Formative Assessment in Elementary School:
Promoting Self-Regulated Learning, Intrinsic Motivation, and Self-Efficacy

by

Patricia W. Keenan
B.Ed., University of Victoria, 1987

A Project Submitted in Partial Fulfillment
of the Requirements for the Degree of

MASTER OF EDUCATION

in the Department of Curriculum and Instruction

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Supervisory Committee

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Supervisory Committee

Dr. Todd Milford, (Department of Curriculum and Instruction)
Supervisor

Dr. Michelle Wiebe, (Department of Curriculum and Instruction)
Second Reader
Abstract

Supervisory Committee
Dr. Todd Milford, (Department of Curriculum and Instruction)
Supervisor
Dr. Michelle Wiebe, (Department of Curriculum and Instruction)
Second Reader

Formative assessment is an approach for evaluating student progress and achievement that has become a widely used practice in elementary classrooms. It invites student input in every aspect of the learning process, and is argued to promote deeper understanding, encourage active participation and engagement in learning activities, provide opportunity for self and peer-assessment, allow for student responsibility and ownership, and positively affect life-long learning. At the elementary level, there exists a divide between formative assessment and the more typical practice of summative assessment, the latter being characterized by numerical scores and letter grades determined by teachers to communicate student learning. Literature suggests that formative assessment is the favorable choice for assessment practice. This project reviews empirical evidence that suggests formative assessment better supports student learning in three major areas: self-regulated learning, intrinsic motivation, and self-efficacy. Studies report that the formative approach allows students to develop needed skills at a self-regulated pace, increases intrinsic motivation for tasks, and enhances self-efficacy. Formative assessment has become a relevant topic for researchers and the greater educational community for its positive impact on student learning.

Keywords: formative assessment, summative assessment, self-regulated learning, intrinsic motivation, self-efficacy, elementary school.
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Acknowledgments

With sincere gratitude, I acknowledge Dr. Todd Milford and Dr. Michelle Wiebe for their support in guiding me to the completion of my thesis project. Both individuals were present at the very beginning of this journey when I first became interested in pursuing my Master’s degree at the University of Victoria. Coming full circle, both Todd and Michelle became my supervisory committee. I extend a special note of appreciation to Todd for exemplifying formative assessment practice and for generously providing times for us to meet throughout the year. Together we discussed project ideas, collaborated on the direction of my writing, and generated rich conversation on assessment practice - true learning in action.
Dedication

For me, returning to university after a career in teaching was a leap of faith and being part of an online cohort program was a monumental learning curve. This Master’s degree is dedicated to my sons, Stewart and Adam Keenan. To my boys who always believed I could do it, supported and encouraged me every step of the way, “Thank you.” Both of you make me proud beyond words. The three of us have been a team for a very long time. I am so lucky to be part of a family trio who provide such inspiration and support to each other as we venture through life.
Chapter One: Introduction

This review examines the application of formative assessment to the elementary classroom. Formative assessment or *assessment for learning* is a method of evaluation that has gained considerable attention from educational stakeholders for its capacity to positively impact student learning (Baas, Casteljins, Vermeulen, Martens, & Segers, 2015; Faber, Luyten, & Visscher, 2016; Loughland & Kilpatrick, 2015). For elementary school students, formative assessment occurs in the context of the classroom environment where students actively engage in learning activities. Through feedback, formative assessment allows instruction to be adapted and modified for students so the learning process becomes fluid and specific to student needs. For teachers using the formative approach, it is beneficial to possess knowledge and skills in this method of assessment (Baas et al., 2015, p. 43). It has been suggested that formative assessment encourages student learning (Brookhart, 1997; Crooks, 1988; Wiliam & Black, 1998), making it a relevant topic of study. Three significant areas of learning emerged from this review as benefits of formative assessment: self-regulated learning (SRL), intrinsic motivation, and self-efficacy; however, despite these findings, there continues to be a reliance for British Columbia (BC) school districts to use summative assessment to communicate elementary student progress and achievement in formal reporting (i.e., report cards). In the introduction, I begin by stating why this study is of personal interest and then provide research studies that examine the effects of using formative assessment in the elementary classroom on students’ SRL, intrinsic motivation, and self-efficacy.

**Personal Interest and Investment**

As a veteran elementary teacher of over three decades, I observed the personal and professional struggle that elementary school educators face with the dichotomy that exists
between formative and summative assessment practices, most specifically for formal reporting. Assessment for learning is a common daily assessment practice in elementary classrooms, yet the focus of assessment is term reporting; summative assessment which relies on numerical symbols and letter grades to indicate student learning. Over my career, I provided student letter grades on more than two thousand report cards. I invested countless hours using BC Ministry of Education (MOE) performance standards, rating scales, and adding scores to calculate percentages to determine a letter grade for each of the four core academic subject areas in the elementary school curriculum: language arts, social studies, mathematics, and science. Repeatedly, I witnessed the exclusive focus that students and parents place on marks and grades which represent a teacher generated, summative snapshot of student progress and performance. It is my experience that due to the impact of letter grades, parents and students place a secondary value on acknowledging individualized student growth and development; recognizing active engagement in learning tasks; the importance of intrinsic motivation; and the power of student control to direct and assess their own learning progress. All of which are core concepts in the BC curriculum document and integral to formal assessment practice.

My interest in reviewing some of the literature around formative assessment is to uncover viable ways to expand its implementation so that this form of assessment may be used on elementary student report cards as an alternative to letter grades. In my experience as a classroom teacher, I observed the positive influence of formative assessment on student motivation, self-perception, self-esteem, participation, and academic performance. For these reasons and based on the information that is revealed in the literature review, I ask, “How can formative assessment be used for both informal and formal reporting at the elementary school level?”
Significance and Importance

According to the reviewed literature, formative assessment has the power to affect SRL, intrinsic motivation, and self-efficacy. This is important to BC students and also timely. With the recent mandatory implementation of the revised BC curriculum (https://curriculum.gov.bc.ca/) in 2016, teachers are exploring both how best to implement the expectations of the learning competencies and to assess these in BC classrooms. There is impetus by the BC MOE to seek input from interested parties on assessment practices. This movement will serve to ignite conversation regarding the best practice for the assessment of student learning. It is my intention to be an integral part of this discourse and become an active participant in the process for constructing an assessment policy so that elementary students have the opportunity to develop SRL, intrinsic motivation, and self-efficacy for lifelong learning.

Background

Formative assessment is a term that is prominent in literature on assessment practice. The review of literature presented in this paper suggests that this method of evaluation encourages student learning. In their seminal work, Assessment and Classroom Learning, (Black & Wiliam, 1998) the authors state that although formative assessment does not have “tightly defined and widely accepted meaning” (p. 7), it argues to promote the transparency of learning direction; deepen cognitive understanding; allow for teacher, peer, and student feedback; and activate student ownership and responsibility. Research suggests that by providing regular feedback to students and then using this information to adapt instruction (Decristan et al., 2015) an individualized continuum based on mastery learning is established so that student competency and achievement can be realized. The literature has revealed that within the construct of
formative assessment, there exists a positive relationship between SRL, intrinsic motivation, and self-efficacy (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016).

In this review, several studies are examined to articulate how SRL has emerged as a catalyst for encouraging and increasing student motivation and self-efficacy. By placing the student in the hub of the learning process, SRL reinforces student control, making it personalized and flexible to individual needs. Under the umbrella of SRL, the student becomes accountable for the pace, direction, and achievement of learning outcomes while learning important critical thinking and judgement skills when engaged in self or peer assessment of progress and performance. Studies report that to maximize the positive effects of formative assessment on student learning, both students (Stoeger, Heidrun, Zielger & Albert, 2008) and teachers (Baaß et al., 2015) should be provided with training to best effect SRL in elementary classrooms. Furthermore, it was suggested that it may be advantageous to introduce the formative assessment strategy of SLR during elementary school years to cultivate this important skill for lifetime learning (Throndsen, 2011).

Throughout the literature on formative assessment, several studies identified intrinsic motivation as a positive by-product, particularly when SRL is present (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2013; Järvelä, Järvenoja, & Malmberg, 2012; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016; Yıldızlı & Saban, 2016). Authentic and relevant activity learning tasks which optimize formative comments to produce mastery are task involving; the result being increased student motivation (Butler, 1987; Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009) and improved student performance (Faber, Luyten, & Visscher, 2016; Seo & Taherbhai, 2009).
Literature indicated that self-efficacy for SRL has the capacity to affect and predict student learning success and should be promoted throughout schooling (Usher & Pajares, 2008). Findings articulated that the view that students have of themselves and its impact on competence outcomes is a key to achievement and continues for older learners (van Dinther, Dochy, Segers, & Braeken, 2014). Positive self-efficacy in subject domains corresponded to student intrinsic motivation and enjoyment in those same areas; however, literature suggested that results are largely domain specific and caution should be taken not to generalize findings (Chatzistamatiou, Dermitzaki, Eflides, & Leondari, 2015). Consequently, in this paper, effort is taken to use studies which include a variety of learning domains and are cross-cultural to support the universal use of formative assessment practice at the elementary school level.

**Research Questions**

Three main areas of importance emerged on the topic of formative assessment following the review of twenty-five studies and guided the exploration of my topic in the literature study:

1. Does formative assessment promote SRL at the elementary level of schooling?
2. What is the relationship between formative assessment and intrinsic motivation at the elementary level of schooling?
3. Does formative assessment promote self-efficacy at the elementary level of schooling?

**Definitions**

For formative assessment to be fully understood there is associated terminology which needs to be clearly defined. These terms include formative assessment, summative assessment, self-efficacy, self-regulated learning, motivation, and elementary school.

**Formative assessment.** Formative assessment is an approach to assess student learning. It relies on two main features; that is, performance feedback and instructional adjustment so that
students are able to close the learning gap between where they are and goal achievement (Baas et al., 2015). This is accomplished by identifying student strengths and areas of need, monitoring, and regularly assessing progress in order to achieve mastery. Formative assessment practice can be both formal and informal and include - but is not limited to - student portfolios, progress graphs, journals, and goal setting.

**Summative assessment.** This method for assessment summarizes student progress and achievement performance at a specific time during the learning process (Crooks, 1988). It is characterized by the use of numerical values and letter grades to evaluate student progress and achievement. In this approach, a teacher assumes the primary role of assessor for student work. Examples of summative strategies include tests, rating scales, percentages, and letter grades. Summative assessment is noted for its absence of student participation and input.

**Self-regulated learning.** This main strategy within formative assessment is the degree to which students actively engage in their own learning processes (Zimmerman, 1989). During SRL, the student uses a variety of thought processes (i.e., metacognitions) to engage in a cyclic process of goal setting, monitoring, and reflection towards achieving learning outcomes (Labuhn, Zimmerman, & Hasselhorn, 2010).

**Self-efficacy.** Self-efficacy is the belief or self-perception in one’s competence to achieve or perform by influencing an individual’s emotional, cognitive, motivational, and behavioural conduct (Bandura, 1994).

**Motivation.** Motivation can be extrinsic or intrinsic. Extrinsic motivation is elicited from an external source, for example, a reward; while intrinsic motivation is influenced by student interest and enjoyment. Intrinsic motivation is considered important for sustained engagement and long-term learning.
**Elementary school.** Elementary school is the educational venue for students beginning formal schooling where learning skills are introduced and begin to develop. In the elementary school system, grade configurations can shift; kindergarten to grade five or kindergarten to grade six. For the purpose of this paper, elementary school is defined as those students in kindergarten to grade seven, five to twelve years of age.

