What assessment knowledge and skills do initial teacher education programs address? A Western Canadian perspective

Cheryl-Anne Poth

University of Alberta

Teacher education programs play a crucial role in preparing teachers for their future assessment roles and responsibilities, yet many beginning teachers feel unprepared to assess their students' performances (Mertler, 2009). To address concerns related to the relevancy of pre-service assessment education, this study examined 57 syllabi from assessment courses offered by 14 Western Canadian teacher education programs. Content analysis revealed trends related to the scope and nature of assessment education in terms of intended learner outcomes, instructional topics, teaching mediums, and assessment strategies. Implications for informing how initial teacher education programs go about preparing pre-service teachers for their future assessment roles and responsibilities are discussed.

Les programmes de formation des enseignants jouent un rôle critique dans la préparation des enseignants face à leurs rôles et responsabilités relativement à l'évaluation. Il demeure, par contre, que plusieurs enseignants débutants se sentent pris au dépourvu face à l'évaluation de la performance de leurs étudiants (Mertler, 2009). Afin d'aborder des préoccupations liées à la pertinence de la formation à l'évaluation, cette étude a examiné 57 programmes de cours d'évaluation offerts dans le cadre de 14 programmes de formation des enseignants dans l'Ouest canadien. Une analyse du contenu a révélé des tendances liées à l'envergure et à la nature de l'éducation à l'évaluation, et portant sur les résultats d'apprentissage, les thèmes étudiés, les moyens d'enseignement et les stratégies d'évaluation. On discute des incidences de faire comprendre la préparation des enseignants face à leurs rôles et responsabilités relativement à l'évaluation.

Evidence of a shifting paradigm from a culture of testing to a culture of learning reflects the evolution of classroom assessment policies. This shift is occurring in response to the impact of formative practices on enhancing student learning and complementing more traditional summative assessments (i.e., graded assignments focused on measuring achievement) (Shepard, 2000). Classroom assessment practices involve collecting information on student achievement and performance using tasks designed to monitor and improve student learning (Alberta Assessment Consortium, 2009; Gipps, 1994). Among the current assessment practice shifts are tendencies toward more frequent and authentic assessments (i.e., assessments requiring the application of skills to real-life tasks). The importance of building assessment knowledge and skills that are aligned with current policies and practices during teacher education programs is heightened within this shifting culture because of this broadened view of assessment is integral

to the instructional process and its influence on student motivation (Wiliam, Lee, Harrison, & Black, 2004). Initial teacher education, in contrast to short-term professional learning opportunities for in-service teachers, refers to the undergraduate degree programs most pre-service teachers complete prior to leading their own classroom. These programs play a crucial role in preparing teachers for their classroom roles yet many beginning teachers feel generally unprepared to assess their students' performances (Mertler, 2009). Understanding the current state of pre-service assessment education provides an important first step to ensuring that beginning teachers are properly prepared to undertake their classroom assessment responsibilities.

Content analysis of assessment-focused course syllabi provides one way to gain an understanding of the instructional content and practices within an initial teacher education program. Course syllabi outline the intended experiences pre-service teachers receive because institutions often require their submission and approval as representative of the course teaching and learning environment. Thus, a content analysis of course syllabi provides information related to the scope and nature of what was taught and the learning environment experienced by those enrolled. To that end, this study examined 57 available syllabi from assessment courses offered by 14 Western Canadian teacher education programs. The purpose of this study was to assess the current state of pre-service assessment education in Western Canada by (1) reporting the extent to which assessment-focused courses were required and offered within teacher education programs, (2) examining the course syllabi within each of the existing assessment courses related to intended learner outcomes, instructional topics, teaching mediums, and assessment strategies, and (3) considering the overall relevance of pre-service assessment education offerings to current classroom assessment policies and practices.

The balance of the paper is organized in four sections. First, a review of the literature is presented followed by the study's methodology, including a description of the selection and retrieval of course syllabi and the processes involved in the content analysis. The integrated findings are then presented and discussed. The paper concludes with directions for further research and implications for pre-service assessment education that are relevant to the classrooms in which the students enrolled in undergraduate pre-service education programs, when they become teachers, will work.

Literature Review

The Role of Initial Teacher Education Programs

The effectiveness of initial teacher education programs in preparing teachers for their classroom assessment responsibilities continues to be a major concern for educational researchers. Research has found that completion of a pre-service assessment course has little effect on beginning teachers' classroom assessment practices (Campbell & Evans, 2000; Darling-Hammond & Bransford, 2005). Among the common reasons cited in the literature for this are the many inconsistencies among programs in terms of course offerings with a particular emphasis on a lack of common content (e.g., Stiggins, 1999; Volante & Fazio, 2007) and the challenges associated with teacher education reform (Cole, 2000). An additional concern is related to the continued use of a didactic teaching approach, focused on the transmission of knowledge. Such direct teaching does not provide access to the thinking behind the assessment decisions teachers are expected to make as part of their daily classroom practice (Mertler, 1999).

Two changes to pre-service assessment education have been suggested as having the strong potential to impact actual classroom practice: (a) greater alignment of the knowledge and skills developed within initial teacher education programs with current classroom realities (Alberta Education, 2009; Manitoba Education, Citizenship & Youth, 2006) and (b) a shift to a modeling-focused instructional approach whereby students experience the type of assessment practices as teachers they will be expected to implement (Goos & Moni, 2001; Volante, 2006). Few studies have examined the gaps in teacher education in regards to assessment training, yet of one study on the state of assessment training two decades ago did raise concerns and provide recommendations (Rogers, 1991). Thus, the present research is timely because the past two decades have seen major shifts in classroom assessment policy and practice as well as changes to the typical instructional environment within 21st century classrooms.

In his article, *Educational Assessment in Canada: Evolution or Extinction?* Rogers (1991) presented an analysis of the historical and then current situation of assessment training in Canada in the 1990s. Throughout his analysis, he examined the social context and the influence of pre-service teacher training and made recommendations for changing the focus of assessment to improve teacher preparedness. He highlighted the dominant view of assessment during the previous 20 or 30 years was testing in order to report accountability and was increasingly disconnected from teacher classroom practice. At the time, assessment practices had responded to social pressures and educational policy development that reflected a call for greater accountability. Accountability referred to the public reporting of scores and summaries of scores obtained from standardized summative instruments, which provided one score and informed policy development and implementation. A disconnect existed between policies being made and the actual classroom environment since one overarching score could not encapsulate student, teacher, school, or school board differences. Rogers argued that classroom assessment should be designed to support instruction and to take place within a lower-pressure environment (i.e., the everyday classroom as opposed to the higher-pressure environment typically experienced by students during standardized exams). This classroom assessment environment must reflect the use of a variety of methods appropriate for supporting, accurately measuring, and communicating in a timely manner students' progress towards achievement of course outcomes.

Rogers (1991) cited the findings of a study highlighting weaknesses in teacher education programs related to their lack of focus on what he called training in the content areas of measurement and evaluation, today considered assessment education. He called for a review of assessment education because an estimated 60-75% of graduates from Canadian teacher education programs were beginning their teaching careers without completing an educational assessment course. The study described the state of assessment training within the Canadian context in 1991 as inadequate and a "patchwork approach" (p. 187). Although his study made a valuable contribution by highlighting the inconsistencies among program offerings and the required completion of an assessment course, it was limited by its self-reporting methodology. Thirty-three Canadian teacher education programs had been asked to contribute descriptions of their measurement and evaluation component using an oral interview. Rogers's analysis was focused on whether a measurement course was offered and, if so, whether it was a program requirement. Missing from this study was greater detail related to instructional topics (i.e., what were considered day-to-day classroom issues at that time?) and the type of teaching environment created (i.e., was it discussion-based or didactic teaching?). Finally, had he confirmed his findings using an additional source (e.g., course outlines or an instructor), as recommended by researchers (e.g., Creswell, 2013), there would have been greater confidence

for his conclusions. Regardless of its methodological shortcomings, Rogers's (1991) study was important and served as a point of comparison for the results of the present content analysis of syllabi content. By comparing this results of this study to Rogers's, we can gauge the extent to which Western Canadian initial teacher education programs have evolved during the past two decades in terms of program offerings and requirements. Furthermore this study extends Rogers's work by examining instructional topics taught and approaches to teaching.

