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New BC Curriculum and Communicating Student Learning in an Age of Assessment for Learning

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The purpose of this paper is to provide an in-depth analysis and review of effective and meaningful practices in reporting and communicating student learning in K-12 within the framework of assessment for learning. The timeliness of this topic is derived from the launch of the new curriculum in British Columbia (B.C.), which promotes innovations in both assessment and reporting. To accomplish this goal, research in assessment, grading and reporting student learning from the last two decades is explored to provide information on ways to report and communicate student learning within the changing demands of the new curriculum. Our review of research suggests the need for policy change with respect to developing new systems that are anchored in competency, mastery-oriented and evidence-based learning. There is great potential to change and expand assessment, reporting and communication processes at all levels which are supported by the increased availability of digital technologies, ongoing and personalized assessment, and emerging innovative practices we have noted in B.C. To conclude we recommend digital portfolio practices as they offer a promising direction for creating new processes that complement existing systems in communicating student learning and support competency-based curriculum.

L'objectif de cet article est d'offrir une analyse et une critique approfondie des pratiques efficaces et significatives portant sur l'établissement de rapports et la communication de l'apprentissage par les élèves de la maternelle à la douzième dans le cadre de l'évaluation au service de l'apprentissage. Le caractère opportun de cette question découle du lancement du nouveau programme d'études de la Colombie-Britannique (C.-B.) qui favorise l'innovation tant dans le domaine de l'évaluation que celui du reportage. Ainsi, nous nous sommes penchés sur la recherche portant sur l'évaluation, l'attribution de notes et le reportage de l'apprentissage des élèves au cours des vingt dernières années afin d'être en mesure de rendre compte des résultats d'apprentissage et de les communiquer dans le contexte de l'évolution des exigences du nouveau programmes d'études. Notre examen de la recherche fait ressortir le besoin d'un changement de politiques quant aux nouveaux systèmes en cours de développement et reposant sur la compétence, la maitrise, et l'apprentissage fondé sur des données probantes. Le potentiel pour changer et étendre les processus d'évaluation, de reportage et de communication est grand à tous les niveaux qui sont appuyés par la disponibilité croissante de technologies numériques, de l'évaluation continue et personnalisée et de pratiques novatrices émergeantes que nous avons notées en C.-B. En guise de conclusion, nous recommandons des pratiques numériques de portefeuille car elles offrent une orientation prometteuse pour la création de nouveaux processus qui complètent les systèmes existants visant la communication de l'apprentissage des élèves et qui appuient un programme d'études basé sur les compétences.

In British Columbia (B.C.), there is a new education curriculum that was launched in 2015 with the intent to prepare students for the 21st century. The response from the mainstream media was not positive with titles such as "Failed fads resurface in 'new' B.C. curriculum" (Houle, 2015). However, attention grabbing headings did not capture the sentiment from the field with both the B.C. teachers' federation and school districts in broad support of a more thematic, flexible, multi-disciplinary and competency-based curriculum that reduced the need for high stakes testing. Key in this new curriculum is the intent for reporting student learning to enable all students to chart personalized ongoing success through school by making curriculum and assessment more coherently interconnected. Particularly, "new provincial graduation exams will align not only with new curriculum, but with research on best practice, which highlights student centered and personalized ways of learning" (British Columbia Ministry of Education, 2018a, para. 2). Provincial exams will be rigorous but only in numeracy and literacy, with other subject areas assessed by teachers based on performance standards. The key ideas in the curriculum are the "demonstration and application of learning through different means … [with] classroom assessment that is flexible and personalized … [giving] educators greater flexibility to decide how and when students are assessed" (British Columbia Ministry of Education, 2018a, para. 8). It is claimed that these basic principles are based on recurring themes in the educational literature and supportive of the needed shift in the school curriculum to prepare students for the 21st century. To address this claim we explore the best practices in reporting and communicating student learning in K-12 from our review of the literature. Specifically, we aim to answer the following research question, *how to communicate and report student learning?* Secondly, we explore pockets of innovations in assessment and reporting approaches in B.C. schools that refer to the ideas promoted by B.C.'s New Curriculum.

Assessment and Reporting Practices for 21st Century Learning

Assessment and reporting practices are changing with the demands of 21st century learning and the implementation of the new B.C. curriculum. As Trilling and Fadel (2009) note, 21st century learning is where,

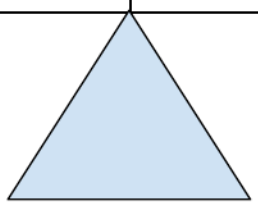
> [t]he world of Knowledge Age work requires a new mix of skills. Jobs that require routine manual and thinking skills are giving way to jobs that involve higher levels of knowledge and applied skills like expert thinking and complex communicating. (p. 9)

Additionally, the authors present an insightful graph on the 21st century learning balance as shown in Figure 1.

Figure 1 describes learning practices that represent "a both-and spectrum—a continuum of learning practices blending both approaches … leaning more to the right of the range of each of these practices" (Trilling & Fadel, 2009, p. 39). The figure indicates a shift from direct instruction for pre-determined and more easily measured outcomes to evolving and more interactive learning, as well as collective problem-solving.

With the demands of the 21st century and the shift in rationale and focus, many educators, as well as students and parents, are finding the existing assessment and reporting practices insufficient. There is an emerging need for re-imagining assessment and reporting to align with

Teacher-directed	Learner-centered
Direct instruction	Interactive exchange
Knowledge	Skills
Content	Process
Basic skills	Applied skills
Facts and principles	Questions and problems
Theory	Practice
Curriculum	Projects
Time-slotted	On-demand
One-size-fits-all	Personalized
Competitive	Collaborative
Classroom	Global community
Text-based	Web-based
Summative tests	Formative evaluations
Learning for school	Learning for life



A New Balance

Figure 1. A New Balance—21st Century Learning Balance (adapted from Trilling & Fadel, 2009, p. 38)

the new B.C. competency-based curriculum.

The newly implemented B.C. curriculum emphasizes 21st century skills and personalized learning, which, the literature indicates, can best be facilitated by competency-based education (Patrick, Kennedy, & Powell, 2013). Competency-based education can also be referred to as proficiency-based, performance-based, or mastery-based education (Twyman, 2014). Multiple resources related to competency-based education have outlined five basic aspects as follows:

1. Students advance upon demonstrated mastery;
2. Competencies include explicit, measurable, transferable learning objectives that empower students;
3. Assessment is a meaningful and positive learning experience for students;
4. Students receive rapid, differentiated support based on their individual learning needs; and
5. Learning outcomes emphasize competencies that include application and creation of knowledge along with the development of important skills and dispositions.