**Research Pathway**

**Research direction and applicable strategies.** To locate studies on formative assessment at the elementary school level, the original search terms that were used included: “formative assessment and elementary school.” I filtered the searches to include journal articles that were peer reviewed and scholarly from 2012 to 2017. This yielded few results. I expanded my search to include journal articles from the year 2000, producing greater results, but still limited in number. The second phase of finding appropriate studies to my topic used terms that emerged during my initial search and included “self-regulated learning”, “motivation”; “self-efficacy.” During the third phase of the search, I used the names of notable leaders linked to “formative assessment,” “SRL,” “student motivation,” “self-efficacy,” and included: “Black and Wiliam;” “Crooks;” “Zimmerman;” “Bandura” (e.g., “formative assessment and Black and Wiliam”). In addition, I found certain studies and researchers were repeatedly cross referenced so I included these in subsequent searches (e.g. “Ruth Butler and assessment,” “Susan Brookhart and formative assessment”). The majority of my exploration uses the University of Victoria Library search engine; however, this is supplemented by the use of Google Scholar, Web of Science (housed within the University of Victoria library resource), and links to the works of notable pioneers, researchers, educators, and authors who study the effects of formative assessment on student learning and achievement. For each study chosen, I checked for a methods section to ensure it was empirical and my choices were influenced by the date the research was
published, with more recent studies being preferred (post year 2000). My search is guided by selecting studies that supported formative assessment practice. Most research on this topic is located in psychology or educational journals. Examples of these include but are not limited to the American Psychological Association; British Educational Research Journal; Journal of Educational Psychology; and Educational Research and Evaluation.

**The scope of the literature.** The search produced a collection of twenty-five peer reviewed and scholarly qualitative or mixed methods studies which suggest that formative assessment is a desirable approach to communicate student learning and one which considers, encourages, and cultivates SRL, intrinsic motivation, self-efficacy, and performance. Although the importance of using recent studies to support the exploration of the impact formative assessment on elementary students is recognized, it is prudent to include seminal and other influential articles as references because these works provide valuable background knowledge on formative assessment and the identified themes of SRL, intrinsic motivation, and self-efficacy. These include works by Crooks (1988), Bandura (1994), Brookhart (1997; 2008; 2009), Black and Wiliam (1998), Sadler (1989), Zimmerman (1989, 2002) and Clark (2012). As aforementioned, effort is taken to locate studies that are cross-cultural and conducted across a variety of learning domains.

In the subsequent section, I use research findings to demonstrate the way that formative assessment promotes SRL, explore the relationship between formative assessment and intrinsic motivation, and illustrate the manner in which self-efficacy can be promoted by formative assessment. In the following review, empirical evidence supports formative assessment as an informed choice for evaluating elementary student progress and performance because of its ability to promote the respective areas of SRL, intrinsic motivation, and self-efficacy.
Chapter Two: Literature Review

The purpose of this study is to review some of the literature on the use of formative assessment in the elementary classroom. The literature in this review supports formative assessment as a viable evaluation method at the elementary level of schooling (Baas et al., 2015; Brookhart, Andolina, Zuza, & Furman, 2004; Decristan et al., 2015; Ferreira, Veiga Simão, & Lopes da Silva, 2015; Koenig, Eckert, & Hier, 2016; Loughland & Kilpatrick, 2015). Three interconnected themes emerged from the empirical studies that are examined here: self-regulated learning (SRL), intrinsic motivation, and self-efficacy (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016; Stoeger, Heidrun, & Ziegler, 2008; Yıldızlı & Saban, 2016). From these themes, three research questions are answered in the literature review: Does formative assessment promote self-regulated learning at the elementary level of schooling? What is the relationship between formative assessment and intrinsic motivation at the elementary level of schooling? Does formative assessment promote self-efficacy at the elementary level of schooling? In the following review, the three research questions are respectively answered in three individual sections using empirical evidence.

The empirical findings investigated in this literature review answered the first research question: Does formative assessment promote self-regulated learning at the elementary level of schooling? Formative assessment has been shown to promote SRL (Ferreira, Veiga Simão, & Lopes da Silva, 2015; Kovovolenis, Goudas, Dermitzaki, & Kitsantas, 2013; Kramarski, Weisse, & Kololshi-Minsker, 2010; Labuhn, Zimmerman, & Hasselhorn; Mykkänen, Perry, & Järvelä, 2017; Throndsen, 2011; Yıldızlı & Saban, 2016). In the first section of the review which focuses on formative assessment and SRL, four sub-themes emerged from the literature, which focus on the promotion of formative assessment through the strategy of SRL; each was supported by
empirical results which promote SRL as an important formative assessment strategy. The four identified sub-themes are feedback (Loughland & Kilpatrick, 2015; Mykkänen, Perry, & Järvelä, 2017); using monitoring (Baas et al., 2015; Brookhart, Andolina, Zuza, & Furman, 2004; Ferreira, Veiga Simão & Lopes da Silva, 2015; Loughland & Kilpatrick, 2015; Koenig, Eckert, & Hier, 2016; Kovovelenis, Goudas, Dermitzaki, & Kitsantas, 2013; Labuhn, Zimmerman, & Hasselhorn, 2010); scaffolding (Baas et al., 2015; Decristan et al., 2015; Kovovelenis, Goudas, Dermitzaki, & Kitsantas, 2013); and student autonomy (Ferreira, Veiga Simão, & Lopes da Silva, 2015; Kovovelenis, Goudas, Dermitzake, & Kitsantas, 2013; Loughland & Kilpatrick, 2013; Yıldızlı & Saban, 2016). In the review, each sub-theme is supported by empirical results, which promote SRL as an important formative assessment strategy for elementary school students.

Following the presentation of the empirical findings for the four sub-themes and preceding the discussion for section one, there is an additional sub-section which highlights surprising and contradictory findings in this literature review on formative assessment and SRL.

The second section focuses on the relationship between formative assessment and intrinsic motivation. Studies revealed a close and interrelated connection between formative assessment and intrinsic motivation (Butler, 1987; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Faber, Luyten, & Visscher, 2016; Järvelä, Järvenoja, & Malmberg, 2012; Kramarski, Weisse, & Kololshi-Minsker, 2010; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016; Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009; Yıldızlı & Saban, 2016). Guiding the review which investigates the relationship of formative assessment and intrinsic motivation are the three sub-themes of SRL strategy and intrinsic motivation; motivational goal orientations; and the student characteristics of high and low achievers. The reviewed literature suggested that SRL strategy and intrinsic motivation in students are closely
linked (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Järvelä, Järvenoja, & Malmberg, 2012; Yıldızlı & Saban, 2016); task oriented goals are effective in promoting intrinsic motivation (Butler, 1987; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009); and motivational differences exist for high and low achieving students (Butler, 1987; Faber, Luyten, and Visscher, 2016; Järvelä, Järvenoja, & Malmberg, 2012).

The third section of the literature review answers the research question: Does formative assessment promote self-efficacy at the elementary level of schooling? There exists empirical support for the promotion of self-efficacy through formative assessment (Chan & Lam, 2010; Miller & Lavin, 2007; Seo & Taherbhai, 2009; Usher & Pajares, 2009; Yıldızlı & Saban, 2016). This section of the literature review examines the empirical evidence for the promotion of self-efficacy through formative assessment using the two sub-themes of predicative quality and social persuasions. The literature in this review suggested that student self-efficacy exerts a powerful and predictive effect on student success (Lee & Jonson-Reid, 2016; Seo & Taherbhai, 2009; Usher & Pajares, 2008; Yıldızlı & Saban, 2016). The empirical findings that suggested academic self-efficacy is predictive of student achievement at the elementary level (Lee & Jonson-Reid, 2016; Seo & Taherbhai, 2009; Usher & Pajares, 2008; Yıldızlı & Saban, 2016) mirrored a similar finding for older students (van Dinther, Dochy, Segers, & Braeken, 2014). Social persuasions, a term used to describe evaluative feedback from others was found to be instrumental in influencing student self-efficacy in both younger (Chan & Lam, 2010) and in older students (van Dinther, Dochy, Segers, & Braeken, 2014).

Based on the findings, formative assessment in the elementary classroom is a worthwhile exploration because it is educationally valuable. In the following subsections, I review the
literature in view of three questions to be answered: (a) Does formative assessment promote self-regulated learning at the elementary school level? (b) What is the relationship between formative assessment and intrinsic motivation at the elementary school level of schooling? (c) Does formative assessment promote self-efficacy at the elementary level of schooling?

**Formative Assessment and Self-regulated Learning**

**Introduction.** The first of the three research questions, which guide this review, is Does formative assessment promote self-regulated learning at the elementary level of schooling? The objective of this question is to learn if formative assessment promotes SRL for elementary students. The reviewed literature suggested there is empirical support for the ability of formative assessment to promote SRL in the elementary classroom; that is, the empirical studies that answer this question indicated that formative assessment successfully promotes SRL by creating an interactive classroom environment that allows learners to participate actively in their learning progress in order to realize achievement goals (Baas et al., 2015; Brookhart, Andolina, Zuza, & Furman, 2004; Ferriera, Veiga Simão & Lopes da Silva, 2015; Kovovelonis, Goudas, Dermitzaki, & Kitsantas, 2012; Kramarski, Weisse, & Kololshi-Minsker, 2010; Mykkänen, Perry, & Järvelä, 2017; Stoeger, Heidrun, & Ziegler, 2008; Yıldızlı & Saban, 2016). This finding is useful because empirical evidence revealed an informed approach for evaluating elementary student progress and achievement. Zimmerman’s (2002) model of SRL was widely used across a number of studies to demonstrate how the formative assessment approach successfully promotes SRL at the elementary level (Baas et al., 2015; Ferriera, Veiga Simão, & Lopes da Silva, 2015; Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2012; Labuhn, Zimmerman, & Hasselhorn 2010; Stoeger, Heidrun, & Ziegler, 2008; Yıldızlı & Saban, 2016). Both important deep thinking skills through
metacognition (Ferreira, Veiga Simão & Lopes da Silva, 2015; Mykkänen, Perry, & Järvelä, 2017) and student autonomy (Baas, et al., 2015; Loughland & Kilpatrick, 2015; Mykkänen, Perry, & Järvelä, 2015; Yıldızlı & Saban, 2016) were fostered through the use of Zimmerman’s (2002) SRL model at the elementary level. All the investigated studies supported the promotion of SRL through formative assessment at the elementary level for benefitting student learning. This review looks at four sub-themes associated with the literature surrounding formative assessment and SRL: feedback, monitoring, scaffolding, and student autonomy.

**Feedback and monitoring.** Feedback is defined as an intervention method which provides information to students for improving performance (Koenig, Eckert, & Hier, 2016). Across the investigated studies, feedback was found to support SRL effectively (Baas et al., 2015; Brookhart, Andolina, Zuza, & Furman, 2004; Decristan et al. 2015; Ferreira, Veiga Simão & Lopes da Silva, 2015; Koenig, Eckert, & Hier, 2016; Mykkänen, Perry, & Järvelä, 2017; Labuhn, Zimmerman, & Hasselhorn, 2010; Lougland & Kilpatrick, 2015; Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013; Mykkänen, Perry, & Järvelä, 2017; Stoeger, Heidrun, & Ziegler, 2008; Yıldızlı & Saban, 2016). In a study on the effect of SRL in mathematics, findings reported that the use of student learning logs and homework diaries, which received constant teacher assessment and feedback as well as student reflection, resulted in high level thinking skills (i.e. metacognition) and academic achievement; indicating that the self-regulating process of monitoring student learning is effective in an elementary classroom environment where formative assessment is evidenced (Yıldızlı & Saban, 2016).

