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The Application of Differentiated Instruction in Postsecondary Environments: Benefits, Challenges, and Future Directions

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The population of students pursuing higher education is increasingly diverse. Research suggests, however, postsecondary instructional beliefs and practices have not evolved in ways that effectively respond to diverse students' unique needs. This scholarly self-study examined the nature and impact of using differentiated instruction in an introductory-level graduate course comprised of students who varied significantly in terms of their levels of readiness, their interests, and their learning profiles. The findings suggest differentiation had a positive and meaningful impact on student learning. Students' class performance and their reflections on the experience indicated that students were appropriately challenged and were able to find meaning and relevance in the course content and activities. Themes emerging from this study highlight the necessity for pedagogy that reflects college students' (a) diverse ways of learning, (b) diverse interests, experiences, and goals, and (c) diverse personal circumstances. Insights gleaned from this investigation are offered and recommendations for future research are provided.

> I process information in a different way than it is taught or utilized in science courses. I learn to understand by putting [concepts] into my own language, not by memorizing and spitting out the words as I receive them… [The other students] were not attentively taking notes, computing problems along with the professor, or asking questions. Most appeared bored. Either they had the material before, or they were totally lost…I am not stimulated to think all this information through as I copy it into my notes. So, when a question or doubt arises in mind, I let it float on by… I wasn't willing to change the study habits and thought processes that worked so well for me in literature, history, and political science… I insisted on studying to understand, not memorize and perform… I was weeded out…because the material never really captivated or stimulated me in ways that I am used to being stimulated. (Tobias, 1990, pp. 54, 57-58)

It is well-documented that the population of students who are pursuing higher education is increasingly diverse. Specifically, we have seen changes with the postsecondary student population related to race, ethnicity, gender, economic class, and nationality (Almanac Issue, 2005; American Council on Education [ACE], 1999, 2000; National Center for Educational Statistics [NCES], 2005). There is also an increasing number of older adult learners, many who have significant responsibilities such as working and caring for dependants while attending college (National Survey of Student Engagement [NSSE], 2006). Finally, there has been a dramatic rise in enrollment among students with disabilities who now comprise 11.4% of undergraduates (Brinkerhoff, McGuire, & Shaw, 2002; NCES, 2005).

A separate body of research suggests that several salient factors influence postsecondary learning outcomes and experiences. First, students' performances are influenced by their academic skills (Mull, Sitlington, & Alper, 2001) and self-regulatory strategies (Hofer & Pintrich, 1997; Pintrich & Schunk, 2002; Ruban & Reis, 2006). Specifically, difficulties in areas such as reading, writing, mathematics, memory, time management, and organization negatively impact performance in individual courses and reduce the overall likelihood of degree completion (Allsopp, Minskiff, & Bolt, 2005; Reis, Neu, & McGuire, 1997; Wirt, Choy, Rooney, Provanik, Sen, & Tobin, 2004). Second, students' previous educational experiences impact levels of engagement and motivation in subsequent courses (Kuh, 2007; NSSE, 2006). Third, learning outcomes are influenced by instructors' beliefs about the process of teaching and learning. A student-centered, learning-oriented epistemology promotes learning; a teacher-centered, transmission-oriented epistemology inhibits learning (Kember 1997, 2001; Norton, Richardson, Hartley, Newstead, & Mayes, 2005; Samuelowicz & Bain, 2001; Trigwell, Prosser & Waterhouse, 1999). Fourth, positive outcomes are associated with the use of certain instructional techniques. Specifically, efficacy is promoted by interactive, engaging, and collaborative instruction (Hake, 1998; NSSE, 2006; Putnam & Burko, 2000) that is congruent with students' interests, beliefs, and background experiences (Grossman, 2005; Ross, 1983; Ross, McCormick, & Krisak, 1986; Wideen, Mayer-Smith, & Moon, 1998) and aligned with their learning profiles (Hativa & Birenbaum, 2000; Kember, 2001; Layton & Lock, 2003; Tobias, 1990).

By juxtaposing knowledge of increased student diversity with insights related to teaching and learning, one would logically assume postsecondary instructional practices have evolved from being uniform and didactic. However, as the introductory quotation illustrated, the status quo persists. Pilner & Johnson (2004) explain,

> Although higher education became more available to historically underrepresented groups, educational practices and culture did not shift significantly to address the experiences and learning needs of the students newly enrolled. So, although legislation opened the door to diverse student populations, the absence of efforts to change the culture or the educational practices in higher education (such as the curriculum, physical layout, and teaching and testing methods) have created significant barriers to access, retention, and graduation for many students. (p. 106)

Differentiated Instruction

In contrast to the educational practices that exist in higher education, pedagogy in elementary and secondary schools is evolving to meet the needs of diverse learners (e.g., Darling-Hammond, 2006; Pugach, 2005). This has been accomplished, in part, through the use of differentiated instruction (Haager & Klinger, 2005; Salend, 2008; Tomlinson, 2005a, 2005b). The overarching premise of differentiated instruction is that learning experiences need to be designed and adapted to meet students' individual, and diverse needs in order to facilitate student success. In other words, teachers need to be "flexible in their approach to teaching and adjust the curriculum and presentation of information to learners, rather than expecting students to modify themselves for the curriculum" (Hall, Strangman, & Meyer, 2003, p. 2). Differentiated instruction has expanded in both breadth and depth during the past few decades and is now recognized as an effective way for elementary- and secondary-level teachers to meet all students' diverse needs (Lawrence-Brown, 2004; Olenchak, 2001; Piggott, 2002; Stodolsky & Grossman, 2000; Strangman, Hall, & Meyer, 2003; Tomlinson, Brimijoin, & Narvaez, 2008; Tomlinson et al., 2003). The widespread endorsement of, and interest in, differentiation is further evidenced by its integral presence in professional journals and teacher education programs (Hagger & Klinger, 2005; Mastropieri & Scruggs, 2007; Pugach, 2005; Salend, 2008).

As with most pedagogical approaches, multiple models of differentiated instruction have been proposed. However, because Tomlinson's (2005a, 2005b) comprehensive framework is one of the most frequently cited in professional literature (Hall et al., 2003), it was used as the theoretical foundation for this investigation. The premise of Tomlinson's model is that teachers promote equity and excellence by differentiating high quality content, process, and product based on their understanding of students' readiness levels, interests, and learning profiles.