(Freeland, 2014; Patrick et al., 2013; Phillips & Schneider, 2016; Twyman, 2014)

These aspects also comprise a working definition of competency-based education, which is used in contrast to the traditional time-based system. It is evident from the list above that the focus is on students demonstrating competency or mastery of their learning. The third aspect is particularly relevant to the shift in assessment models from the traditional practice of testing and grading. In particular:

> Teacher and students work together in a formative manner to identify strengths and weaknesses (Miliband, 2006). Performance-based assessments enable individual students to demonstrate mastery in diverse ways. Systems of assessments are used to support frequent feedback loops from entry through progressions using embedded and formative methods to track progress in the learning environment, as well as project-based, performance-based assessments providing feedback on each individual student's skills, gaps, strengths, and weaknesses. Personalized learning strategies enable students to demonstrate knowledge attainment by relating to their own interests and aspirations. (Patrick et al., 2013, p. 23)

Within the above context, a key concern for communicating student learning is captured in Figure 2. Parents want to know how well their child is doing in order to give them support and track how they are making progress. Students want to learn, want to do well with their studies and therefore receive feedback through assessment that helps them progress. For administrators of education, at the school, district, ministry and postsecondary levels, the intent is to evaluate student success in order to gauge how the schooling system is doing and to track the progress of student learning across the system. All of these intents need to be addressed by the system, but too often competing demands and political pressures cause the intent of one group to

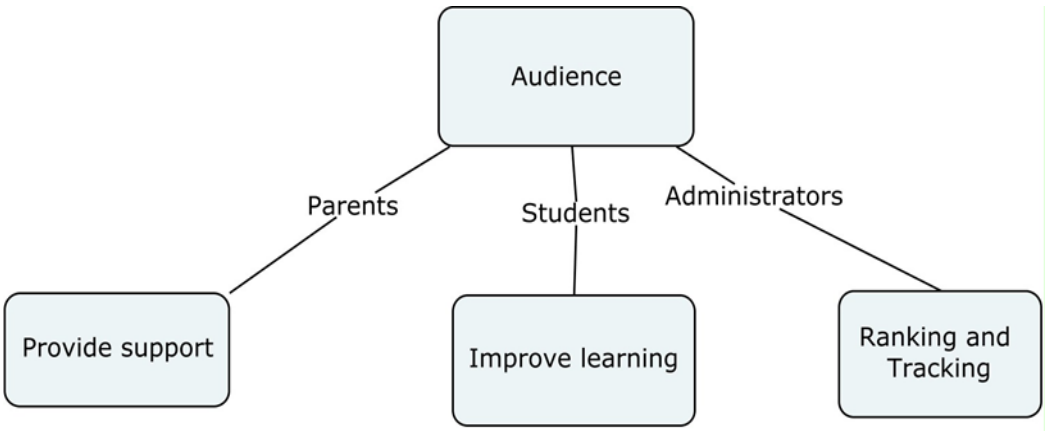


Figure 2. Overview of Audiences and Intents for Schools Communicating Student Learning.

undermine or devalue that of the others. Overall, society wants the indicators of student learning to be valid so that students can successfully transition into career paths from school or after post-secondary education.

With this complexity in mind, the purpose of this paper is to provide an in-depth analysis and a review of the best practices in reporting and communicating students' learning in K-12 within the landscape of changing demands in B.C.'s new curriculum.

Methods

We conducted several rounds of searching. We began with our University Summons software (a university-based search engine subsuming multiple databases) and Google Scholar limited to publications in the last two decades. The keywords and keyword combinations included in this round of search were: report, student report, parents, communicate student learning, as well as variations of these terms. This search yielded some but limited results related to our review focus. We then started a second round of searching by using our professional knowledge about key authors in educational assessment, with a focus on assessment for and of learning, grading and reporting. During this search, we also noticed scholarly theses on the topic of reporting student learning in B.C. schools. Based on the result of these two searches, we checked through the references of relevant literature and snowballed into a larger pool of resources, including both reports and empirical research. Thirdly, we made use of Google+ curating tools to gather online resources on digital learning and portfolio practices. Fourthly, we added competency-based education and K-12, into our pool of literature to reflect the new B.C. curriculum in its tenet of personalized education and 21st century skills. Finally, we searched postsecondary readiness and college readiness literature as an addition to the purpose of K-12 school education. All resources were read for title and abstract, and in some cases, the whole article, to determine relevance.

The selected resources were uploaded to a shared reference management software and research network system called Mendeley for annotation. In total we considered 71 sources comprising of 52 journal articles, seven books/eBooks or book chapters, nine reports, two theses and one website to anchor our analysis. All resources were read, annotated, grouped and cross-referenced into major themes: assessment, grading, competency-based education, postsecondary readiness, alternatives in reporting, and portfolios. We are aware that there are no clear-cut boundaries between these themes. However, these categories were created in our endeavor to capture a complete picture to describe the landscape of current assessment and reporting practices.

Assessment: Learning as Purpose

Communicating student learning can be influenced by two perspectives: (1) *assessment for learning*, which refers to the formative type of assessment used by teachers in the classroom to enable student learning, and (2) *assessment of learning*, which gauges the summative progress of students with regard to pre-determined indicators of learning. This latter perspective can be used to assess the effectiveness of the system and to communicate students' learning for potential career paths and post-secondary education. As noted by Harlen (2005), the synergy between these two perspectives requires that the system should be designed with both purposes in mind and should include arrangements for using evidence from both. Wiliam and Black's

(1996) seminal work on school assessment pointed to the dangers of conflating formative and diagnostic information with summative and evaluative assessments for communicating student learning when the same assessments may be used to serve more than one function. These terms are therefore not descriptions of the kinds of assessments given to students but rather these terms refer to how the arising information is used to communicate student learning.

The following definition by Black, Harrison, Lee, Marshall, and Wiliam (2004) for assessment for learning helps to frame the purposes of assessment:

> Assessment for learning is any assessment for which the first priority in its design and practice is to serve the purpose of promoting students' learning. It thus differs from assessment designed primarily to serve the purposes of accountability, or of ranking, or of certifying competence. An assessment activity can help learning if it provides information that teachers and their students can use as feedback in assessing themselves and one another and in modifying the teaching and learning activities in which they are engaged. Such assessment becomes "formative assessment" when the evidence is actually used to adapt the teaching work to meet learning needs. (p. 10)

Though this understanding of assessment implies more formative types of assessment, it should be noted that summative assessments could also be used for a similar purpose. For example, funding could be directed to assist students performing below expectations on summative tests, or where summative assessment is used as a tool to direct students to more appropriate learning experiences. In such cases, summative assessment is used in a formative way. Assessment of learning then tends to be recognized as summative in nature but also allows for an evaluative role when used within a formative process, if the information is used to enhance student future learning. In this application of summative assessments of student learning there are various ways information can be collected about student achievement. These ways include the following: internal school tracking of students' progress; informing parents, students and their next teacher of what has been achieved; certification or accreditation of learning by an external body; and selection for employment or higher education. Summative types of assessment can also be used, with other information, for monitoring the performance of teachers and schools over time.