The literature suggested that using self-reporting methods to provide performance feedback effectively promotes SRL by means of monitoring student growth; i.e., blogs, portfolios, learning diaries, journal tasks, and reflection logs as these techniques provide students
with valuable information for planning and adaptive goal setting towards achieving academic success (Baas et al., 2015; Ferriera, Veiga Simão, & Lopes da Silva, 2015; Loughland & Kilpatrick, 2015). Results suggested that training students in SRL to provide feedback through monitoring develops SRL and produces greater academic achievement (Ferriera, Veiga Simão, & Lopes da Silva, 2015; Stoeger, Heidrun, & Zielger, 2008). Graphing is a monitoring technique for recording feedback to show patterns in performance for the comparison of results for individual student learning or for social comparison between students (Labuhn, Zimmerman, & Hasselhorn, 2010). Empirical studies suggested that monitoring performance through the technique of graphing offers a formative assessment intervention which provides a visually clear and consistent assessment of student progress, positively contributing to academic achievement in mathematics (Brookhart, Andolina, Zuza, & Furman, 2004) in writing (Koenig, Eckert, & Hier, 2016) and strongly supports student self-monitoring (Labuhn, Zimmerman, and Hasselhorn, 2010).

Providing feedback directly from teacher to student to successfully improve student learning is referenced in the literature on formative assessment and SRL (Baas et al., 2015; Decristan et al., 2015; Koenig, Eckert, & Hier, 2016; Mykkänen, Perry, & Järvelä, 2017); however, the literature emphasized the positive effect of self and peer assessment on self-regulation (Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016) and specifically on self-evaluative judgements (Labuhn, Zimmerman, & Hasselhorn, 2010). The literature revealed that social feedback is effective by positively contributing to SRL processes in physical education (Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013), in writing (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016) and in mathematics (Labuhn, Zimmerman, & Hasselhorn, 2010). Interestingly, in one
study, social comparative feedback proved to be more effective on student learning than self-evaluative feedback (Labuhn, Zimmerman, & Hasselhorn, 2010); however, this is not the generalized finding in this review.

Research suggested that young learners are optimistic in their abilities (Mykkänen, Perry, & Järvelä, 2017; Throndsen, 2011); therefore, it is important that self-regulated learners at the elementary level receive feedback to develop the skills which allow them to evaluate performances with realism and objectivity in order to successfully achieve learning outcomes. Study findings suggested that self-regulation can be successfully introduced in the early years of schooling, indicating that SRL is a skill that can be improved with training (Ferriera, Veiga Simão, & Lopes da Silva, 2015; Stoeger, Heidrun, & Ziegler, 2008) and practice (Brookhart, Andolina, Zuza, & Furman, 2004) with significant benefits to young students (Throndsen, 2011). Results reported that social feedback is an effective measure furthering achievement through teacher and peer input (Mykkänen, Perry, & Järvelä, 2017). Results emerged that indicated peer and self-assessment are equally effective as formative interventions which promote SRL skills (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016). For example, feedback through teacher and peer support, prompting, questioning, and discussion supports SRL (Mykkänen, Perry, & Järvelä, 2017).

Findings reported that teacher, peer, and self-questioning increased active student participation by raising student awareness, encouraging student reflection, and impacting the evaluation process (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016); therefore, these interventions are important for providing feedback in the SRL process. In a study in the science domain, the researchers found that teacher questioning which directs student learning is very effective for learning progression; while the resulting peer discussion encourages new ideas and
a deeper understanding of the task activity (Loughland & Kilpatrick, 2015). In the area of mathematics, findings revealed that teacher questioning is an effective technique to elicit active student participation and develop metacognition which is an important factor in SRL strategy use (Throndsen, 2011). Empirical research findings reported that self-questioning feedback developed metacognitive strategies in SRL during mathematics’ problem-solving skills, producing student success in a hierarchy of tasks including basic, complex, and transfer (Kramarski, Weisse, & Kololshi-Minsker, 2010).

Scaffolding. Findings generally reported that scaffolding, or providing learning in a step by step sequence, increases SRL to realize achievement as evidenced by one study in physical education (Kovavelonis, Goudas, Dermitzake, & Kitsantas, 2013); and is positively associated with students’ surface and deep level learning strategies and being able to evaluate the process which leads to successfully meeting learning outcomes (Baas et al., 2015). For example, teaching approaches which include scaffolding and formative guidance resulted in improved conceptual understanding for science in elementary school students (Decristan et al., 2015). Further results from the same study indicated that scaffolding with the addition of guidance particularly supports students with lower language proficiency (Decristan et al., 2015); an important finding when addressing student diversity at the elementary school level. In a study using student portfolios to elicit feedback towards academic growth, results revealed that the formative tool of scaffolding through adapting learning is an effective method to equip students with SRL skills which encourages student ownership in learning (Baas et al., 2015). In this study, student choice, reflective conversation, and transparency between teacher and student during the assessment process guided successful scaffolding; confirming the existence of a positive relationship between formative assessment and SRL’s metacognitive strategy use in the elementary school
classroom (Baas et al., 2015). Importantly, the study implies the placement of student as governor of learning and the teacher as facilitator which is typical of SRL in formative assessment practice.

**Student autonomy.** Overall, feedback, monitoring, scaffolding, and goal setting of student performance embedded in Zimmerman’s (2002) model of SRL encouraged student autonomy (Ferriera, Veiga Simão, & Lopes da Silva, 2015; Kovovelonis, Goudas, Dermitzake, & Kitsantas, 2013; Loughland & Kilpatrick, 2013; Yıldızlı & Saban, 2016) which is a hallmark of SRL. The examined studies in this review suggested that formative assessment promotes SRL at the elementary school level by providing opportunities for students to become active participants in learning tasks through feedback, monitoring, and a scaffolding of skills which not only allow for the adaptation of learning outcomes for mastery, but permits a gradual release of responsibility to occur so that student autonomy is realized. In a study of mathematics for sixth grade students, findings indicated that promoting SRL by means of formative assessment contributes to student ownership of learning (Yıldızlı & Saban, 2016); an example of the generalized finding in this literature review for student autonomy achieved through SRL.

**Surprising and contradictory findings.** Two areas of interest arise from the review of the literature involving formative assessment and SRL to answer the research question: Does formative assessment promote self-regulated learning at the elementary school level? These areas of interest are: (a) Surprising findings and (b) Contradictory findings.

**Surprising findings.** A surprising finding that emerged from a study in the physical education domain revealed that performance calibration accuracy is not affected by formative intervention; that is, SRL did not improve the accuracy between a student’s view of his or her performance and the real performance of the task; i.e., basketball dribbling; but SRL did improve
performance. (Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013). These results were similar to a study which reported that externally established self-evaluative standards have no effect on calibration accuracy and surprisingly, these study findings further indicated that externally established self-evaluative standards have no effect on performance in mathematics for grade five students (Labuhn, Zimmerman, & Hasselhorn, 2010). In reference to the study on basketball dribbling, it was surprising to learn that both performance and process goals led to improvement in dribbling performance (Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013) as the literature generally indicated that process goals and mastery learning are more effective for promoting SRL. It is noteworthy that the promotion of SRL by means of formative assessment is not limited to academic areas of learning as findings supported this premise in the area of physical education, a non-academic domain of learning (Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013). The literature examined for this review indicated that written expression significantly improves when feedback conditions exist; however, unexpectedly, the addition of goal setting did not benefit student writing performance more than feedback on its own (Koenig, Eckert, & Hier, 2016). Noticeably, there was scant reference to gender difference in the investigated empirical studies for the promotion of SRL through formative assessment. The one study which included findings on gender distinction, suggested differences exist for SRL; that is, girls outperform boys on surface strategies, deep learning strategies, and on product and process evaluation (Baas et al., 2015, p. 41). The investigated literature reflected a general agreement that results for SRL are domain specific and that findings should not be generalized to other areas of learning. This is interesting because all of the examined studies in this review which cover a variety of domains including mathematics, science, writing, English as a Foreign
Language, and physical education supported the promotion of SRL through formative assessment.

**Contradictory findings.** In general, the literature suggested the formative strategy of SRL takes time to develop. Generally, older students have greater cognitive and metacognitive strategies than their younger classmates due to cumulative practice and learning; however, a contradictory finding was uncovered which describes grade four students reporting more process evaluation than grade six students (Baas et al., 2015). Despite one study’s findings that suggested the addition of goals did not increase student performance (Koenig, Eckert, & Hier, 2016); the difficulty of the task challenge does impact student learning (Mykkänen, Perry, & Järvelä, 2017) so ideally, learning targets should be student chosen to encourage success and support student autonomy. With respect to goal setting, students should be given control to choose goals that are challenging, yet achievable (Mykkänen, Perry, & Järvelä, 2017; Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013).

**Discussion.** In summary, this review examines empirical literature which answers the question: Does formative assessment promote self-regulated learning at the elementary level of schooling? The results presented in this review indicated that formative assessment promotes SRL and its trademark element of metacognition through feedback, monitoring, scaffolding, and student autonomy which are all reflective of a formative classroom environment. In this section on formative assessment and SRL, empirical support exists for the four sub-themes of feedback, monitoring, scaffolding, and student autonomy. Most studies used Zimmerman’s (2002) SRL model to suggest that the formative strategies of feedback, monitoring, scaffolding, and a gradual release of responsibility to the student effectively promotes SRL at the elementary school level. With the exception of one study conducted in a quiet room (Labhun, Zimmerman, & Hasselhorn,
2010) and one study conducted in a gymnasium (Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013), the research studies can generalize appropriately as all were conducted in a classroom environment; an authentic setting that is reflective of formative assessment practice and one that reflects ecological validity.

*Extending the research.* While it is empowering to uncover the many benefits of student self-regulation in daily classroom learning, it may be useful to extend the research to investigate the effects of using formative assessment to communicate student learning for formal reporting, i.e. report cards at the elementary level of schooling. Secondly, the literature suggested that longitudinal studies are needed in the area of SRL for younger students (Ferriera, Veiga Simão, & Lopes da Silva, 2015; Kramarski, Weisse, & Kololshi-Minsker, 2009; Thronsen, 2011); therefore, it may be prudent to extend the research on formative assessment and SRL to determine the effects on student learning over time. It was stated that research on SRL strategy use using younger children as a sample population is limited (Thronsen, 2011) and that empirical studies for this age group are few (Baas et al., 2015); therefore, more research on formative assessment and SRL is needed using elementary school students. The majority of the studies identified parental consent as needed for student participation which indicates that conducting research with children at the elementary level of schooling may present unique considerations; for example, gaining permission for student involvement. It may be interesting and useful to have researchers investigate if gaining parent permission presents an additional bias for student characteristics.

In conclusion, the literature findings presented in this review are pertinent and useful. These empirical results can exert a significant impact when choosing an informed assessment approach for students at the elementary level of schooling. In the following section, the
relationship between formative assessment and intrinsic motivation is investigated using empirical evidence as support for answering the second research question: What is the relationship between formative assessment and intrinsic motivation at the elementary level of schooling?

Formative Assessment and Intrinsic Motivation

Introduction. The second of the three research questions, which guide this review is: What is the relationship between formative assessment and intrinsic motivation at the elementary level of schooling? In this section of the review, the objective is to investigate the relationship between formative assessment and intrinsic motivation at the elementary level using empirical evidence. The examined literature revealed a close, positive, and interconnected relationship between formative assessment practice and intrinsic motivation (Butler, 1987; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Faber, Luyten, & Visscher, 2016; Järvelä, Järvenoja, & Malmberg, 2012; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016; Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009; Yıldızlı & Saban, 2016). This overall finding is relevant because the research studies presented in this review indicated that formative assessment and intrinsic motivation work together to benefit student learning at the elementary level.

