are designed to analyse main themes which emerge from the conversations.
- ✓ Lastly, interviewer will ask if the interviewee has any questions they would like. This should encourage student's role as an active participant in experiment.

APPENDIX 12: LIST OF FOCUS GROUP QUESTIONS

Treatment Group:

- ✓ Was the teacher feedback clear and easy to understand?
- ✓ Were there issues with the teacher feedback you did not discuss with the teacher during the meeting?
- ✓ Did you find the one-to-one meeting useful?
- ✓ Did the one-to-one meeting with teacher make you reflect on your original answers? Did you make any changes?
- ✓ Did your grades increase when you reflected on your new answers? If so, what different approach did you use?
- ✓ Will you use this new approach in your future studies?

Control Group:

- ✓ Was the teacher written feedback clear and easy to understand?
- ✓ Did you have questions that were not answered?
- ✓ Did you schedule time to see the teacher during her office hours for explanations on the written feedback you received?
- ✓ Has the value of teacher feedback changed for you? Why? Or why not?
- ✓ Did your grades increase when you reflected on your new answers? If so, what different approach did you use?
- ✓ Will you use this new approach in your future studies?

APPENDIX 13: RAW DATA TREATMENT GROUP

Student number	Formative assessment marks	Summative assessment marks (midterm)
1530366	48	80
1532070	90	60
1531760	56	77
1531761	66	87
1610175	81	88
1531282	77	62
1531260	10	80
1431641	43	80
1530628	76	100
1532303	73	100
1530230	58	75
1530757	33	95
1430429	41	85
1431652	43	80
1430668	56	46
1430022	59	93
1610468	67	90
1531798	57	47
1530561	15	87
1611365	58	67
1330248	63	97
1630883	82	100
1610455	85	70
Mean Score	58.13	80.26

+38.07 %(Increase)

APPENDIX 14: RAW DATA CONTROL GROUP

Student number	Formative assessment mark	Summative assessment marks(mid-term)
1530340	70	90
1510178	5	90
1510239	17	100
1532116	70	90
1511087	70	100
1630509	96	97
1531185	67	85
1631338	64	100
1531626	88	100
1410754	27	73
1531048	56	70
1531114	63	100
1610074	39	100
1530530	38	100
1531403	70	60
1430044	33	100
1630920	95	100
1530655	81	100
1610067	81	97
1530218	98	100
1530274	87	68
1530916	97	95
1611220	98	100
1530759	45	96
0620165	66	100
1531463	68	61
1510083	72	65
Mean Score	65.22	90.26

+38.39% (Increase)