Summative assessment within a provincial or national system is often seen as high-stakes testing to grade, rank and sort students. The published reviews of research on communicating student learning consistently point to the detrimental effect of such testing. In a review of teachers' practices related to external examination in the 1990s and early 2000s, Harlen (2005) noted that:

> High-stakes use is universally found to be associated with teachers focusing on the content of the tests, administering repeated practice tests, training students in the answers to specific questions or types of question, and adopting transmission styles of teaching. In such circumstances teachers make little use of assessment formatively to help the learning process. (p. 209)

In an earlier systematic review of 183 research studies on reporting student learning, Harlen and Deakin Crick (2002) also found the following:

- When passing tests is high stakes, teachers adopt a teaching style which emphasizes transmission teaching of knowledge, thereby favouring those students who prefer to learn in this way and disadvantaging and lowering the self-esteem of those who prefer more active and creative learning experiences.

- High-stakes tests can become the rationale for all that is done in classrooms and permeates teachers' own assessment interactions.
- Repeated practice tests reinforce the low self-image of the lower-achieving students.
- Students dislike selection and high-stakes tests, show high levels of test anxiety (particularly girls) and prefer other forms of assessment.
- An education system that puts great emphasis on evaluation and selectivity produces students with strong extrinsic orientation towards grades and social status. (p. 4)

Additionally, Harlen and Deakin Crick (2002) noted that,

> [t]hose who learn in order to gain an extrinsic reward are unlikely to continue learning once the reward is obtained or the penalty avoided, and they will give up earlier if reward seems unobtainable. For continued learning, the motive needs to be intrinsic, the reward being within the process of learning and in the recognition of being in control of, and responsible for, one's own learning. (p. 2)

It is this extrinsic effect of summative grading that can lead to students dropping out of school systems where learning is collapsed to measureable indicators, or where high achieving students are driven by a desire to get grades at the expense of true learning.

These particular reviews speak to the need to make better sense of the diverse voices in the landscape of assessment, grading, and reporting, especially the purpose of assessment. Different approaches to assessment are intended for different audiences; while summative large-scale assessments can be useful for policymakers and perhaps principals, formative self-assessment is more for students and teachers. The reimagining of assessment correlates with a change in understanding the role(s) of education in the 21st century. Sliwka and Yee (2015) in their review of research on the notion of schooling described "a changing perception of schooling, encompassing cognitive, metacognitive and social-emotional perspectives to enable engaged learning and growth mindsets" (p. 175). Of particular importance is the making of "engaged learners" who become "co-designers of their own learning" (Sliwka & Yee, 2015, p. 176) Based on studies of student learners who set performance-based goals or learning-based goals, Sliwka and Yee (2015) believed that there exists a corresponding fixed mindset and growth mindset to education and assessment practices. While traditional reward systems, such as assigning grades, largely reflect a fixed mindset, there are emerging practices that acknowledge and celebrate growth. Sliwka and Yee also cited examples from Canada and Germany to illustrate changes in reporting and communicating student learning, where parents receive progress reports on growth and achievement instead of report cards with numerical grades. Such a shift in reporting student learning creates the conditions for "moving away from the accumulation of content knowledge towards the development of essential competencies" (Sliwka & Yee, 2015, p. 181) within a growth mindset for the 21st century.

Likewise, Stiggins (2008) in his manifesto on assessment identified two clear purposes of assessment: (1) to gather evidence to inform instructional decisions—inform decisions; and (2) to encourage students to try to learn—to motivate and engage students. The first purpose requires a distinguishing of audiences into three levels: classroom, school and institution where all three levels of assessment are important (Stiggins & DuFour, 2009). Whereas the second purpose, which advocates for assessment for learning, focuses more on the emotional dynamics of the assessment experience taking into consideration the potential to positively influence students' sense of self-efficacy (Stiggins, 2009). In this way, assessments become far more than merely one-time events attached onto the end of the teaching; rather, they become part of the

learning process by keeping students posted on their progress and confident enough to continue striving. With the role of schooling shifting from sorting students to helping all students succeed in meeting standards, Stiggins (2007) and others have consistently advocated a vision of assessment focused on assessment for learning to motivate every student in their learning (see for example, Black, Harrison, Lee, Marshall & Wiliam, 2003; Black & Wiliam, 2009; Harlen, 2005). Following the positions taken by these scholars, we believe assessment for learning is therefore the foundation of reporting practices in the landscape of the new B.C. curriculum.

Rethinking Grading Practices

The idea of assessment for learning critiques typical practices in grading as not being accurate, consistent, meaningful, and supportive of learning. As O'Conner and Wormeli (2011) stated, "[e]ffective assessment is revelatory; it reveals the student's story. Students need a safe place to tell that story and receive helpful feedback on its unfolding. For that feedback to be useful, we limit judgment and evaluation" (p. 44). This type of assessment is also termed formative assessment, where students are provided with descriptive feedback, followed by opportunities to revise and be assessed and accredited anew. Summative assessments, in contrast, are for evaluative declarations and sorting students. Black and Wiliam (2009) offered the following definition on formative assessment practices:

> Practice in a classroom is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers, to make decisions about the next steps in instruction that are likely to be better, or better founded, than the decisions they would have taken in the absence of the evidence that was elicited. (p. 9)

Black and colleagues (2004) described four ways to enable formative assessment to happen: questioning; feedback; self and peer assessment; and formative use of summative tests. In particular, research experiments have established that, while student learning can be advanced by feedback through comments, the giving of numerical scores or grades has a negative effect, in that students ignore comments when marks are also given (Butler, 1988). This result is echoed by Pulfrey, Buchs and Butera's (2011) study on performance-approach and performance-avoidance goals which highlight that elimination or diminishing grading seems to be an important condition for any form of feedback to be effective for students seeking to obtain competence. As noted in the study, students' "focus on avoiding normative incompetence" is strongly "linked to anxiety, hopelessness, [and] shame" associated with the powerlessness of taking externally valued tests (p. 683-684). Additionally, providing comments to students helps parents to focus on the learning issues rather than on trying to interpret a score or grade. Scholars believe that the effort that many teachers devote to grading may be misdirected. In agreement, Black and colleagues (2004) noted "[a] numerical score or a grade does not tell students how to improve their work, so an opportunity to enhance their learning is lost" (p. 13). Further, we have found in a review of relevant literature that self-assessment, together with peer assessment as its complement, enables students to understand the learning goal and thus to better achieve it (Hopper, Fu, & Sanford, 2016). However, teachers need to help students, particularly the "low achievers", in developing the skill of self-assessment. Another important observation by Black and colleagues (2004) relates to students' motivation to learn. Contrary to the assumption that extrinsic rewards such as grades, gold stars, and prizes are the best ways to

motivate students, ample evidence showed that feedback given as rewards or grades generally enhances ego involvement rather than task involvement (Ryan & Deci, 2000). This kind of feedback and grading can focus students' attention on their "ability" rather than on the importance of effort, thus damaging the self-esteem and motivation of low achievers in particular. In comparison,