Readiness, interest, and learning profile. The concept of readiness encompasses students' knowledge, understanding, and skill vis-à-vis the instruction a teacher is planning (Tomlinson 2005a, 2005b). Readiness is not synonymous with intellectual ability; it is a much broader and deeper construct that is shaped by prior learning and life experiences, attitudes about school, as well as cognitive and metacognitive proficiency. The goal of readiness differentiation is to ensure all students are provided with appropriately challenging learning experiences (Vygotsky, 1962, 1978). Tomlinson (2005a) explains,

> A task that's a good match for student readiness extends that student's knowledge, understanding, and skills a bit beyond what the student can do independently. A good readiness match pushes the student a little beyond his or her comfort zone and then provides support in bridging the gap between the known and the unknown. (p. 45)

Students' interests are the topics and/or processes that evoke curiosity and inspire passion (Tomlinson, 2005a, 2005b). Differentiating instruction according to students' existing interests promotes engagement, facilitates motivation, and helps them connect what it being taught with things they already value. Interest-based differentiation can also be structured to encourage students to discover new interests.

Learning profile describes the ways in which a student learns most effectively (Tomlinson, 2005a, 2005b). Salient factors include group orientation, cognitive styles, intelligence preferences, and learning environment preferences. Differentiation based on learning profile allows students to learn in ways that are natural and efficient.

Content, process, and product. Teachers' knowledge of students' levels of readiness, interests, and learning profile characteristics facilitates effective and appropriate content, process, and product differentiation. Content consists of both *what* is being taught as well as *how* students access that material (Tomlinson, 2005a, 2005b; Tomlinson & McTighe, 2006). In the vast majority of instances, it is preferable for *what* is taught to remain relatively constant across learners, with teachers varying *how* students get access to specified content to address learners' needs. In other words, if the objective of a lesson is to solve algebraic equations, that expectation should apply to all students;

some may need to work in ways that are more complex and with more independence and others with greater scaffolding (support) from the teacher and peers. Exceptions to this guideline occur in two instances: (a) when a student has already mastered complex understandings and applications of that goal, or (b) when a student has gaps in prerequisite elements such that there is little or no likelihood he or she will be able to successfully reach the goal, even with support. In these cases, teachers augment required content with opportunity and support to master prerequisite content or extend required content. In all other cases, essential or core understandings form the basis from which differentiation occurs.

Strategies that promote content differentiation in response to readiness include, but are not limited to (a) providing text materials at varied reading levels and levels of complexity (and languages, if appropriate), (b) curriculum compacting, (c) using small group instruction to re-teach or reinforce content, (d) providing text on audiotape, (e) supplementing oral presentations with videotapes and visual demonstrations, (f) providing note-taking organizers, (g) highlighting or summarizing key portions of text, and (h) using manipulatives (Tomlinson, 2005a, 2005b). Allowing students to focus on an area they select, focusing the overall content on student-derived topics and questions, and offering examples that relate to students' experiences and areas of interest are all examples of how content can be successfully differentiated in response to students' interests. Content differentiation in response to students' learning profile characteristics can be effectively achieved using strategies such as presenting material in visual, auditory, and kinesthetic ways, using examples and illustrations that represent varied ways of thinking, and presenting information in both deductive and inductive formats.

Process can be thought of as "sense-making-activities" that allow each student to increase his or her level of understanding about the topic being taught (Tomlinson, 2005a, p. 79). Although there is inherent overlap between content and process, a simplistic way to contrast the two is to think of process as being the task (or series of tasks) that allow students to begin thinking about, working with, and personalizing information after they stop listening to the teacher or reading text materials (the content). High-quality differentiated activities focus clearly on essential learning goals, facilitate students' ability to understand content, are interesting and engaging, require students to use higher-level thinking, and involve use or application of content (rather than rote recall).

As with content differentiation, process can be differentiated in response to readiness, interest, and learning profile (Tomlinson, 2005a, 2005b). Examples of strategies that promote effective process differentiation include providing varied levels of support and accommodations (e.g., graphic organizers, structured activity guides), tiering activities to various levels of complexity, providing directions at varied levels of specificity, varying the pace of work, offering multiple options of expression, giving students alternative topics on which to focus, explicitly helping students make connections between personal interests and learning activities, and creating activities that are harmonious with students' preferred modalities of learning.

Products are culminating assessments that allow students to demonstrate how much they understand and how well they can apply their knowledge and skills after a significant segment of instruction (Tomlinson, 2005a, 2005b). Contrasting the performance orientation of differentiated products with more traditional, formal assessment procedures, Tomlinson (2005a) explained, "teachers may replace some tests with rich product assignments, or combine tests with product options so the broadest range of students has maximum opportunities to think about, apply, and demonstrate what they have learned" (p. 85). Products should offer students' multiple pathways to show mastery of common learning goals. Hallmarks of effectively differentiated product assignments include providing clear and appropriate criteria for success, focusing on real-world relevance and application, promoting creative and critical thinking, requiring the analysis and synthesis of multiple sources of information, and allowing varied modes of expression. Throughout product development, it is also important for teachers to provide students with adequate scaffolding and support, as well as opportunities for peer and self-evaluation.

Purpose of the Study

Despite the well-documented interest in, and indications of success with, differentiation at elementary- and secondary-levels, there is a paucity of research exploring parallel implementation in higher education. This scholarly self-study was designed to address that gap in the extant literature. Specifically, the purpose of this research was to explore the nature and impact of using differentiated instruction in an introductory-level graduate course (Education and Psychology of Exceptional Learners) taught by the first author. Students enrolled in the course were highly diverse in terms of their levels of readiness, interests, and learning profiles. Three research questions served to focus this investigation: (a) How do the principles and practices associated with differentiated instruction influence students' progress towards course objectives?; (b) How do students perceive the use of differentiated instruction?; and (c)

What conditions and/or strategies contribute to the outcomes?