In a more recent study examining the general state of assessment practices within both K-12 and post-secondary classrooms, one Western Canadian province identified several challenges to maintaining relevance between policy and classroom practice within initial teacher education programs (Alberta Education, 2009). Among the key challenges named were inconsistent faculty knowledge and understanding of assessment practices and pre-service teachers' observing good assessment practices during their practicums while experiencing outdated assessment practices within their initial teacher education programs or vice-versa. This study, which captured the perspectives of parents, teachers, administrators, and students, called for greater consistency across initial teacher education programs and for the modeling of appropriate assessment practices by university faculty members. A key recommendation was the implementation of a new instructional approach where assessment was to be "an explicitly taught, practice-oriented component of teacher education programs" (p. 146). However, lacking in this report was a practical direction related to how this recommendation might be enacted–a shortcoming the present study will address. The need for actionable guidance is especially concerning given that the province had previously published a document whose purpose had been to "clearly articulate the student assessment knowledge, skills and attributes expected under the Teaching Quality Standard Ministerial Order of applicants for Alberta interim professional teacher certification" (Alberta Education, 2006, p. i). Clearly, there remained a need to highlight the core content and instructional experiences pre-service teachers required in a manner easily applied across teacher education programs.

Educational Assessment Policy in Western Canada

The Western and Northern Canadian Protocol for Collaboration in Education's (WNCPCE) publication, *Rethinking Classroom Assessment with Purpose in Mind*, served as an essential classroom assessment resource for Western Canadian educators (Manitoba Education, Citizenship & Youth, 2006). As an outcome of a collaborative endeavor between the provinces of Alberta, British Columbia, Manitoba, and Saskatchewan, as well as the Northwest Territories, Nunavut, and Yukon, the publication represented a shared perspective on the influential role of classroom assessment practices: "[T]he power of assessment for student learning" (see Manitoba Education, Citizenship & Youth, 2006, p. viii for further information). The WNCPCE publication provided practical information to guide classroom assessment practice in Western Canada for its intended audience-classroom teachers.

By providing background evidence grounded in the assessment literature and a reflective framework to guide professional learning, the WNCPCE publication aimed to support the development of professional judgment to inform assessment decisions. In so doing, teachers were encouraged to consider why, when, and how they might assess throughout the instructional process. The background outlined the evolution of historical and social assessment-related issues and the societal expectations of 21st century skills that schools were responsible for developing in their students. It then connected learning and motivation theories

with assessment policy and practices. The resulting shift to a culture of learning was emphasized as classroom assessment was understood as integral to the non-linear and iterative instructional process (Shepard, 2000). This view of assessment directly contrasted past linear conceptions where teachers first instructed, assessed their students on what they had taught, made judgments about students' achievement, and then taught subsequent content (Murtagh & Baker, 2009).

Increased student motivation provided a strong rationale for deliberately using assessment to support learning in addition to using assessment just for measuring learning (Hargreaves, 2005; Wiliam, Lee, Harrison, & Black, 2004). Thus, the purpose of assessment has broadened beyond assessment *of* learning (i.e., summative) to assessment *for* learning and *as* learning (i.e., formative). Formative assessments are used to assess and then communicate to students the extent to which they have attained curricular expectations during instruction. This information is then shared with the students' parents and other relevant parties (i.e., principals). In contrast, summative assessments are used to determine what students know and have learned after an instructional segment. This information is subsequently communicated to students, their parents and other relevant parties. If the WNCPCE document is to influence actual classroom practice, then initial teacher education programs must introduce the document and support its efforts by teaching the assessment-focused knowledge and skills required for developing the professional judgment needed to inform assessment decisions.

Where the publication is limited in its usefulness is in guiding teacher application of the four measurement principles described as important for quality assessment practice: reliability, reference point, validity, and record keeping. Although it introduced these concepts accurately, it did not provide teachers with adequate guidance in how these principles would be applied in practice. For example, the description of reliability focused on how reliability was increased with the use of diverse assessment strategies and teacher collaborative practices; yet it provided no description for how teachers might collaborate to improve reliability. In addition, there is no reference to the *Principles for Fair Student Assessment Practices for Education in Canada* (Joint Advisory Committee, 1993), an earlier document that provided practical guidance related to assessment practices and reflected the collaboration of cross-nation educational stakeholders. As classroom assessment policies and practices have shifted, it would seem fitting that initial teacher education programs would reflect developing the knowledge and skills necessary for beginning teachers. Comparing the results of the present content analysis of syllabi with the WNCPCE publication provides insight into the extent to which Western Canadian initial teacher education programs are preparing teachers for their current assessment roles and responsibilities.

Methods

To examine the relevancy of pre-service assessment education, this study examined 57 syllabi from assessment courses offered at 14 Western Canadian teacher education programs. Content analysis was used to examine the scope and nature of pre-service assessment education across four components: intended learner outcomes, instructional topics, teaching mediums, and assessment strategies. Content analysis has been previously applied across a number of educational contexts (e.g., Chin et al., 2007; Donnelly, 2001) for generating understandings related to course content. For example, the identification of knowledge and skills within auditing and e-commerce courses in business schools (e.g., American Accounting Association,

2003; Rezaee, Lambert, & Ken, 2006). The present study was undertaken in two sequential phases: (a) the data collection phase, which involved in the selection and retrieval of the educational assessment course syllabi, and (b) the content analysis phase, which involved the coding development, validation, and application processes.

Data Collection Phase

The selection of the course syllabi involved searching 23 Western Canadian teacher education programs' websites. The websites were search for programs offering courses related to educational assessment using the key words *classroom assessment* and *student evaluation* in fall 2010. The search revealed 21 teacher education programs offering assessment courses, of which 19 required students to complete an assessment course. The remaining two programs' assessment courses were optional (see Figure 1). As topics related to assessment are often included within curriculum-focused courses, the same keyword search within the 21 programs revealed course descriptions for 63 content courses that included an assessment focus. For a course syllabus to be included in the present study, the description needed to reflect the intent to have students gain knowledge and/or build skills related to assessment. For example, an intended course outcome could be: students will learn to select appropriate assessment processes and instruments to evaluate the academic, social, and emotional abilities/needs of the children/adolescents in their classrooms and to plan to evaluate instruction.

