

COURSE SYLLABUS

Course: Differentiation and the Brain

Presenters: David Sousa and Carol Ann Tomlinson

Credits: 3 Graduate Credits

Required eBook: *Differentiation and the Brain: How Neuroscience Supports the Learner-Friendly Classroom* (Sousa and Tomlinson, Solution Tree Press, 2011)

Course Overview

Research is revealing so much about how the brain learns that educators can no longer ignore the implications of these discoveries for educational practice. Teachers need to find ways to use this brain research to develop strategies that will allow students to succeed in classrooms with a diverse mix of student readiness, interest, and learning profile. This course, led by expert presenters Carol Ann Tomlinson and David A. Sousa, offers a model for teachers for setting up a differentiated and brain-friendly classroom. Through workshop and classroom footage and interviews with practitioners, participants will explore how teachers' and students' mindsets affect differentiation and learn how to develop learning environments most conducive to differentiation. They will study the major components of a brain-friendly quality curriculum; explore effective practices for assessing student achievement to inform instruction; learn how to respond to student readiness, interests, and learning profiles; and investigate effective management techniques for the differentiated classroom.

Presenters' Bios

David A. Sousa, Ed.D., is an international consultant in educational neuroscience and author of more than a dozen books that suggest ways that educators and parents can translate current brain research into strategies for improving learning. Dr. Sousa has edited science books and published dozens of articles in leading journals on staff development, science education, and educational research. His most popular books for educators include *How the Brain Learns*, third edition; *How the Special Needs Brain Learns*, second edition; *How the Gifted Brain Learns*; *How the Brain Learns to Read*; *How the Brain Influences Behavior*; *How the Brain Learns Mathematics*, which was selected by the Independent Publishers' Association as one of the best professional development books of 2008; *The Leadership Brain*; and *Mind, Brain, and Education: Neuroscience Implications for the Classroom*.

Dr. Sousa is past president of the National Staff Development Council. He has received numerous awards, including the Distinguished Alumni Award and an honorary doctorate from Massachusetts State College at Bridgewater and an honorary doctorate from Gratz College in Philadelphia. He has a master of arts teaching degree in science from Harvard University and a doctorate from Rutgers University. He has taught senior high school science and has served as a K-12 director of science and a district superintendent in New Jersey schools. He has also been an adjunct professor of education at Seton Hall University and a visiting lecturer at Rutgers University.



Carol Ann Tomlinson, Ed.D. is a highly esteemed consultant, trainer, presenter, and author. She works with teachers through the United States and internationally to develop more responsive, heterogeneous classrooms. Her education experience includes twenty-one years as a public school teacher and twelve years as a program administrator of special services for struggling and advanced learners. Recognized by the state of Virginia as Teacher of the year, Dr. Tomlinson has focused throughout her career on curriculum and instruction for struggling and advanced learners and encouraging creative and critical thinking in the classroom. She is a faculty member at the University of Virginia's Curry School of Education, where she is the William Clary Parrish Jr. Professor and chair of the Department of Educational Leadership, Foundations, and Policy. Dr. Tomlinson codirects the university's Institutes on Academic Diversity. She was named Outstanding Professor in the Curry School of Education in 2004 and received an All University Teaching Award in 2008.

Dr. Tomlinson is a reviewer for eight journals and the author of more than two hundred articles, book chapters, books, and professional development materials. Among her books on differentiation are: *How to Differentiate Instruction in Mixed-Ability Classrooms*, *The Differentiated Classroom: Responding to the Needs of All Learners*, *Fulfilling the Promise of the Differentiated Classroom: Strategies and Tools for Responsive Teaching*, *Integrating Differentiated Instruction and Understanding by Design: Connecting Content and Kids* (with Jay McTighe), and *Leading and Managing a Differentiated Classroom* (with Marcia Imbeau). Dr. Tomlinson's master's degree and doctor of education degree come from the University of Virginia.