There was overall agreement the literature which indicated that self-regulated learning strategy and intrinsic motivation in elementary students are closely linked (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Faber, Luyten, & Visscher, 2017; Järvelä, Järvenoja, & Malmberg, 2012; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016; Yıldızlı & Saban, 2016); task oriented or mastery goals promote intrinsic motivation (Butler, 1987; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009); and differences exist for the student characteristics of high and low
achievers at the elementary level (Butler, 1987; Faber, Luyten, & Visscher, 2017). Based on the empirical evidence, this review explores three sub-themes associated with the literature surrounding formative assessment and intrinsic motivation. These three sub-themes are: SRL and intrinsic motivation (Chatzistamatiou, DeRmitzaki, Efklides, & Leondari, 2015; Faber, Luyten, & Visscher, 2017; Järvelä, Järvenoja, & Malmberg, 2012; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016; Yıldızlı & Saban, 2016); motivational goal orientations (Butler, 1987; Chatzistamatiou, DeRmitzaki, Efklides, & Leondari, 2015; Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009); and the student characteristics of high and low achievers (Butler, 1987; Faber, Luyten, and Visscher, 2016).

In this section of the review which focuses on the relationship between formative assessment and intrinsic motivation, all of the empirical studies that were examined demonstrated ecological validity; and interestingly, over half of these studies used mathematics as the academic learning context. The rationale that was offered for choosing mathematics as a popular context is the mathematics’ domain is a core subject area in the elementary educational curriculum (Chatzistamatiou, DeRmitzaki, Efklides, & Leondari, 2015). Often there are motivational influences at work, i.e., anxiety and stress associated with this subject area even for young learners (Kramarksi, Weisse, & Kololshi-Minsker, 2010); therefore, mathematics provides a valuable domain and elementary students, due to their young ages, provide a relevant age group to study the relationship of formative assessment and intrinsic motivation. Findings suggested that even as early as grades five and six, students demonstrate the existence of a connection between formative strategy use and the influence of motivation (Chatzistamatiou, DeRmitzaki, Efklides, & Leondari, 2015); therefore, there is empirical evidence which supports
elementary students being a useful sample population to provide valuable information when examining the relationship between formative assessment and intrinsic motivation.

**Self-regulated learning and student motivation.** Numerous studies that were reviewed suggested that student SRL through means of formative assessment is closely and positively linked to intrinsic motivation for elementary students (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Faber, Luyten, & Visscher, 2017; Järvelä, Järvenoja, & Malmberg, 2012; Yıldızlı & Saban, 2016). Empirical evidence suggested the framework of formative assessment provides a supportive learning environment with positive and immediate feedback; and when combined with adapted learning tasks, it has a positive effect on student motivation (Faber, Luyten, & Visscher, 2017).

Only some of the literature offered explicit definitions for the concept of intrinsic motivation. For those studies that defined the concept, one study described intrinsic motivation as students having personal interest and seeking to become competent learners (Meusen-Beekman, Joosten-ten-Brinke, & Boshuizen, 2016, p. 129). Another study stated intrinsic motivation is “students’ emotions, willingness to learn, and a desire to attain self-efficacy,” (Kramarski, Weisse, & Kololshi-Minsker, 2010, p. 180), while other studies expressed broader definitions; that is, perseverance is an important factor in motivational beliefs (Seo & Taherbhai, 2009); student motivation is associated with student interest, the value attached to a given learning domain, and the enjoyment students gain from engaging in the task activity or subject area (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015, p. 835; Yıldızlı & Saban, 2016).

Motivational beliefs were found to be a significant aspect of the formative assessment strategy of SRL in the area of mathematics (Yıldızlı & Saban, 2016, p. 1). In this same study, researchers used Zimmerman’s (2002) model of SRL to illustrate that task oriented or mastery
learning produced less student anxiety and fear while empirical evidence indicated an increase in perseverance against challenges; supporting the notion of a close relationship between formative assessment and intrinsic motivation (Yıldızlı & Saban, 2016). Parallel findings emerged which support the close link between student motivation and active SRL from a study that used computer software in science; furthermore, the authors suggested that student motivation is integral to learning success (Järvelä, Järvenoja, & Malmberg, 2012). In a study that used a digital formative assessment tool (DFAT) called Snappet on a large population sample of 1808 grade three students, it was revealed that in the mathematics’ domain, formative practice which has students receiving feedback and engaging in adaptive assignments, exercises a positive and significant effect on student motivation and achievement; specifically, this study revealed that students who complete more online assignments demonstrate greater motivation (Faber, Luyten, & Visscher, 2017), indicating a close and interconnected relationship between formative practice and student motivation.

A surprising finding emerged in the reviewed literature that suggested increasing external or extrinsic motivational factors does not cause an adverse effect on student SRL in the area of writing (Meusen-Beekman, Joosten-tent Brinke, & Boshuizen, 2016, p. 134); implying that formative assessment is a powerful intervention technique for elementary students, even when extrinsic motivators are present. With respect to student attitude, a factor in intrinsic motivation, a noteworthy finding was uncovered; that is, it was found that the greater the experience students have with SRL strategy, the greater their attitudes grow in positivity (Meusen-Beekman, Joosten-ten, Brinke, & Boshuizen, 2016, p. 132). Both in traditional learning activities, i.e., learning logs, homework diaries (Yıldızlı & Saban 2016), written assignments (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016) and when using technological learning tools (Faber, Luyten, &
Visscher, 2017; Järvelä, Järvenoja, & Malmberg, 2012), empirical evidence showed that there exists a close, positive, and interconnected relationship between the formative assessment strategy of SRL and intrinsic motivation in student learning at the elementary school level.

**The motivational influence of goal orientations.** The literature reviewed to answer the research question: What is the relationship between formative assessment and intrinsic motivation, exposed the motivational influence of goal orientations for student learning (Butler, 1987; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009). In general, the empirical studies used for this sub-section on goal orientations refer to performance approach and performance avoidance behaviours or goals (Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009); task involved and ego involved motivational orientations (Butler, 1987); learning, mastery, and performance goals (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Seo & Taherbhai, 2009) when revealing evidence which describes the relationship between formative practice and intrinsic motivation for elementary students.

All of the reviewed studies used to investigate the relationship between formative assessment and intrinsic motivation within the sub-section of goal orientation found that mastery goals which are task involving and reflective of formative assessment, promote student enjoyment and interest in learning; two factors which are important to intrinsic motivation and are conducive to student learning (Butler, 1987; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009).

In an iconic study that was repeatedly referenced in the literature regarding the relationship between formative assessment and intrinsic motivation, findings emerged that are particularly noteworthy for educational assessment practice (Butler, 1987). Empirical evidence
suggested that different types of feedback produce different kinds of motivational orientations (Butler, 1987, p. 480). Specifically, formative comments alone succeed in producing greater intrinsic motivation in students as compared to students who receive letter grades and even grades with comments (Butler, 1987). This is significant as these study results suggested that the formative assessment practice of providing descriptive comments achieves the most success with promoting intrinsic motivation and divergent thinking (Butler, 1987). These seminal findings indicated that grades and praise together are found to have more effect than no feedback, suggesting that feedback is important for student motivation and learning; but the formative approach is better (Butler, 1987).

While Butler’s (1987) historic study was conducted with elementary school students, a more recent similar study used a college student population (Pulfrey, Buchs, & Butera, 2011). Of significance are the parallel results which emerged regarding goal orientation and the source of feedback on intrinsic motivation. The results indicated that the formative approach of providing comments opposed to the summative practice of assigning letter grades show higher student interest (Butler, 1987) and reduced performance avoidance behaviours (Pulfrey, Buchs, & Butera, 2011). Additionally, findings in the older student population, indicated that performance avoidance behaviour and less autonomous motivation is observed when normative grading opposed to formative assessment conditions exist (Pulfrey, Buchs, & Butera, 2011).

Learning goal orientation which is a staple in formative assessment is task involving and results show that it should be used to encourage elementary student interest, intrinsic motivation and learning (Butler, 1987; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Seo & Taherbhai, 2009); furthermore, empirical evidence exists for mastery goal orientation to positively affect student enjoyment for learning (Chatzistamatiou, Dermitzaki, Efklides, &
Leondari, 2015). The reviewed literature uncovered that task goals are positively associated with persistence in learning and performance avoidance goals do not support learning in the mathematics’ domain; furthermore, empirical results showed that motivated students demonstrate greater interest in their learning by exerting more effort, persisting through challenges, and using effective strategies to make learning progress and achievement showing that learning is impacted by goal orientation (Seo & Taherbhai, 2009). Interestingly, findings from this same study suggested that performance approach goals and task goals both contribute to student persistence and results reveal that both motivational goal orientations activate student learning (Seo & Taherbhai, 2009) which is an isolated finding in this review. Another study revealed a slightly similar finding in that performance goals in math had a direct influence on student formative strategy use, but in this study, mastery goals still proved more effective overall (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015). Overall, these findings are unique with regard to the effect of performance goals on student learning; for example, they did not mirror other findings which suggested the strong and positive motivational influence of task involved orientation on intrinsic motivation (Butler, 1987). It was suggested that the cultural aspect of a Korean classroom and cultural differences between student populations may explain this anomalous result that was uncovered in this review of the literature on formative assessment and student motivation (Seo & Taherbhai, 2009).

A cultural perspective: one study’s results. The majority of the studies examined in this review which investigated the relationship of intrinsic motivation and formative assessment used student populations from countries considered more culturally western than eastern rooted including Israel (Butler, 1987; Kramarski, Weisse, & Koloshi-Minsker, 2010); Greece (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015); the Dutch province of Overijssel
(Faber, Luyten, & Visscher, 2017); Finland (Järvelä, Järvenoja, & Malmberg, 2012); the Netherlands (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016); Switzerland (Pulfrey, Buchs, & Butera, 2011); and Turkey (Yıldızlı & Saban, 2016). When examining empirical evidence, this review is cognizant of the cultural differences that may exist to understand surprising or contradictory results. One Korean study which investigated goal orientation in mathematics found that task and performance oriented goals affect student motivation in a number of ways (Seo & Taherbhai, 2009). These include: task oriented goals encourage performance approach behaviour; task values were not associated with performance avoidance behaviour, task oriented goals are positively connected to perseverance and student interest; and performance avoidance goals have no connection to persistence in learning; (Seo and Taherbhai, 2009, p. 197); therefore, motivational goal orientation is important in the elementary classroom because the literature indicates that cross-culturally, task oriented goals and performance approach behaviours positively contribute to student persistence and achievement. Of particular note in this study was the finding that suggests both task and performance goals contribute to task values and positive self-efficacy, a finding not evident in the other studies in this review which focussed on motivational goal orientations (Butler, 1987; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Pulfrey, Buchs, & Butera, 2011).

This review of the literature on motivational goal orientations has suggested that over time and across age groups, the relationship between formative assessment and intrinsic motivation is strong, closely linked, and should be an important consideration when choosing an informed assessment method. Importantly, at the elementary level, formative assessment practice positively influences intrinsic motivation (Butler, 1987).
**Student characteristics: high and low achievers.** With respect to formative assessment practice and its relationship with intrinsic motivation, two of the examined studies reported differences in the student characteristics of high and low achievers (Butler, 1987; Kramarski, Weisse, & Kololshi-Minsker, 2010). Interestingly, there did not appear to be a common thread linking both findings on high and low achievers. One study’s findings favoured high achievers in respect of formative assessment intervention benefitting student motivation by increasing positive thinking and lessening negative thoughts (Kramarski, Weisse, & Kololshi-Minsker, 2010); that is, both high and low achievers motivationally benefitted from formative practice, but high achievers benefitted more. In the other study, findings revealed that the motivational perceptions of both high and low achievers were comparable with one exception; that is, in the absence of feedback, high achieving students credited their views of achievement to ego-involved factors; while low achieving students considered task involved activities having influenced their successes (Butler, 1987).