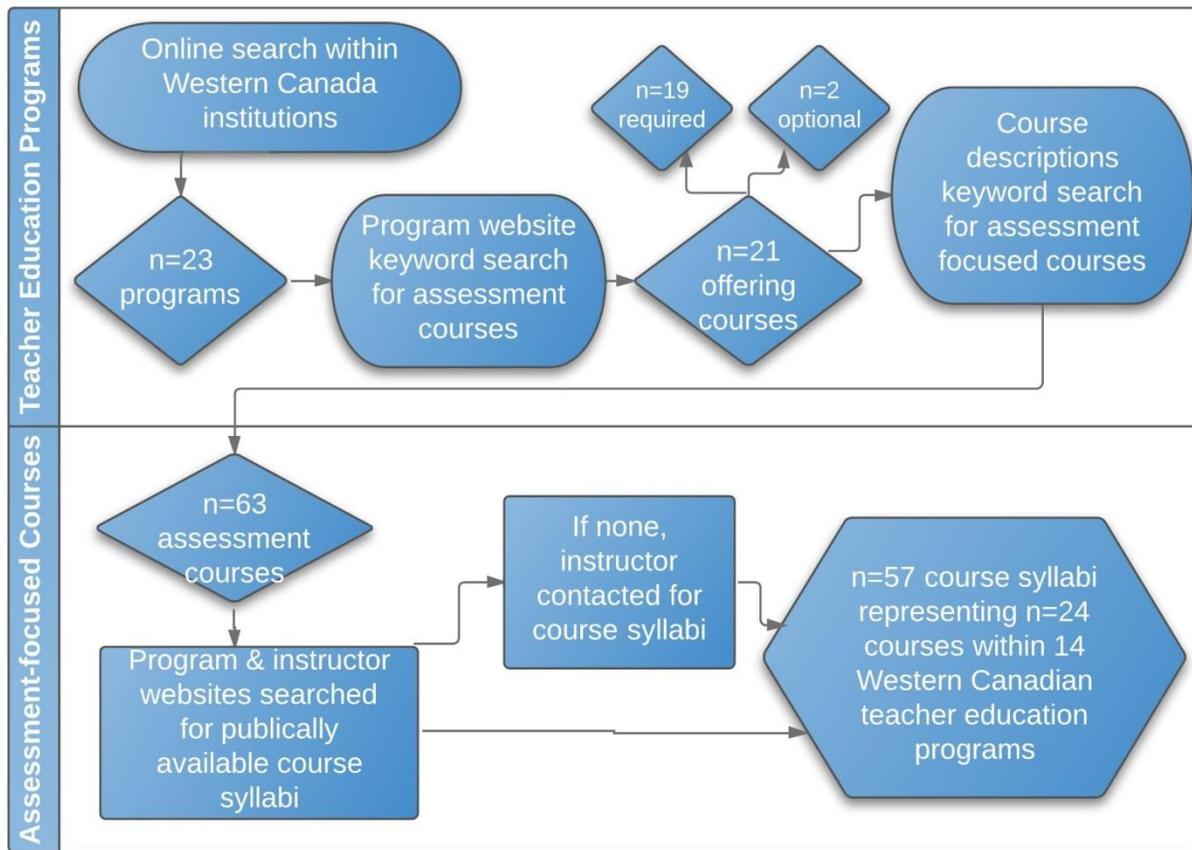To retrieve a copy of each course syllabus the program website was searched and, if the

Figure 1. Data collection summary of the procedures involved in the selection and retrieval of assessment course syllabi.

syllabus was not found, the instructor's website was searched (from the list of current course offerings). If the syllabus was not publically available an email was sent to either the instructor or to a primary contact listed on the program website. The email explained the purposes of the present study and requested a copy of the course syllabus. If there was no response within two weeks, a follow-up email was sent to the same email address in addition to an email directed to an alternate instructor or administrative personnel. If there was no response within two weeks, a follow-up phone call was placed. A total of 57[1] educational assessment-related course syllabi were retrieved, representing 24 different assessment course numbers offered within 14[2] Western Canadian teacher education programs (see Appendix A).

The decision to focus on programs, rather than courses, as the unit of analysis presented implications for programs offering more than one assessment course. When multiple syllabi were found with the same course code coordination of the same course was assessed and one outline was used to represent the course. When multiple assessment-focused courses (with different course codes) were offered within a program, all syllabi were taken into account by looking for similarities and differences to develop a program profile of the course. In these cases, a common course syllabus was generated independently by two researchers. When differences were found between the two course descriptions, a third researcher was consulted until consensus was reached. All course syllabi were then uploaded into Atlas-ti for analysis.

Content Analysis Phase

An inductive process involving a sample of four course syllabi representing each of the Western provinces was used to generate an initial set of codes (see Figure 2). Two researchers independently examined the four syllabi in an effort to generate common code lists for four components: intended learner outcomes, instructional topics, teaching mediums, and assessment strategies. Each of the researchers looked for common as well as unique elements across the four syllabi and compiled a list of codes that were common to at least two of the syllabi. For each code, each researcher developed a description (i.e., definition) to guide its subsequent application. Once these codes and descriptions were completed, the researchers assessed the similarities and differences between their lists of initial codes and descriptions. When differences were revealed, consensus was sought through discussion and code definitions were modified. Finally, a third researcher (the author) applied the code list and definitions to the one of the course syllabi in the initial sample. All discrepancies were addressed and the revised coding scheme was then applied to three additional course syllabi. When 95% inter-coder reliability was reached, code lists were finalized and used to analyze the remaining syllabi.

The application of the code lists revealed patterns across the course syllabi. To examine these patterns, tracking tables were created. These tables served as a means of tracking the frequency of codes within a single syllabus as well as, if applicable, across multiple syllabi of the same course and by programs to allow comparisons to be made. Throughout the iterative analysis process, the researchers used memos to document emerging insights and evolving understandings of the patterns. In the literature, memos are described as written comments that document the researcher's thoughts about the data analysis (Maietta, 2006) and have long been identified as a useful analysis technique (e.g., Creswell, 2013; Miles & Huberman, 1994; Strauss & Corbin, 1990). Once the coding was completed, the researchers generated categories, guided by the literature, from the codes for each of the four components that guided the interpretation of data patterns. For example, the intended learner outcomes codes were categorized according
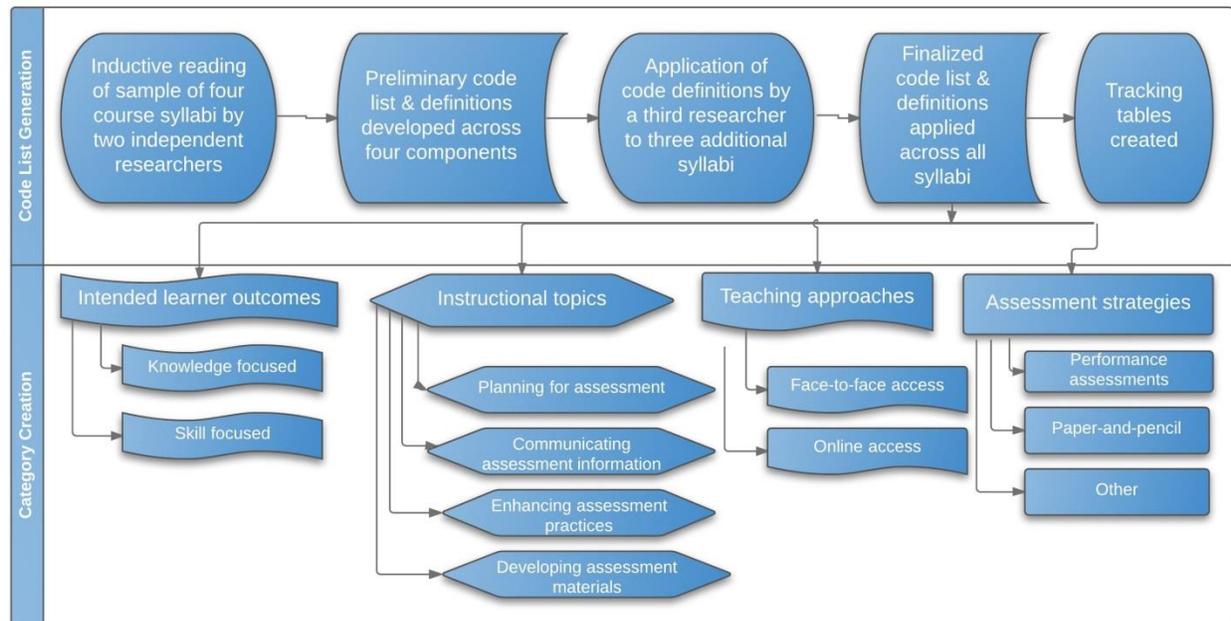
Figure 2. Content analysis summary of the coding development, validation, and application processes.

to their focus as either foundational knowledge or skills application. These two categories were related to lower- and higher-ordered cognitive thinking, respectively, and their development was guided by the revised Bloom's taxonomy (Overbaugh & Schultz, n.d.). The rationale for use of Bloom's taxonomy is provided within the following sections, as is the guiding literature for the categories for the other three components.

