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Confidence to Differentiate and Knowledge to Assess: Do these Differ Between Concurrent and Consecutive Teacher Candidates?

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Abstract

This paper reports on one aspect of a larger study to examine the relationship between pre-service teachers' self-reports of their levels of knowledge and confidence in regard to many key areas of professional knowledge and skill. Using information provided by current and recently graduated concurrent and consecutive bachelor of education students, their confidence in providing differentiated learning opportunities and knowledge of appropriate related assessment practices in the classroom was examined. Results indicate that the consecutive teacher candidates consistently scored higher, on average, compared to the concurrent education program participants on the measures of knowledge and confidence used in this study, but, when age was discounted, levels of knowledge and confidence were similar. Levels of knowledge and confidence were not overly strong for either participant group regarding uses of assessment. As the ability to provide differentiated learning experiences and supportive assessments in the classroom is a key expectation of professional teachers, this finding is important. This research supports the need for additional strategic instruction for teacher candidates to help them understand the theory related to differentiation,

access resources to support and assess their use of differentiation strategies in the classroom, and gain the confidence to use the strategies in day-to-day instruction.

Keywords: Differentiation, Knowledge and confidence of teacher candidates, Concurrent education programs, Consecutive education programs, Assessment

Introduction

In Ontario, teacher education is organized into two streams: consecutive and concurrent, with an Orientation to Teaching (OTT) entry path to the consecutive stream being an option in some institutions as well. Currently, the *consecutive* model requires prospective teachers to complete a one year Faculty of Education program only after completing an undergraduate degree. On the other hand, in the *concurrent* model, prospective teachers complete courses towards an undergraduate degree while also taking education specific courses, typically completing the undergraduate degree and the B.Ed. degree within five years. Regardless of the teaching stream, the goal of teacher education is to provide prospective teachers with the knowledge and confidence necessary to be effective teachers. Effectiveness is characterized by many features of professional practice, including the ability to use approaches to differentiation, along with effective assessment strategies to support differentiated learning (Tomlinson, 1995; Maynes & Julien-Schultz, 2012; 2014).

A number of researchers, including Bennett and Carre (1993), have highlighted the dearth of empirical investigation into the content and impact of teacher education courses. Given that the goals of Faculties of Education include imparting professional knowledge and instilling confidence in teacher candidates, it is surprising that very little empirical research has been conducted to determine whether this objective has been achieved. Research into pre-service teacher confidence has primarily focused on teaching specific courses such as science, math (Brady & Bowd, 2005; Li & Kulm, 2008; Swetman, Munday, & Windham, 1993; Tekkaya, Cakiroglu, & Ozkan, 2004), and music (Ebbeck, Yim, & Lee, 2008). Results of these studies indicate that even with limited knowledge, teacher candidates report feeling confident in their abilities (Li & Kulm, 2008). Others have found that in-service teachers were significantly more confident (M = 32.6) than the pre-service teachers (M = 29) in their confidence to teach music; however, confidence was assessed using a total score that ranged from 10-50 suggesting that neither group was, on average, overly confident.

It may be that having knowledge is not a requirement for feeling confident about teaching subject matter or using specific strategies. Similarly, feeling confident may not be a reflection of having good knowledge. In fact, the participant's age may be the single greatest predictor of their self-reported knowledge and confidence to provide differentiation and approriate asessments for students.It may also be that teacher candidates relate to the practical aspects of using differentiation as it is needed in the classroom but feel less confident in their abilities to consider potential, more abstract ideas about differentiation and assessment when they are removed from the immediate need to provide either.

This complex interaction between a teacher candidate's knowledge to plan for differentiation and assessment and their actual confidence to use this knowledge in the day-to-day functions of teaching in the classroom is clearly important to study. When examining confidence in teacher candidates, a measure of knowledge must also be incorporated since one of these aspects of teaching is not necessarily indicative of the other.

Theoretical Framework

Little empirical research has been conducted to investigate general confidence of teacher candidates, regardless of program route. Most of the research evidence to date has focused on measures of confidence in specific subject areas. Research has demonstrated that teacher candidates' confidence and knowledge in a subject area are not interchangeable. It is possible that knowledge and confidence may differ in other duties, such as providing appropriate differentiation supports for students and using the cycle between knowing the learner and providing differentiated instruction and assessment to meet the needs of the learner.