Methodology

Self-study research has received increasing attention in recent years and is now recognized as a valuable and necessary form of scholarship, especially within the field of teacher education (Clift & Brady, 2005; Richardson, 1996; Russell, 2002; Zeichner & Noffke, 2001). As Zeichner (1999) explained,

> Contrary to the frequent image of the writings of teacher educators in the wider educational research community as shallow, under-theorized, self-promotional, and inconsequential, much of the work has provided a deep and critical look at practices and structures in teacher education. This work can both inform the practices of teacher educators who conduct it and contribute to knowledge and understanding of teacher education for the larger community of scholars and educators... Teacher educators conducting research about their own practices can play an important part in communicating this complexity to those who themselves are not involved in the work of teacher education. This disciplined and systematic inquiry into one's own teaching practice provides a model for prospective teachers and for teachers of the kind of inquiry that more and more teachers are hoping their students employ. (p. 11)

In keeping with that tradition, the motivation for this self-study was three-fold. First, it was anticipated that the research experience would expand the instructor's reflectivity and pedagogical repertoire. Second, given the hypothesized efficacy of differentiation, it was anticipated that students' learning outcomes and experiences would be positively impacted. Third, it was anticipated that publicly sharing the findings would offer insight, promote critical discussion, and spawn questions for subsequent inquiries (Loughran, 2007; Louie, Drevdahl, Purdy, & Stackman, 2003; Zeichner, 2007).

An Introduction to the Students

This study was conducted at a large, state-supported university accredited by the National Council for Accreditation of Teacher Education. During the semester this research was conducted, 25 students (16 female and 9 male), ranging in age from nineteen to "sixty-plus," were enrolled in Education and Psychology of Exceptional Learners. They represented the full spectrum of socioeconomic classes, as well as several different racial and ethnic groups. As outlined in Table 1 (and described in the next section), students were also highly diverse on multiple factors associated with readiness, interest, and learning profile which, collectively, had significant implications for course content, processes, and products.

Readiness. Related to readiness, three factors were particularly salient for the instructor to understand and use as a guide for appropriate differentiation. First, students began the course with differing levels of background knowledge. Three members of the class were nearing completion of their master's program; they had completed an extensive amount of educationally-related course work at the graduate-level. Nine students had completed some educationally-related coursework at the undergraduate-level, but were just beginning their graduate studies (either as part of an alterative route certification or master's degree program). The remaining 13 had completed little or no coursework in topics related to education. Second, students differed in terms of relevant experience. Regarding school-based experiences, eight students were experienced educators, five were beginning their first year of teaching, and 12 had no practical experience. Regarding personal experiences, five students had a close relative with a disability and three had disabilities themselves. Third, students had differing levels of proficiency with skills that were relevant for the course. Five students were highly proficient readers and writers, 16 possessed adequate reading and writing skills, and four students had significant difficulty with reading fluency, reading comprehension, or expressing their ideas in written form (two students had a documented learning disability and two were learning English as a second language).

Interest. Two factors related to interest proved to be especially important for appropriate differentiation. First, students were (or were aspiring to become) employed in a variety of professional roles. These included school psychologist (four students), special education teacher (six students), learning disability teacher consultant (five students), general education teacher (four students representing three content areas), curriculum specialist (one student), school counselor (three students), and building administrator (one student). Two students were taking the course as an elective and not pursuing educationally-relate careers. Second, students had different preferences regarding the age group on which to focus. Two students were most interested in preschool-aged children, 13 were interested in elementary-aged children, seven were interested in middle- or high-school aged students, and one was interested in adults.

Learning profile. Related to learning profile, four factors were important to consider. First, students differed in terms of their preferred modalities of

Table 1
Student Characteristics

Characteristic	n	% (N = 25)
Previous education coursework		
Extensive graduate	3	12
Some undergraduate	9	36
None	13	52
Previous school-based experience		
Extensive	8	32
First year teacher	5	20
None	12	48
Previous personal experience		
Family member with a disability	5	20
Self	3	12
None	17	68
Reading & writing skills		
Highly proficient	5	20
Adequate	16	64
Difficulties	4	16
Professional role		
Special education teacher	6	24
Learning disability teacher consultant	5	20
School psychologist	4	16
General education teacher	4	16
School counselor	3	12
Curriculum specialist	1	4
Building administrator	1	4
Other, not educationally-related	2	8
Population of interest		
Preschool	2	8
Elementary	13	52
Secondary (middle and high)	7	28
Adults	1	4
Preferred learning modality		
Visual	20	80
Auditory	5	20
Active	23	92
Passive	2	8
Preferred grouping format		
Alone	3	12
Pairs or small groups	22	88
Preferred level of autonomy		
Highly structured, guided	23	92
Autonomy, minimal guidance	2	8
Preferred mode of expression		
Written narration	11	44
Oral	6	24
Creative	8	32

learning. The majority of the class learned best through visual representations and active, hands-on activities. A few, however, preferred auditory input and more passive, reflective learning experiences. Second, students had different grouping preferences. Three strongly preferred to work alone, whereas the rest of the class found pairs and small groups enhanced their learning. Third, students differed in their desired level of autonomy. The majority of the class preferred a high level of structure and guidance from the instructor. However, two found minimal guidance and self-directed learning to be most beneficial. Finally, students differed in their preferred mode of expression. Eleven believed they were best able to communicate their thoughts and knowledge through written narration, six preferred oral formats, and eight favored 'creative' means (e.g., visual representations, demonstrations, and/or PowerPoint presentations).

An Overview of the Course

Education and Psychology of Exceptional Learners was a three-credit hour, introductory-level graduate course. It was a requirement for students pursuing graduate degrees in special education, school psychology, school counseling, and nursing, but was open to any graduate student at the university. The overarching goal of the course was to develop an understanding of, and appreciation for, the impact and implications of having a disability. The primary areas

of focus included: categorical disability characteristics, relevant federal laws and state regulations, school classification procedures, community resource options, and classroom practices that facilitate positive experiences and outcomes for students with disabilities.

Preparation. To design a differentiated version of Education and Psychology of Exceptional Learners, the instructor needed first to identify a set of clear course objectives that delineated the knowledge, understandings, skills, and dispositions all students were expected to demonstrate by the end of the semester (see Figure 1). After the objectives were established, the instructor selected an anchor text (Hardman, Drew, & Egan, 2005) and drafted a weekly topical outline.