> [f]eedback that focuses on what needs to be done can encourage all to believe that they can improve. Such feedback can enhance learning, both directly through the effort that can ensue and indirectly by supporting the motivation to invest such effort. (Black et al., 2004, p. 18)

Changing Practices in Grading: Standards-based, Competencies and Performance

As a foundational element in educational systems, "[g]rading represents teachers' evaluations—formative or summative—of students' performance", while "[r]eporting is how the results of those evaluations are communicated to students, parents, or others" (Muñoz & Guskey, 2015, p. 64). It is believed that grading and reporting practices must always meet the criteria for validity and reliability, are meaningful, accurate, and fair, and serve the purpose of "describ[ing] how well students have achieved the learning objectives or goals established for a class or course of study" ((Muñoz & Guskey, 2015, p. 65). For this purpose, multiple reviews on assessment practices by Guskey and others have advocated the use of standard-based approaches to grading (Guskey, 2001, 2013; Guskey & Bailey, 2001; Guskey, Jung, & Swan, 2011; Marzano & Heflebower, 2011; Swan, Guskey, & Jung, 2014). A key feature of standard-based grading is to distinguish the product, process and progress of student learning and report them separately. As we have clarified earlier, student learning should be assessed using both competency-based and performance-based approaches. Student ability to perform and complete certain tasks, such as digital literacy skills, can be captured by evidences of them doing these tasks. These evidences can then be compared with standards that are established as benchmarks to indicate student success in learning. According to Guskey (2001) in a standard-based approach to reporting learning, a variety of standards, including learning outcome, learning process, and attitude, are used to give a more complete picture of student learning. Another suggestion from Guskey is to clarify the purpose of diverse reporting tools, which include report cards, progress reports, meetings, newsletters, projects or assignments, parent-teacher conferences, and student-led conferences. Once the purpose or function of reporting is clear, teachers can choose the right form to report. However, standards-based grading also has shortcomings: it is a lot of work to prepare; can be too complicated for parents to understand; and sometimes does not communicate the appropriateness of student's progress (Guskey, 2001). Nevertheless, this move toward making grades meaningful has received positive results in U.S. as shown in Figure 3 (Guskey et al., 2011). The report card in Figure 3 shows that the grade 2 Language Arts and Mathematics grades, assigned based on standards marks, is just one element in an array of assessments that point to study habits such as participation and respect, as well as descriptive examples from the teacher that imply feedback for future learning. Additionally, research into parents' and teachers' perception of standard-based grading and reporting showed that parents overwhelmingly preferred the standard-based form (Swan et al., 2014).

These practices, while still anchored within the general commitment to grading students, offer alternatives to the traditional omnibus and simplistic letter grade or percentage grade that leads to ranking and implicit competition. Marzano and Heflebower (2011) provided some

FIG. 1.
Example of an Elementary Report from the Standards-based Report Pilot

Kentucky UNBRIDLED SPIRIT
STANDARDS BASED REPORT
Elementary Report Card
Student: Chris Lipup
Reporting Period: 3

Standard Marks	
4	Exemplary
3	Proficient
2	Progressing
1	Struggling
N/A	Not Assessed

*Based on modified standard(s). See Progress Report

Process Marks	
+ +	Consistently
+	Moderately
–	Rarely
N/A	Not Assessed

Grade 2 Language Arts – Ms. Bausch

Reading	4
Writing	3
Speaking	2
Listening	3
Language	4

Process Goals	
Preparation	+
Participation	+ +
Homework	+
Cooperation	+
Respect	+ +

Description/Comments:
Students have been very busy during the 3rd reporting period working on the following topics: consonants, vowels, and their corresponding sounds; identifying syllables in words; stressed and unstressed syllables; closed syllables, vocabulary development; compound words, antonyms; homophones; synonyms, multiple meaning words; idioms; comprehension skills; main ideas and supporting details; fluency; and reading strategies such as sequencing, cause and effect, and facts and opinions. We also worked on how to answer open-response questions.

Chris is improving with the articulation difficulties that we recently observed. We are coordinating efforts with the speech therapist to continue the progress we've made into the next marking period.

Grade 2 Mathematics – Mr. Reedy

Operations and Algebraic Thinking	3
Numbers and Operations — Base 10	3
Numbers and Operations — Fractions	2
Measurement and Data	2
Geometry	N/A
Mathematical Practices	3

Process Goals	
Preparation	–
Participation	+ +
Homework	–
Cooperation	+ +
Respect	+

Description/Comments:
Over the past nine weeks students have been learning about measurement, probability, and data analysis. They explored their world with the concepts of measurement and used tools and units to measure objects in the classroom and at home. They learned that probability can be fun by using Skittles candies to predict the chance of an event. We also learned about numbers on a spinner and how to describe probability using words such as "impossible," "likely," and "not likely." Students learned when and why to use different types of graphs. They created graphs for specific situations and learned that graphs must have titles, labels, x-axis, y-axis, and scale. We even made a classroom grid to identify ordered pairs.

Chris has had a pretty successful marking period, although homework and preparation continue to be issues. Most of the problems Chris is experiencing with measurement and fractions stem from not practicing enough to build a level of fluency. We will begin the next reporting period with supervised study to see if we can help Chris develop better out-of-class study habits.

Figure 3. Example of Elementary Report from Kentucky Standards Based Report Pilot

useful recommendations in this regard including the elimination of an overall or omnibus grade to reflect both academic achievement and progress, a proposition also supported by Guskey et al. (2011). Another recommendation is to expand the assessment options available to students, such as probing discussions, unobtrusive assessments and student-generated assessments. Still another possibility involves allowing students to continually update their scores on previous topics being measured, which is the most transformational and requires a different kind of

classroom. In a recent article targeted at the resurgence of percentage grades as a result of increased use of technology, Guskey (2013) demonstrated that the percentage grade lacks reliability in both historical and current research, as different teachers can give vastly different grades to the same work of a student. Another issue with the percentage grade is its practice of distinguishing 60 different levels of failure, which is hardly helpful to students. A grade of zero in a percentage grade system, in particular, functions to punish students by making a recovery to 60 almost impossible. Therefore, an integer grading system of 0-4 or 0-5 makes it possible for students to recover—as "improving from a failing grade to a passing grade means moving from 0 to 1, not from 0 to 60 or 65" (Guskey, 2013, p. 71). In addition, the integer system and more accurately reflects what students have learned and accomplished.

