# Strengthening Program Coherence around Differentiated Instruction to Improve Candidate Learning Outcomes

Hilary Dack

Department of Middle, Secondary, & K-12 Education

Cato College of Education

#### Abstract

The investigator proposes the development of innovative instructional resources about the essential teaching practice of differentiation to be used in multiple teacher preparation courses in the department of Middle, Secondary, and K-12 Education (MDSK) across multiple semesters. The development of these purposefully sequenced resources will strengthen our programs' coherence. It will provide opportunities for teacher educators to build shared conceptualizations of this multifaceted practice, and it will yield resources rooted in these shared conceptualizations for use by multiple teacher educators throughout the program.

Differentiation focuses on proactively responding to academic diversity, or differences among students that affect learning. It features complex strategies that respond equitably to patterns of learner variance across whole classes of students.

Research suggests that when candidates are taught the same model of differentiation across multiple program components, it supports their learning; when such coherence is lacking, it detracts from learning. To support coherence, all teacher educators must present similar interpretations of differentiation to candidates through explicit instruction, modeling, and coaching. This requires their intentional collaboration.

Based on data from recent graduates, our department has concluded that coherence in our programs related to candidate learning about differentiation should be strengthened. The proposed project responds to this conclusion.

A two-part study, with part 1 occurring within the SOTL grant period and part 2 occurring subsequently, will evaluate the effectiveness of the developed resources through data gathered from teacher candidates. This project will study program-level outcomes, and it focuses on a teaching practice that promotes equitable K-12 instruction.\*

\*SOTL areas of focus

## SoTL Budget Request & Budget Narrative January 15, 2022 to June 30, 2023

Lead Principal Investigator: Hilary Dack Principal Investigator 800#: 800907429

Title of Project: Strengthening Program Coherence around Differentiated Instruction to

Improve Candidate Learning Outcomes

Allocate operating budget to Department of: MDSK

Fiscal Year	One (January 15, 2022 to June 30, 2022)	
Faculty Stipend	Paid directly from Academic Affairs fund on May 15, 2022	3,850.00
911250	Graduate Student Salaries	
911300	Special Pay to Faculty other than Grantee	
915000	Student (Undergraduate or Graduate) Temporary Wages	
915900	Non-student Temporary Wages	
920000	Honorarium (Individual(s) not with UNCC)	
921160	Subject Incentive Fee	
925000	Domestic Travel	
926000	Foreign Travel	
928000	Communication and/or Printing	
930000	Supplies	
942000	Computing Equipment	
944000	Educational Equipment	
951000	Other Contracted Services	
	Year One Subtotal	3,850.00
Fiscal Year	Гwo (July 1, 2022 to May 30, 2023)	1
Faculty Stipend	Paid directly from Academic Affairs fund on May 15, 2023	
911250	Graduate Student Salaries	

911300	Special Pay to Faculty other than Grantee	
915000	Student (Undergraduate or Graduate) Temporary Wages	
915900	Non-student Temporary Wages	
920000	Honorarium (Individual(s) not with UNCC)	
921160	Subject Incentive Fee	
925000	Domestic Travel	
926000	Foreign Travel	
928000	Communication and/or Printing	
930000	Supplies	
942000	Computing Equipment	
944000	Educational Equipment	
951000	Other Contracted Services	
Year Two Subtotal		
	TOTAL FUNDS REQUESTED (Year One + Year Two) 3,850.00	

## **Budget Narrative**

The budget will be used to support a faculty stipend during fiscal year one. This will allow the investigator to teach only one term in summer 2022. The other summer term will be reserved for the development of the differentiation learning trajectory and differentiation-focused instructional resources following one-on-one conversations with numerous program stakeholders, which will be time-consuming.

## **Project Narrative**

## **Specific Aims**

## **Purpose and Rationale**

In recent years, as teacher preparation programs have become increasingly focused on preparing teacher candidates to work with diverse learners, differentiation has gained prominence as a response to this challenge. This teaching approach involves identifying the needs and interests of all students in a class and responding to them equitably through instruction. Differentiation, or differentiated instruction, requires robust teaching skills that must be developed through a series of coherent experiences spanning the program.