**Discussion.** Based on the empirical findings in this section of the literature review which answers the question, What is the relationship between formative assessment and intrinsic motivation; it is strongly suggested that there exists a close, positive, and interconnected link between formative practice and student motivation. In this review, evidence exists which supports the increase of intrinsic motivation when self-regulation is initiated and students are actively engaged in learning (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016). All the reviewed studies which focussed on formative assessment and intrinsic motivation imply an overall agreement that student interest, enjoyment, perseverance, and value of tasks are important factors for effecting intrinsic motivation in student learning and achievement; and that
formative assessment intervention (i.e. task goals and anecdotal feedback) can positively affect student motivation.

It is interesting to note that some differences exist between high and low achievers in respect to formative assessment and intrinsic motivation; as in the first section of this literature review, this aspect of student characteristics did not emerge as significant when answering the question: Does formative assessment promote self-regulated learning at the elementary level of schooling?

Overall, findings supported SRL positively impacting intrinsic motivation and achievement in elementary school students; however, study limitations including the short length of a study and using only one grade of older students, highlight the need for longitudinal research to determine whether formative assessment is effective over time with younger students (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016); and across subject domains (Seo & Taherbhai, 2009). The need for more longitudinal studies parallels the findings in the first section of this review on formative assessment and SRL; that is, future studies are needed which take root in the primary years of elementary schooling and continue to post-secondary. In this case, future research is needed to provide a clear indication of the endurance and validity of the relationship between intrinsic motivation and formative assessment. Another limitation that emerged in the reviewed literature for formative assessment and intrinsic motivation is that the collected data is all or mostly based on student self-reporting which may affect objectivity (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016); therefore, in future studies, researchers should take effort to employ a variety of appropriate tools for measuring the relationship between formative assessment and intrinsic motivation.
Of particular interest in this section of the review which investigates the relationship of formative assessment and intrinsic motivation at the elementary level is the cross-cultural evidence which included the finding that both performance and task goals promote student interest, task values, and learning (Seo & Taherbhai, 2009). More studies are needed that compare results across culturally different elementary student populations to further explore the relationship between formative practice and student motivation (Seo & Taherbhari, 2009) to establish evidence of a pattern across world cultures for better understanding the relationship between formative assessment and student motivation.

It is interesting to reflect on the studies which used technology to investigate the relationship of formative intervention and student motivation (Faber, Luyten, & Visscher, 2017; Järvelä, Järvenoja, & Malmberg, 2012). As technology becomes commonplace in the elementary level educational system in twenty-first century education, researchers may be increasingly expected to conduct research using computer programs to measure the relationship between formative strategies and motivational orientations for young learners. A potential challenge surrounding technology is when it doesn’t work, i.e., programs freeze or crash which may affect study results through program error or teacher and student frustration coping with inoperative technological assessment tools. Future research may need to find ways to minimize these types of variables so that study results maintain validity.

In one study that used both teacher and student input, researchers speculated that if SRL was increased, student motivation would also increase (Faber, Luyten, & Visscher, 2017); therefore, future research could use degrees of SRL to determine whether or not incremental effects exist for intrinsic motivation in elementary student populations. Furthermore, this could
be conducted cross-culturally to uncover a universal finding for the relationship between formative assessment and intrinsic motivation at the elementary level of schooling.

In conclusion, the literature reviewed in this section, which examined the relationship of formative assessment and intrinsic motivation, illustrated that this connection is close, positive, and interconnected. An important finding that emerged from investigating the connection between formative practice and student motivation suggested that the notion of self-efficacy or the belief in one’s competence (Bandura, 1994), has a significant role in student motivation and the formative strategy of SRL (Throndsen, 2011; Yıldızlı & Saban, 2016); a role that is examined when answering the final research question, Does formative assessment promote self-efficacy at the elementary level of schooling?

**Formative Assessment and Self-efficacy**

**Introduction.** The final research question which guides this review is: Does formative assessment promote self-efficacy at the elementary level of schooling? In the third section of the review, the aim is to discover if formative assessment practice promotes self-efficacy for elementary students. The reviewed literature uncovered evidence which supports formative assessment promoting self-efficacy at the elementary level (Chan & Lam, 2010; Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016; Miller & Lavin, 2007; Seo & Taherhbai, 2009; Usher & Pajares, 2009; Yıldızlı & Saban, 2016) and interestingly, also in older students (van Dinther, Dochy, Segers, & Braeken, 2014).

The majority of the examined studies referenced Bandura’s (1994) notion of self-efficacy to guide the research (Chan & Lam, 2010; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016; Miller & Lavin, 2007; Pulfrey, Buchs, & Butera, 2011; Usher & Pajares, 2008; Yıldızlı &
generally defining self-efficacy as an individual’s self-perception of competence to perform a task (Bandura, 1994). In the reviewed literature, self-efficacy is specifically described as being “subjective” (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016, p. 127); “task-specific” (Pulfrey, Buchs, & Butera, 2011, p. 693) and “domain specific” (Throndsen, 2011, p. 570); influential (Chan & Lam, 2010, p. 38; Seo & Taherbhai, 2009, p. 198); and “predictive” (Lee & Jonson-Reid, 2016, p. 86).

This section of the review examines eleven empirical studies to investigate the promotion of self-efficacy by means of formative assessment using three sub-themes that emerged from the literature. These are: predicative quality (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Lee & Jonson-Reid, 2016; Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016; Pulfrey, Buchs, & Butera, 2011; Seo & Taherbhai, 2009; Usher & Pajares, 2008; van Dinther, Dochy, Segers, & Braeken, 2014; Yıldızlı & Saban, 2016), social persuasion (Chan & Lam, 2010; van Dinther, Dochy, Segers, & Braeken, 2014), and the triadic relationship between formative assessment, intrinsic motivation, and self-efficacy (Throndsen, 2011; Yıldızlı & Saban, 2016).

**The predictive quality of self-efficacy.** The majority of the reviewed literature for this section suggests that student self-efficacy exercises a predictive effect on learning success for elementary students (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Lee & Jonson-Reid, 2016; Seo & Taherbhai, 2009; Throndsen, 2011; Usher & Pajares, 2008; Yıldızlı & Saban, 2016); interestingly, a similar finding was found for older students (van Dinther, Dochy, Segers, & Braeken, 2014). Many studies revealed the predictive quality of student self-efficacy on student achievement in a variety of academic domains including reading (Lee & Jonson-Reid, 2016), mathematics (Throndsen, 2011), writing, science and in general academics (Usher &
Pajares, 2008). The predicative quality of student self-efficacy is not only observed across subject areas in elementary student populations (Lee & Jonson-Reid, 2016; Seo & Taherbhai, 2009; Throndsen, 2011; Usher & Pajares, 2008; Yidzli & Saban, 2016), but exists in older student populations for competence-based evaluation (van Dinther, Dochy, Segers, & Braeken, 2014).

At the elementary level, the results of a mathematics study found that younger learners believe that they can perform better than their abilities dictate; but as they mature and by year three, students demonstrate a link between self-efficacy and performance in mathematics’ problem solving (Throndsen, 2011). Interestingly, in this same study, empirical results revealed that in year three, capable students believe success or failure is more related to effort; while less capable students indicate failure is related to ability; a finding not evidenced for students in the previous year of schooling (Throndsen, 2011); therefore, the predicative quality of self-efficacy is seen in elementary students as early as primary grades.

A cross-cultural study conducted at the elementary level, revealed that student self-efficacy has direct effects on learning, including the value of the activity, motivational goal orientations, thinking, and performance (Seo & Taherbhai, 2009, p. 198). Furthermore, the researchers who conducted this Korean study found that when students consider themselves less able, they will not actively participate; the result being that lower levels of achievement are visibly demonstrated (Seo & Taherbhai, 2009, p. 201).

From one study, two surprising findings emerged on formative assessment and self-efficacy. Study results indicated that a formative assessment strategy using peer and self-assessment did not appear to promote self-efficacy in the area of writing; however, upon further analysis, the researchers discovered a very slight effect of formative assessment on student self-
efficacy, but in general, results suggested it was not significant (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016).

The second surprising finding from this study revealed that SRL predicted student self-efficacy more than intrinsic motivation (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016). This is interesting as these results indicated that the formative assessment strategy of SRL is predictive of self-efficacy; while most study findings implied that self-efficacy has a predictive quality on formative strategy use (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Lee & Jonson-Reid, 2016; Seo & Taherbhai, 2009; Throndsen, 2011; Usher & Pajares, 2008; Yıldızlı & Saban, 2016). Based on the findings reviewed in this section, clearly formative assessment and self-efficacy share a close connection.

**Social persuasion.** In the literature on formative assessment and self-efficacy, social persuasion is a term referencing evaluative feedback from others, including teachers and peers (Chan & Lam, 2010). In this review, social persuasions are found to be useful for enhancing student self-efficacy in both elementary students (Chan & Lam, 2010) and in older learners (van Dinther, Dochy, Segers, & Braeken, 2014) implying that self-efficacy has an enduring quality that is powerfully predictive with the ability to span student age groups.

In a cross-cultural study using self-evaluative and teacher assessed feedback in the area of vocabulary building for a Chinese student population, it was found that formative assessment of self-referenced feedback promoted student self-efficacy (Chan & Lam, 2010). The rationale that was offered by the researchers for this statistically significant result is that when students feel they have control over their learning, self-efficacy is higher than when control to evaluate performance is ceded to others. Findings suggested that formative assessment’s learning or mastery goals promote student self-efficacy due to students having autonomy over performance
assessment opposed to peer comparison (Chan & Lam, 2010); therefore, the formative assessment aspects of self-assessment and student autonomy promote self-efficacy at the elementary level.

A study which used a student-teacher sample population revealed that formative assessment through mastery learning promotes self-efficacy for older learners (van Dinther, Dochy, Segers, & Braeken, 2014). This is an important finding as it indicates that an individual’s belief in competence exists in children and in adults; therefore, strengthening the premise that formative assessment is beneficial to student learning at any level and further supporting the idea that formative practice can be universally appropriate for all age groups (Crooks, 1988).

**A triadic relationship.** This sub-section of the literature review which explores the empirical findings supporting the role of self-efficacy within the relationship of formative assessment and intrinsic motivation focusses on the results of four studies. The literature reviewed for this paper suggests that formative assessment, intrinsic motivation, and self-efficacy are three aspects of student learning which closely relate to one another when active task-based student engagement takes place (Chan & Lam, 2010; Throndsen, 2011; Yıldızlı & Saban, 2016). This triadic relationship is important because empirical evidence implied that elementary level student performance is affected by formative assessment, student motivation and self-efficacy working together (Thronsen, 2011; Yıldızlı & Saban, 2016).

In both Western and Eastern cultural perspectives, and for both elementary and older students, the empirical evidence of two studies indicated that formative assessment, intrinsic motivation, and student self-efficacy influences student learning (Chan & Lam, 2010; Pulfrey, Buchs, & Butera, 2011). Results indicated less student control attributed to teacher assessment produced lower self-efficacy and favoured performance goal orientation (Chan & Lam, 2010). A
key finding emerged linking student effort towards achieving a learning goal, which study results showed to have a positive effect on self-efficacy (Chan & Lam, 2010); that is, student self-efficacy is promoted by formative practice.

Findings from the second study further support the promotion of task specific self-efficacy by demonstrating that formative opposed to summative assessment practice is preferable (Pulfrey, Buchs, & Butera, 2011). Self-efficacy and intrinsic motivation both predict and influence goal orientation; indicating that formative comments opposed to grading result in fewer performance avoidance behaviours (Pulfrey, Buchs, & Butera, 2011); hence, it has been suggested that the triadic relationship between formative practice, intrinsic motivation, and self-efficacy can positively influence students in their learning progress and achievement of learning outcomes (Throndsen, 2011). This is an important finding when choosing an informed and responsible assessment approach for elementary students, for both daily classroom evaluation and for formal reporting.