Diminishing Grading Practices

Apart from the above attempts to reform the traditional and largely ineffective grading system, other scholars have been more revolutionary by questioning the very act of grading students. Wright (2010), for example, believed that grades, even standards-based grades, "can be influenced by individual educators' perceptions of a child's effort, alertness, attention to detail, penmanship, and actual achievement … which makes the meaning of reports cards 'idiosyncratic and murky' at best" (p. 11). Therefore, report cards can only be viewed as "estimated summations" of what children have learned and can do (p. 11). For the case of preschools and primary level elementary schools, the author found narrative reports in lieu of or along with report cards helpful in filling gaps of a single grade and providing parents with a "multifaceted assessment" of their children (Wright, 2010, p. 15).

As noted earlier, Pulfrey et al. (2011) studied the relationship between grading and performance avoidance goals. Their three experiments showed that when students expected a grade for a task, compared with expecting no grade, they would adopt performance-avoidance goals not performance-approach goals for the task, even though such grades were accompanied with formative comments. The study constitutes direct experimental evidence of links between grades and performance-avoidance goals, with the results showing that grading can severely limit students' learning and work against the fundamental purposes of education.

Guskey (2014), likewise, questioned the purpose of grading by pointing out that grading schemes that may be effective in selecting talents often fail to benefit all students and to notice promising students. According to Guskey (2014), while differentiating students by grading may work to select talents, it hardly works to develop talents, which should be the real purpose of educators. Furthermore, widely differentiated grades often reflect poor teaching and the inability of education to successfully support every student's learning. Grading and ranking is often grounded on norm-based criteria that lead to harmful competition among learners, which weighs down on true learning for all and genuine collaborative learning. Therefore, such practices as grading and ranking should be seriously challenged and reconsidered.

Perhaps a more radical questioning of grades is raised by educator Alfie Kohn (2011), who commented that the basic elements in educational assessment are only two: collecting information on students' learning and sharing that information with students and parents. However, Kohn (2011) pointed out that "[c]ollecting information doesn't require tests, and sharing that information doesn't require grades" (p. 28). Summarizing prior research on the effects of grades, Kohn discovered that when students who are led to focus on grades are compared with those who are not, the results showed that: 1) grades tend to diminish students'

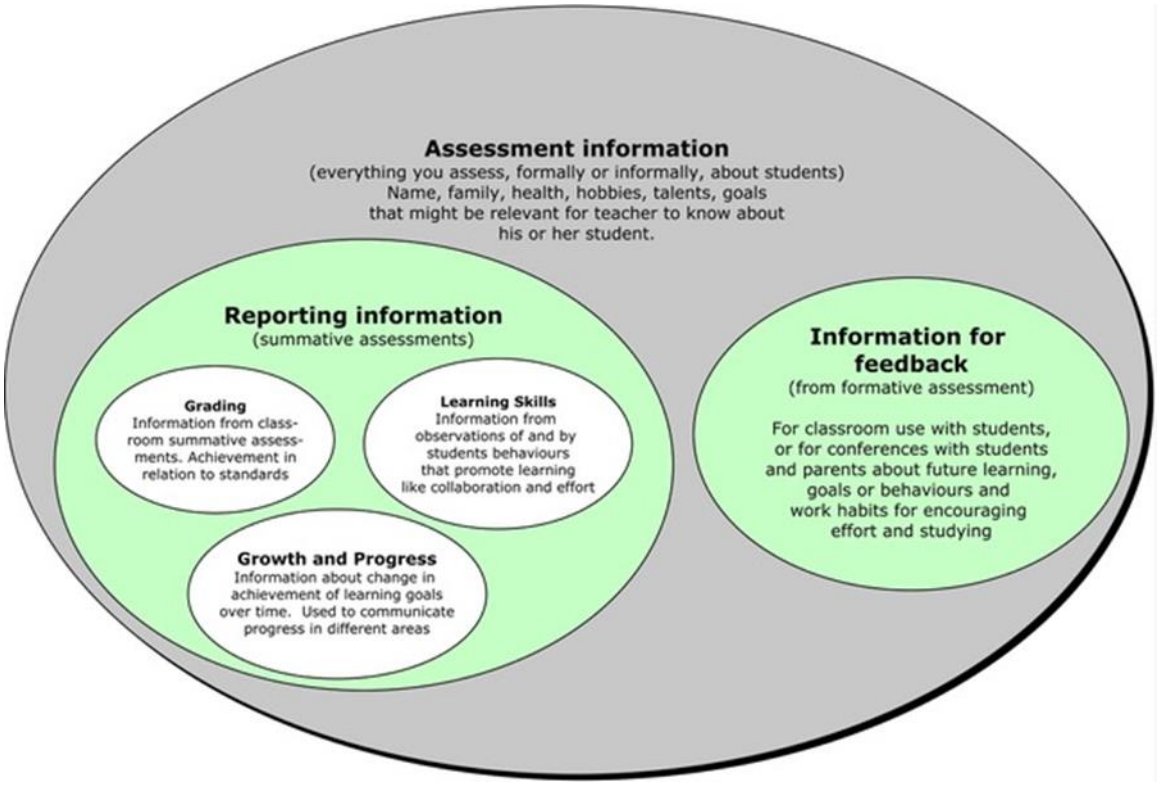
interest in whatever they are learning; 2) grades create a preference for the easiest possible task; and 3) grades tend to reduce the quality of students' thinking. Further evidence from research is provided by Kohn on the negative impact of grades on motivation and achievement, the inability of grades to quantify learning, and the mismatch between innovations in curriculum and the traditional standardized assessment methods. Moreover, although it is important to assess the quality of teaching and learning, it is not always possible or even necessary to measure, or quantify, those things. Learning and teaching are far more complex processes than relying on a simplistic number or letter. Therefore, Kohn (2011) pointed out that improving grading itself is not enough and he called for deleting or diluting grades by replacing letter and number grades with narrative assessments or conferences, and other forms of authentic assessment.

On the practice side, Mark Barnes (2013; see also FreshGrade, 2016) experimented with his No-Grades Classroom using technology and student-centered pedagogy. With learning being the only result that students care about, the traditional classroom is transformed into a bustling community of learners who collaborate on long-term projects rather than "worksheets, homework, tests and quizzes," (Barnes, 2013, p. 31) receive constant narrative feedback, and manage their own learning without worries of punitive points, percentages, and letter grades. Additionally, technology and web-based platforms go a long way toward making this type of classroom possible. The observations by Barnes (2013) were echoed in the recent iBook made into an award winning documentary film *Most Likely to Succeed* (Wagner, 2015). The film documents the progress of students working in a project based learning school called High Tech High. Based on teacher-student developed themes, students are challenged to develop projects using an array of materials to demonstrate insights that are presented at the end of term festival event. Through the learning process students debrief with peers and teachers as they outline their challenges and plans. Assessment is ongoing and focused on competencies and goals with a final summative debrief session to set up for the next term. A key insight from the film is that students who were failing in the traditional grade based system are blossoming in the alternative system and parents of the students, despite initial concerns, are happy and excited with the progress of their children.