Course Objectives

After completing this course, educators will know:

- Mindset's effects on student learning
- Environment's effects on learning
- High quality, brain-friendly curriculum
- Effective assessment strategies
- Differentiation strategies to meet the needs of students' different readiness, interests, and learning profiles
- Effective management techniques for the differentiated classroom

Student Learning Outcomes

After completing this course, educators will apply the following skills:

- Embrace a growth mindset to affect student achievement
- Create a cooperative classroom environment
- Develop high quality curriculum
- Employ assessment strategies for, as, and of student learning
- Differentiate for readiness, interest, and learning profile
- Lead and manage their differentiated classrooms



Unit 1: Mindset, Learning Environment, and Differentiation

In this unit, Dr. Tomlinson and Dr. Sousa explore the notion that the learning environment impacts everything else that goes on in the classroom either positively or negatively; as Dr. Sousa says, there are no neutral classrooms. In this context, the presenters and workshop participants consider students' social and emotional needs; the effects of the teacher's growth or a fixed mindset on the student's mindset and, therefore, his or her growth or achievement; and the importance of making personal connections with students.

Unit Objectives

After completing this unit, educators will know:

- A productive definition of differentiated instruction
- Classroom environment's impact on student learning
- Fixed vs. growth mindsets and their effects on student learning

Student Learning Outcomes

After completing this unit, educators will apply the following skills:

- Create classroom environments that support student learning
- Impact student learning by maintaining a growth mindset

eBook: Chapters 1 & 2

Participants read Chapter 1, "The Nonnegotiables of Effective Differentiation," and Chapter 2, "Mindset, Learning Environment, and Differentiation," in their eBook, and respond to reflection prompts.

Unit 2: A Community of Learners

As Dr. Sousa notes, teachers are brain changers, not only in the intellectual work they facilitate for students, but the emotional and social work as well. In this unit, the presenters and workshop participants explore the impact of emotion on student learning, how to forge connections with students, and how to engage them socially to construct a community of learners.

Unit Objectives

After completing this unit, educators will know:

- The emotional and social climate's effects on student learning
- Strategies for forging connections with students



- The dangers of stereotype threat

Student Learning Outcomes

After completing this unit, educators will apply the following skills:

- Meet students' emotional and social needs in the classroom
- Forge connections with their students that facilitate learning
- Employ flexible grouping strategies that contribute to a community of learners

Unit 3: Sense and Meaning

Sample lesson plans anchor this unit's consideration of such subjects as what constitutes 21st century learning, how to enable shifts of new information from students' short-term to their long-term memory, how to emphasize the meaning or relevance of content, and how to orient students toward learning.

Unit Objectives

After completing this unit, educators will know:

- 21st century students' needs
- The process the brain undergoes to shift knowledge from short- to long-term memory
- The importance of assisting students in finding meaning in content
- How to successfully orient students toward learning

Student Learning Outcomes

After completing this unit, educators will apply the following skills:

- Facilitate the shift of knowledge from short- to long-term memory
- Highlight sense and meaning in relation to new content
- Orient students toward learning

eBook: Chapter 3

Participants read Chapter 3, "Curriculum and Differentiation," in their eBook and respond to reflection prompts.

Unit 4: Curriculum and Differentiation

When teachers differentiate high quality curriculum, the quality of their differentiation and the prospects for student learning are stronger. Dr. Tomlinson specifies that high quality curriculum includes clear KUDs



(know, understand, do), respectful tasks, a plan to engage learners, and “teaching up.” Dr. Sousa adds that curriculum races are not brain-friendly. Time must be allowed for students to find sense and meaning in what they are learning in order to remember it.