Next, the instructor designed five primary course assignments and wrote a comprehensive rubric that corresponded with each assignment (see Figure 2). Development of these assignments was guided by Tomlinson's (2005a, 2005b) recommendations for differentiating content, process, and product in response to anticipated diversity in students' levels of readiness, interests, and learning profiles. The rubric for each assignment was trichotomous (i.e., Exceeds Expectations, Meets Expectations, Does not Meet Expectations) and included descriptive indices that corresponded with course objectives (or a portion thereof). Rubrics included a self-evaluation component (i.e., students rated themselves on each element prior to submitting an assignment) and an instructor evaluation component (i.e., the instructor assigned a point value to each element after reviewing the assignment). Students had the option to use feedback from the instructor to revise all assignments except the summative course assessment. A recommended schedule for completion and due dates were outlined for each assignment. During the semester, however, if a student needed additional time, he or she could discuss that need with the instructor. This non-threatening dialogue resulted in a mutually agreed upon plan for completion and additional support was provided, when necessary.

The instructor's final preparation task was to create a pre-assessment that each student would complete during the first class meeting (see Figure 3). Students' responses were carefully reviewed by the instructor and then graphed to facilitate understanding of individual levels of readiness, interests, and learning profile characteristics, as well as salient patterns of similarity and difference among members of the class.

Implementation. Data from the pre-assessment, combined with that ascertained by other informal and formal techniques were used by the instructor to appropriately differentiate content and process throughout the semester. For instance, with regard to readiness, students' responses to the open-ended pre-assessment questions served as an initial assessment of their reading and writing proficiency, as well as their relevant content knowledge. During each class meeting, the instructor furthered her understanding of students' levels of readiness by carefully observing interactions and engagement during a variety of activities and by reviewing students' performance on written tasks. Additionally, the instructor frequently dialogued with each member of the class to solicit information related to salient strengths and needs. Collectively, these strategies ensured assessment reflected both the instructor's evaluation, as well as students' self-evaluations.

To differentiate content, a variety of supplemental reading materials was used for each course topic. This provided each student with opportunities to focus on content that was appropriate, relevant, and engaging. To address a variety of readiness needs, supplemental materials of differing complexity were used. Students who had limited knowledge or experience with a particular topic were able to select materials that offered background information and clear outlines of key points. Students who already understood the fundamentals were able to select materials that offered a more advanced discussion of topics. An illustration of this is seen regarding the topic "special education processes and procedures." Students selected and read (at least) one of three articles in addition to the text. The first article provided an easy-to-read, practitioner-oriented overview of the steps required to determine special education eligibility in public school settings. The second article offered a comprehensive discussion of procedural best practices for school professionals involved with classification decisions. The third article was an empirical examination of how specific standardized assessments can be used to increase diagnostic validity among English Language Learners. Supplemental materials were also used to address differing interests. For example, when the topic was "learning disabilities," students selected and read (at least) two of four articles in addition to the text. The first article focused on early intervention and diagnosis, the second on challenges faced by middle school students, the third on effective transition strategies for students going to college, and the fourth on social experiences among adults.

To facilitate access to content presented via text format, all readings were available in paper and electronic form; guided reading questions, key point summaries, and highlighted texts were also available to students who felt they would be beneficial. Finally, students who had difficulty with reading fluency were given advanced copies of supplemental text materials and any readings that were used during class. Strategies that facilitated access to content presented during class

Figure 1
Course Objectives

Students will demonstrate knowledge and understanding of:

a) The current laws, regulations, and best practices related to providing services to individuals with exceptionalities;
b) The current best practice procedures for defining, assessing, and diagnosing a variety of exceptionalities within an educational setting;
c) Empirically-based instructional strategies, modifications, and accommodations that effectively support individuals with exceptionalities, including those from culturally diverse backgrounds, throughout the lifespan; and
d) Many educational and community-based resources which promote learning outcomes and personal independence among individuals with exceptionalities.

Students will demonstrate the ability to:

a) Access, critically evaluate, and utilize articles from professional journals;
b) Locate and reflect upon the relevance of various educational and community-based resources for individuals with exceptionalities;
c) Effectively collaborate with professional peers to gain knowledge, deliver a professional-development workshop, and increase personal reflection; and
d) Effectively communicate facts and ideas.

Students will demonstrate they value and are committed to:

a) Understanding and embracing exceptionalities and other aspects of diversity;
b) Working to improve the lives and experiences of individuals with exceptionalities; and
c) Collaboratively supporting learning outcomes and personal independence among individuals with exceptionalities.

included the use of multi-media presentations, pairing oral explanations with visual representations, offering note taking guides, having students discuss key ideas using a Think-Pair-Share format, and offering supplemental instruction outside of the scheduled class meeting times.

Regarding process differentiation, tiered activities were used to address varied levels of readiness (Tomlinson, 2005a, 2005b). This ensured that each student had opportunities to obtain a solid understanding of essential information, as well as to learn about more advanced topics, when appropriate. An illustration of this is seen in conjunction with the course topic "special education eligibility and placement decisions." Two groups of students with little experience or knowledge were assigned a Jigsaw activity (Clarke, 1994; Johnson, Johnson, & Holubec, 1994); each group member become an expert on one stage in the eligibility process and taught what they learned to their peers. Concurrently, another group comprised of experienced school psychologists and special education teachers were assigned a role-play activity that simulated a contentious placement meeting for a student with a learning disability and then reflected on the experience. Homework assignments corresponding to tiered activities were also structured to ensure that students had opportunities to reinforce fundamental understanding and to extend their inquiry, when appropriate.

To capitalize on students' diverse interests and future goals, interest-based learning centers were used during the last two course meetings (Tomlinson, 2005a, 2005b). The topics (multiple/severe disabilities, gifted and talented instruction, transition issues, early childhood education) reflected students' preferences as indicated on the pre-assessment. Students completed activities at three of the four learning centers and were given the option of working independently, with a partner, or in a small group.

Appropriate differentiation for one student who was nearing completion of his degree in school psychology was achieved through the use of a semester-long independent study experience because the pre-assessment data (and follow-up conversations) revealed he already demonstrated unilateral mastery of the course objectives. Collaboratively, he and the instructor designed a meaningful and challenging research project focused on a topic of particular interest to him (traumatic brain injury) using a format that was personally relevant (creating a comprehensive handbook and designing and implementing professional development workshop for his colleagues at the school where he worked). He and the instructor had regular meetings throughout the semester to discuss the topic and review his progress on the project. At the end of the semester, he assumed the role of 'instructor' during one class meeting and taught his peers about his selected topic.