Regarding the topic of differentation, there is a great deal of literature in the education field. A vast amount of literature is available on the underlying concepts of differentiated instruction and its key principles, which include the concepts of various forms and uses of assessment to support learning. Key principles include: knowing the learner; responding to the needs of the learner; using choice; designing respectful learning tasks; using flexible groupings; and continual assessment and feedback for learners (Gregory & Chapman, 2013, Heacox, 2009, Levy, 2006, Subban, 2006,Tomlinson, 1995,1999, 2006).This literature clearly makes a strong link between providing effective differentiation and providing effective assessment. Tiering is presented as one of the many instructional strategies/ structures used in the planning and implementation of differentiated instruction and there are several resources that present examples of tiering based on readiness, interest, or learning preferences (Adams and Pierce, 2003; Armstrong & Haskins, 2010; Kingmore, 2006; Pullen, Tuckwiller, and Konald, 2010;Tomlinson, 1995, 1999; Tomlinson &McTighe, 2006). This differentiation strategy is mentioned here because it is the most visibly obvious strategy that would require differences in approaches to assessment.

Adams and Pierce (2003) developed a model called the CIRCLE MAP (Creating an Integrated Response for Challenging Learners Equitably). CIRCLE MAP weaves together four elements: classroom management strategies; anchoring activities; differentiated instructional strategies; and, differentiated assessment. Concepts such as the Circle Map can provide teacher candidates with the knowledge they need to try to use differentiation strategies in their classrooms. Differentiation strategies such as the Circle Map are designed to respond to the needs of the learner in a challenging and respectful manner and to provide teachers with the pedagogical knowledge they need to make decisions about the use of differentiation in their classrooms. However, having this conceptual knowledge may not be enough to help new teachers use these strategies confidently. For the purposes of this study, this model presents further evidence of the connection between differentiation and assessment.

In 2006, Tomlinson and McTighe collaborated to integrate Understanding by Design (UbD) and Differentiated Instruction (DI). In the original Wiggins and McTighe (2005) model, the focus was on planning backwards or backwards design. The McTighe planning template offers specific boxes to follow in different stages of planning a lesson. In Stage1, designers are asked to specify the desired understandings and the essential questions that reflect the established learning goals, such as content standards. These elements help clarify the content

priorities and ensure that the big ideas and essential questions are prominent in a learning episode, making the link between assessment and differentiation. These are then drawn into more specific knowledge and skills that students should be able to learn at the end of this lesson or unit. Stage 2 distinguishes between performance tasks and other information that will provide valid and reliable evidence of the desired learning. Stage 3 involves planning for purposeful learning activities and directed teaching to help students reach the desired achievements. Once again, the link between differentiation and assessment is evident.

Similarly, other authors provide differentiation models (Armstrong & Haskins, 2010; Maynes&Hatt, 2011; Maynes&Julien-Schultz, 2014, Gregory &Chapman, 2013).These concepts are essential learning in teacher preparation programs and should provide new teachers with some level of knowledge about how to approach differentiation in their own teaching and how to make the pedagogical link between differentiation and assessment.

Given the breadth of academic and conceptual information about the need to differentiate instruction in the classroom, the reasons for doing so, the stated priority of the provincial government in having this practice characterise the classrooms of the jusrisdiction, and the many available models for realizing this goal, an investigation into the self-reported levels of knowledge about assessment and its correlation to confidence to differentiate among new teachers will be beneficial; this investigation will allow program developers to identify areas in which teacher candidates from either program route feel more or less knowledgeable and confident, and allow those with program design responsibilities to adapt and improve the program to ensure the fidelity of these aspects of the program.

Additionally, teacher candidates who acquire accreditation via different program routes (i.e., consecutive or concurrent) may differ in their reports of knowledge of assessment and confidence levels in using differentiation approaches in the classroom. Comparing the knowledge and confidence of students completing these distinctly different accreditation routes will be useful for making program design decisions. It is also possible that levels of knowledge and confidence differ within program routes across divisions (i.e., primary/junior, junior/intermediate, intermediate/senior). Investigation of these variables will allow us to determine the program situations that appear to create the strongest knowledge and confidence in these important aspects of teacher growth.

Focus of the Study

The study was designed to contribute information that addresses the dearth of empirical investigation into the content and impact of teacher education courses in the jurisdiction.We can inform program changes by adding to our body of information about perceived impacts on teacher candidates' professional knowledge and confidence regarding the many tasks related to their role as teacher. This information will allow for areas of concern and strengths to be identified and will inform programming.

Our focus in this part of the larger study was to determine whether teacher candidates feel knowledgeable about their background in different forms and uses of assessment and correspondingly confident in their use of various strategies for using differentiation in their

classroom practicesand to compare confidence and knowledge between teachers who acquired their accreditation through different program routes.We conclude by making several recommendations for ways that redesigned accreditation programs can work toward improving levels of confidence and knowledge in its graduates with the use of differentiation and related assessment approaches in their instructional repetoire.

Research Questions

Six related research questions guided our study. These included:

1) What level of confidence is self-reported by teacher candidates regarding their comfort with differentiation?