Unit Objectives

After completing this unit, educators will know:

- What constitutes high quality curricula
- What constitutes high quality differentiation
- How memory systems work
- Strategies to effect student engagement
- How to foreground essential knowledge, skills, and understanding
- Why to “teach up”
- Respectful tasks

Student Learning Outcomes

After completing this unit, educators will apply the following skills:

- Create high quality curricula
- Plan and execute high quality differentiation
- Help students transfer new knowledge, skills, and understanding to long-term memory
- Effect student engagement
- Detail essential knowledge, skills, and understandings
- Translate standards into essential knowledge, skills, and understanding
- Challenge all students
- Construct respectful differentiated tasks

eBook: Chapter 4

Participants read Chapter 4, “Classroom Assessment and Differentiation,” in their eBook and respond to reflection prompts.

Unit 5: Classroom Assessment and Differentiation

In this unit, Dr. Tomlinson and Dr. Sousa consider the role of assessment in a differentiated classroom. Assessment is a process, not an instrument, they argue, and should be ongoing as assessment for instruction, as instruction, and of instruction. They explore the role of feedback vs. grades and provide methods for reducing students’ anxiety, which inhibits memory recall.

Unit Objectives



After completing this unit, educators will know:

- When, why, and how to assess students' readiness, interest, and learning profiles
- When, why, and how to assess students' work
- The role of pre-, formative, and summative assessment
- The importance of ongoing feedback
- The importance of facilitating high quality processing through assessment
- How to minimize students' stress in relation to assessment

Student Learning Outcomes

After completing this unit, educators will apply the following skills:

- Engage in ongoing practices that promote assessment for, as, and of student learning
- Provide productive feedback to students
- Use assessment to facilitate high quality processing tasks
- Diminish students' assessment anxiety

eBook: Chapters 5, 6 & 7

Participants read Chapter 5, "Differentiating in Response to Student Readiness," Chapter 6, "Differentiating in Response to Student Interest," and Chapter 7, "Differentiating in Response to Student Learning Profile," in their eBook and respond to reflection prompts.

Unit 6: Differentiating in Response to Student Readiness, Interest, and Learning Profile

Differentiated instruction tends to students' varied readiness, interests, and learning profiles. In this unit, Dr. Tomlinson details what those three terms mean and offers examples of how to meet those needs. Dr. Sousa elaborates on students' need for challenge and intrinsic rewards, as well as the need to feel a sense of belonging and safety.

Unit Objectives

After completing this unit, educators will know:

- Grouping strategies that facilitate differentiation and learning
- The relationships of differentiation to student growth, motivation, and efficiency
- Strategies for productive differentiation for readiness, interest, and learning profile
- The role of dopamine in student learning
- The functions of multiple-modality projects

Student Learning Outcomes



After completing this unit, educators will apply the following skills:

- Group students to facilitate learning
- Differentiate to effect student growth, motivation, and efficiency
- Differentiate for students' readiness, interests, and learning profiles
- Provide more opportunities for students' success
- Employ multiple-modality projects to engage different learning profiles

eBook: Chapter 8

Participants read Chapter 8, "Managing a Differentiated Classroom," in their eBook and respond to reflection prompts.

Unit 7: Leading and Managing a Differentiated Classroom

A differentiated classroom requires flexible classroom management from teachers, which in turn supports high level learning. Dr. Tomlinson compares teachers as leaders to teachers as managers and the role each plays, while Dr. Sousa describes students' need for order and routine and the opportunity to take risks and make mistakes.

Unit Objectives

After completing this unit, educators will know:

- Different learning environments and their effects on student learning
- Teachers as managers vs. teachers as leaders
- The importance of routine
- The importance of an environment conducive to risk-taking

Student Learning Outcomes

After completing this unit, educators will apply the following skills:

- Distinguish between dysfunctional, adequate, orderly, orderly/restrictive, and orderly/enabling learning environments
- Facilitate an orderly/enabling environment through differentiated instruction
- Embrace their roles as both managers and leaders
- Establish routines that enable learning
- Construct a classroom environment conducive to risk-taking