Reporting with Assessment for Learning in Mind

The diagram in Figure 4, adapted from Brookhart (2011), maps the relationship between assessment information (as in everything you assess) with information for feedback (used in classroom) and reporting information (grading, observations to promote learning, growth and progress information).

As shown in Figure 4, reporting student learning should not only be about grading information, but also about student progress and about skills learning and learned. Brookhart (2011) also believes that any communication about student achievement, progress, or behavior should be supported by evidence. All communication methods, including report cards, narratives, conferences, and portfolios both traditional paper based and digital, "should be based on an evidentiary process that begins with setting the purpose for the communication" (Brookhart, 2011, p. 125). This means that students create, collect, and reflect on evidence with an audience and a purpose in mind, be it their peers, the teacher, accreditation body, parents, or public. Assessment information is therefore a much wider concept than just reporting information. Assessment information is a profile of data on a student that combines reporting information with information for feedback where grading should not be viewed as the major



(Diagram adapted from Brookhart, 2011, p. 8)

Figure 4. Venn Diagram of Relationships among Assessment, Grading and Reporting

element, nor, as in many cases, the only element in both reporting and assessment. For example, when comparing Figure 4 with Guskey's (2011) standard-based report cards shown in Figure 3, it is not difficult to see that the latter is an operationalization of the former. Ultimately assessment information focuses on the unique talents, abilities and aspirations of the student with future learning goals, behaviors, and work habits as the outcome of an assessment process.

Parents as Stakeholders

Perspectives from parents have also been considered by prior research. The survey results by Munk and Bursuck (2001) on high school parents in the midwestern U.S. indicated that parents ranked three purposes of reporting as most important: 1) communicate general achievement and quality of work; 2) communicate their child's effort and work habits; 3) communicate their child's strengths or needs and provide feedback on how to improve. However, report card grades were not very effective in meeting these purposes. Significant differences were also found between the perceptions of the parents of high-achieving students without disabilities and those of students with disabilities, where the former perceive grades as being important and effective for post school planning and communicating information to post-secondary schools or employers. Parents of students with disabilities, who are experiencing the negative effects associated with poor grades, assign more importance to purposes involving communication of individual strengths or needs (p. 285). A similar discovery was made by Swan et al. (2014), who observed that parents have conflicting ideas on the purpose of grading with parents of high-

achieving students favoring the percentage grades in traditional report cards where teachers finely discriminate among learners and make note of any differences in students' performance (p. 298). Likewise, in describing the complexity faced by 26 New Zealand teachers in assessment, Harris and Brown (2009) noted that parents may want comparative data and that teachers view grades as encouraging high-achieving students but potentially discouraging low-achievers (pp. 372-374).

Effective communication with parents has been acknowledged to be of foundational importance for parental support in student learning both by educational researchers (Graham-Clay, 2005) and a report by a member legislative assembly for B.C. Ministry of Education (Thornthwaite, 2013). According to the latter report, parents want more frequent updates and discussion about their children's learning and see traditional report cards as just a snapshot into the past. As is noted, "[v]oices from the parents indicate a need for districts to introduce online portfolios that could provide parents with more insight into their child's learning and a better understanding of what their child is working on in real time" (Thornthwaite, 2013, p. 10).

Taking all the messiness involved in reporting and communicating student learning to parents into consideration, we suggest that: 1) reporting needs to be based on actual evidence of students' learning; 2) reporting needs to motivate students in their own learning and enhance parents' support to student learning; and 3) parents may use reporting for different purposes, such as postsecondary application and competition. Critical here is to allow parents to select from an array of assessments and to not allow post-secondary institutions to offer placements on a narrow set of grades. Post-secondary institutions should consider broadening their admission processes to better embrace what students can do in relation to the program they wish to study, not a grade that may have little correlation to program requirements. Prior research in the U.S. has indicated that attention to high school tests can actually become a barrier for college readiness (Kirst, Venezia & antonio, 2004; Perna & Thomas, 2009; Sommerfeld, 2011). Four elements have been identified as central in college readiness and postsecondary success: 1) key cognitive strategies emphasized in entry-level college courses; 2) key content knowledge necessary to understand the structure of each academic discipline; 3) self-management skills that enable students to cope with the academic demands of college; and 4) the college knowledge necessary to understand how the postsecondary system operates (Conley, 2007, p. 9). Not all of these, however, are readily reflected or required in the present assessment and reporting practices.

Cases in B.C.: From Report Cards to Digital Portfolios

In B.C., Beloin (2015) carried out an in-depth review of the Ministry of Education documents and identified six different purposes of the report card over time: 1) teacher accountability; 2) assisting the child to evaluate growth; 3) encouragement of parents to co-operate with the teacher; 4) improvement of home and school relationship; 5) easy comparison of students to each other and to standards; and 6) transferability of student achievement information. However, Beloin questioned whether a single document, such as a report card, as the dominant form of communicating student learning, can accomplish all these purposes. Agreeing with Guskey and Bailey (2001), she believes that one reason that reporting reform efforts often fail is that the systems try to accomplish too much with a single reporting device in a situation where there are many audiences. Summarizing prior research, she believes that using grades for reporting to parents is hardly helpful because it can foster a fixed mindset by leading children to

attach their identities and their intelligence to their grades. She further suggests that grading students reduces students' engagement with their learning.

The B.C. teachers interviewed by Beloin (2015) identified the purpose of the report card for parents as communicating what their child is doing in the classroom. Additionally, the teachers found the use of digital portfolios, or e-portfolios (eP), beneficial in allowing for more personalized reporting for teachers and students. However, the use of ePs does not easily address the last two purposes identified above as the comparison of students to each other and to standards or transferability of student achievement information. Therefore, the author concluded that if there is a separation of the administrative needs for transferability and comparison from reporting on student progress to parents and students, then the implementation of ePs is a good option for reporting on student progress to parents.

Echoing current change in the new B.C. curriculum to focus on mastery and personalized learning for today's learners, Watson (2015), in agreement with Beloin (2015), believed that digital portfolios can offer an attractive alternative to support, assess, and communicate student learning. Therefore, her study reflects a project designed to support K-12 teachers in this shift by centering on 21st century learning, formative assessment, self-regulation, and digital portfolios. This project, in the form of a website, is a meta-portfolio where educators can make their professional learning visible, seek and provide feedback, and learn from each other, thus creating a community of practice. Watson believes that these changes make it necessary for both educators and students to meaningfully describe, collect and demonstrate their learning, thus digital portfolios can best serve this purpose. Specifically, the changing vision and philosophy of education in B.C. on mastery learning and growth demands that students document their learning, set goals, and monitor and reflect on the progress they are making. Teachers also need a way to assess and support each individual student's learning along their learning path, and parents need a way to be more involved in their child's learning and have a voice in the assessment process. Prior literature on digital portfolios or ePs in professional learning positioned it as a form of authentic assessment process that integrates both the summative and formative modes of assessment, utilizes self-assessment through reflection, and connects both the personal and professional identities of the learner (Karsenti, Dumouchel, & Collin, 2014; McWhorter, Delello, & Roberts, 2013; Trevitt, Macduff, & Steed, 2014; Wakimoto & Lewis, 2014).