2) What level of knowledge is self-reported by teacher candidates regarding their knowledge of the various forms and uses of assessment to promote classroom differentiation?

3) Is there a correlation between levels of knowledge with assessment and levels of confidence with differentiation?

4) Is there a significant difference in levels of knowledge about assessment and levels

of confidence about differentiation between teacher candidates who complete their accreditation through the concurrent vs. the consecutive program route?

5) Can mean differences in age between the two groups of teacher candidates account for any differences in the levels of knowledge and confidence?

6) Is there any difference in knowledge about assessment uses and forms and/or confidence to use differentiation strategies across divisions in either the concurrent or consecutive program routes?

Methodology

Participants

Participants were from both the consecutive and the concurrent programs at three campuses from one Northern Ontario university. A total of 212 respondents (25 males, 186 females, 1 gender not reported) completed the survey and were include in the study. Respondents' median age was slightly over 23 years old (M = 23.18, SD = 4.91). Respondents were completing or had completed a consecutive teacher preparation program (n = 81) or were completing or had completed the concurrent program (n = 131).

Demographic data were collected to identify the details of each respondent's program route and the stage of completion of their teacher preparation. Twenty-one respondents had previously graduated.

Measures

Demographics. Age, gender (0 = male, 1 = female), current status in the education program were collected for descriptive information and to investigate relationships between demographics and dependant variables.

Knowledge. A total of 15 questions was developed by the researchers to assess self-perceived knowledge about the various ways that assessment information is used in the classroom to inform instruction. The link between effective, ongoing, unobtrusive assessment and effective differentiation is well established in the research literature (Tomlinson, 1995; 1999; Tomlinson & McTighe, 2006; Wiggins & McTighe, 2005) and therefore these indicators serve well as a knowledge basis for providing appropriate assessment in the classroom.

The 15 questions related to measures of knowledge about forms and uses of assessment included: Do you have enough knowledge regarding: a) how to select an assessment approach to measure learning, b) how to design an assessment approach to measure learning, c) diagnostic assessment; d) formative assessment, e) summative assessment, f) when to use of different forms of assessment to guide students' learning, g) how to use rubrics, h) how to use anecdotal records, i) how to use checklists, j) how to use rating scales, k) how to use assessment *as* learning, l) how to use assessment *for* learning, m) how to maintain your focus on students' learning; and, n) the difference between assessment and evaluation?Total scores could range between 0 and 70; higher scores indicated more knowledge about the uses and forms of assessment to support classroom instruction. Internal consistency was calculated using Cronbach's alpha and was found to be highly consistent (a= .965).

Confidence. A total of 15 questions developed by the researchers was used to assess confidence regarding differentiation in classroom instruction. Questions included: Do you have enough confidence regarding: a) applying program accommodations, b) applying program modifications, c) assessing online Ministry support documents (i.e., related to diffferentiation), d) use online support documents to guide your instruction, e) adjust your teaching strategies on the spot, f) apply differentiation in your classroom, g) use differntiation as changes in content, h) use differentiation as changes in process, i) use differentiation as changes in products, j) recognize when change in a teaching strategy is needed, k)provide relevant experiences to support students' understanding, l) provide relevant details to support students' understanding, m) provide relevant examples to support students' understanding, and, n) reflect on your teaching? Questions were responded to on a 5 point scale from 0 = *definitely not* to 4 = *definitely*. Total scores could range between 0 and 75; higher scores indicated more confidence with differentiation. Internal consistency was calculated using Cronbach's alpha and was found to be highly consistent ($\alpha = .961$).

Procedure

An invitation to participate in the study was posted on an existing facebook group designed to give professional support among teacher candidates. A brief description of the purpose of the study and a link to the information letter was provided. Those who were interested followed the link to the information sheet. The information link provided all informaton necessary for informed consent.

After completingreading of the introductory letter, potential participants could agree to continue or could exit the program. Completion of the questionnaire indicated each respondent's agreement to participate in the study. One reminder of the opportunity to participate in the survey research was posted on the facebook site one month after it was first

advertised. Completion of the entire questionnaire required approximately 15 minutes.

Results

There were six key ways that we examined these data and their significance to program decisions and designs in teacher education contexts. These included investigation of the following questions.

1. What level of confidence is self-reported by teacher candidates regarding their

comfort with differentiation?

2. What level of knowledge is self-reported by teacher candidates regarding their knowledge of the various forms and uses of assessment to promote classroom differentiation?

3. Is there a correlation between levels of knowledge with assessment and levels of confidence with differentiation?

4. Is there a significant difference in levels of knowledge about assessment and levels of confidence about differentiation between teacher candidates who complete their accreditation through the concurrent vs. the consecutive program route?