Methods of Instruction

- Videos (presentations consisting of lecture, interviews, and classroom footage)
- Readings
- Reflection questions (open-ended questions at intervals throughout the video presentations where participants are asked to reflect on the course content, their own practice, and their intentions for their practice)
- Quizzes (selected-response quizzes to assess understanding of the video presentations)
- Discussion forum (prompts after each unit that engage participants in online dialogue with their cohorts)
- Midterm (a project intended to get teachers to begin to develop their practice by putting to work in the classroom what they have learned)
- Final (a project that enables educators to reflect on their practice and assess their students' work through the lens of what they have learned)

Plagiarism Policy

KDS recognizes plagiarism as a serious academic offense. Plagiarism is the passing off of someone else's work as one's own and includes failing to cite sources for others' ideas, copying material from books or the Internet (including lesson plans and rubrics), and handing in work written by someone other than the participant. Plagiarism will result in a failing grade and may have additional consequences. For more information about plagiarism and guidelines for appropriate citation, consult plagiarism.org.

Percentage of Course Credit

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|------------------------|-----|
| • Reflection questions | 25% |
| • Quizzes | 15% |
| • Midterm | 25% |
| • Final | 35% |

In order to complete the requirements of the course, the participant must complete all course work (e.g., reflections, quizzes, and any midterm and/or final), including watching all videos and participating in all discussion forums. We do not award partial credit.

Grading Policy

A: 3.4 – 4.0
B: 2.7 – 3.3
C: 2.0 – 2.6
F: < 2.0



Reflection/Quiz Rubric

Activity	Distinguished (4)	Proficient (3)	Basic (2)	Unsatisfactory (1)
Quizzes	90-100%	80-89%	70-79%	69% or below
Reflection Question	<p>Participant has provided rich detail and supporting examples from the course content.</p> <p>Participant has made responses to prompts personally meaningful and relevant to his or her teaching practice.</p>	<p>Participant has included appropriate content from the course content.</p> <p>Participant has made thoughtful comments in direct response to the prompts.</p>	<p>Participant has included little that indicates consideration and comprehension of course content.</p> <p>Participant has answered most questions directly but some too briefly.</p>	<p>Participant has included little to no content indicating consideration and comprehension of course content.</p> <p>Participant has not addressed the specific questions posed.</p> <p>Participant has not responded to all reflection questions.</p> <p>Participant has copied from the course transcript without synthesis or analysis.</p>

Midterm

Develop a “brain-friendly” lesson plan that specifically intends to engage your students as a community of learners, contributing to one another’s success in meeting a particular standard. Please do the following:

1. Identify a standard (e.g., from your state standards or the Common Core State Standards) that the lesson plan will target.
2. Identify 3 learning objectives for your lesson plan that are tied to the standard you have identified.
3. List the steps or separate activities of the lesson plan that relate to the standard and learning objectives.
4. Explain how these steps or activities are “brain-friendly.”
5. Define a “community of learners” and explain how one or more of the steps or activities you have described require students to engage as a community of learners.
6. Complete the *Intervention Planning Worksheet* located in the Resources section of the eClassroom. In this worksheet you will identify mastery thresholds, associated red flags, and appropriate interventions.
7. Implement your proactive intervention plan as you will revise the plan for your final.