Historically, coherent learning experiences about differentiation - and other similarly complex topics - have been lacking in preparation programs (Dack, 2019b). Candidates have experienced disconnects between core ideas presented across different courses, or between ideas presented in courses and ideas embraced by experienced teachers in the field. Such problems of coherence often center upon multi-faceted pedagogical approaches that are a) defined and modeled by different instructors in significantly different ways across courses, or b) advocated by university instructors but not widely implemented in the field. Because both of these criteria are often met in the case of differentiation, it is particularly important for programs to ensure that the teaching of differentiation is coherent.

Three undergraduate initial licensure programs within the department of MDSK (B.A. in middle grades education, minor in secondary education, minor in foreign language education) have recently determined that program coherence around differentiation needs to be strengthened. This determination was rooted in our assessment of recent programmatic data gathered from candidates in these programs while student-teaching. (Data sources are detailed in the Evaluation section.)

For several years, 1) scores on observation protocols that assess candidates' teaching performance and 2) candidates' responses on program exit surveys describing their perceptions of their preparedness to teach have both suggested many graduates are not fully prepared to differentiate upon completion of these programs. Additionally, some course instructors and site coordinators (full-time university employees

who supervise and coach student-teachers in the field) have expressed interest in learning more about empirically based methods of differentiation and ensuring their messages about differentiation align with other teacher educators' messages.

The investigator is a nationally recognized expert on differentiation whose research on this topic (e.g., Dack, 2018; Dack, 2019a; Dack et al., 2019; Dack & Triplett, 2020) includes a study on the most effective methods of achieving program coherence surrounding differentiation (Dack, 2019b). As a result, the investigator possesses the knowledge needed to lead this work and accomplish the objectives.

## **Objectives and Prior Work**

The project objectives are to:

- develop a documented learning trajectory of understanding, knowledge, and skill objectives
   related to differentiation that will be taught throughout the targeted programs;
- develop numerous resources on differentiation aligned to those objectives to be used at different points in the programs (foundations, methods, student teaching seminar courses); and
- determine the developed resources' efficacy through data gathered from candidates in the targeted programs.

The first two objectives will be accomplished in consultation with other faculty and site coordinators.

The project will build upon previous work in three areas.

- The investigator has piloted the design of resources for differentiating social studies instruction in collaboration with the social studies methods instructor and site coordinator. These resources will be expanded during the project and then serve as a model for the development of resources for other content areas.
- The project will adapt "coherence check" structures employed during our department's program redesign work in 2018-2019, when the investigator led workshops designed to strengthen coherence related to lesson planning. The same workshop structure will be used for this project.

 The investigator has studied the role of program coherence in candidate learning about differentiation at another institution (Dack, 2019b). The design of this project builds directly on those findings.

## **Research Questions**

The project will involve a two-part mixed-methods study aligned to the third objective. Part 1, which will occur during the SOTL grant period, will address the question:

- What impact does exposure to cohesive resources focused on differentiation in a foundations
  course have on candidates' perceptions of their preparedness to teach diverse learners?
   Part 2, which will occur after the SOTL grant period, will compare an experimental group who
  experienced the new resources with a control group from the previous cohort to address the questions:
  - What impact does exposure to cohesive resources focused on differentiation at multiple points in
    a teacher education program have on candidates' performance of teaching skills related to
    differentiation, in comparison with candidates who did not use the resources?
  - What impact does exposure to cohesive resources focused on differentiation at multiple points in a teacher education program have on candidates' perceptions of their preparedness to teach diverse learners, in comparison with candidates who did not use the resources?

## **Impact**

The impact of this project is expected to be substantial. Differentiation skills are essential for equitably supporting student needs. During the pandemic, they are more important than ever, as variance in student proficiencies has widened even further (Darling-Hammond & Hyler, 2020). All undergraduate candidates enrolled in middle grades, secondary, or foreign language preparation programs will benefit. This includes candidates seeking licensure to teach math, science, social studies, language arts, or world languages (approximately 55). We anticipate that data will show the experimental group is significantly more prepared to meet the needs of diverse learners than the prior cohort. Should study results be positive, this project could be expanded into other teacher preparation programs in the college, possibly

impacting hundreds of candidates each semester. It could also be expanded to formally train clinical educators (experienced teachers who host student-teachers) with the resources.