Results and Discussion

The content analysis of the available course syllabi revealed patterns related to the scope and nature of intended learner outcomes, instructional topics, teaching mediums, and assessment strategies. Each of these topics is presented below in four sections, with the results for each section summarized in an accompanying table. Overall, it was encouraging that the majority of Western Canadian-trained teachers begin their teaching career having had some level of assessment education as 12 of the 14 programs in this study required completion of at least one educational assessment course. Mandating an assessment course within a teacher education program represented a dramatic shift from the requirements two decades ago as Rogers (1991) program review found that the completion of an educational assessment course in most programs was not required.

Intended Learner Outcomes

The analysis revealed an equal distribution of intended learner outcomes common across all 14 programs between two categories: foundational knowledge and skills application (see Table 1). The categories were differentiated by the cognitive level of thinking required by learner outcomes as either providing opportunities for building foundational knowledge or applying the necessary skills within the revised Bloom's taxonomy (Overbaugh & Schultz, n.d.). The use of Bloom's taxonomy was appropriate because it has long been used as a framework for

formulating course objectives within post-secondary education (Fink, 2003). Foundational, knowledge-focused learner outcomes involved what are considered to be *lower-ordered* cognitive levels, such as remembering assessment knowledge (i.e., recalling information) or being able to demonstrate understanding of assessment ideas (i.e., explaining concepts). An example within this study was learning about the document *Principles for Fair Student Assessment Practices for Education in Canada* (Joint Advisory Committee, 1993). In contrast, skills application-focused learner outcomes involved what are considered to be *higher-ordered* cognitive levels such as applying information in new ways, analyzing assessment strategies (i.e., distinguishing among them), evaluating assessment methods (i.e., aligning the most appropriate assessment method(s) with a learner outcome), and creating assessment materials (i.e., developing a scoring rubric). An example within this study was applying the knowledge of the *Principles for Fair Student Assessment Practices for Education in Canada* to the process of developing appropriate classroom assessment materials. The two-category pattern reflected two important aspects for assessment education, discussed below: scaffolding foundational knowledge and skills application and developing relevant skills for classroom assessment responsibilities.

Scaffolding foundational knowledge and skills application. The majority of programs reflected an approach to instructional scaffolding, meaning a connectedness between learner outcomes that were focused on acquiring foundational knowledge and learner outcomes

Table 1

Scope and Nature of the Intended Learner Outcomes in Assessment Courses Across Western Canadian Teacher Education Programs (n=14)

Category	Codes Related to Intended Learner Outcomes	Frequency	Percentage*
Foundational knowledge	Introduce a variety of assessment strategies	10	71.4
	Role of assessment as embedded within the instructional process	9	64.3
	Explore multiple purposes of classroom assessment	8	57.1
	Discuss innovative/authentic assessment approaches	6	42.9
	Introduce the *Principles for Fair Student Assessment Practices for Education in Canada* (1993)	5	35.7
	Introduce issues related to measurement	4	28.6
Skills application	Develop appropriate classroom assessment materials	10	71.4
	Develop communicating skills for reporting achievement	8	57.1
	Evaluate the quality of an assessment strategy	7	50.0
	Develop interpreting skills for inferring the measurement of learning	4	28.6
	Develop high quality instruments for scoring	4	28.6
	Prepare for field experiences	2	14.3

* More than one description specified per program.

that were focused on developing skills. Evidence of instructional scaffolding was all six foundational, knowledge-focused learner outcomes contributed to developing appropriate classroom assessment materials, meaning the pre-service teacher must be knowledgeable about the *Principles for Fair Student Assessment Practices for Education in Canada* (Joint Advisory Committee, 1993) as well as the assessment strategies, innovative approaches, multiple purposes, measurement issues, and role of assessment as embedded within the instructional process. Thus, it was desirable within introductory courses for the foundational, knowledge-focused learner outcomes to provide scaffolding for the more advanced learning involved in the skills application-focused learner outcomes (Murtagh & Webster, 2010). This scaffolding related to learning outcomes was necessary because participation in the higher-ordered thinking tasks (i.e., applying, analyzing, evaluating, creating) was predicated on being successful in the lower-ordered thinking tasks (i.e., remembering, understanding). These findings indicated that even though inconsistencies remained among programs with respect to the foundational knowledge and skills that were being taught, there was some evidence of scaffolding efforts.

Developing relevant skills for classroom assessment responsibilities. The majority of programs reflected development of knowledge and skills relevant to fulfilling a teacher's classroom assessment roles and responsibilities. Evidence of some level of relevance was that the most frequently found foundational knowledge-focused learner outcomes across programs was the introduction of assessment strategies (71% of programs) and the integration of assessment as embedded within the instructional process (64%). The most frequently found skills application-focused learner outcomes was the development of classroom assessment materials (71%) and reporting achievement (57%). The two most frequently found foundation and knowledge skills provided the understandings and skills pre-service teachers needed to develop to meet the professional standards of their province. For example, among the knowledge, skills, and attributes required by teachers within the province of Alberta, as outlined in the *Teaching Quality Standard Applicable to the Provision of Basic Education* (Alberta Government, 1997), were planning, interpreting, and reporting activities related to assessment. Although some findings were encouraging, others were concerning as only a minority of programs addressed the need for teachers to build skills related to developing instruments, scoring, and interpreting and communicating results (28.6%).

The lack of a consistent focus on scoring, interpreting, and communicating was especially concerning given that teachers were expected to apply assessment knowledge to develop/select, administer, score, interpret, and communicate information to multiple audiences, as evidenced by the following quote: "When teachers use classroom assessment to become aware of the knowledge, skills, and beliefs that their students bring to a learning task, use this knowledge as a starting point for new instruction, and monitor students' changing perceptions as instruction proceeds, classroom assessment promotes learning" (Manitoba Education, Citizenship & Youth, 2006, p. 5). Instructionally scaffolded learner outcomes and a focus on relevant skills were, therefore, not only desirable, but essential. Pre-service teachers require opportunities to apply their knowledge and develop skills to prepare them for their future classroom assessment roles and responsibilities. What remains to be further considered are the types of mechanisms that maintain alignment with the knowledge and skills needed by teachers in their dynamic classrooms and are responsive to emerging innovative classroom policies and practices (Poth, 2011).

Instructional Topics

Three categories related to instructional topics emerged from the content analysis of the syllabi for all 14 programs: planning for assessment, developing assessment materials, and communicating assessment information. A fourth category, enhancing assessment practices, was represented across 11 of the 14 programs (see Table 2). The first three categories were adapted from the three processes (i.e., planning, coaching, and judging and reporting) outlined by the Alberta Assessment Consortium (2012). The categories were differentiated based on the intended use of the understandings generated by each instructional topic. For example, topics related to report cards, calculating grades, portfolios, rubrics, conferences/interviews, and

Table 2

Scope and Nature of Instructional Topics in Assessment Courses Across Western Canadian Teacher Education Programs (n=14)

Category	Codes Related to Instructional Topics	Frequency	Percentage*
Planning for assessment	Identifying assessment purposes	14	100
	Measuring achievement	14	100
	Supporting learning	9	64.3
	Enhancing instruction	3	21.4
	Aligning assessment with instruction	11	78.6
	Principles for Fair Student Assessment Practices for Education in Canada (1993)	8	57.1
	Measurement issues	8	57.1
	Aligning assessment with curriculum	7	50.0
Developing assessment materials	Pencil-and-paper tests	13	92.8
	Selected response items	12	85.7
	Constructed response items	7	50.0
	Performance assessments	13	92.9
	Observational checklists	5	35.7
	Peer assessment	4	28.6
	Self assessment	2	14.3
Communicating assessment information	Report cards	13	92.8
	Calculating grades	12	85.7
	Portfolios	10	71.4
	Rubrics	10	71.4
	Conferences/interviews	7	50.0
	Writing comments	2	14.3
Enhancing assessment practices	Item analysis	10	71.4
	Assessment issues	6	42.9
	Differentiated assessment	5	35.7
	Misuse of assessment information and results	3	21.4

*More than one topic specified per program.

written comments all contributed to the overall process of communicating assessment information. The fourth category was related to the process of revising assessments in response to changing classroom contexts. The patterns revealed within each of the categories are presented and discussed in the sections below.