5. Can mean differences in age between the two groups of teacher candidates account for any differences in the levels of knowledge and confidence?

6. Is there any difference in knowledge about assessment uses and forms and/or confidence to use differentiation strategies across divisions in either the concurrent or consecutive program routes.

Each of these questions is addressed separately in the following paragraphs.

To investigate the level of confidence reported by teacher candidates regarding their comfort with differentiation, we asked 15 questions. Independent samples t-tests were conducted to compare the average consecutive education program response to the average concurrent program response. When the responses to the 15 questions were averaged for the two program participant sets, there was a significant difference between average consecutive ($M=3.11$, $SD=0.64$) education and concurrent ($M=2.84$, $SD=0.73$) education program scores, $t(167)=2.473$, $p=0.014$. That is, the consecutive teacher candidates were found to be more confident on average than the concurrent students (Figure 1). However, although the consecutive teacher candidates on average were significantly more confident than concurrent teacher candidates, this level of difference was not maintained throughout the 15 sub-set questions in this group of questions.

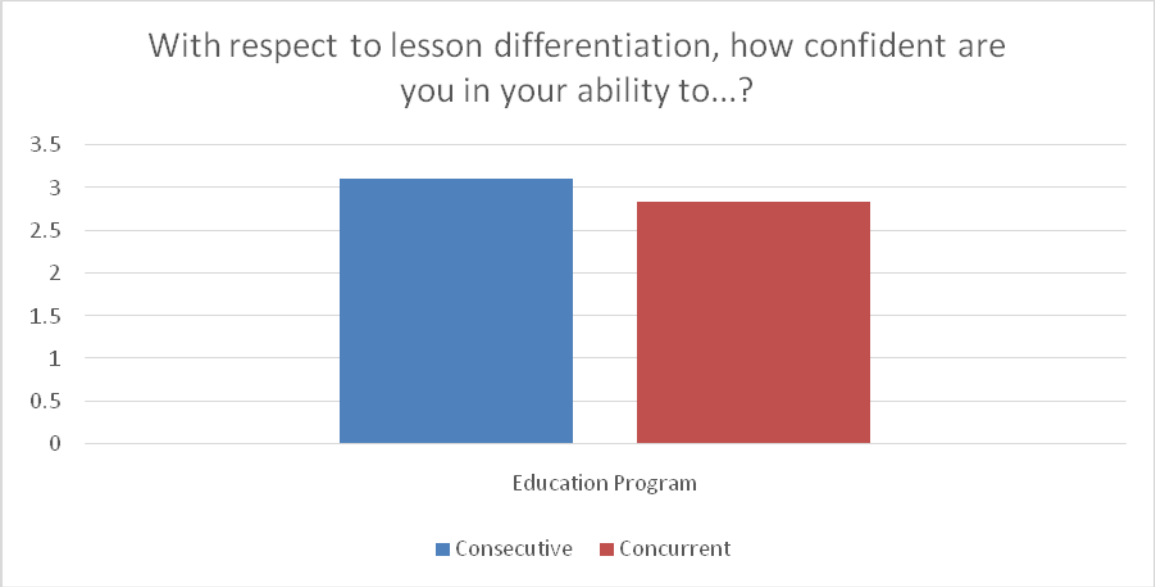

Figure 1. Overall confidence of participants with respect to differentiation

The sub-set questions showed a significant difference between the consecutive and the concurrent teacher candidates with the consecutive teacher candidates consistently showing more confidence (see Appendix 1).

While the consecutive education program participants consistently scored higher, on average, compared to the concurrent education program participants regarding confidence to provide differentiation, scores on some items did not show differences that were statistically significant. These confidence prompts included confidence to: apply differentiation in your classroom: use differentiation as changes of content; use differentiation in changes of process; use differentiation as changes in products; recognize when a change in teaching strategy is needed; and, provide relevant experiences to support students' understanding (see Appendix 2)..

Next, fifteen questions that examined the teacher candidates' knowledge of approaches to assessment were considered. Independent samples t-tests were conducted to compare consecutive and concurrent participants on these measures.

When the fifteen items were considered as a single scale, there was a significant difference between consecutive ($M = 3.03$, $SD = 0.68$) and concurrent ($M = 2.70$, $SD = 0.83$) education program participants, $t(196) = 2.886$, $p = 0.004$ (Figure 2). Consecutive teacher candidates felt that they were significantly more knowledgeable about assessment than the knowledge reported by concurrent program participants. On individual items in the set of questions about assessment, several patterns emerged (see Appendix 3).