Midterm Rubric

Step	Distinguished (4)	Proficient (3)	Basic (2)	Unsatisfactory (1)
<p>Identify a standard that the lesson plan will target.</p> <p>Identify 3 learning objectives for your lesson plan that are tied to the standard you have identified.</p>	<p>Participant has identified a clearly relevant and highly appropriate standard for the lesson plan.</p> <p>Participant has identified clear, concise, and relevant learning objective(s) closely tied to the chosen standard.</p>	<p>Participant has identified an appropriate standard to target for the lesson plan.</p> <p>Participant has identified appropriate learning objective(s) tied to the chosen standard.</p>	<p>Participant has identified a standard to target, though it is not relevant to the lesson plan.</p> <p>Participant has identified learning objective(s), but they are either not entirely appropriate to the lesson or not clearly described.</p>	<p>Participant has not identified a standard to target.</p> <p>Participant has not identified learning objectives.</p>
<p>List the steps or separate activities of the lesson plan that relate to the standard and learning objectives.</p>	<p>Participant has provided a thorough and sensible list of steps or separate activities clearly aligned to the standard.</p>	<p>Participant has listed the steps or separate activities aligned with the standard.</p>	<p>Participant has listed steps or separate activities, though their alignment to the standard is unclear.</p>	<p>Participant has not listed steps or separate activities, or they are inappropriate.</p>
<p>Explain how these steps or activities are brain-friendly.</p> <p>Explain how one or more steps and activities require students to engage as a community of learners, defining “community of learners” as you do so.</p>	<p>Participant has persuasively argued with rich supporting detail, gathered from research and the course content how these steps or activities are brain-friendly.</p> <p>Participant has both accurately and concisely defined “community of learners” in his or her own words and explained with rich supporting detail how the steps or activities will engage students as such.</p>	<p>Participant has explained how these steps or activities are brain-friendly, with some examples or support.</p> <p>Participant has defined “community of learners” in his or her own words and explained how the steps or activities will engage students as such.</p>	<p>Participant has indicated how these steps or activities are brain-friendly, though with only minimal reference to the appropriate research or data from the course.</p> <p>Participant has indicated how the steps or activities will engage students as a “community of learners”, but has not defined the term or has not done so in his or her own words.</p>	<p>Participant has not indicated how these steps or activities are brain-friendly or has misrepresented the data and/or research from the course.</p> <p>Participant has neither defined “community of learners” in his or her own words nor indicated how the steps of activities will engage students as such.</p>



Formal issues	<p>Participant has made no grammatical errors.</p> <p>Participant has organized paragraphs around clearly articulated main ideas.</p> <p>Participant has written in an effective and eloquent style—i.e., has varied his or her sentence structure and made careful word choice.</p>	<p>Participant has made a few grammatical errors.</p> <p>Participant has organized most paragraphs around clearly articulated main ideas.</p> <p>Participant has written in an effective and eloquent style—i.e., has varied his or her sentence structure though not always found the right word.</p>	<p>Participant has made some distracting grammatical errors.</p> <p>Participant has organized some paragraphs around main ideas but not others.</p> <p>Participant has written in a style that communicates his or her thoughts but with no marked eloquence and insufficient attention to word choice.</p>	<p>Participant has made multiple grammatical errors.</p> <p>Paragraphs are not organized around main ideas.</p> <p>Participant has written in a style that does not effectively communicate his or her thoughts.</p>
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Final

Dr. Tomlinson remarks that “a powerful activity is one in which students make or do something, using essential knowledge and essential skills, in order to arrive at or explain an essential understanding.” Your task is to design such an activity (*you may choose the same unit of study as your midterm, but must design a new activity for this assignment*) and to differentiate that activity for student readiness, interest, or learning profile. Please do the following:

1. Describe the key steps or stages of the activity you will implement with your students.
2. Explain the outcomes of the activity (i.e. what the activity asks students to make or do).
3. Explain what essential understanding you want your students to achieve by engaging in this activity.
4. Explain what essential knowledge and skills students will demonstrate throughout the activity.
5. Explain how the activity is brain-friendly.
6. Describe how you would differentiate the activity for student readiness, interest, or learning profile.
7. Note what your assessment process will be for this activity. The assessment process should include pre-assessment, formative assessment, and summative assessment.