Planning for assessment within an interactive instructional process. The only topic present across all 14 program syllabi within the category of planning for assessment was related to identifying the purposes of assessment. While it was not surprising that the purpose for assessing students' knowledge and skills was found in all syllabi (i.e., measuring achievement), only two-thirds of the program syllabi specified that the purpose of assessment was to support learning (64%). These findings reflected that many programs have embraced the well-established, broadened view of assessment beyond a focus on measuring student achievement to include a focus on supporting learning (e.g., British Columbia Teacher's Federation, 2009; Earl, 2003; Manitoba Education, Citizenship & Youth, 2006; Popham, 2008) and provided somewhat of a contrast to Rogers (1991). There was little recognition that assessment could be used to enhance instruction as less than a quarter of the syllabi specified that one purpose of assessment was to enhance instruction (21%). In addition to instructing future teachers theory guiding the *how* of assessment, students must also have access to observing how assessment results are used to alter instruction practices by working teachers, thereby increasing student learning. Thus in addition to assessment for the purposes of measuring achievement and supporting learning, the idea that the instructional process can be informed by assessment information also needs to be embraced.

More than three-quarters of the course syllabi specified the need to align assessment with instruction and half of the course syllabi specified the need to align assessment with the curriculum. The difference between the two percentages may have to do with the way the authors of the syllabi viewed instruction and curriculum. Some authors may have understood instruction and curriculum as separate entities while others saw them as merged. Taken together, these results suggested congruence with the WNCPCE : "Curriculum, assessment, instruction, and learning are interconnected and interact in an iterative and sometimes (but not always) cyclical process. All four parts need to be coherently aligned for the learning to be effective and meaningful" (Manitoba Education, Citizenship & Youth, 2006, p. 15). Only when assessment is aligned with both instruction and curriculum, can assessment results and information be accurately interpreted, thereby meeting one of the aspects of validity outlined in the WNCPCE document: "having a good match among the assessment approaches, the intended learning, and the decisions that teachers and students make about the learning" (Manitoba Education, Citizenship & Youth, 2006, p. 11). This notion was also reflected by Rogers's (1991) suggestion that aligning assessment with instruction was assisted by decisions related to assessment purposes and uses. Therefore, it is essential that pre-service teachers consistently receive instruction and experience teaching reflects the alignment between curriculum, instruction, and assessment if they are to appropriately undertake teachers' professional responsibility to accurately interpret students' assessment results.

An additional element requiring professional judgments involved applying the *Principles for Fair Student Assessment Practices for Education in Canada* (Joint Advisory Committee, 1993) and addressing measurement issues in an effort to enhance the reliability and validity of assessments. Yet, although the WNCPCE publication required teachers to apply sound judgments in their work, just over half of the programs list instructional topics related to either fair assessment or issues in measurement. Indeed, the WNCPCE protocol stated: "Classroom

assessment involves complex processes requiring teachers' professional judgment. Teachers decide how to assess, what to assess, and when to assess" (Manitoba Education, Citizenship & Youth, 2006, p.15). One aspect requiring consideration was the pressing need for pre-service teachers to have access to the types of decisions that inform the professional judgments they will make related to planning for assessment

Developing a variety of appropriate summative assessment materials. The most common instructional topics related to developing summative assessment materials were creating paper-and-pencil exams and performance assessments (93% each). Three other assessment methods or strategies were found in some, but not all, of the course syllabi: observational checklists, peer assessment, and self assessment. The focus on creating performance assessment along with observational checklists (35%) suggested an increased focus on more authentic assessments reflective of real-life tasks. However this interpretation was limited by our coding definition of performance assessments as we did not differentiate between types of performance assessment. Indeed, while there is general agreement that assessment methods should accurately allow students to demonstrate what they know (Stiggins, 2008) there remains an ongoing discussion whether all performance assessments must be authentic and vice versa. In the present study, we operationally defined performance assessment as demonstrating skills intended to be measured by doing real-world tasks.

The analysis revealed a curious imbalance related to the type of assessment methods taught. The majority of the programs (86%) covered topics related to the development of selected response items (i.e., multiple choice) but only half of the programs cover topics related to the development of constructed response items (i.e., short or long answer). This is especially noteworthy given that constructed response items can be considered performance assessments, whereas selected response items are generally not. The use of various types of assessment methods was aligned with the WNCPCE: "In order to fulfill these two purposes, educators extended their assessment practices and began assessing a wider range of student work, such as practical tasks, coursework, projects and presentation" (Manitoba Education, Citizenship & Youth, 2006, p. 4). What remains to be investigated is the types of selected and constructed items that are being taught and the level of thinking or cognitive processing required to formulate a response. Twenty years ago, Rogers (1991) pointed out that the focus was on lower-ordered thinking and therefore "their [teachers'] tests provide little indication of the attainment of higher-ordered cognitive knowledge and processes" (p. 182). Selected response is usually considered to require lower-ordered thinking, whereas constructed response is usually considered to require higher-ordered thinking.

Only about a quarter of the programs (29%) reported topics related to developing peer-assessment, with even fewer programs (14%) reporting inclusion of self-assessment as an instructional topic. Although peer- and self-assessment can be used formatively during instruction and summatively after instruction, their use is generally associated with formative purposes (Boud, Cohen, & Sampson, 1999; Dysthe, 2008). Further, what did not emerge in the content analysis of the 14 syllabi was the development and use of assessment for formative purposes as well as for summative purposes. Thus, the lower frequency of teaching peer- and self-assessment and the use of observations may be influenced more by the use of assessment for summative purposes and the failure to recognize the *continual, ongoing* assessment that occur during instruction. Consequently, pre-service teachers likely were not receiving instruction related to developing assessment strategies to be used formatively (i.e., solely for supporting learning and enhancing instruction). Further, Rogers (1991) found that "while

teachers appear to value classroom assessment as an instructional tool and feel assessments benefit their students, the formative purpose gives way to summative purposes with increasing grade" (p. 182). The inclusion of topics related to developing formative assessment strategies, in addition to summative assessment strategies across programs, is especially important. This is because of the emphasis on promoting student involvement and the literature that points to the positive impact of formative assessment as a way to support the progression and development of knowledge and skills over time–or continuous learning (Black & Wiliam, 1998; Manitoba Education, Citizenship & Youth, 2006).

Communicating summative assessment information. Report cards were the most common (93%) communication strategy taught to pre-service teachers. Other modes of communication were specified in at least 70% of the course syllabi. Reporting achievement using report cards is often limited by predetermined schedules rather than being responsive to students' learning progression: "Traditional reporting, which relies only on a student's average score, provides little information about that student's skill development or knowledge" (Manitoba Education, Citizenship & Youth, 2006, p. 60). The second most common topic was course grades (85.7%). These were most often reported in a report card. Only two course syllabi included comment writing as a topic to be presented to the pre-service teachers even though most report cards contain a space for teachers to enter written comments, although some only require choice from a provided list. The lack of instruction on comment writing is particularly disconcerting because high quality feedback has been found to play an important role in supporting learning by pointing to strengths and areas for improvement (Higgins, Hartley, & Skelton, 2002; Peterson & Irving, 2008). The finding that only half of the course syllabi identified conferences and/or interviews (50%) may be attributable to the observation that conferences/interviews are more prevalent at the elementary school level than at the secondary school level. What remains to be further investigated is what guidelines are taught for conducting conferences that involve parents and/or students because the most crucial part of communicating student learning is to ensure a shared understanding: "Assessment, evaluation and communication of student achievement and growth are essential parts of the teaching and learning process." (Manitoba Education, Citizenship & Youth, 2006: viii). Lastly, the inclusion of both portfolios and rubrics as instructional topics in many of the programs (71.4%) was encouraging because it suggested efforts to increase the transparency and frequency of assessment-related communication between students, parents, and teachers (Alberta Government, 1997; Manitoba Education, Citizenship & Youth, 2006).