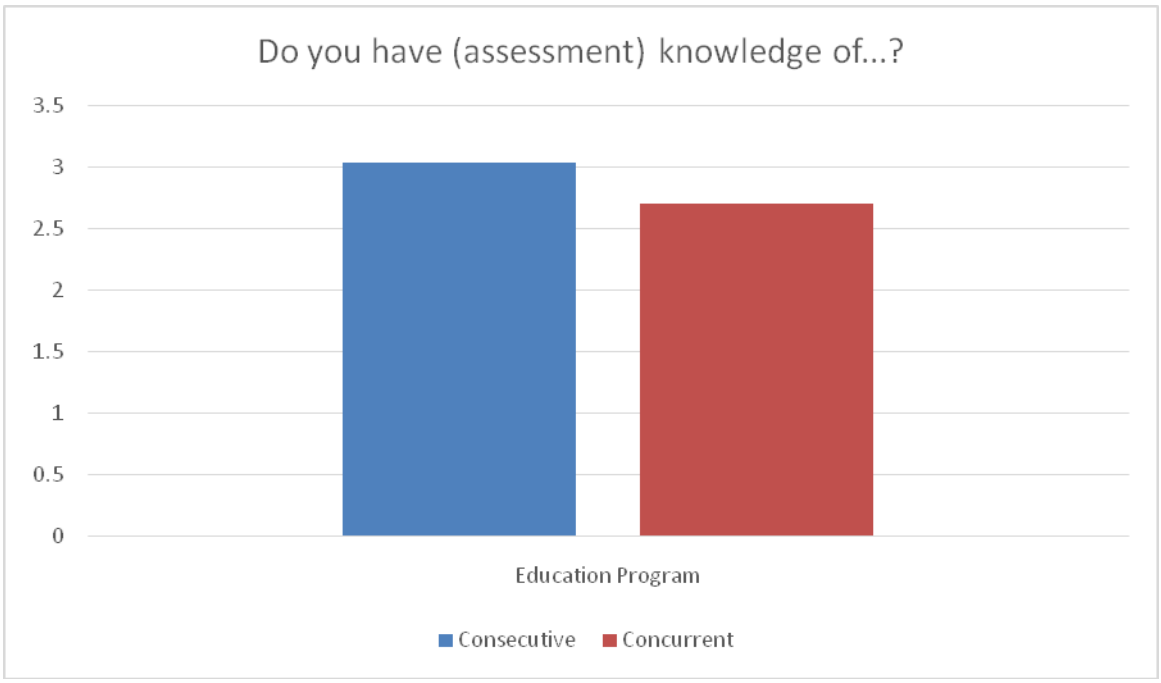

Figure 2. Knowledge of approaches to assessment

For 'how to select an assessment approach to measure learning', there was a significant difference between consecutive (M = 3.03, SD = 0.67) and concurrent (M = 2.69, SD = 0.95) education program participants, t(193.864) = 2.886, p = 0.004.

For 'knowing how to design an assessment approach to measure learning', there was a significant difference between consecutive (M = 2.94, SD = 0.75) and concurrent (M = 2.56, SD = 0.98) education program participants, t(189.545) = 3.019, p = 0.003.For 'knowing how to use diagnostic assessment', there was a significant difference between consecutive (M = 3.00, SD = 0.93) and concurrent (M = 2.42, SD = 1.05) education program participants, t(175.425) = 4.057, p = 0.000.For 'knowing how to use formative assessment', there was a significant difference between consecutive (M = 3.04, SD = 0.85) and concurrent (M = 2.50, SD = 1.03) education program participants, t(182.757) = 3.978, p = 0.000.For 'knowledge of how to use summative assessment', there was a significant difference between consecutive (M = 3.09, SD = 0.81) and concurrent (M = 2.57, SD = 0.99) education program participants, t(183.474) = 4.028, p = 0.000.

Further significant differences in knowledge about assessment were demonstrated for the items related to the uses of assessment *for, as*, and *of* learning. For 'how to use assessment *of* learning', there was a significant difference between consecutive (M = 2.82, SD = 1.10) and concurrent (M = 2.44, SD = 1.12) education program participants, t(196) = 2.341, p = 0.020. For 'how to use assessment *as* learning', there was a significant difference between consecutive (M = 2.77, SD = 1.07) and concurrent (M = 2.34, SD = 1.14) education program participants, t(196) = 2.634, p = 0.009.For 'how to use assessment *for* learning', there was a significant difference between consecutive (M = 2.78, SD = 1.11) and concurrent (M = 2.38, SD = 1.13) education program participants, t(196) = 2.445, p = 0.015.It is important to note

that, although consecutive program teacher candidates report more knowledge about these three uses of assessment, neither group is overly confident in their knowledge about this critical role. Overall, participants also reported significant discrepancies in their understanding of the differences between assessment and evaluation (consecutive (M = 3.30, SD = 0.71) and concurrent (M = 2.89, SD = 1.06) education program participants, t(195.408) = 3.240, p = 0.001).