#### Literature Review

## Coherence

In the field of teacher preparation, program coherence refers to a shared vision of good teaching rooting all aspects of candidates' experiences. Teacher educators within the same program should have a robust, collective vision of effective practice reflected across all courses and all fieldwork, including student-teaching (Grossman et al., 2008; Hammerness & Klette, 2015). (Teacher educators include faculty who teach courses and site coordinators who coach candidates in the field.)

Strong program coherence is associated with: candidates receiving more effective opportunities to learn to teach; improved effects on graduates' instruction; and graduates being more likely to stay in the teaching force. In contrast, incoherent programs have had relatively ineffective influences on novices' practice (Feiman-Nemser et al., 2014; Hammerness, 2014).

Factors that contribute to a lack of program coherence include lack of collaboration among course instructors and site coordinators' lack of familiarity with specific course content (Darling-Hammond, 2006; Zeichner, 2010). Darling-Hammond (2006) argued strong coherence begins with teacher educators having common knowledge, shared beliefs, and well-established relationships. Teacher educators must have collaborative, ongoing communication about the program's common vision and how it will be reflected across coursework and fieldwork (Allsopp et al., 2006).

Coherence within coursework. Research dating back three decades suggests a long history of teacher education programs offering disconnected courses lacking a unified conceptual framework of teaching (Korthagen & Kessels, 1999; Tom, 1997). Grossman, Hammerness, and McDonald (2009) highlighted the common "curricular divide" between foundations courses targeting general principles of instruction and methods courses focused on the specifics of a content area. Programs featuring unrelated courses that do not emphasize a shared vision of teaching have had relatively ineffective influences on the practice of new teachers (Zeichner & Gore, 1990). Approaches to improving coherence among courses

include faculty planning together and teaching common ideas and instructional strategies across multiple courses (Darling-Hammond, 2006).

Coherence between coursework and fieldwork. Even when a program achieves coherence among its courses, it often lacks coherence between candidates' learning experiences in courses and their experiences in the field, such as during student-teaching. This occurs when clinical educators do not enact aspects of the program's vision of effective teaching. The role of site coordinators is especially important when this occurs, as they must reinforce the program's vision with candidates - and possibly mentor clinical educators. This will only be possible if site coordinators have been engaged in coherence work within the program (LaBoskey & Richert, 2002).

The project seeks to strengthen coherence in MDSK programs across courses taught by different faculty and between coursework and fieldwork supervised by site coordinators.

#### Differentiation

Differentiation is an approach to instruction focused on proactively responding to academic diversity, or differences among students that affect learning (Tomlinson, 2017). It includes strategies that respond not only to individual learner differences (e.g., special education students or English learners) but also to patterns of learner differences across a whole class.

Differentiation addresses learner differences including: readiness, or proficiency with objectives; interests, or affinities that motivate learning; and learning profile, or preferred ways to approach learning. In response to these differences, teachers offer multiple ways for learners to access content, process knowledge, and show evidence of learning through products. In doing so, teachers may assign students one version of a task suited to their needs or interests, or teachers may offer students choices among options (Tomlinson, 2017).

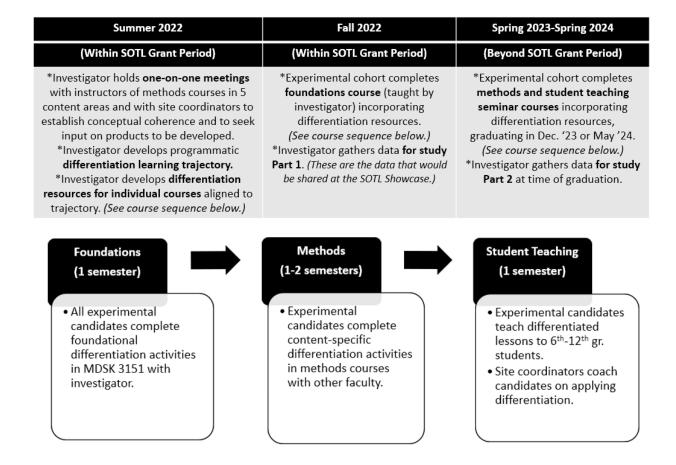
The importance of differentiation's use lies in its potential benefits for learning outcomes, as positive effects on achievement and higher-order thinking have been found among diverse K-12 students in varied settings (Geisler et al., 2009; Marulanda et al., 2006). Increases in achievement across grade

levels, content areas, and diverse demographic groups have also been documented when it was used schoolwide (Beecher & Sweeny, 2008; Burris & Garrity, 2008).