Enhancing assessment practices through use of assessment results. The most frequent topic for enhancing assessment practices across programs was item analysis (71%). Item analysis is a very specific skill related to assessing the psychometric properties of items. Items that work well and items that work less well can be identified and used when developing future assessments. Being able to assess and reflect on their assessment methods is a critical skill for all teachers to develop because as their students change so should their assessment practices.

Given the strong potential for enhancing practice through engaging in review and reflection, the second most frequent topic was assessment issues (43%). Among the specific assessment issues highlighted across programs were differentiated assessment (35%) and misuse of assessment results and information (21%). These findings are important given that teachers must be able to respond to diverse students needs within their classrooms:

> Many jurisdictions have moved toward differentiated instruction—from the one-size-fits-all emphasis on the whole class to identify the unique learning patterns for each student, using various instructional approaches to accommodate the range of learning patterns and styles, including designing instruction for students with various learning challenges and disabilities. (Manitoba Education, Citizenship & Youth, 2006, p. 7)

Differentiated instruction, intended to meet the needs of students in today's classrooms, may require differentiated assessments reflective of Tomlinson's (1999) model. However, the fact that differentiated assessment was a topic on only about a third of the syllabi suggested that many pre-service teachers would be unprepared to meet the variety of student needs when teaching. This lack needs to be concretely addressed to better equip future teachers.

Likewise, while the topic of the misuse of assessment results and information was found in only 3 of the 14 course syllabi, such misuse does occur, as witnessed by the need for such documents as the *Principles of Fair Student Assessment Practices for Education in Canada* (Joint Advisory Committee, 1993) and the forthcoming *Classroom Assessment Standards* (Joint Committee on Standards for Educational Evaluation, n.d.). Instructors of assessment courses for pre-service teachers should discuss and provide examples of how assessment results and information are misused and how this misuse can be avoided.

Teaching Mediums

The analysis revealed two categories related to how pre-service teachers enrolled in assessment courses acquired the knowledge and skills outlined in the course syllabi: face-to-face interaction and computer-mediated interaction (see Table 3). With the exception of two programs, face-to-face and computer-mediated interactions were used in tandem. In-class lectures were complemented with small group discussions/activities (64%), guest speakers (57%), and oral student presentations (43%). In addition, instructor office hours were provided for 10 of the 14 (71%) programs. The low use of small group discussions/activities and student presentations suggested that instructor-led interactions remained the prevalent teaching approach across programs rather than the student-centered instruction encouraged by most contemporary educational policies (Manitoba Education, Citizenship & Youth, 2006). However, it must be kept in mind that large class sizes in these pre-service programs may explain the less frequent use of student-centered instruction.

Complementary use of computer-mediated interactions. As indicated above, all but two of the programs involved the use of computers. Instructors tended to use computer-mediated interactions to complement face-to-face instruction. Email was used in 12 of the programs, lecture resources were provided online for eight programs, assignment examples were provided online for two programs, and an online discussion board was provided online for four programs. Other than the use email, the reported use of computers and online resources for teaching was low, yet today's students are quite familiar with computers and their applications. For example, instructors' failure to use discussion boards, which are similar to social media approaches (e.g., Facebook and Twitter), suggested lost computer-supported learning opportunities that would allow class members to participate in coursework on demand (i.e., wherever and whenever). Such learning networks have been found to improve traditional ways of teaching and learning by "opening up entirely new avenues of communication, collaboration, and knowledge-building" (Harasim, Hiltz, Teles, & Turoff, 1995, p. xi). These findings suggested

Table 3

Scope and Nature of the Teaching Mediums in Assessment Courses Across Western Canadian Teacher Education Programs (n=14)

Category	Codes Related to Teaching Mediums	Frequency	Percentage*
Face-to-face interaction	In-class lectures	14	100
	Small group discussions/activities	9	64.3
	Guest speakers	8	57.1
	Oral presentations by students	6	42.9
	Instructor office hours	10	71.4
Computer-mediated interaction	Email (with instructor)	12	85.7
	Lecture resources	8	57.1
	Assignment examples	2	14.3
	Discussion board (with class)	4	28.6

*More than one basis for course structure specified.

that technology's potential as a platform for modeling the type of computer-mediated interactions teachers are expected to use with both students and parents in 21st century classrooms remained untapped.

Potential impact of class size on teaching medium. Programs that employed online group interactions were less likely to employ face-to-face small group discussions and activities within the lecture. As indicated earlier, further examination of the influence of class size on the teaching approaches is required, particularly in light that post-secondary institutions are encouraging, if not mandating, large classes (> 75 students) as a cost-effective means for instructing a large number of students (Guder, Malliaris & Jalilvand, 2009; Clark, Trick, & Van Loom, 2011). Among the challenges reported by both students and instructors concerning large classes was the decreased frequency of individual student-teacher interactions compared with smaller-sized classes (Mulryan-Kyne, 2010). If large classes are used for assessment education, then greater use of small group activities within the lectures and computer-mediated learning networks may compensate for the reduced instructor-student interaction.

Assessment Strategies

The analysis indicated that whereas assessment strategies associated with summative assessments that contributed to their course grade were listed on the course syllabi assessment strategies typically associated with formative assessments were not. This finding was disturbing in that formative assessments were supposedly in regular use by teachers in their classrooms. The strategies associated with the summative purpose were represented in three categories: performance assessment (i.e., requiring the performance of a skill), paper-and-pencil assessment (i.e., written exam involving either or both selected and constructed items) and other (i.e., strategies that did not fit into the other two) (See Table 4). Specifically, two trends emerged: the widespread use of performance assessments and the misuse of assessment strategies for summative purposes.

Table 4

Scope and Nature of Summative Assessment Strategies in Assessment Courses Across Western Canadian Teacher Education Programs (n=14)

Category	Codes Related to Summative Assessment Strategies	Frequency	Percentage*
Performance Assessments	Reflection	9	64.3
	Selected and constructed items	7	50.0
	Rubric construction	6	42.9
	Oral presentation	6	42.9
Paper-and-pencil assessments	Test during term	6	42.9
	Final exam	7	50.0
	Quiz	5	35.7
Other assessments	Attendance	5	35.7
	Participation	5	35.7
	Peer Assessment	2	14.3

*More than one basis for assessing students' performance specified.

Widespread use of performance assessments. Many programs required the completion of a performance assessment whereas it was less common to embed paper-and-pencil tests (43%) and quizzes (35.7%) during the term. The most type of common performance assessment was a written reflection (65%) followed by the creation of selected and constructed items (50%). Only half included a written final exam (50%). Less common performance tasks included developing a scoring rubric and making an oral presentation (43% each). The finding that performance assessments were used along with traditional exams reflected current classroom policies and may encourage their use by teachers in their own classrooms: "Alternative assessment techniques have been part of the educational landscape for several decades, and, although many of them seem to have been adopted, significant changes in classroom assessment purpose have not been evident" (Manitoba Education, Citizenship & Youth, 2006, p 70). Indeed, providing opportunities for pre-service teachers to experience the benefits of such strategies, which, in turn, would promote future use, is desirable. Such an increase in knowledge and skills related to performance assessments would enhance the availability and variety of authentic assessment strategies is aligned with previous suggestions by Rogers (1991).

Misuse of assessment strategies for summative purposes. Of concern was that assessment strategies best suited for formative assessment were used for summative purposes. For example, of the programs (36%) that included peer assessment as a strategy, half included peer assessment results when computing course grades. The use of peer assessment for summative purposes represented a misalignment with their intended formative purpose. Furthermore, the use of these assessment strategies, intended for the purpose of supporting learning, for grades reinforced practices that are not congruent with current policies: "Teachers who are making changes in their understanding of assessment, and learning new ways of assessment, are at the same time revisiting their views about how children learn and what role

teachers play in supporting learning for every student" (Manitoba Education, Citizenship & Youth, 2006, p. 71). Teachers have a responsibility to use assessment in a way that is aligned with their intended purpose.

