INTRODUCTION

"It makes no sense, unless you think back to Lawrence's long march across the desert to Aqaba. It is easier to dress soldiers in bright uniforms and have them march to the sound of fife and drum corps than it is to have them ride through the six hundred miles through snake-infested desert on the back of camels. It is easier and far more satisfying to retreat and compose yourself after every score—and execute perfectly choreographed plays—than to swarm about arms flailing, and contest every inch of the basketball court. Underdog strategies are hard."

—Gladwell, 2013

I walked into a classroom in September of 2017 and noticed a typical poster on the wall of Albert Einstein. This wasn't a particularly unique poster, but it stood out for me this time. The poster showed a headshot of Albert Einstein with the quote, "*Imagination is more important than knowledge.*" I have seen this poster countless times, but on this day as I was observing students engaging in solving a problem that had not been solved by adults in the history of mankind, I was caught by how the teacher in the classroom was actualizing this adage in his teaching practices. The teacher was having students focus on their imaginations, and when needed, the students would search online or ask for the knowledge needed to make a case for their solution. The students were playing the part of experts working with others to create an elegant solution to the problem. The teacher

was using an inquiry-based method to enable students to discover knowledge, explore solutions, and co-construct an approach to solving a real-life challenge.

It's tempting for teachers to try to create a classroom like this from the beginning and to want to treat their students as experts so early on in their learning. That is to bestow upon our youth the belief and expectation that they will solve the contemporary problems of the world, in class, today. First off, it seems to make intuitive sense that if students participate in activities that experts participate in, they will more likely become experts. Secondly, there is an element of empowering students to take ownership over their own learning that resonates with how adults feel about their own work experiences and how they would want to be treated as a child. As such, teachers look to find instructional methods that fit that paradigm.

Unfortunately, there is a major limitation to treating students like experts from Day 1 (or Day 417, as we will see later). How students think in their early years differs dramatically from how they think when they become experts (Willingham, 2010). Yes, that's right. They actually *can't* think like an expert (yet). We need to provide them with experiences that enable them to develop into experts while not expecting them to be experts right now. Moreover, we need to make sure that we show them we have high expectations and value them as learners while not requiring too much or too little from them as developing experts. This book provides a roadmap for navigating this demand.

> We need to provide students with experiences that enable them to develop into experts while not expecting them to be experts right now.

Accelerating Cognition: Developing Expertise Over Time

Ten thousand hours is the estimate of what it takes for someone to become an expert in a field. Ten thousand hours is the equivalent of 417 days or a little over nine years, if you were to devote approximately three hours to your craft per day (Gladwell, 2011). Unfortunately, this idea of time as the key or sole variable is incorrect. The literature actually shows that the "right" practice

during those 10,000 hours is critical. As Ericsson and Pool (2016) argue, people must move beyond practicing a skill to engaging in deliberate and continuous practice during those 10,000 hours. If not, the result is people who are experienced but not necessarily experts.

So, what is the key differentiator of deliberate practice versus just practicing? For one, students need a clear sense of what strategies will enhance their learning as they move from understanding initial ideas to relating and transferring skills and ideas to different situations. Figure 0.1 illuminates these levels of complexity. Students must have a proportional level of understanding at surface, deep, and transfer to develop expertise.

To develop this level of understanding across surface, deep, and transfer levels, teachers need to anchor their instructional approaches to cognitive principles, such as the following:

- Students need to engage in practice over time to solidify understanding.

- Understanding begins with prior knowledge.

- Learning requires feedback and modeling from others.

- To learn, people need to understand expectations and current performance to reinvest in learning.