Digital Portfolios Practice in B.C. and Other Parts of Canada

Recently, multiple B.C. schools, both as grass-root teacher/school initiatives and as district wide implementations, have adopted digital portfolios. The digital aspect of a portfolio signifies access to the ever-growing resource of digital artifacts created and integrated with and shared by a student to enable and show their learning. Digital portfolios allow ongoing progress that can record productivity through a progression of interconnected digital artifacts from an array of projects or tasks that link to curriculum competencies, offering authentic and robust evidence of student learning.

The tools or platforms used are diverse (see brief summary of digital portfolio use in schools in BC https://folioz.ca/group/folioz-scholarly-work-sshrc-ep/ep-in-schools). In some B.C. schools, the FreshGrade Portfolio has been adopted as one type of digital portfolios to communicate student learning. In these cases, digital technology has revived the old idea of portfolio assessment by being convenient, emphasizing process rather than only product, and

de-emphasizing the traditional grades (FreshGrade, 2016). In Surrey for example, schools using FreshGrade found that what parents really want is real time sharing of student learning so as to support their children, knowing if their children are learning and progressing, and subsequent dialogues with schools (CBC News, 2015). In this news report, survey results showed positive family response and meaningful conversation with students.

Elsewhere in Canada, Electronic Portfolio Encouraging Active Reflective Learning (ePEARL) was developed at the Centre for the Study of Learning and Performance of Concordia University in Montreal. It is a Canadian-wide research-based electronic portfolio that encourages active reflective learning. Manitoba Education and Training (Manitoba Education and Training, 2016) provides a general description and rationale of using digital portfolio for literacy education as encouraging students to think about their learning, and their learning styles, and become increasingly self-directed in their learning. Digital portfolios such as ePEARL support evidence-based pedagogy "not only because they organize content, but also because they are designed to support a variety of evidence-based pedagogical processes and assessment purposes" (Meyer, Abrami, Wade, & Scherzer, 2011, p. 191).

Meyer, Abrami, Wade, Aslan, and Deault (2010) presented the findings of a year-long study conducted in three Canadian provinces during the 2007–2008 school year on grades 4-6. Compared with a control group, teaching with ePEARL has positive impacts on students' literacy and self-regulated learning skills when the tool is used regularly and integrated into classroom instruction. Among the lessons learned, it seems that the belief in the value of digital portfolios for authentic and meaningful learning and the will to implement are both important in its success. In relation to lessons learned, Meyer et al. (2011) found that teachers who were low implementers of digital portfolios experienced significant technical obstacles and/or were reluctant to change their established practices, whereas high implementers reported feeling supported by their administration, experiencing growth in their teaching practice, and using more pedagogical practices that support self-regulated learning as a result of the scaffolding provided by the software. Other studies of ePEARL in different settings found it effective in promoting self-regulated learning, feedback, communication, and student engagement (Upitis, Abrami, Brook, Troop, & Catalano, 2010).

Conditions and Challenges for Reporting Digital Portfolios to Stakeholders

With regard to the perspectives of students, teachers and parents on the use of digital portfolios, a design-based research by McLeod and Vasinda (2009) found that in general students, teachers, and parents attributed subjective satisfaction to the portfolio process. Students began thinking more deeply about the content and about themselves as learners while teachers obtained valuable insights into those thoughts. In addition, parents began to perceive the portfolios as a means of communicating their child's classroom learning, and connecting home and school more deeply. The research studies we have investigated in the above two sections also provide rational for using digital portfolios to achieve powerful learning and effective assessment. However, as Beloin (2015) has pointed out about the challenge with digital portfolio in the current system,

> If the theorists' and academics' recommendations regarding changing the reporting method are undertaken without changing the language regarding reporting in the current legislation, a dual system of reporting will be created. If a dual system exists, one method would be more valued by

> students and parents if it was the one that had historically been relied on for comparison, special honours or admission to universities and the other method would soon be ignored. (p. 33)

Digital portfolios grow from the concept of electronic portfolios or eP, for which Helen Barrett (2016) has created a website to address its diverse topics and provide ample evidence for its effectiveness in education and assessment. With prior research as a foundation, we are calling for putting the digital before eP, in other words, integrating the possibilities of sharing and networking into the original eP concept. Particularly, reporting via digital portfolios can enable the sharing and networking among teachers, students, peers, and public audiences, thus creating conditions for better learning (Hopper, Sanford, & Fu, 2016; Hopper, Sanford, Fu, & Monk, 2016). Although there can be other non-traditional approaches to assessing and reporting student learning with or without the help of digital technology, such as conferencing, pedagogical documentation, capstone projects, self and peer assessment, Character Growth Cards (Gregory, Cameron, & Davies, 2011; MacDonald, 2007; Petersen, 2016), we believe that digital portfolios have the potential to become the hub of all these alternative assessment approaches and the next step practice in meaningful and transformative lifelong learning.

Returning to the five basic aspects of the new B.C. curriculum, we provide the following brief analysis of the connection between the three Core Competencies of Communication, Creative and Critical Thinking, the Personal and Social and digital portfolios, both as an approach to learning and to assessment. The Communication competency enables the student to become an active part in the assessment process so as to "exchange information, experiences and ideas, to explore the world around them" (British Columbia Ministry of Education, 2018c, para. 1). The use of digital systems or platforms to facilitate self- and peer-assessment provides the chance "to understand and effectively engage in the use of digital media" (para. 1). Research evidence supports the findings that digital portfolios develop metacognitive and reflective abilities, which echo the Creative and Critical Thinking competency outlined in the B.C. curriculum (Karsenti et al., 2014; Masters, 2013, Strudler & Wetzel, 2011). Through the process of co-creating criteria or rubrics, making judgement of their own or their peer's work, and consequently endeavoring to improve their work, students "take subject-specific concepts and content and transform them into a new understanding" by "creative" and "critical" thinking (B.C. Ministry of Education, 2016b, para. 1). With regard to the Personal and Social competency, students are provided with powerful experiences of being an individual and a valued member of the society by creating their own digital learning profile. Specifically, the B.C. Ministry of Education (2018a) notes that students will increase their personal awareness and responsibilities by taking responsibility of their own learning and achievement goals and they show social responsibility by functioning in and contributing to a community of learners. As a result, they can gradually develop their positive personal and cultural identities that will enable them to understand and care about themselves and others and ultimately to thrive in society.