Some items in the set of knowledge of assessment questions showed no significant differences between the consecutive and concurrent program respondents. There was no significant difference in participants' knowledge regarding: when to use different forms of assessment to guide students' learning; how to use rubrics; how to use anecdotal records; how to use checklists; how to use rating scales; or how to maintain your focus on students' learning.

When we examined the third question to determine if there was a correlation between the levels of knowledge about assessment and the levels of confidence with differentiation, the following results were found. For the overall sample of participants (consecutive and concurrent), there was a significant correlation between differentiation confidence and knowledge of assessment, r = 0.796, p = 0.000, n = 169.When the groups of participants are considered separately, there was a significant correlation between differentiation confidence and knowledge of assessment for consecutive education program participants, r = 0.652, p = 0.000, n = 70.For concurrent education program participants, there was also a significant correlation between differentiation confidence and knowledge of assessment, r = 0.856, p = 0.000, n = 99.Interestingly, although there were positive correlations between differentiation confidence and knowledge of assessment for both consecutive and concurrent education program participants, the correlation was stronger for the concurrent program participants. That is, there seems to be a stronger link between differentiation confidence and knowledge of assessment for the concurrent group. Such a correlation would be expected since links between these two concepts are essential to understanding either concept fully. This is a recurring theme in the literature about differentiation and the literature about effective assessment. This data set speaks to the fourth question of this study.

Further, some analysis was done to try to account for the differences in the data between the two programs with respect to the differences in confidence regarding differentiation and knowledge regarding assessment. Interestingly, an independent samples t-test found a significant difference between consecutive (M = 26.88, SD = 6.16) and concurrent (M = 20.95, SD = 1.66) education program participants on average age, t(82.724) = 8.268, p=0.000. This finding supports the possibility that age may help to explain the differences between consecutive and concurrent program participants on differentiation and knowledge items.

To support this conclusion, further details of the analysis are provided. An analysis of covariance was conducted to determine whether age differences between groups explain the differences between consecutive and concurrent education program participants on differentiation confidence. Prior to conducting the ANCOVA, an independent samples t-test was conducted to determine whether consecutive and concurrent education program

participants differed significantly on these items. This analysis, which did not take age into account, found a significant difference regarding differentiation between average consecutive (M=3.11, SD=0.64) and concurrent (M=2.84, SD=0.73) education program participants' scores, t(167)=2.473, p=0.014. However, when an ANCOVA was conducted with age as a covariate, the difference between consecutive and concurrent education program participants' average scores was no longer significant.

Similarly, an analysis of covariance was conducted to determine whether age differences between groups explain the differences between consecutive and concurrent education program participants on knowledge of assessment. Prior to conducting the ANCOVA, an independent samples t-test was conducted to determine whether consecutive and concurrent education program participants differed significantly on the knowledge items. This analysis, which did not take age into account, found a significant difference in these itemsbetween average consecutive (M = 3.03, SD = 0.68) and concurrent (M = 2.70, SD = 0.83) education program participants' scores, t(196) = 2.886, p = 0.004. However, when an ANCOVA was conducted with age as a covariate, the difference between consecutive and concurrent education program participants' average scores was no longer significant.

What the above analyses suggest is that age differences between groups may have been largely responsible for the differences found on confidence with differentiation and knowledge of assessment between consecutive and concurrent students. When we examined data for all consecutive participants (n=81) and only the concurrent participants presently in Year 5 of their program (n=5), we found that there was no significant difference on any items of either scale between the two sets of teacher candidates.

Finally, we investigated the possibility that there may be differences across program divisions on these two sets of items. In this jurisdiction, teacher candidates enroll in teacher preparation programs in any one of the primary/junior, junior/intermediate, or intermediate/senior divisions. When measures of confidence with differentiation and knowledge of assessment items were examined across the two programs (i.e., consecutive and concurrent) no significant differences were found on any of the measures across the three divisions.

Significance of this Study

This study was an attempt to understand how teacher candidates describe their levels of confidence with the use of differentiation strategies in their classrooms and how knowledgeable they feel about assessment, including its various forms and uses. Results indicate that on many measures of confidence with differentiation and knowledge of assessment the consecutive teacher candidates feel more confident and knowledgeable. However, this is not true across all measures of confidence of knowledge. The results are surprising in that it could be hypothesized that more classroom exposure and practice with teaching should result in more confidence with key teaching roles and more knowledge about strategies. Since the concurrent teacher candidates spend 19 weeks on practicum during their program, while the consecutive teacher candidates spend 12 weeks on practicum to earn the same qualifications, it seems logical that this additional exposure to the realities of a classroom would make a positive difference in both confidence and knowledge.