**Discussion.** Much is revealed from the reviewed literature which answers the third research question, Does formative assessment promote self-efficacy at the elementary level of schooling? Overall, cross-cultural evidence exists that supports formative assessment promoting self-efficacy in elementary student populations. Additionally, it is suggested that student self-efficacy is predictive (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015; Lee & Jonson-Reid, 2016; Seo & Taherbhai, 2009; Throndsen, 2011; Usher & Pajares, 2008; van Dinther, Dochy, Segers, & Braeken, 2014; Yıldızlı & Saban, 2016), is influenced by social persuasion (Chan & Lam, 2010; van Dinther, Dochy, Segers, & Braeken, 2014), and shares an intra-connected relationship with formative assessment and intrinsic motivation (Throndsen, 2011; Yıldızlı & Saban, 2016). The majority of studies found a promotional link between formative
assessment and student self-efficacy with the exception of one study which generally found no connection (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016) but this exception is a unique finding. The success of student learning needs to be a priority regardless of age, as reviewed studies have indicated that the importance of student self-efficacy for learning exists in both younger and older student populations.

Most of the studies which used elementary student populations referenced the lack of studies in the area examining the self-efficacy beliefs of young learners as rationale for conducting the research. This claim reflected my difficulty with finding empirical evidence which answered not only the research question for this section of the literature review, but the challenge with findings which used elementary level student populations to answer all three of the questions presented in this review.

The review of the literature on formative assessment and student self-efficacy raised some ideas for future research studies. It was suggested that there should be more longitudinal studies which investigate the long-term effects of formative assessment practice encouraging self-efficacy at the elementary level (Chatzistamatiou, Dermitzaki, Efklides, & Leondari, 2015, Throndsen, 2011) and with larger populations (Throndsen, 2011).

Generally, there is a visible lack of cross-cultural studies in this review. Considering the cross-cultural results were somewhat contradictory in regard to performance goal orientation, it would be useful to have more studies on formative assessment and self-efficacy which investigate the similarities and differences amongst young learners from a variety of cultures.

Findings suggested that elementary students demonstrate greater self-efficacy in SRL than students in grades eight to twelve; with the researchers further speculating that middle and senior high school students do not receive as much support in formative assessment measures
(Usher and Pajares, 2008) which prompts the question: If formative assessment is increased for older students, would self-efficacy be better promoted; thus increasing student progress and achievement in upper grade levels? Future studies are needed to explore formative assessment and student self-perception across all grade levels to more fully understand the relationship and its implications for student learning.

**Summary of Findings for the Three Research Questions**

This literature review empirically answered three research questions: (a) Does formative assessment promote SRL at the elementary level of schooling? (b) What is the relationship between formative assessment and intrinsic motivation? (c) Does formative assessment promote self-efficacy at the elementary level of schooling? Based on the evidence of twenty-five studies which used qualitative, quantitative, and mixed methods approaches; overall, it was found that formative assessment does promote SRL; formative assessment does enjoy a close and connected relationship with intrinsic motivation; and formative assessment does promote self-efficacy at the elementary level of schooling. Overwhelmingly, formative assessment provides an informed approach for the evaluation of elementary student progress and achievement. The majority of the studies were conducted in elementary school classrooms, illustrating an overall ecological validity for study results. The majority of study findings strongly indicated that the formative assessment strategy of SRL, intrinsic motivation, and self-efficacy are important factors for active student engagement at the elementary level. This literature review suggests that formative assessment is a viable and responsible choice for elementary student evaluation for its overall ability to engage, motivate, and empower student learning. Future studies which emphasize parent input may be a prudent measure in studying formative assessment at the elementary level. To study the views of parents on assessment methods as well as students and teachers, may be
useful when addressing formative assessment practice verses summative or grading practice at the elementary level. For informed decision making to take place on assessment policy, it is important that current and empirically based research contributes to the conversation on educational assessment and if warranted, stimulates reform in the area of elementary student assessment.

The following section of this paper explores the implications of formative assessment through a personal reflection of professional practice to demonstrate the educational value of this approach for elementary students.
Chapter Three: Implications of Formative Assessment in Elementary School

Introduction

The use of formative assessment in elementary school is supported by empirical literature and has been the mainstay of my student assessment practice as an elementary school teacher for the majority of my career. In my role as an educator for grades two through five, I have personally witnessed the benefits of formative assessment for promoting self-regulated learning (SRL), intrinsic motivation, and self-efficacy. My professional experience with using formative assessment is supported by the findings for the three research questions answered in the literature review and included in this paper; i.e., (a) Does formative assessment promote self-regulated learning at the elementary level of schooling? (b) Is there a relationship between formative assessment and intrinsic motivation at the elementary level of schooling? (c) Does formative assessment promote self-efficacy at the elementary level of schooling?

In the following section, two sub-sections are presented: (a) Summary of findings from the literature review; and (b) links to implications for classroom assessment; communicating and reporting through three-way conferencing; and formal reporting. Together, these sub-sections demonstrate personal and professional relevance and directly connect to the BC educational curriculum for assessing and reporting student growth and mastery of learning outcomes (BC MOE, 2017). The implications of formative assessment are educationally valuable for students at the elementary level of schooling.

The suggestions provided within the following sub-sections of classroom assessment and three-way conferencing serve as data points for communicating elementary student progress and achievement; and should be used in place of letter grades for formal reporting. Based on my
personal experience, summative assessment, which has been traditionally used for formal reporting (Brookhart et al. 2016) is disconnected from the formative assessment practice that is supported and ongoing in elementary classrooms in BC. My experience as an educator in the BC public school system coupled with the overall findings of the literature review supports formative assessment as a viable replacement for letter grades on elementary student report cards. Formative assessment practice provides an authentic, accountable, and empowering method for student learning and should be universally implemented for sharing information on student development and performance.

The rationale for presenting my project in written form is based on the understanding that when presenting information to the BC Ministry of Education (MOE) written documentation is preferable to other formats. It is my intention to use the implications of formative assessment provided in this document to contribute to the conversation on policy reform for elementary student assessment practice; therefore, in sub-section (b), I provide suggestions for implementing the formative assessment approach at the elementary school level under the sub-heading links to implications: classroom assessment; the communication triangle: three-way conferencing; and formal reporting.

Summary of Findings

The findings from the literature review revealed that formative assessment is an informed and viable approach for evaluating elementary student progress and achievement based on the three research questions that were investigated: (a) Does formative assessment promote self-regulated learning at the elementary level of schooling? (b) Is there a relationship between formative assessment and intrinsic motivation at the elementary level of schooling? (c) Does formative assessment promote self-efficacy at the elementary level of schooling? Specifically,
empirical evidence supported formative assessment practice while promoting the areas of SRL, intrinsic motivation, and self-efficacy for elementary students; that is, empirical evidence exists supporting formative assessment as a favourable choice for positively impacting student learning. Based on the strong implication of this overall finding, I suggest that formative assessment replace summative assessment at the elementary school level.

**Formative Assessment for Formal Reporting**

Formative assessment has the ability to evaluate student learning effectively as well as promote SRL, intrinsic motivation, and student self-efficacy. For these reasons and the strong support that is presented in the following sub-sections of classroom assessment; the communication triangle: three-way conferencing; and formal reporting, I offer a robust argument for replacing summative assessment with formative assessment on elementary student report cards. My intention is to persuade the educational community as a whole that formative assessment can be easily and successfully expanded from the classroom to formal reporting.

For most of my career, I used a variety of formative assessment tools in the classroom to evaluate student learning; however, I was required by my school district to use the summative assessment measure of providing letter grades on intermediate level report cards; doing so for thousands of students. To compensate for my participation in a practice that I consider fraudulent, subjective, and invalid; that is, using letter grades to assess elementary student progress and achievement for the academic subject areas of Language Arts, Mathematics, Social Studies, and Science, I made a personal commitment to provide additional extensive anecdotal comments; a formative technique more aligned with my classroom practice. It was my belief that comments specific to each subject area would provide a comprehensive explanation of the assigned letter grade to further inspire learning. Two studies in my literature review revealed that
grades and comments together are not as effective as comment feedback alone; furthermore, grades and grades with comments negatively affect intrinsic motivation and student self-efficacy (Butler, 1987; Pulfrey, Buchs, & Butera, 2011). This finding was very unsettling for me as over my career, I have carefully crafted lengthy anecdotal commentary unique and personal to each child, only to discover that literature does not support grades and comments together as being an effective assessment method. The realization that the addition of comments cannot mitigate the damage of letter grades further impassions my quest for assessment reform at the elementary level of schooling.

Formative assessment is a powerful and effective approach which has the ability through its structure to replace summative assessment at the elementary level of schooling. A challenge to its universal implementation continues to be that summative assessment is an understood and accepted practice for many educational stakeholders. Summative assessment in the form of grading has been used to formally communicate student performance on report cards for over a century (Brookhart et al., 2016). Totalling test scores, averaging performance standards, and calculating percentages to produce letter grades for upper elementary students is commonplace in many school districts. The notion of replacing summative practice with formative assessment constitutes a significant shift in thinking about assessment. I argue that through the inherent framework of formative assessment, i.e., formative tools; this method of assessment can and should replace the summative practice of assigning letter grades on elementary student report cards.

Student portfolios; reflection journals; goal setting; class, peer and self-made rubrics; graphing; and work samples are all examples of formative assessment tools which provide feedback and monitoring for promoting continuous student learning and assessment. Based on
personal practice and the overall findings in the literature review, these tools have proven successful for assessing student progress and performance; therefore, my overall suggestion is that the use of these techniques should be expanded in conjunction with three-way conferencing to replace letter grades on elementary student report cards.

In the following section under the sub-headings: classroom assessment; the communication triangle: three-way conferencing; and formal reporting; suggestions are presented which demonstrate viable ways to replace summative assessment with formative assessment for the formal reporting of elementary students.

**Classroom Assessment**

Based on the authenticity and legitimacy of formative classroom assessment techniques including: student portfolios; reflection journals; goal setting; class, peer and self-made rubrics; graphing; and student work samples; I argue that these tools can effectively replace the summative practice of assigning letter grades on report cards to indicate student progress and achievement.

There are many reasons to expand the use of formative assessment from the classroom to formal reporting. In the elementary classroom, assessment occurs while students become self-regulated learners. Students take control of learning, while teachers become facilitators. These techniques contribute to SRL; instrumental for supporting learning and student assessment. By promoting active engagement and providing feedback, the formative assessment approach through SRL creates independent, competent, lifelong learners (Clark, 2012).

In his review of “The Impact of Classroom Evaluation Practices on Students,” Crooks (1988) suggested that classroom evaluation practice has an influential impact on student learning; a finding that was supported by empirical evidence in the literature review included in
this paper. As an elementary teacher with over three decades in the classroom, my personal experience suggests that the classroom is a fertile environment for appropriate assessment practice to occur. Formative assessment in the classroom provides for feedback and monitoring to flourish in an authentic setting through effective tools; ones which support this assessment approach to be expanded to formal reporting.

**Student portfolios.** I suggest that the student portfolio is a formative assessment tool that can easily be conscripted for formal reporting without change to its format. By its definition of being a collection of student work samples for assessment; usually with specific content for different purposes and audiences (Arter, 1990, p. 1, para. 1), I argue that the student portfolio has the characteristics to fully meet the requirements of formal reporting.

The portfolio provides evidence of student learning by representing a simple, yet effective assessment tool which acts as a repository for ongoing student chosen work samples. It easily and clearly communicates student growth over time by providing a concrete timeline of academic growth through dated examples of student work. The student portfolio is a proven assessment tool to measure student progress and demonstrate performance (Baas et al., 2015). For these reasons, the student portfolio is one means to replace summative assessment with formative assessment for formal reporting at the elementary school level.