Figure 2
Primary Course Assignments

Video Case Reflections

Students selected four (of five) CD-ROM video cases (Harris, 2005). Each case focused on a specific exceptionality, included actual classroom interactions, and offered insightful perspectives from children, families, and a variety of school / community professionals. After viewing each case, students selected and answered five questions from the accompanying workbook. These responses could be submitted in written or oral form (via audio or video tape).

Site Visitations and Resource Guides

Students selected, researched, and visited two organizations that provided some form of service or support to individuals with exceptionalities. They then created a 'resource guide' which synthesized and highlighted useful information about each site (e.g., contact information, targeted population, available services). At the end of the semester, each student gave a brief oral summary of their two sites and distributed their resource guides to the other members of the class.

Sensitivity Experience and Reflection

Students engaged in a series of tasks which simulated the challenges that might be faced by someone who uses a wheelchair. Students who were employed in an educational setting, completed this activity in that environment, so they could gain first hand-knowledge of any barriers that existed. Those who were not (yet) working in a school setting selected a relevant public place (e.g., a local retail mall). After completing the experiential portion of the assignment, students reflected on various aspects of the experience and identified specific ways to improve conditions for individuals with physical disabilities. These responses could be submitted in written or oral form (via audio or video tape).

Professional Development Workshop

Students collaboratively researched a disability category of interest, designed a professional development workshop (targeted towards colleagues within a school setting), and then implemented it during one class meeting. To facilitate successful collaboration and personal relevance, the first task for each group was to identify the unique skills, preferences, and contributions each member had to offer (e.g., creating a PowerPoint presentation, leading activities for the class, locating and interpreting research) and then outline equitable responsibilities based on that insight. Each group was required to meet with the instructor at least two times before giving their presentation to ensure they successfully located / interpreted relevant articles, and created an accurate, comprehensive, and engaging professional development experience.

Summative Content Assessment

At the end of the semester, students were required to demonstrate their cumulative knowledge, understanding, and skills. The class collaboratively wrote six questions that reflected salient course topics; each student selected four to complete. This final assessment was given out on the last day of class and students had up to two weeks to prepare their answers. Students completed this assignment individually, but were allowed to use their notes and other resources they found useful. The four students who experienced significant difficulty expressing their thoughts in writing were given (and exercised) the option of engaging in a professional dialogue with the instructor about each topic.

Data Collection and Analysis

Students' progress towards mastery of the course objectives was documented via performance on the pre-assessment, the primary course assignments, and other class-based activities. At least two sources of data were used to assess each course objective. Students' perspectives about the class were ascertained using the Student Instructional Report (SIR) II, a standardized course evaluation instrument with well-established reliability and validity (Educational Testing Service, 1995). The SIR II was administered by a neutral faculty member during the last class meeting, in adherence with all the prescribed procedures. The SIR II provided students an opportunity to respond anonymously to 45 items using a five-point Likert scale. Twelve items were pre-selected as being directly relevant for the research questions of this study (see Table 2). Descriptive statistical techniques were used for analysis (Hinkle, Wiersma, & Jurs, 1994).

Students' perspectives about differentiation were documented in narrative format. After the semester concluded, students were given the opportunity to respond to the question, "Based on your experience with this class, what do you see as the benefits and drawbacks of differentiated instruction?" All 25 members of the class submitted a written reflection; responses ranged from six sentences to two pages. These narrative data were analyzed inductively using the constant comparative method and open coding procedures (Miles & Huberman, 1994; Strauss & Corbin, 1998). This allowed for the emergence,

Figure 3
Pre-Assessment

1. List the major provisions / requirements related to each of the following laws:
   Individuals with Disabilities Education Act (IDEA) (as per the 2004 reauthorization)
   Section 504
   The Americans with Disabilities Act (ADA)

2. What key changes were made to IDEA when it was re-authorized in 2004?

3. Describe the process that would occur between the time a parent suspects their child has a learning disability until the time an IEP is written:

4. Define "inclusion" and describe your thoughts about this concept.

5. Complete the following chart related to each of the disability categories we will study in this course (Headings included: definition, common characteristics, diagnosis / assessment, effective intervention strategies, personal relevance / level of interest).

6. Define "differentiated instruction" and describe your thoughts about this concept.

7. Describe your personal "learning profile." In other words, "How do you learn best?" (e.g., auditory, visual, kinesthetic; individual, small group, large group; active or passive; from the big picture to details or vice-versa).

8. Describe how this course relates to your professional / personal experiences, your interests, and your goals.

9. How knowledgeable / comfortable are you with APA style for writing and referencing?

10. How knowledgeable / comfortable are you with accessing, reading, and utilizing research articles from professional journals?

11. Please rank the following topics based on your interest level:
   Multiple / severe exceptionalities
   Gifted / talented students
   Transition issues
   Exceptionalities during early childhood
   Working with families of students with exceptionalities
   Court cases that influence school practices
   Assistive technology

identification, integration, and synthesis of thematic codes and categories (available from the first author, upon request). Computers and coding software (i.e., QSR NVivo) facilitated data interpretation. However, this technology was used in conjunction with manual techniques to ensure that the richness and context of the data were preserved (Hesse-Biber, 2004). The use of a thematic conceptual network also facilitated integration, analysis, and interpretation of the quantitative and qualitative data (Coffey & Atkinson, 1996; Miles & Huberman, 1994).