Implications

The recent shift to an assessment culture focused on learning is fundamentally altering how and why teachers use assessments in their classrooms. This study puts forth three important implications for informing how initial teacher education programs should prepare pre-service teachers for their assessment roles and responsibilities as practicing teachers. First, there needs to be a realignment between the knowledge and skills that are taught within introductory assessment courses and the roles and responsibilities of beginning teachers. For example, only four out of 14 programs included skills focused on the development of high quality instruments for scoring and only three programs addressed the misuse of assessment information and results. This is concerning given that the most important task for classroom teachers is to gather accurate information related to student learning. In addition, viable alternatives to more traditional selected response items, such as conferencing and interviews and the development of constructive response items, were only partially covered.

Second, instructors of the assessment courses are strongly encouraged to model as many aspects of the teaching and learning environment that pre-service teachers will be expected to re-create in their own future classrooms as possible. For example, make the reasons behind instructional decisions and the assessment strategies used to monitor student learning explicit and integrate available instructional technology. In doing so, pre-service teachers will be afforded opportunities to (a) experience the benefits of sound, relevant, and meaningful assessment practices, (b) access the thinking that informs professional judgments during the instructional and assessment processes, and (c) practice the technology modalities that are typically embedded within a 21st century classroom. This is particularly important because some pre-service teachers may be the products of a traditional learning environment dominated by culture of testing that emphasized summative assessment and instructional approaches that occurred face-to-face using didactic methods. Adopting practices that differ from their past experience is understandably difficult as the assessment practice that pre-service teachers experienced as students are known to significantly influence their future classroom practices (Brown, 2008; Cizek, Fitzgerald, & Racher, 1995). Yet, if the desired outcome is classroom practices that reflect current policies, then initial teacher education programs should consider shifting their predominant teaching approach to modeling-based.

Finally, it should be noted that this study focused on the pre-service courses that provided foundational assessment knowledge and skills and did not examine the additional assessment knowledge and skills covered in subsequent curriculum courses or practicum experiences. All teachers should be encouraged to continue in-service professional learning about assessment once they enter the field. This study was limited by the course syllabi that were made available to the researchers and by the information that was accessible in written form on these syllabi. Further research is needed to (a) address the limitations highlighted within these findings and to (b) replicate this study across contexts for greater generalization and understandings of how pre-service assessment education is being offered globally.

Conclusion

This study provided evidence of a shift towards a more learning-focused assessment culture within Western Canadian teacher education programs. The inclusion of pre-service assessment education as a required program component within most initial teacher education was encouraging. The study highlighted a need for the teaching and learning environment within these courses to be more reflective of current classroom realities so that our students are able to effectively respond to changing student populations, teaching environments, and educational policies. To that end, this study highlighted the need for program administrators to foster a culture of ongoing course development, specifically maintaining relevance of learner outcomes, instructional topics, teaching mediums, and assessment strategies that teachers will need coupled with modeling these procedures that students, as teachers, will use during and at the end of the assessment course.

Acknowledgement

References

Alberta Assessment Consortium. (2009). *Assessment glossary*. Retrieved from http://www.aac.ab.ca/

Alberta Assessment Consortium. (2012). *Key visual: Assessing student learning in the classroom*. Retrieved from http://www.aac.ab.ca/

Alberta Education. (2006). *Effective student assessment and evaluation in the classroom*. Retrieved from http://education.alberta.ca/apps/publications/PublicationList.asp?ID=E

Alberta Education. (2009). *The Alberta student assessment study: Final report*. Retrieved from http://education.alberta.ca/media/1165612/albertaassessmentstudyfinalreport.pdf

Alberta Government. (1997). *Teaching quality standard applicable to the provision of basic education in Alberta* (Ministerial Order # 016/97). Retrieved from http://www.education.alberta.ca/department/policy/standards/teachqual.aspx

American Accounting Association. (2003). Challenges to audit education for the 21st century: A survey of curricula, course content, and delivery methods. *Issues in Accounting Education, 18*(3), 241–263. Retrieved from http://aaajournals.org/loi/iace

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education, 5*, 7-71. doi:10.1080/0969595980050102

Boud, D., Cohen, R., & Sampson, J. (1999). Peer learning and assessment. *Assessment & Evaluation in Higher Education, 24*(4), 413-426. doi:10.1080/0260293990240405

Brown, G. T. L. (2008). *Integrating teachers' conceptions: Assessment, teaching, learning, curriculum and efficacy*. Hauppauge, NY: Nova Science Publishers.

British Columbia Teacher's Federation. (2009). *Instruction, assessment, and learning: From standardization to a focus on students: A position paper*. Retrieved from http://www.bctf.ca/uploadedFiles/Public/Publications/Briefs/InstructionAssessmentLearning.pdf

Campbell, C., & Evans, J. A. (2000). Investigation of preservice teachers' classroom assessment practices during student teaching. *The Journal of Educational Research, 93*(6), 350-355. doi:10.1080/00220670009598729

Chin, P., Zanibbi, M., Dalgarno, N., Poth, C., Ayala, G., Hutchinson, N., & Munby, H. (2007). Teaching science for the workplace? Analysis of Canadian science curriculum documents. *Canadian Journal of Science, Mathematics & Technology Education, 7*, 107-132. doi:10.1080/14926150709556723

Cizek, G. J., Fitzgerald, S. M., & Racher, R. E. (1995). Teachers' assessment practices: Preparation, isolation, and the kitchen sink. *Educational Assessment, 3*(2), 159-179. doi:10.1207/s15326977ea0302_3

Clark, I. D., Trick, D. K., & Van Loom, R. (2011). *Academic reform: Policy options for improving the quality and cost-effectiveness of undergraduate education in Ontario*. Montreal, QC: McGill-Queen's University Press.

Cole, A. (2000). Toward a preliminary understanding of teacher education reform in anglophone Canada. *McGill Journal of Education, 35*, 139-154. Retrieved from http://ajer.synergiesprairies.ca/

Creswell, J. (2013). *Qualitative inquiry & research design*. Thousand Oaks, CA: Sage.

Darling-Hammond, L., & Bransford, J. (Eds.). (2005). *Preparing teachers for a changing world: What teachers should learn and be able to do*. San Francisco, CA: Jossey-Bass.

Donnelly, J. (2001). Contested terrain or unified project? The nature of science in the national curriculum for England and Wales. *International Journal of Science Education, 23*, 181-195. doi:10.1080/09500690120412

Dysthe, O. (2008). The challenges of assessment in a new learing culture. In A. Havnes & L. McDowell (Eds.), *Balancing dilemmas in assessment and learning in contemporary education* (pp. 15-28). New York, NY: Routledge.

Earl, L. (2003). *Assessment as learning: Using classroom assessment to maximize student learning*. Thousand Oaks, CA: Corwin.

Fink, L. D. (2003). *Creating significant learning experiences: An integrated approach to designing college courses*. San Francisco, CA: Jossey-Bass.

Gipps, C. (1994). *Beyond testing: Towards a theory of educational assessment*. Washington, DC: The Falmer Press.

Goos, M., & Moni, K. (2001). Modelling professional practice: A collaborative approach to developing criteria and standards-based assessment in pre-service teacher education courses. *Assessment & Evaluation in Higher Education, 26*, 73-88. doi:10.1080/02602930020022291a

Guder, F., Malliaris, M., & Jalilvand, A. (2009). Changing the culture of a school: The effect of larger class size on instructor and student performance. *American Journal of Business Education, 2*(9), 83-90. Retrieved from http://journals.cluteonline.com/index.php/AJBE/index

Hargreaves, E. (2005). Assessment for learning? Thinking outside the (black) box. *Cambridge Journal of Education, 35*, 213-224. doi:10.1080/03057640500146880

Harasim, L., Hiltz, S. R., Teles, L., & Turoff, M. (1995). *Learning networks: A field guide to teaching and learning on-line*. Cambridge, MA: The MIT Press.