## **Program Coherence around Differentiation**

Preparation program coherence problems may explain research indicating candidates are often unable to enact differentiation in their early careers (Dack & Triplett, 2020; McCray & McHatton, 2011), since a lack of coherence makes it less likely graduates will use this approach effectively as inservice teachers. Unfortunately, teacher educators' presentations of differentiation have often reflected misconceptions about its purpose and function (Sands & Barker, 2004; Santangelo & Tomlinson, 2012), which program graduates adopt and enact. This research underscores the importance of teacher educators focusing coherence work on differentiation.

**Timeline & Methods** 



The project will occur in three phases. For phase 1 in summer 2022, the investigator will develop two products. The differentiation learning trajectory will identify increasingly complex objectives addressed at introductory, extension, and full application levels (see Appendix A), corresponding with the courses sequenced above. The differentiation resources will include a variety of instructional materials, such as: concept maps depicting differentiation's principles; readings with discussion questions; video examples of differentiated lessons with discussion questions; lesson planning templates for specific differentiation strategies; content-specific exemplars of differentiated lesson plans with analysis questions; and rubrics for evaluating differentiated lesson quality. (Although these resources are intended for use in coursework, they could also be informally shared by site coordinators with clinical educators as needed to strengthen coherence between coursework and fieldwork.)

To create products that are applicable in varied courses, the investigator will meet individually with all methods course faculty and site coordinators. These conversations will focus on co-constructing an empirically based definition of differentiation and reaching consensus on how it should be enacted in a particular content area.

For phase 2 in fall 2022, experimental candidates will engage with new foundations-level differentiation resources in MDSK 3151. For phase 3, they will engage with more advanced resources in methods and student teaching seminar courses between spring 2023 and spring 2024. As described below, a two-part study will measure project impact. The quasi-experimental design involves a control group who experienced the original program and an experimental group who completed the program with the new resources.

## **Evaluation**

Project effectiveness will be evaluated using data related to candidates' teaching performance and perceptions of program experiences. In part 2 of the study, data will be compared between control candidates who graduate in December 2022 and May 2023 (estimated n=70 based on current enrollment in foundations courses) and experimental candidates who graduate in December 2023 and May 2024

(estimated n=55 based on prior trends). In part 1 of the study, data will only be gathered from the experimental candidates.

## Part 1 (Within SOTL Grant Period)

In December 2022, after experimental candidates have experienced the foundational level of the differentiation resources, they will complete a short survey with questions about their perceptions of the efficacy of the resources and of their preparedness to teach diverse learners. (These questions will mirror those on graduate exit surveys, described in Part 2 below.) Qualitative data will be analyzed using interpretive qualitative methodologies (Marshall & Rossman, 2011). Quantitative data will be analyzed to determine mean scores on applicable questions. Part 1 data will be analyzed over winter break and will inform potential changes to methods course resources that will be used in spring 2023.

## Part 2 (Beyond SOTL Grant Period)

**CPAST.** During student teaching, all candidates across control and experimental groups will be assessed using the Candidate Preservice Assessment of Student Teaching (CPAST), a validated and reliable observation protocol designed to assess student-teachers. The assessment is completed by site coordinators, who are trained scorers (VARI-EPP, 2017). Candidate sub-scores on the Differentiated Methods item (see Appendix B) are particularly relevant to the study.

edTPA. All candidates across control and experimental groups will also complete edTPA during student-teaching, a validated and reliable performance-based assessment that measures a candidate's proficiency with planning, instructing, and assessing learning (SCALE, 2014). This standardized assessment is scored externally by trained Pearson evaluators to enhance reliability. Candidate sub-scores on the Rubric 2 – Planning for Varied Student Learning Needs item (see Appendix C) are particularly relevant to the study.