Trustworthiness and Authenticity

Although discussion regarding the nuanced connotations of what constitutes "high-quality" self-study research continues, thematic consensus has emerged in several areas (Bullough & Pinnegar, 2001; Feldman, 2003; Loughran, 2007; Zeichner, 2007; Zeichner & Noffke, 2001). Scholarly self-study necessitates: (a) grounding an investigation with theory and research; (b) collecting and analyzing data with rigorous, comprehensive, systematic, and competently

Table 2
SIR II Results

Statement	5	4	3	M (SD)
5. The instructors way of summarizing or emphasizing important points in class	21 (84%)	4 (16%)	0 (0%)	4.84 (0.37)
6. The instructors ability to make clear and understandable presentations	25 (100%)	0 (0%)	0 (0%)	5.00 (0.0)
7. The instructors use of examples or illustrations to clarify course material	23 (92%)	2 (8%)	0 (0%)	4.92 (0.28)
11. Instructors helpfulness and responsiveness	22 (88%)	3 (12%)	0 (0%)	4.88 (0.33)
13. Instructors concern for student progress	23 (92%)	2 (8%)	0 (0%)	4.92 (0.28)
14. Availability of extra help for this class	21 (84%)	4 (16%)	0 (0%)	4.84 (0.37)
29. My learning increased in this course.	17 (68%)	8 (32%)	0 (0%)	4.68 (0.48)
31. My interest in the subject areas has increased	13 (52%)	12 (48%)	0 (0%)	4.52 (0.51)
33. This course actively involved me in what I was learning	16 (64%)	7 (28%)	2 (8%)	4.56 (0.65)
34. I studied and put effort into this course	10 (40%)	8 (32%)	7 (20%)	4.12 (0.83)
36. I was challenged by this course	11 (44%)	10 (40%)	4 (16%)	4.28 (0.74)
40. Rate the quality of instruction in this course as it contributed to your learning (try to set aside your feelings about the course content)	18 (72%)	7 (28%)	0 (0%)	4.72 (0.46)

Note. For items 5-14 & 40: 5 = Very effective; 4 = Effective; 3 = Moderately effective; 2 = Somewhat ineffective; 1 = Ineffective. For items 29-36: 5 = Much more than most courses; 4 = More than most courses; 3 = About the same as other courses; 2 = Less than most courses; 1 = Much less than most courses. Ratings of 1 or 2 were not used.

applied methods; (c) providing a detailed description of the research setting and process; (d) producing credible, justifiable, and contextually-situated findings; (e) democratic participation; (f) vigilantly searching for alternative perspectives and explanations; and (g) publicly sharing the results. These salient principles, along with time-honored expectations for qualitative inquiry (e.g., Brantlinger, Jimenez, Klinger, Pugach, & Richardson, 2005; Denzin, 2004; Lincoln & Guba, 2002; Miles & Huberman, 1994), guided the design and implementation of this research, as well as the writing of this article.

This investigation was preceded and informed by a comprehensive review of the relevant extant literature. The study was solidly grounded in Tomlinson's well-established, comprehensive theoretical framework of differentiated instruction. The use of guiding research questions ensured data collection, interpretation, and analysis were focused, appropriate, and relevant. A thorough description of the students, the course, and the methodology provided transparency and established the context. The findings are supported by direct quotations and data triangulated by type, method, and source (e.g., qualitative and quantitative, gathered over an extended period of time, collected from every member of the class, and reflective of perceptions as well as actual learning outcomes). Deliberate steps were taken to avoid an over-representation of articulate, high-status, or conforming participants and/or influence from the inherent institutional power structure (e.g., SIR II anonymity, written reflections on differentiation completed after grades were submitted). Finally, peer debriefing and second-level member checks were used to encourage critical consideration of emerging themes. Collectively, these strategies promoted trustworthiness and authenticity.

Results

Impact on Learning

The first research question was "How do the principles and practices associated with differentiated instruction influence students' progress toward course objectives?" Collectively, the data documented differentiation had a positive and meaningful impact on student learning. Performance on primary assignments and other class activities documented that all 25 members of the class successfully mastered each course objective. Fourteen students exceeded the required course expectations by completing assignments or activities that reflected advanced goals. The SIR II data provided additional evidence of the positive impact.

Specifically, students indicated their learning increased significantly (SIR II item 29; *M* = 4.68(.48)) and the quality of instruction positively impacted learning (SIR II item 40; *M* = 4.72(.46)).

Insights about Differentiated Instruction

The second and third research questions were "How do students perceive the use of differentiated instruction?" and "What conditions and/or strategies contribute to the outcomes?" Collectively, the data yielded the overarching theme that members of the class viewed differentiation as unique, but highly beneficial because it allowed the course to be structured in ways that reflected diversity among members of the class. Supporting that broad finding, three thematic strands emerged: (a) Differentiation was beneficial because college students have diverse ways of learning; (b) Differentiation was beneficial because college students have diverse interests, experiences, and goals; and (c) Differentiation was beneficial because college students have diverse personal circumstances.

Diverse ways of learning. All 25 students indicated that differentiated instruction was effective because college students do not learn in a single, uniform fashion. Students' narrative reflections about the course provided strong evidence for this conclusion. For instance, an experienced general education teacher who was just beginning her master's program in special education summarized her perception this way:

> As a teacher, I know that not all students are the same cookie cutter shape. Everyone learns differently and approaches learning from a different point of view. We recognize this with our younger students, so why not give adults the same opportunities. If you think about it, as adults, we're no different from our children and we should be given opportunities to maximize our learning potential. Not everyone is Einstein, doing complex math problems in the blink of an eye. Some people need more time, more resources, different models, or support in other ways. Isn't the ultimate goal to have everyone get the right answer? This class showed that using differentiated instruction makes that possible, and I now believe necessary, at this level.

Students indicated that using a variety of materials and activities was especially beneficial because it promoted active learning and engagement. This, in turn, led to improved comprehension of key ideas. Some also extended that relationship to include enhanced self-perceptions. For example, a student enrolled in the alternative route certification program explained:

> In contrast to what I experienced in this class, differentiated instruction is not evident in most courses that have been part of my alternate route teacher preparation program. Time after time, professors stand in front of everyone, speak about the benefits of differentiated instruction, and then proceed to lecture for hours while you feverishly took notes. I can tell you that I remember absolutely nothing from those long Saturdays, other than the fact that my hand hurt from all the writing. For anyone who was not an auditory learner, the experience seemed like an eternity and only left you with a sense of failure as a student and future teacher.

Others correlated high engagement with the potential to improve attendance, as illustrated by the response from a special education teacher.

> I think that if more college professors took the stance that they were there to engage their students, a lot more students would come to class. I think that all too often professors believe that college students should be able to learn from dry lecture, because they are in college and that's what they are supposed to do. News flash: college is still about learning and teaching in a way that ensures the maximum amount of learning.

Another experienced special education administrator hypothesized:

> If other graduate courses were taught like this one, more people would be apt to go back to school and continue their professional development through course work at a university because they would see the learning as engaging and relevant.