Higgins, R., Hartley, P., & Skelton, A. (2002). The conscientious consumer: Reconsidering the role of assessment feedback in student learning. *Studies in Higher Education, 27*(1), 53-64. doi:10.1080/03075070120099368

Joint Advisory Committee. (1993). *Principles for fair student assessment practices for education in Canada*. Retrieved from http://www2.education.ualberta.ca/educ/psych/crame/files/eng_prin.pdf

Joint Committee on Standards for Educational Evaluation.(n.d.). *Classroom assessment standards*. Unpublished manuscript.

Miles, A., & Huberman, A. M. (1994). *Qualitative data analysis*. Thousand Oaks, CA: Sage.

Maietta, R. C. (2006). State of the art: Integrating software with qualitative analysis. In L.A. Curry, R. Shield & T. Wetle (Eds.), *Improving aging and public health research: Qualitative and mixed methods* (pp. 117-139). Washington, DC: American Public Health Association and the Gerontological Society of America.

Manitoba Education, Citizenship & Youth. (2006). *Rethinking classroom assessment with purpose in mind: Assessment for learning, assessment as learning, and assessment of learning*. Retrieved from http://www.wncp.ca/media/40539/rethink.pdf

Mertler, C.A. (1999). Assessing student performance: A descriptive study of the classroom assessment practices of Ohio teachers. *Education, 120*, 285–96. Retrieved from http://www.projectinnovation.biz/index.html

Mertler, C. A. (2009). Teachers' assessment knowledge and their perceptions of the impact of classroom assessment on professional development. *Improving Schools, 12*, 101-113. doi:10.1177/1365480209105575

Mulryan-Kyne, C. (2010). Teaching large classes at college and university level: Challenges and opportunities. *Teaching in Higher Education, 15*, 175-185. doi:10.1080/13562511003620001

Murtagh, L., & Baker, N. (2009). Feedback to feed forward: Student response to tutors' written comments on assignments. *Practitioner Research in Higher Education, 3*, 20-28. Retrieved from http://194.81.189.19/ojs/index.php/prhe/index

Murtagh, L., & Webster, M. (2010). Scaffolding teaching, learning and assessment in higher education, *Teacher Education Advancement Network Journal, 1*(2). Retrieved from http://194.81.189.19/ojs/index.php/TEAN/issue/view/17

Overbaugh, R. & Schultz, L. (n.d.). *Bloom's taxonomy*. Retrieved from http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm

Peterson, E. R., & Irving, S. E. (2008). Secondary school students' conceptions of assessment and feedback. *Learning and Instruction, 18*, 238–250. Retrieved from http://www.sciencedirect.com/

Popham, W. J. (2008). *Transformative assessment*. Alexandria, VA: Association for Supervision and Curriculum Development.

Poth, C. (2011). The untapped potential of developmental evaluation in teacher education programs. In T. Falkenberg & H. Smits (Eds.), *The question of evidence in research in teacher education in the context of teacher education program review in Canada* (pp. 205-214). Winnipeg, MB: Faculty of Education of the University of Manitoba.

Rezaee, Z., Lambert, K., & Ken H., (2006). Electronic commerce education: Analysis of existing courses. *Accounting Education, 15*, 73-88. doi:10.1080/06939280600579370

Rogers, W. T. (1991). Educational assessment in Canada: Evolution or extinction? *The Alberta Journal of Educational Research, 37*, 179-192. Retrieved from http://ajer.synergiesprairies.ca/

Shepard, L.A. (2000). The role of assessment in a learning culture. *Educational Researcher, 29*(7), 4-14. doi:10.2307/1176145

Stiggins, R. J. (1999). Evaluating classroom assessment training in teacher education programs. *Educational Measurement: Issues and Practice, 18*, 23-27. doi:10.1111/j.1745-3992.1999.tb00004.x

Stiggins, R. J. (2008). *Assessment manifesto: A call for the development of balanced assessment systems*. Portland, OR: ETS Assessment Training Institute.

Strauss, A. L., & Corbin, J. (1990). *Basics of qualitative research: Grounded theory procedures and techniques*. Newbury Park, CA: Sage.

Tomlinson, C. A. (1999). *The differentiated classroom: Responding to the needs of all learners*. Alexandria, CA: Association for Supervision and Curriculum Development.

Volante, L. (2006). Essential elements in teacher education: Preservice student perspectives. *Alberta Journal of Educational Research, 52*, 167-180. Retrieved from http://ajer.synergiesprairies.ca/

Volante, L., & Fazio, X. (2007). Exploring teacher candidates' assessment literacy: Implications for teacher education reform and professional development. *Canadian Journal of Education, 30*(3), 749-770. Retrieved from http://www.csse-scee.ca/CJE/

Wiliam, D., Lee, C., Harrison, C., & Black, P. (2004). Teachers developing assessment for learning: Impact on student achievement. *Assessment in Education: Principles, Policy and Practice, 11*, 49–65. doi:10.1080/0969594042000208994

Notes

[1] Although reasonable measures were taken to ensure inclusion of all available courses and course syllabi, there were instances when course syllabi could not be obtained for all teacher education programs. For example, Vancouver Island University, Concordia University, and Campus Saint Jean at the University of Alberta. Thus, the included course syllabi must be viewed as a sample of existing assessment education courses.

[2] The exclusion of seven teacher education programs was beyond the researchers' control where access to course syllabi was not provided. Three programs were under review and four programs were non-responsive to researchers' requests.

Cheryl-Anne Poth, PhD, is a faculty member of the Center for Research in Applied Measurement and Evaluation within the Department of Educational Psychology at the University of Alberta. In this role, she teaches as well as coordinates the mandatory undergraduate classroom assessment course in the pre-service teacher education program. Cheryl brings over a decade of experience including working as a teacher, evaluation consultant and researcher with school boards, post-secondary institutions, and Federal organizations in the areas of Educational programs and Health Services. She brings expertise in qualitative, quantitative, and mixed methodologies.

Appendix A

Sample List of Assessment Course Syllabi and Institutions Included in the Study

Programs	Courses
British Columbia	
Simon Fraser University	EDUC 325-3: Assessment for Classroom Teaching
University of British Columbia	EPSE 423: Learning, Measurement and Teaching
University of the Fraser Valley	EDUC 445: Introduction to the Principles of Assessment EDUC 452: Principles of Assessment, Evaluation, and Reporting
University of Northern British Columbia	EDUC 421-3: Classroom Assessment Practices (both Elementary & Secondary)
University of Victoria	ED-D 407 Evaluating and Reporting Student Progress (Elementary students only) ED-D 337: Evaluation of Student Achievement (Secondary students only): Four different syllabi
Vancouver Island University	EDTE 300: Principles of Teaching and Learning Level I EDTE 301: Principles of Teaching and Learning Level II EDTE 400: Principles of Teaching and Learning Level III EDTE 401: Principles of Teaching and Learning Level IV EDPB 511: Principles of Teaching EDTE 613: Instructional Design: Evaluating and Reporting (both Elementary & Secondary)
Alberta	
Concordia University	EDU 541: Reflections on Field Experience I & II: Educational Assessment and Classroom Management
Red Deer College	EDPY 303: Educational Assessment
University of Alberta (North Campus)	EDPY 303: Educational Assessment
University of Lethbridge	Education 3504: Evaluation of Student Learning. Education 3604: Evaluation of Student Learning
Saskatchewan	
University of Saskatchewan	EPSE 448.3 Assessing Learning in the Classroom
Manitoba	
Brandon University	4.353 Evaluation and Assessment
University of Manitoba	EDUA 1502: Measurement and Evaluation