It was also surprising to find that neither group reported feeling overly confident about the uses of assessment *for, as*, and *of* learning. Since this is a critical teacher skill and a major concept that supports understanding of differentiation, this aspect of teacher's professional growth requires further development in their teacher preparation programs. It may support confidence and knowledge development if faculty of education instructors relied upon and posted graphics that demonstrate this connection visually and reuse the same graphic in various courses.

It is interesting to note that when questions focused on the teacher candidates' ability to use specific assessment strategies (e.g., when to use different forms of assessment to guide students' learning; how to use rubrics; how to use anecdotal records; how to use checklists; how to use rating scales; or how to maintain your focus on students' learning) there was no significant difference between the two groups. It seems that teacher candidates from both groups have similar levels of faith in their pedagogical content knowledge, and feel similarly able to use the strategies they have learned about in their programs.

While teacher candidates may have opportunities to work with existing approaches to differentiation and assessment while they participate in practicum assignments throughout their programs, these research results point to the need for a more targeted approach to practicum experiences where teacher candidates could be expected to develop certain knowledge and skills in relation to differentiation and to assessment and have regular support to provide feedback on their use of these approaches in their teaching. Similarly, it seems clear that further conceptual work needs to be done on developing both concepts in the teacher preparation courses. Particularly, further work is needed to help teacher candidates understand the cyclical relationship between collecting ongoing information about a student's progress and using that information to design responsive instruction. This connection is particularly lacking in the consecutive teacher candidates so efforts should be made to draw the connection between these two concepts in many areas of their program.

While we cannot say conclusively what has caused the differences in self-reported confidence regarding differentiation and self-reported knowledge about assessment, we do know that the age of the students at the time of data collection was a factor in these results. However, when the age of participants is co-varied, the participants show insignificant differences in confidence with differentiation and knowledge of assessment on all measures.

Discussion

The research about practices with differentiation used in classrooms to support learning success for students is closely linked to the strategies that teachers use to assess learning (Wiggins &McTighe, 2005). Many researchers who write about differentiation speak of the need to move constantly between knowing the learner's strengths, interests and learning styles, adjusting the learning approaches to respond to this knowledge, and selecting assessment approaches that reflect the types of individual approaches that may be available to support the learner further (Wiggins, 1993; Wiggins &McTighe, 2005). For this reason, this paper has focused on examining the relationship between self-reports of confidence with differentiation and knowledge of assessment. The finding that these two areas of teacher

development are linked in teacher candidates' perceptions is encouraging. Making this connection is a critical step in the maturation of a teacher as it signifies their internalization of appropriate instructional understanding about why and how we assess students. Teachers who can make the connection between differentiation and assessment will better understand that students do not learn so that they can be assessed. Rather, these teachers understand that we assess student progress so that we know more about how to support further learning.

In interpreting the value of this study, we need to continue to be mindful of the limitations of self-reported data. Our confidence in our conclusions would be supported by opportunities to triangulate the self-report data by actually testing teacher candidates' knowledge of assessment. Similarly, our conclusions would be supported if third party assessments of teacher candidates' confidence with the use of differentiation strategies were available. While it may be that teachers who graduate in either program route have the knowledge and confidence to differentiate learning in hypothetical or practicum contexts where close supports are available, there may be a lack of ability to use the knowledge, techniques, and equipment, while teaching in employment contexts that require additional professional duties on a regular basis. Further research is needed into why teachers may not actually use approaches even if they report having the knowledge and confidence to use them.

In the jurisdiction where this study was completed, new government legislation will increase the amount of teacher preparation time in the local teacher accreditation program. This will include a corresponding increase in the amount of practicum time that teacher candidates spend in classrooms, where theories may be applied to practice. New courses could be well designed to build on the findings of this study by building stronger connections between teacher candidates' understanding of differentiation as it connects to their understanding of assessment, regardless of the program route taken.

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Appendix 1

- With respect to 'apply program accommodations', there was a significant difference between average consecutive (M=3.06, SD=0.70) education and concurrent (M=2.72, SD=0.89) education program scores, t(165.177)=2.772, p=0.006.

- With respect to 'apply program modifications', there was a significant difference between average consecutive (M=3.01, SD=0.75) education and concurrent (M=2.69, SD=0.91) education program scores, t(162.965)=2.553, p=0.012.

- With respect to 'access online Ministry support documents', there was a significant difference between average consecutive (M=3.19, SD=1.01) education and concurrent (M=2.55, SD=1.17) education program scores, t(160.395)=3.794, p=0.000.

- With respect to 'use online Ministry support documents to guide your instruction', there was a significant difference between average consecutive (M=3.13, SD=0.99) education and concurrent (M=2.56, SD=1.14) education program scores, t(160.178)=3.469, p=0.001.