Using portfolios meets the needs of students and teachers in a number of ways. This formative technique provides a collection of information to stimulate questioning; an important skill that empirical literature advocates as necessary for increased student participation, raising student awareness, and for encouraging student reflection (Meusen-Beekman, Joosten-ten Brinke, & Boshuizen, 2016). Student portfolios provide for the development of student thought processes, i.e. cognitive and metacognitive thinking skills through teacher questioning and peer
discussion (Loughland & Kilpatrick, 2015). This useful tool supports SRL by allowing the learning process to unfold, tailoring to individual student learning pace; that is student portfolios successfully dovetail with Zimmerman’s (2002) model of SRL. The student portfolio tool offers a tangible opportunity to document student reflections, identify and record student strengths and set specific goals for students to work towards achieving. The student portfolio provides a non-threatening method of assessment which represents a clear, authentic, tangible, accountable, celebratory example of formative assessment which supports and enhances student learning in the elementary classroom. Based on the many applicable elements of the student portfolio, this multi-dimensional formative assessment tool is a suitable replacement for the one-dimensional letter grade.

**Reflection journals.** I suggest that the formative assessment tool, a reflection journal is an appropriate replacement for the summative assessment approach used in formal reporting. I argue that due to its ability to provide comparable information, the reflection journal represents a justifiable example of formative assessment that can be used to replace letter grades on elementary student report cards.

Reflection journals, often referred to as diary tasks and blog posts are examples of formative assessment in action. Student journaling provides anecdotal evidence of student performance, growth, and attainment of skills while identifying areas of strength and need through student writing samples. Formal reporting, which is based on the summative practice of assigning letter grades to academic subject areas, demands information, which identifies a student’s current academic status, targets a learning outcome, and suggests ways to support student learning from home. The reflection journal provides similar information, but with greater
clarity and depth; therefore, it represents a practical replacement for elementary school letter grades.

The journaling tool is effective for being open-ended which allows for varying degrees of student skill levels, an important consideration in multi-age and multi-grade classrooms. Reflection journals are versatile across learning domains, which is an important consideration in elementary classrooms that integrate all subject areas. Self-journaling provides concrete evidence of individual student growth and performance for assessment purposes. Instead of one symbol, i.e., A-F to represent student knowledge, skills, and mastery of curricular outcomes, journaling presents a useful feedback tool for the comprehensive information it can provide. Journal samples easily dovetail with student portfolios to provide evidence of student growth and performance; an important expectation in formal reporting. For these reasons, I argue that the reflection journal is another valuable formative measure that may be combined with other formative assessment tools in lieu of letter grades.

**Goal setting.** I suggest that student goals become an integral piece of the elementary student report card and replace letter grades to report student learning. It is important to be able to identify current performance and to target the gap between where the student is and where the student wants to be (Sadler, 1989, p. 121); the act of goal setting provides this opportunity. I argue that goals can be easily incorporated in formal reporting by including one overarching and one specific goal for each core subject area. It has been my experience for goal setting to be optimal, goals need to be student created; furthermore, goals create student accountability, an important aspect of the BC educational curriculum (Province of British Columbia, 2016, Area of Learning: Career Education section, para. 1-5).
In the literature on formative assessment, goal setting is identified as an integral phase in the evaluation process for student learning (Black & Wiliam, 1998; Zimmerman, 2002). Goal setting is easily incorporated across subject domains in the elementary classroom and can be adapted to meet short or long-term targets. As the literature demonstrated, goal setting can be equally realized in academic areas, e.g., mathematics (Brookhart, Andolina, Zuza, & Furman, 2004), and in non-academic areas of learning (Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013). It is important to be specific when writing goals (Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013). In Figure 1, the student template for identifying strengths and areas of need provides an opportunity for the student to recognize and identify specific learning skills by recording these abilities in a clear and organized manner (see Appendix A for the complete template for identifying student strengths and areas of need).

![Student Reflections](image)

**Figure 1** Student template for identifying strengths and areas of need
Student goal setting can be as straightforward as identifying areas of strength and areas of need; or may be more detailed by including a strategic plan for meeting outcomes. Figure 2 provides an example of a scaffolded template. It requires the student to target a specific skill and subsequently create a plan to address strengthening this area of need (see Appendix B for the complete example of a strategic plan for student goal setting).

![Using a Plan To Meet Your Goal](image)

Name: __________________________
Grade: _________________________
Date: ___________________________
Subject Area: ___________________ e.g. mathematics

One specific skill I want to improve is

... e.g., recalling the multiplication facts to 9x9 with greater accuracy.

My goal is to e.g., gain at least one more correct answer each week to increase my total score.

Below, list ways you can strengthen the skill you identified so that you can fully meet your stated goal:

Figure 2 Example of a student template for creating a strategic plan for goal setting

Literature indicates that scaffolding is an important aspect in formative practice (Baas et al., 2015; Decristan, et al.; Kolovelonis, Goudas, Dermitzaki, & Kitsantas, 2013) and my experience suggests that scaffolding is an effective process in goal setting. Goal setting is most successful when teachers introduce and model the goal setting process; provide guidance and
support to practice this skill with peer buddies; and finally release the responsibility to individual learners for creating self-made targets. Goal setting through scaffolding is an important and successful formative assessment technique. Together with other formative tools, goal setting represents yet another way to replace summative assessment practice for the elementary student body.

**Class, peer and self-made rubrics.** Throughout my career, rubrics have been a staple in my assessment practice for both primary and intermediate students due to a rubric’s ability to span subject domains and for its transparency of learning expectations. Based on the versatility and strength of this tool to convey student learning, I argue that the rubric represents an excellent assessment tool for formal reporting; one that is superior to letter grades for the formal reporting of elementary student growth and performance.

A rubric contains criteria which guides and assesses student learning. Rubrics can be teacher, peer, or self-made; however, based on my experience and supported by researchers who used Zimmerman’s (2002) model for SRL (Labhun, Zimmerman, & Hasselhorn, 2010; Kolovelonis, Goudas, Dermitzaki, Kitsantas, 2013), self-made rubrics are very successful and promote SRL. To successfully build a rubric, the scaffolding skill is effective, beginning with teacher modelling and ending with student autonomy (Kolovelonis, Goudas, Dermitzaki, Kitsantas, 2013; Zimmerman, 2002). Figure 3 illustrates an example of a writing template based on teacher guided student input for paragraph construction at the grade four and five level (see Appendix C for the complete template of a teacher guided class made rubric for paragraph writing).
Below, tick each criterion that applies.

**Topic Sentence**

Do you have a **topic sentence** that describes your topic?  **Circle:**  Yes or No

Is it **indented, informative, and interesting** (3 I’s)?

**Body or Content**

Have you included **5-7 sentences that connect to your topic?**

Do you have **capital letters** at the beginning of each sentence.

Have you correctly used a **variety of punctuation** *(periods, exclamation marks, question marks, commas, quotation marks, brackets, colons, other)*.

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**Figure 3** Template of a teacher guided class made rubric for paragraph writing

It has been my experience that when individual students craft rubrics to guide and measure their performances on learning tasks, the important elements of intrinsic motivation and student self-efficacy begin to be realized. For all of these reasons, rubrics are part of many formative ways that can work together for replacing letter grades on elementary student report cards.

**Graphing.** Literature has defined graphing as a monitoring technique for recording feedback to show patterns in performance for the comparison of results for individual student learning or for social comparison between students (Labhun, Zimmerman, & Hasselhorn, 2010). In the literature (Brookhart, Andolina, Zuza, & Furman, 2004; Koenig, Eckert, & Hier, 2016; Labhun, Zimmerman, & Hasselhorn, 2010) and in personal practice, bar and line graphing emerged as powerful techniques for student assessment; therefore, based on its strength to
demonstrate student learning, I argue that graphing is another fitting alternative to summative assessment for formal reporting at the elementary school level.

Without adaptation, graphs can be used for informal classroom assessment and also be used effectively for formal reporting. This claim is based on the ability of graphs to highlight specific growth patterns opposed to a single letter grade which alone cannot convey important details about student progress, achievement or learning direction. Usable across learning domains, graphing is an excellent method to monitor and evaluate student growth and performance across time. Due to its visual quality, a graph can be used to elicit questions, prompt reflection, and share academic performance data with students, peers, parents, and teachers. For these many merits, support exists for graphing as another valuable part of the formative assessment toolkit to replace letter grades on elementary student report cards.

**Student work samples.** I consider student work samples as the crux of student assessment tools. Using work samples as evidence of student learning in formal reporting provides an unambiguous view of student learning; therefore, I argue that this formative assessment tool provides an effective method to replace the summative tool of letter grades on elementary student report cards. My suggestion to use student work samples for formal reporting is woven into the current direction for promoting the use of technology outlined in the BC MOE (Province of British Columbia, 2017, Applied Design, Skills, and Technologies section, para. 1) curriculum; furthering the support for this formative assessment tool to replace summative assessment for elementary students in formal reporting.

With new technology being introduced into elementary level schooling in the form of classroom sets of iPads, student work can be documented; reflective comments can be added to work samples and saved for sharing with others; photo, audio, and video recordings of student
learning in action can be made by teachers, peers, and students themselves. I suggest that these examples are concrete evidence of student learning and are valuable for providing information that can be easily incorporated in formal reporting to parents. iPad work collections can be used exclusively or in combination with the more traditional method of collecting drawings, creative writing samples, etc. to demonstrate and share student learning progress and achievement.

Student work is an actual example of performance at a specific point in time. By examining a collection of work samples over the school year, skill growth and overall academic achievement can be evaluated and communicated. I suggest that by viewing the collection over a student’s school career, work samples create a longitudinal visual progress report of learning.

Work samples need to be collected regularly and ideally, be selected by the student. Student choice promotes autonomy, which empirical findings suggested is important for optimal learning (Ferreira, Veiga Simão, & Lopes da Silva, 2015; Kolovelenis, Goudas, Dermitzaki, & Kitsantas, 2013; Loughland & Kilpatrick, 2013; Yıldızlı & Saban, 2016). Work samples are usually housed in a student portfolio in chronological order or by subject area; or can be saved to student folders using iPads, ready to be shared during formal interviews with teachers and parents.

**The Communication Triangle: Three-Way Conferencing**

Student, parent, and teacher create a dynamic communication triangle for three-way conferencing; therefore, it is my suggestion to formalize this communication triangle as it represents an active and relevant option to formally report student learning. I argue that replacing the summative practice of letter grades with documented three-way conferencing is a natural and seamless method to report student learning. It is able to satisfy the requirements expected for formal reporting; that is, communicating student strengths, areas of need, and ways to support learning with respect to curricular outcomes. Three-way conferencing is another formative tool
that reflects formative assessment in action. My proposal for three-way conferencing to successfully replace letter grades includes an adaptation which repositions the student at the hub of the assessment process. When the student takes ownership of the conference, the parent and teacher inherit the role of facilitators. This rebalance of roles allows for parent and teacher to prompt student reflection and dialogue about the personal learning journey while the student controls the direction of the assessment. In personal practice, I refer to this model of reporting as student-led conferencing.

I argue a model that establishes the student as the governor of learning, the teacher as facilitator and includes involvement by the parent community on an ongoing basis is a worthwhile undertaking for its educational value and vision. My suggestion to document the conference transforms the informal nature of student-led conferencing to a formal interview. By purposely recording the three-way conference, an official report is created that satisfies formal reporting. My proposal involves the teacher documenting the conference by creating detailed notes to be used as evidence of communicating student learning. This includes the documentation of a formalized learning path for the student to follow and monitor.