Final Rubric

Step	Distinguished (4)	Proficient (3)	Basic (2)	Unsatisfactory (1)
Describe the key steps or stages of the activity.	Participant has described with illustrative detail the key steps or stages of the activity.	Participant has described the key steps or stages of the activity with some detail.	Participant has listed the key steps or stages of the activity, though not all of them appear relevant.	Participant has either not indicated the key steps or stages of the activity or indicated inappropriate ones.
Explain the outcomes of the activity (i.e. what the activity asks students to make or do).	Participant has detailed a challenging and engaging outcome (i.e. what students are asked to make and/or do).	Participant has adequately explained what the activity asks students to make or do.	Participant has stated what the activity asks students to make or do, though its appropriateness is in question and/or the outcome is not entirely clear	Participant has not indicated what the activity asks students to make or do.
Explain what essential understanding you want your students to achieve.	Participant has explained in detail an essential understanding in highly appropriate terms he or she wants students to achieve.	Participant has explained an essential understanding he or she wants students to achieve.	Participant has indicated an essential understanding he or she wants students to achieve, though that essential understanding is more of a skill or concept.	Participant has not indicated an essential understanding he or she wants students to achieve.
Explain what essential knowledge and skills students will demonstrate through the activity.	Participant has explained with rich supporting detail what knowledge and skill students will demonstrate through this activity and how the activity requires students to use that knowledge and those skills.	Participant has described the knowledge and skill students will demonstrate and indicated, with some support, how the activity requires students to use the essential knowledge and skills.	Participant has indicated how the activity requires students to use either essential knowledge or skills and/or with inadequate support.	Participant has not indicated how the activity requires students to use essential knowledge or skills.
Explain how the activity is brain-friendly.	Participant has explained with rich supporting detail from the course content	Participant has explained with some detail how the activity is brain-	Participant has indicated how the activity is brain-friendly, though it is	Participant has not indicated how the activity is brain-friendly.



	how the activity is brain-friendly.	friendly.	not convincingly so.	
Describe how you would differentiate the activity for student readiness, interest, or learning profile.	<p>Participant has described with rich supporting detail how he or she would differentiated for one of the following:</p> <ul style="list-style-type: none"> • Student readiness • Interest • Learning profile 	<p>Participant has described with some detail how he or she would differentiate for one of the following:</p> <ul style="list-style-type: none"> • Student readiness • Interest • Learning profile 	<p>Participant has listed differentiation strategies for one of the following:</p> <ul style="list-style-type: none"> • Student readiness • Interest • Learning profile 	<p>Participant has not indicated any differentiation strategies.</p>
Note what your assessment process would be in relation to the activity, referring to pre-assessment, formative assessment, and summative assessment.	<p>Participant has described in rich detail the assessment process, referring to all 3 kinds of assessments.</p> <p>All 3 assessments are well aligned to the activity.</p>	<p>Participant has noted an appropriate assessment process, referring to all 3 kinds of assessments.</p>	<p>Participant has indicated the assessment process, though by referring to 2 kinds of assessments. The assessments' alignment to the activity isn't entirely clear.</p>	<p>Participant has not indicated an appropriate assessment process and/or referred to only 1 kind of assessment.</p>
Formal issues	<p>Participant has made no grammatical errors.</p> <p>Participant has organized paragraphs around clearly articulated main ideas.</p> <p>Participant has written in an effective and eloquent style—i.e., has varied his or her sentence structure and made careful word choice.</p>	<p>Participant has made a few grammatical errors.</p> <p>Participant has organized most paragraphs around clearly articulated main ideas.</p> <p>Participant has written in an effective and eloquent style—i.e., has varied his or her sentence structure though not always found the right word.</p>	<p>Participant has made some distracting grammatical errors.</p> <p>Participant has organized some paragraphs around main ideas but not others.</p> <p>Participant has written in a style that communicates his or her thoughts but with no marked eloquence and insufficient attention to word choice.</p>	<p>Participant has made multiple grammatical errors.</p> <p>Paragraphs are not organized around main ideas.</p> <p>Participant has written in a style that does not effectively communicate his or her thoughts.</p>