Along with identifying the benefit of using a variety of materials and activities, many students also noted the additive value of participating in collaborative learning opportunities and of having options for expression. For example, a general education teacher explained:

> Within our groups, we were allowed to capitalize on our strengths and choose what and how we'd like to contribute. I really appreciated that we could each have a different format for any of our presentations, because, alas, I'm still a poster-board man in a Power Point world! However, I will admit I learned a lot about Power Point presentations from my cohorts, and this was an unexpected benefit of the course.

Similarly, the students with writing difficulties indicated that being able to submit some of the course assignments in oral form provided them with an opportunity to validly demonstrate their knowledge. One of the students who did not speak English as her native language explained, "This was my first time where I can show what I do know, not just what I do not know."

Finally, all of the students who had difficulty with reading indicated they benefited from the strategies that were designed to support text comprehension because those strategies allowed them to master (and in many instances exceed) the course objectives. One student with a learning disability summarized her thoughts this way:

> I know that I definitely benefited from differentiated instruction within our classroom. The experience truly was helpful for me. I am a slow reader and by giving me handouts to pre-read and allowing me to have extra time, I was successful. It wasn't something that I was used to.

Another student who had significant difficulties with fluency and comprehension (but who was not officially diagnosed as having a learning disability) concurred.

> I feel like once we make it to college, where we're expected to be capable adults, the recognition of needed accommodations seems to be forgotten. If the purpose of college is to educate, then these accommodations and learning techniques which have been proven through research to be helpful, should continue. . . Too many college courses are simple lecture and "read on your own" type classes. Many professors mistakenly assume that at this level, learners don't have varied needs anymore. This is far from the truth. I needed the extra 'boost' like highlighters, questions to focus me, and outlines to follow. With that, I was fine. Without that, I would have really been having a tough time.

The SIR II data provided additional support for the conclusion that differentiation was beneficial because college students have diverse ways of learning. Specifically, students felt challenged (SIR II item 36; M = 4.28(.74)), but also supported (SIR II items 11, M = 4.88(.33); 13, M = 4.92(.28); and 14, M = 4.84(.37)). They also believed important points were summarized effectively (SIR II item 5; M = 4.84(.37)), presentations were clear and understandable (SIR II item 6; M = 5.00(0.0)), and examples and illustrations were used effectively (SIR II item 7; M = 4.92(.28)).

Diverse interests, experiences, and goals. All 25 students indicated that differentiated instruction was effective because college students have different interests, experiences, and goals. Specifically, students strongly endorsed class-based activities and course assignments that allowed them to select topics and tasks that were at an appropriate level of complexity and that were personally relevant. These options increased motivation to put forth effort, enhanced understanding and internalization of the concepts, and created a desire to pursue additional, independent learning. For example, a student finishing her degree in school psychology explained:

> My previous experiences stressed conformity as opposed to individuality. I feel that I learn best when I am able to freely explore alternatives and find answers on my own. By being able to do this, it allowed me to derive personal meaning from the material that I was studying and further explore information that would readily apply to my future.

The student who engaged in the independent research project offered a similar reflection:

> I want to thank you again for this opportunity to move beyond a pedantic learning experience into a realm of abstract and in-depth research on a topic. It allowed me to move past germane facts... and delve into a more complex rationale and theory in an effort to individualize the material into my current situation!

Finally, the provision of choices led students to feel an increased sense of voice and personal agency in the class. For example, one student who was finishing her master's degree in special education explained:

> The course began by allowing us to choose what we were interested in learning about. I really appreciated how things were adapted to meet my needs. For example, being able to complete the sensitivity project at my school allowed me to actually improve it. It gave me a feeling of power which is often taken away in college courses.

The SIR II data provided additional support for the conclusion that differentiation was beneficial because college students have diverse interests, experiences, and goals. Specifically, students strongly agreed with the statements: "My interest in the subject areas has increased" (SIR II item 31; M = 4.52(.51)); "This course actively involved me in what I was learning," (SIR II item 33; M = 4.56(.65)); and "I studied and put effort into the course" (SIR II item 34; M = 4.12(.83)).

Diverse personal circumstances. Eight students indicated that differentiated instruction was effective because college students have personal and professional

responsibilities which impact their course experiences (e.g., working multiple jobs, raising families, and taking other courses). Within that context, the use of flexible timelines reduced students' stress levels and provided the opportunity for them to produce high quality work. One of the full time special education teachers explained,

> In one of the articles we could choose to read for the last class, we read about a teacher who believes that kids should be comfortable in their class in order to perform their best. In this class, we were made comfortable with flexible timelines and they saved my sanity during this term! I knew I wanted to do the work, and do it well, but I just didn't have the time. Being able to take a step back and know that I didn't have to have everything done that next day really helped me put the extra effort into each assignment. It goes without saying that extra effort only increased my knowledge.

In many instances, students who requested additional time completed advanced activities, and indicated that doing so was only possible because of having that option.

Discussion and Conclusions

This self-study was designed to explore the nature and impact of using differentiation in an introductory-level graduate course. Guided by Tomlinson's (2005a, 2005b) model, course content, processes, and products were differentiated to reflect students' levels of readiness, interests, and learning profiles. It was hoped that this research would expand the instructor's reflectivity and pedagogical repertoire, enhance students' learning outcomes and experiences, and offer insight for subsequent inquiries and discussion.

Perhaps the most noteworthy finding from this investigation is that the efficacy associated with differentiation in P-12 settings can also be realized in a postsecondary environment (Lawrence-Brown, 2004; Olenchak, 2001; Piggott, 2002; Stodolsky & Grossman, 2000; Strangman et al., 2003; Tomlinson, 2005a, 2005b; Tomlinson et al., in press; Tomlinson et al., 2003). More specifically, Tomlinson's (2005a, 2005b) theoretical framework for instructional design and delivery can be utilized to successfully address the needs of an increasingly diverse college student population (ACE 1999, 2000; Almanac Issue, 2005; Brinkerhoff et al., 2002; NCES, 2005; NSSE, 2006). Collectively, the data provided evidence that differentiation optimized the learning experience for the 25 students enrolled in Education and Psychology of Exceptional Learners; each member of the class was provided with appropriate levels of support and opportunities. Students who would have struggled to be successful if the course was taught with traditional pedagogy were able to master all the course objectives. Students who started the semester demonstrating mastery (or near mastery) of some objectives, as well as those who sought out opportunities for accelerated and advanced learning, were able to experience a challenging and enriching curriculum. Differentiation enabled all students to find meaning and relevance in the course content and activities. Incorporating a wide-variety of materials and activities, using flexible grouping strategies, providing options for expression, supporting text comprehension, offering choices, and being flexible with timelines were some of the strategies that proved to be most beneficial.