- With respect to 'adjust your teaching strategies on the spot', there was a significant difference between average consecutive (M=3.04, SD=0.84) education and concurrent (M=2.78, SD=0.84) education program scores, t(167)=2.020, p=0.045.

- With respect to 'adjust your teaching strategies to respond to your perceptions of students' learning', there was a significant difference between average consecutive (M=3.10, SD=0.76) education and concurrent (M=2.81, SD=0.85) education program scores, t(167)=2.286, p=0.024.

- With respect to 'provide relevant details to support students' understanding', there was a significant difference between average consecutive (M=3.14, SD=0.71) education and concurrent (M=2.88, SD=0.84) education program scores, t(167)=2.152, p=0.033.

- With respect to 'provide relevant examples to support students' understanding', there was a significant difference between average consecutive (M=3.17, SD=0.68) education and concurrent (M=2.92, SD=0.89) education program scores, t(167)=1.997, p=0.047.

- With respect to 'reflect on your teaching', there was a significant difference between average consecutive (M=3.39, SD=0.67) education and concurrent (M=3.10, SD=0.87) education program scores, t(167)=2.293, p=0.023.

Appendix 2

Table 1. Confidence with Differentiation

	Consecutive Education Program	Concurrent Education Program
Confidence with Differentiation	M=3.11, SD=0.64	M=2.84, SD=0.73
apply program accommodations	M=3.06, SD=0.70	M=2.72, SD=0.89
apply program modifications	M=3.01, SD=0.75	M=2.69, SD=0.91
access online Ministry support documents	M=3.19, SD=1.01	M=2.55, SD=1.17
use online Ministry support documents to guide your instruction	M=3.13, SD=0.99	M=2.56, SD=1.14
apply differentiation in your classroom	M = 3.16, SD = 0.77	M = 3.04, SD = 0.75
use differentiation as changes in content	M = 2.94, SD = 0.87	M = 2.90, SD = 0.87
use differentiation as changes in processes	M = 2.91, SD = 0.86	M = 2.89, SD = 0.86
use differentiation as changes in products	M = 2.99, SD = 0.89	M = 2.87, SD = 0.86
adjust your teaching strategies on the spot	M=3.04, SD=0.84	M=2.78, SD=0.84
adjust your teaching strategies to respond to your perceptions of students' learning	M=3.10, SD=0.76	M=2.81, SD=0.85
recognize when a change in teaching strategy is needed	M = 3.21, SD = 0.74	M = 2.98, SD = 0.82
provide relevant details to support students' understanding	M=3.14, SD=0.71	M=2.88, SD=0.84
provide relevant examples to support students' understanding	M=3.17, SD=0.68	M=2.92, SD=0.89
provide relevant experiences to support students' understanding	M = 3.16, SD = 0.69	M = 2.92, SD = 0.90
reflect on your teaching	M=3.39, SD=0.67	M=3.10, SD=0.87

Appendix 3

Table 2. Knowledge of Assessment

	Consecutive Education Program	Concurrent Education Program
Knowledge of Assessment Items	M = 3.03, SD = 0.68	M = 2.70, SD = 0.83
how to select an assessment approach to measure learning	M = 3.03, SD = 0.67	M = 2.69, SD = 0.95
how to design an assessment approach to measure learning	M = 2.94, SD = 0.75	M = 2.56, SD = 0.98
diagnostic assessment	M = 3.00, SD = 0.93	M = 2.42, SD = 1.05
formative assessment	M = 3.04, SD = 0.85	M = 2.50, SD = 1.03
summative assessment	M = 3.09, SD = 0.81	M = 2.57, SD = 0.99
when to use different forms of assessment to guide students' learning	M = 2.86, SD = 0.90	M = 2.73, SD = 0.98
how to use rubrics	M = 3.27, SD = 0.77	M = 3.15, SD = 0.83
how to use anecdotal records	M = 3.06, SD = 0.91	M = 2.85, SD = 0.97
how to use checklists	M = 3.31, SD = 0.69	M = 3.17, SD = 0.76
how to use rating scales	M = 3.14, SD = 0.91	M = 3.02, SD = 0.87
how to use assessment *of* learning	M = 2.82, SD = 1.10	M = 2.44, SD = 1.12
how to use assessment *as* learning	M = 2.77, SD = 1.07	M = 2.34, SD = 1.14
how to use assessment *for* learning	M = 2.78, SD = 1.11	M = 2.38, SD = 1.13
how to maintain your focus on students' learning	M = 3.00, SD = 0.89	M = 2.79, SD = 0.97
knowingthe difference between assessment and evaluation	M = 3.30, SD = 0.71	M = 2.89, SD = 1.06