My second suggestion is to have all parties sign the document, with the student’s signature listed first, followed by the parent(s), and then the teacher, emphasizing the document’s legitimacy and reinforcing student status at the forefront of the assessment process.

During my career, I have repeatedly witnessed the powerful impact of student-led conferencing for communicating information about student progress and achievement. By establishing the student as governor of the learning process, ownership and control is given to the learner, a notion that is fully endorsed by the literature on formative assessment and student autonomy (Ferreira, Veiga Simão, & Lopes da Silva, 2015; Kolovelonis, Goudas, Dermitzaki, &
Kitsantas, 2013; Loughland & Kilpatrick, 2013; Yıldızlı & Saban, 2016). Student-led conferencing allows for the student to lead the conversation; encourages questioning; shares work that elicits pride and accomplishment; demonstrates individual progress through concrete examples of performance; and invites parental input and engagement all in a non-threatening setting. It openly invites parents to become active participants in the student learning process; a seminal idea in curriculum theory which emphasizes the importance of the parent-child relationship (Addams, 1908).

This communication triangle is a pivotal aspect of the assessment and reporting process and can be equally utilized during the informal sharing of information and in formal interviews. Purposely sharing data points in a student’s learning continuum, outlining strengths and areas needing support and attention; and suggesting ways to provide home support through active discussion allows for student learning to be fully shared and the keystone expectation of teacher accountability to be met. For these reasons, three-way conferencing is a formative assessment technique that can and should be used in place of letter grades on elementary student report cards.

**Formal Reporting**

“In a perfect world there would be no grades” (Brookhart, 2009, p. 5). In my perfect world, ongoing formative assessment conducted in daily classroom life coupled with frequent three-way conferencing with student, parent, and teacher emerge as the accepted formal mode of reporting student progress and performance. I argue that for the transformation from summative to formative assessment to occur, there needs to be a re-definition of the term, formal reporting. Formal reporting is official communication which uses the formative assessment approach to
share ongoing progress, competence with learning outcomes, and directed learning paths for the elementary student.

Summative assessment, a stationary snapshot based on numerical scores and calculated percentages needs to be replaced by a formative assessment model based on the proposed suggestions. In our enlightened twenty-first century education system, I argue that summative assessment needs to be retired for true educational reform to happen. The governing body that determines student assessment policy needs to endorse assessment that is authentic, relevant, empowering, ongoing, specific to individual student needs, and one which supports a continuous curriculum. Formative assessment is the answer. For policy reform on student assessment to be fully supported and successfully implemented, I suggest there needs to be information available for parents and teachers to access easily.

**Parent education.** Brookhart (2011) suggests that there are many pressures that allow grading to continue as an accepted practice for student assessment and reporting. In my experience, parents are familiar with letter grades and less familiar with other forms of reporting. Parent education is necessary for reform to occur.

My suggestions to address parent education are many and include offering education on formative assessment at the local, district, and provincial levels. In the classroom, students can voice support and demonstrate evidence of success using the formative approach by sharing their own experiences. Open house evenings both in local schools and hosted by school districts are ideal opportunities to provide information about assessment practice. At the Ministry of Education level, public forums which present new assessment practice and invite questions are valuable for educating the parent body and should be visibly offered and accessed for parents to become informed.
**Teacher in-service.** As well as providing education for parents, it has been suggested in the literature that teacher training for formative assessment may be valuable (Baas, et al., 2015). I suggest to emphasize the importance of assessment reform and to optimize the reception of new knowledge, it is imperative that in-service opportunities be held during school time so that teachers have the energy and focus to acquire new skills. There needs to be a commitment from school districts and school staffs to use professional development funding towards assessment education. Having teachers and districts advocate the benefits of formative assessment being used on report cards, supports its implementation as a viable and accepted method of formal assessment and reporting.

**Conclusion**

In the implication section, suggestions are presented which provide concrete ideas for the implementation of formative assessment in formal reporting. These suggestions are based on formalizing classroom assessment and three-way conferencing to provide documented evidence of student growth and performance which can be used on report cards as a replacement for letter grades. Additionally, the benefit of equipping parent and teachers with a foundation of knowledge surrounding formative assessment provides for this approach to be better understood and appreciated for its positive impact on student learning, both in elementary school and for life.

The implications of the three questions answered in the literature review demonstrate that formative assessment should be used to communicated student progress and achievement at the elementary level of schooling. Specifically, the empirical findings in combination with my extensive history of personal experience, imply that formative assessment should replace letter grades in formal reporting. Supported by the findings in the literature review, it is shown that the
formative approach is able to deliver authentic assessment which promotes SRL, intrinsic motivation, and student self-efficacy; all important aspects of lifelong learning.

In summary, I argue that using formative assessment for formal reporting is a natural extension of the evaluation process conducted in the classroom and meets the requirements of formal reporting; therefore, formative assessment should be unequivocally used for formal reporting purposes. Classroom assessment together with the communication triangle between student, parent, and teacher forms a viable, responsible, and empowering assessment method for the student population and should be used as the basis for assessment reform at the elementary level of schooling.

Limitations and Suggestions for Future Research

Limitations. Although empirical support is provided, the suggestions offered to replace summative assessment with formative assessment are largely based on personal experience. Despite the length and depth of my teaching experience in elementary education, I recognize and acknowledge that I am using a narrow lens to view assessment practice. Professionally, I approach the topic of formative assessment at the elementary level of schooling as a recently retired, Caucasian, female, elementary school teacher whose experience has been limited to middle class and inner city schools in the Greater Victoria School District within the BC public school system. The majority of my teaching experience was confined to grades two through five, with a nine year assignment in a community school and over a decade in a dual track (French Immersion and English) elementary school. My credentials include a Bachelor of Education in Curriculum Development (Generalist) and eighteen months of educational experience in a Master’s Degree in Education (Curriculum and Instructional Leadership) which lend a unique outlook on the topic investigated in this project.
Further influencing my approach towards the topic of formative assessment is my personal viewpoint on formative versus summative assessment practice. As a student, I received letter grades throughout my schooling and am the parent of two sons who received letter grades from grade four through grade twelve; therefore, I witnessed the negative effects that grading imposed on our motivation and self-efficacy for learning. These biases possibly influenced the proposed suggestions for formalizing classroom assessment and three-way conferencing to become formal reporting at the elementary level of schooling.

In respect to the age of sample populations and to reiterate a statement made in the respective limitation sections of SRL and intrinsic motivation, there are a lack of studies using elementary students; therefore, in addition to the suggestions offered in the following section-Future research, there needs to be more research conducted using elementary student populations on the topic of formative assessment.

Guskey (2011) suggests there are “five obstacles to grading reform” (p. 16). These obstacles include the perception that students should be differentiated; there needs to be a bell curve distribution; there should be social comparison between students; letter grades inspire student motivation and effort; and the belief that a single letter grade is able to fully represent student learning (Guskey, 2011, pp. 17-19).

Based on my professional experience, hindering the change from summative to formative assessment, concerns a resistant attitude from parents and administrators who view summative assessment as a credible practice for formal reporting. These parties dismiss any other form of reporting as being substandard to letter grades. Report card letter grades are a longstanding tradition. Successful replacement of summative assessment with formative assessment relies upon an explicit intent to educate those opposed to reform and time for gradual implementation and acceptance.
**Future research.** There needs to be impetus from researchers to study formative assessment using Canadian elementary student populations as not one study which used Canadian students was found when I searched for studies appropriate to the topic. It was interesting to note that two studies raised the question of cultural differences (Chan & Lam, 2010; Seo & Taherbhai, 2009); therefore, studies conducted with Canadian students may reveal new findings for formative assessment based on cultural diversity.

As the majority of the studies made reference to the need for parental permission to allow elementary student participation, this requirement may add a bias to the research; therefore, future research needs to address this potential variable as in the investigated studies used in this project, there was no reference to a possible influence that consent may have on study results.

It may be noteworthy to discover if economic status is a determining factor in studies which investigate formative assessment practice using elementary students; therefore, future research may consider using students from varied economic backgrounds to discover if differences exist between formative assessment and student learning using economic status as a variable.

In the twenty-five studies that were specifically examined for this project, only two implied how formative assessment could be used to replace letter grades for formal reporting; that is, research findings indicated that feedback using comments is more effective than grades or grades and comments together (Butler, 1987; Pulfrey, Buchs, & Butera, 2011). For future research, it is my hope that the topic of formal reporting in elementary school receives greater attention. The focus on the type of evaluation used on formal reports is an educationally valuable topic and should be pursued in the future to ensure our students have the right to formal reporting that is responsible and empowering.
Bibliography


Regulate one's learning affect how students report self-regulated learning in diary tasks?

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Appendix A
Identifying Student Strengths and Needs- Grade 4/5 Student Template

**Student Reflections**

Name: _____________________________

Grade: _____________________________

List the learning strengths you are proud of owning. Remember to be specific.

Use the reverse side of this paper if you need more space.

🌟 My strengths include:

Consider some areas of learning that you want to improve. Choose no more than three goals. Remember to be specific.

🚀 Some goals for me to work towards achieving are:
From this term, you have many wonderful accomplishments to share!

In the space below, list a highlight that you feel especially proud of achieving.

Optional: In the space below, provide an illustration of yourself engaged in a learning activity that you especially enjoyed. Provide a title or caption to label your drawing.

Student Signature: ___________________________

Date: __________________________
Appendix B

Goal Setting: Strategic Plan- Grade 4/5 Student Template

Using a Plan To Meet Your Goal

Name: ____________________________

Grade: ____________________________

Date: _____________________________

Subject Area: ______________________ e.g. mathematics

One specific skill I want to improve is
e.g., recalling the multiplication facts to 9x9 with greater accuracy.

My goal is to e.g., gain at least one more correct answer each week to increase my total score.

Below, list ways you can strengthen the skill you identified so that you can fully meet your stated goal:

My plan to meet my math goal is
e.g., Practice the facts at home every night for 10 minutes.

Ask a friend to do multiplication flash cards with me.

Spend my free activity time learning my multiplication facts using math games.

Use www.math.com to have online practice.

Use a bar graph to self-record daily scores

Checking In:

Did your plan work to achieve your goal? If it did not, why do you think this is so?
Appendix C

Teacher Guided, Class Made Rubric and Reflection Sheet for Paragraph Writing

Grade 4/5

Name: ___________________________

Grade: ___________________________

Date Completed: ____________________________

Evaluated By: ____________________ (teacher, peer, or student)

Topic: ____________________________

Choose one by circling the stage of publication: First Draft Draft-In-Progress Final Copy

Do you have a title for your paragraph? Circle: Yes or No

Below, tick each criterion that applies.

**Topic Sentence**

Do you have a topic sentence that describes your topic? Circle: Yes or No

Is it indented, informative, and interesting (3 I’s)?

**Body or Content**

Have you included 5-7 sentences that connect to your topic?

Do you have capital letters at the beginning of each sentence.

Have you correctly used a variety of punctuation (periods, exclamation marks, question marks, commas, quotation marks, brackets, colons, other).

Do you have a variety of sentence lengths- some short, some long?

Have you used at least three adjectives? Write at least three of the adjectives here:

**Concluding or Closing Sentence**
Did you include a final sentence that ties up or “parrots” your topic sentence? Circle: Yes or No

**Student Reflections**

Complete each sentence. If you would like to include additional writing skills that you are proud of demonstrating, please do so!

The writing skill(s) that I am most proud of demonstrating on this activity is (are)

One skill that I identified for me is to strengthen is

Using the five point scale below, with “1” being I didn’t care for this activity and “5” being I love to write paragraphs, circle the number that best describes how you felt about this writing activity.

1  2  3  4  5

**Optional:** Use the space below to share any other thoughts you have about writing paragraphs. These may include topics you want to explore and ways to share your work with others!