Students' reflections about differentiation revealed that it was beneficial because college students have (a) diverse ways of learning; (b) diverse interests, experiences, and goals; and (c) diverse personal circumstances. The first two themes reinforce Tomlinson's (2005a, 2005b) assertion that content, product, and products should reflect students' unique levels of readiness, interests, and learning profiles. They also support previous findings that suggest learning experiences and outcomes are influenced by students' academic skills (Allsopp et al., 2005; Mull et al., 2001; Reis et al., 1997; Wirt et al., 2004), the instructor's epistemological beliefs (Kember 1997, 2001; Norton et al., 2005; Samuelowicz & Bain, 2001; Trigwell et al., 1999), and the use of instructional strategies that are congruent with students' interests, beliefs, and background experiences (Grossman, 2005; Ross, 1983; Ross et al., 1986; Wideen et al., 1998) and aligned with their learning profiles (Hativa & Birenbaum, 2000; Kember, 2001; Layton & Lock, 2003; Tobias, 1990).

The third theme highlights a nuanced consideration within the context of postsecondary instruction that is not explicitly noted in Tomlinson's (2005a, 2005b) model; adult learners have competing, external responsibilities that are not typically experienced by P-12 students yet these responsibilities have the potential to significantly influence a student's unique course experience. Responsibilities such as providing and caring for family members, financial obligations, and job responsibilities all compete against college course expectations and requirements for the adult learner's time and attention.

This differentiated course experience also illuminated several important insights and implications for practice. First, appropriate differentiation was predicated on the establishment of clear course objectives. Delineating the common areas of knowledge, understandings, and skills, allowed fundamental elements to be prioritized and enabled the creation of more advanced activities that were aligned with the overarching goals of the course. Clear

objectives also provided a framework for identifying differentiation strategies that could effectively support students' learning without compromising the integrity of the course. For example, allowing multiple forms of expression was appropriate because it enabled the instructor to validly assess students' content knowledge and was harmonious with the objective, 'Students will demonstrate the ability to effectively communicate facts and ideas.'

Second, success with differentiation was achieved through the integral use of assessment throughout the semester. Although Tomlinson's (2005a, 2005b) model provides a theoretical framework for considering how student characteristics can be used to guide instruction, specific decisions regarding how to implement differentiation throughout the course reflect the instructor's evolving understanding of students' levels of readiness, interests, and learning profiles. Because members of the class were keenly aware of their unique needs, assessment strategies that provided opportunities for students to directly offer their feedback and personal insight, in addition to documenting their progress towards course objectives, proved extremely beneficial. As one general education teacher explained,

> From experience, I know what I must do to be successful in a classroom. I need frequent breaks, various delivery techniques (Power Points, videos, group dialogues, research, projects etc.), good student/teacher relationships, and 'inconspicuous' support in class if I don't understand something. But, it's just occurring to me now that even though I have all this insight about how to be successful, no one has ever asked me to share it before.

Third, because the use of differentiation at the postsecondary level is not a common practice, it was critical for the instructor to provide students with an overview of Tomlinson's (2005a, 2005b) model, to initiate discussions about philosophical underpinnings of differentiation, and to clarify the roles and responsibilities that teachers and students assume in a differentiated classroom. This discussion began during the first class meeting, and continued throughout the semester, as "teachable moments" arose.

Finally, the experiences with this course highlighted that fact that effective differentiation requires a significant amount of time, effort, and dedication on the part of the instructor. In so far as the preparation for any college course can be characterized as "substantial," preparing for a course that involves differentiated content, processes, and products proved even more intensive. After the foundational objectives and topical outline were written, the primary assignments and rubrics had to be thoughtfully and strategically created. Initial ideas for supplemental readings and topical activities were outlined, but during the semester they were constantly modified and expanded in response to an evolving understanding of students' needs. With multiple activities and supplemental readings being utilized in each class, the time and effort required inherently exceeded that of a course where all students have a uniform experience. Because the primary course assignments were specifically designed to facilitate critical thinking and reflection, significant time and effort was also dedicated to reading and providing extensive feedback to students on each one. Students had the option to revise each assignment based on the feedback, so often papers were submitted and read more than once. A significant amount of time was also devoted to meeting with each class-facilitation group and to providing individualized support for students who experienced difficulty meeting the high expectations. We would passionately argue, however, that the time, effort, and dedication required for effective differentiation is unequivocally worthwhile when the high level of student engagement and mastery are experienced. Further, once an instructor develops an initial set of differentiated tasks for a particular course, those can serve as a baseline for refinement in subsequent offerings of the course and thus, significantly decrease instructor preparation in the long term.

It is our hope that this self-study will serve as an impetus for others to systematically and reflectively explore ways to ensure that all students have meaningful and appropriately rigorous learning experiences. This initial course experience proved to be validating and inspiring, but it is hardly definitive. Future research is needed to posit an expanded understanding about the nature and impact of utilizing Tomlinson's (2005a, 2005b) model with different courses and with different populations of students. Specifically, we encourage instructors in all disciplines to design a relevant pre-assessment tool and then differentiate content, process, and product in response to students' levels of readiness, interests, and learning profiles. All of the strategies described within the context of this course (e.g., supplemental readings, tiered assignments, interest-based centers, independent study projects, flexible grouping, flexible timelines, reading comprehension supports, multiple options for expression, reading comprehension support) could be readily implemented in other classes. Within the context of teacher education, it will also be critical to establish whether if experiencing differentiation in their college courses has an impact on future teachers' subsequent P-12 practices and outcomes. Finally,

expanding the use of differentiation will only be realized if postsecondary educators endorse the philosophy, understand the model, and gain proficiency with a wide variety of instructional strategies. Thus, there is a necessity to explore current attitudes and practices among college faculty, as well as to enhance their pedagogical repertoires.

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