Control and experimental groups' scores on CPAST and edTPA will be compared. Independent group comparisons will be completed for the total scores on each instrument, as well as on sub-scores that make up the total. Analyses will focus largely on sub-scores for items relevant to differentiation noted above.

Graduate Exit Surveys. Last, comparisons between experimental and control cohorts will be drawn from exit surveys all graduates complete. The survey collects quantitative and qualitative data on candidates' program experience. In particular, the investigator will analyze responses to questions about how well candidates feel prepared to work with diverse learners. Qualitative data will be analyzed using interpretive qualitative methodologies (Marshall & Rossman, 2011). Quantitative data will be analyzed to compare mean scores on relevant survey items between the two groups.

## **Knowledge Dissemination**

The investigator will share results locally with faculty and administration in the college and the entire university at a SoTL Showcase. The investigator will present results at the annual conference of the North Carolina Association of Colleges and Teacher Educators and at the national conference of the American Association of Colleges and Teacher Educators. Additionally, the investigator will submit a manuscript to *Teaching and Teacher Education*, a high-impact journal.

## **Human Subjects**

An IRB protocol will be submitted in summer 2022.

### **External Funding**

The project may serve as a pilot test for a larger, externally funded project. The investigator is currently exploring the Spencer Small Research Grants Program as a next step in funding. The larger project could apply lessons learned from coherence work focused solely on differentiation to coherence work that applies to wider concepts presented more broadly across programs, such as the principles of learning science or high-leverage teaching practices.

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## **Appendix A: Sample Differentiation Learning Trajectory**

Appendix A presents a sample differentiation learning trajectory. (The trajectory has been abbreviated for this proposal.) The sample below addresses one topic: differentiating based on student readiness. It includes four types of learning objectives based on the widely used *Understanding by Design* (Wiggins & McTighe, 2005) curricular framework: understanding, essential question, knowledge, and skill objectives.

- The understanding and essential question objectives represent the "big ideas" of candidate learning about differentiation that will cut across all three courses in which they will learn about this teaching practice. Those objectives therefore remain the same throughout the program.
- The knowledge and skill objectives are specific to each course in which candidates will learn about differentiation. The extension objectives (targeted in methods courses) and full application objectives (targeted in student teaching) build and expand on the objectives presented in the prior course, becoming more advanced over time. Knowledge and skill objectives are intentionally matched to a candidate's development at a particular point in their program.

Learning trajectories will be created for *each* key differentiation topic. It is estimated that at least eight key topics, including differentiating based on student readiness (addressed below), will be targeted across the program. It is therefore anticipated that at least seven more trajectories will be developed.

Each trajectory for each topic will include all four categories of objectives, as in the sample below.

## **Topic: Differentiating based on Student Readiness Understanding Objectives**

## Candidates will understand that...

- Supporting student growth begins with a teacher's focus on student **readiness**, not intelligence or ability.
- Teachers demonstrate respect for students by designing differentiated tasks that give ALL students **equitable** access to equally rigorous and equally engaging learning experiences.

(Same essential understanding objectives for introductory, extension, and full application levels.)

## **Topic: Differentiating based on Student Readiness Essential Question Objectives**

## Candidates will keep considering...

- How can a teacher's focus on intelligence and ability harm students? Why does a teacher's focus on **readiness** better support student growth?
- How does a teacher prevent "differentiation" from becoming an excuse for **inequitable** instruction?

(Same essential question objectives for introductory, extension, and full application levels.)