Conclusion

As education in B.C. adapts to the changing needs of modern society characterized by exponential growth in knowledge, multiple career paths, and rapid shifts in technology, traditional forms of assessment no longer serve the needs of our students. With technological innovations increasingly replacing jobs in both blue-collar and white-collar industries, we have to change how our assessment and reporting practices shape student learning and inform

parents and administrators in education. As we noted in the opening to this paper, Figure 5 returns to the same diagram that focuses on the purpose of reporting to different audiences to determine what and how to report student learning. In an elaboration on the original diagram, we focus on the capacity to share regular insights on student learning to parents with secured digital services. This process then supplies a repository of evidence that can be culled by students to represent summative endpoints in formative cycles of learning evidence that can be witnessed by diverse audiences, which might include practices such as exit interviews and public gallery presentations. These recursive processes of building summative endpoints to learning can then feed into a showcase type of digital portfolio that can complement grading systems, offering recursively evolving and rich contextual information to support, or in some cases replace, exam-based or teacher-based grading systems.

Creating one standard measure or reporting scale, as demonstrated in traditional report cards with a single or a combination of grades, is ill-suited to meet the challenges of the changing landscape of educational assessment. However, the systems of schooling have been set up with such a grading system in mind. Current research identifies the need to develop new systems that are anchored in competency or mastery-oriented and evidence-based learning. With the rapidly evolving digital technologies available in modern society as enablers, as well as innovative and emerging school and district level practices we have noted in British Columbia and encouraged by the new education curriculum, there is great potential to change and expand assessment, reporting and communication processes at all levels of the system. Such a process of renewing can create a system that will be more meaningful for learners and a range of stakeholders. In particular, digital portfolios offer a promising direction for creating new systems that complement existing ones in communicating student learning.

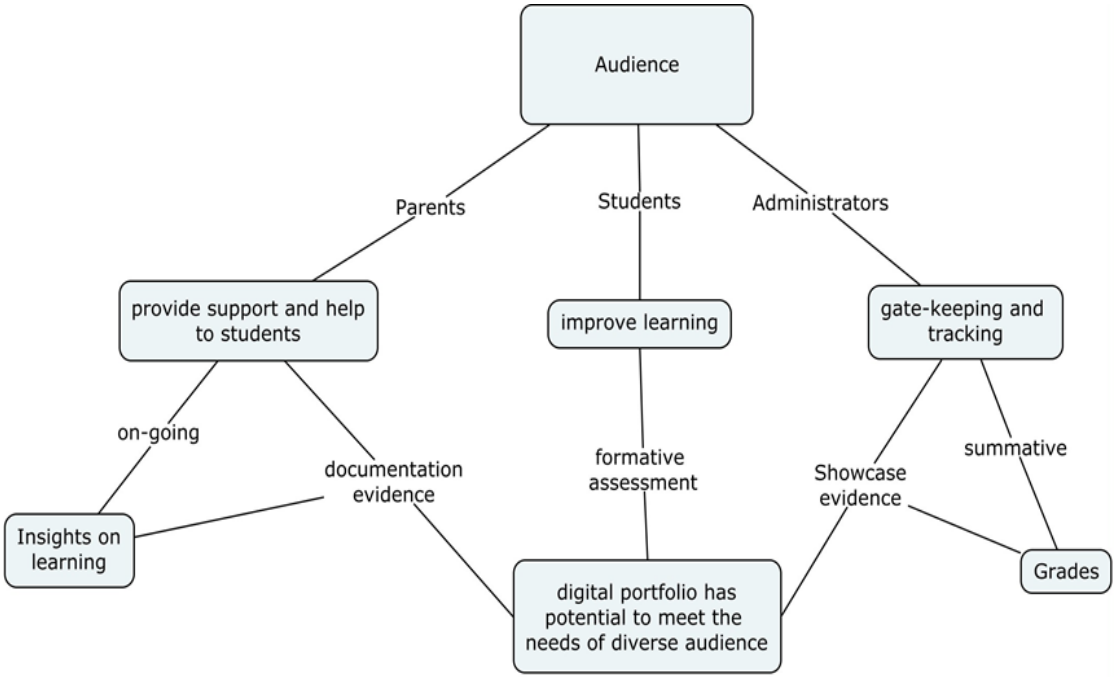


Figure 5. Elaborating on the Processes of Schools Communicating Student Learning

Implication for Policy

What we have reviewed in this document has persuasively pointed to the need for policy change and support with respect to assessment for learning and reporting to improve student learning. However, as noted by Gardner, Harlen, Hayward, and Stobart (2008), changes in assessment practice have been difficult to sustain for two reasons: 1) under-designed initiatives; and 2) a lack of principles and standards designed by stakeholder groups to guide those initiatives. Thus, "the innovative assessment being promoted may be no more than a reincarnation of practices that have waned over time, or a new way of carrying out established activities", such as portfolios and project work, which have often "struggled to maintain momentum" (Gardner et al., 2008, p. 3-4). Likewise, research supported initiatives often fail to make changes in classrooms due to inadequate planning of professional learning opportunities for teachers and dissemination of exemplars. Such professional learning would create the conditions for a shift from transmission to transformation approaches in learning and a focus on teachers and schools as change agents are vital elements in keeping changes in place (Assessment Reform Group, 2003; Mansell, James and Assessment Reform Group, 2009). The "fad" idea used to critique the launch of B.C.'s new curriculum is ever present to undermine educational innovations. However, what may appear to be a fad that then waned may simply have been a needed innovation before its time, before the conditions were right for it to be adopted. Perhaps, more importantly, stakeholders need to be made aware that although there is always the impending demand for evidence of students' achievements, often through summative and quantitative data, changes in assessment practices can only have a long-term effect on student learning outcomes when improvement in "student learning can be identified [in ways] other than by measurement of outcomes alone" (Gardner et al., 2008, p. 17).

The change in assessment and reporting practices has pivotal implications for teachers, and ultimately the whole system of education. Harlen and Deakin Crick (2002) elaborated on the evidence of the detrimental effects of high-stakes external tests on students and of the confusion between performances on tests as the reason for instruction as opposed to instruction for students' actual learning. As such it is our recommendation that tests or examinations be restructured as just a component of an array of teacher led formative and summative assessments developed for and with students. To ensure quality and consistency in summative assessment by teachers, there is a need for ongoing, connected and professionally coordinated skill development. Additionally, teachers need to ensure that their formative assessment practices are not distorted by the demands of summative assessment. This is a "challenging agenda" that requires "a more sophisticated infrastructure of guidance, training, support and cross-checking" to assure the quality we expect from our educational systems (Harlen & Deakin Crick, 2002, p. 15). Signs in B.C. are that teachers are taking up the challenge of assessment for learning but progress will be slow and at times contested. Nevertheless, if student learning is kept as the focus of assessment, then progress will be made.

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