Topic: <u>Differentiating based on Student Readiness</u> Knowledge Objectives			
Introductory Knowledge (Foundations Course)	Extension Knowledge (Methods Course)	Full Application Knowledge (Student Teaching)	
Candidates will know  • definitions of key vocabulary: readiness, ability, tiering, scaffolding respectful tasks	<ul> <li>Candidates will know</li> <li>the three steps in the process of tiering a lesson by readiness, and the sub-steps that compose them</li> </ul>	Candidates will know  • definitions and examples of the two types of respectful tasks (equally powerful and equally engaging) in tiered lessons differentiated by readiness	

Topic: <u>Differentiating based on Student Readiness</u> Skill Objectives			
Introductory Skills (Foundations Course)	Extension Skills (Methods Course)	Full Application Skills (Student Teaching)	
<ul> <li>Candidates will be able to</li> <li>Identify strategies for differentiation by readiness in a given lesson or unit plan.</li> <li>Evaluate whether multiple differentiated versions of a task are equally aligned to a learning objective.</li> </ul>	<ul> <li>Candidates will be able to</li> <li>Design a content-specific lesson in which the strategy of tiering is used to differentiate by readiness.</li> <li>Identify common content topics for which differentiation by readiness will likely be needed.</li> </ul>	Candidates will be able to  • Evaluate whether suggestions for differentiation in pre-set curriculum are appropriate for given students in the student-teaching context, and modify suggested strategies as needed.  • Evaluate whether suggestions for differentiation in pre-set curriculum are equitable, and modify suggested strategies as needed.	

## **Appendix B: CPAST Differentiated Methods Subscale**

The CPAST sub-scale for evaluating differentiated methods (VARI-EPP, 2017, p. 6) is shown below. Site coordinators rate candidate performance on a scale from zero (does not meet expectations) to three (exceeds expectations) using the following criteria:

Exceeds Expectations (3 points)	Meets Expectations	Emerging	Does Not Meet
	(2 points)	(1 point)	Expectations (0 points)
Lessons make meaningful and relevant connections to  1. learners' prior knowledge  2. previous learning  3. future learning  4. other disciplines and real-world experiences  AND  Differentiation of instruction supports learner development  AND  Organizes instruction to ensure content is comprehensible, relevant, and challenging for learners.	Lessons make clear and coherent connections to  1. learners' prior knowledge  2. previous lessons  3. future learning  AND  Differentiation of instruction supports learner development  AND  Organizes instruction to ensure content is comprehensible and relevant for learners.	Lessons make an attempt to build on, but are not completely successful at connecting to,  1. learners' prior knowledge, 2. previous lessons OR future learning  AND  Differentiation of instruction is minimal  AND  Organizes instruction to ensure content is comprehensible to learners	Lessons do not build on or connect to learners' prior knowledge.  AND/OR Explanations given are illogical or inaccurate as to how the content connects to previous and future learning  AND/OR Differentiation of instruction is absent

VARI-EPP (2017) offers the following examples of "possible evidence" related to differentiation aligned with the criteria levels above (p. 6):

Exceeds/Meets Expectations	Emerging/Does Not Meet Expectations
<ul> <li>Frequently uses learners' learning styles, interests, and needs to plan lesson and homework tasks, design assessments, group students, and differentiate the timing and content of tasks.</li> <li>Divides students into groups that support learning and build on learners' strengths.</li> <li>Identifies and effectively employs interventions that meet the needs of specific subpopulations (e.g., ELL, special education).</li> </ul>	<ul> <li>Plans or delivers lessons withcontent that is not suitably differentiated.</li> <li>Inconsistently plans or delivers lessons or assessments designed to reach learners with diverse learning styles and needs.</li> <li>Identifies interventions that meet the needs of specific subpopulations, but does not ensure that all identified students are adequately served by the interventions.</li> </ul>

## Appendix C: edTPA Rubric 2 – Planning for Varied Student Learning Needs

The edTPA sub-scale for evaluating middle grades candidate proficiency with planning for academically diverse students (edTPA, 2019, p. 16) is shown below. (The sub-scales for secondary and foreign language candidates reflect very similar language and concepts.)

Level 1	Level 2	Level 3	Level 4	Level 5
There is no evidence of planned supports.  OR	Planned supports are loosely tied to learning objectives or the central focus of the learning	Planned supports are tied to learning objectives and the central focus with attention to the	Planned supports are tied to learning objectives and the central focus. Supports address the	Level 4, plus:  Supports include specific strategies to identify and respond
Candidate does not attend to any instructional requirements in IEP and 504 plans.	segment.	characteristics of the class as a whole.	needs of specific individuals or groups with similar needs.	to key misconceptions.