(McDowell, 2018)

Interestingly, there is recent research that illustrates that 10,000 hours of deliberate practice accounts for a relatively small amount (approximately 28%) of expertise and that 10,000 hours of deliberate

Figure 0.1   Levels of Complexity

Levels of Complexity	Description
Surface	I can define/label idea(s) or use skill(s) (but I can't connect the ideas and skills together)
Deep	I can relate idea(s) or connect skill(s) (but I can't apply the ideas and skills in different situations)
Transfer	I can apply idea(s) or skill(s) in different situations

experimentation leads to being a top expert (Simonton, 2011). The levels of complexity in Figure 0.1 show that both practice and experimentation are complementary and support novices in developing deeper learning through deliberate practice and then engaging in deliberate experimentation as they take their core knowledge and skills and transfer to authentic, real-world contexts.

Shared Learning: Developing Efficacy Over Time

In pursuing the development of student expertise, teachers must tackle the question of who bears the responsibility of such a task. Often the debate is on whether teachers control the learning of students or they empower students to take ownership over their own learning. Interestingly, these decisions actually come to the same conclusion—both fundamentally are related to teachers controlling the learning. If a teacher can empower (or give power to) a student, then they can also take away that power if needed. This false dichotomy also emerges in the debate over the roles of teachers: the "sage on the stage" or the "guide on the side." This debate often leads to the same type of messaging: "I, the teacher, gave you the opportunity to learn. You have to take that opportunity to learn or else."

I argue that to develop student expertise, the control over learning must be mutually shared between teachers and students. An effective way to move towards a shared responsibility of learning is for teachers to intentionally and consistently teach students how to build their efficacy in learning. Efficacy of learning may be best defined as a student's ability to take full responsibility over their own learning and support others in their pursuit of learning. Figure 0.2 breaks down efficacy into three key areas of focus for learners.

If a faculty engages in the process of developing a student's efficacy, then, over time, a student will develop the knowledge and skills necessary to navigate and lead their own learning. This starts with both teachers and students understanding students are not experts (yet) and that with time, the right interventions, and the right practice, students can build their efficacy and develop and sustain expertise. Moreover, teachers must understand that students require a strong relationship with teachers to develop as experts and that they must be taught content, tools, and strategies to be strong learners. Students will often make mistakes; they will need direct targeted feedback, and they will need to focus their energy and effort on how to improve

Figure 0.2	Areas of Focus—Efficacy of Learning

Areas of Focus	Description
Orientation	A student has a clear understanding of expectations, their current performance, and next steps to improve their learning. Orientation is governed by three essential questions: Where am I going? Where am I now? and What's next?
Activation	A student has a clear understanding of the dispositions and strategies necessary to improve their learning over time. Activation is anchored to the following key questions: What makes a strong learner? What do I do when I'm stuck in my learning? What strategies enhance my learning?
Collaboration	A student has a clear understanding of expectations and strategies to collaborate in groups or teams. Collaboration is anchored to the following key questions: How do I ensure that the feedback I'm giving and receiving is accurate? How do I support others in moving their learning forward? How can others strengthen and challenge my ideas?

over time. This sharing of learning puts teachers in an activator role, constantly assessing student performance and beliefs and taking an active step in supporting students emotionally and cognitively. Over time, students develop a more active role in their learning, developing individual and collective efficacy and expertise (i.e., developing surface-, deep-, and transfer-level knowledge).

> To develop expertise, the control over learning must be mutually shared between teachers and students.

Take Action: Implement the 5Cs Guiding Actions to Develop Student Expertise

How do we then develop a student's expertise and efficacy? Unfortunately, there are no magic potions to be found on your Twitter feed, but there are a lot of potions out there. In fact, since John Hattie's landmark *Visible Learning* research, educators have known that almost

everything in education works. The question really comes down to what makes a substantial impact in building efficacy and expertise.

A few key actions have stood the test of time (see Figure 0.3). We should double down on such guiding actions and say "no" to the unsubstantiated fads of the day. Unfortunately, many of the guided practices shown in Figure 0.3 are not necessarily popular nor have they been perceived in the past to make much of a difference. Current hot topics such as creating better learning spaces, better curriculum, inquiry-based methods, giving over control of learning to students, optimal class sizes, changing our role to being facilitator teachers, or creating different class schedules in fact don't yield much of an impact on student learning or help build expertise (Hattie, 2009). These trends might be popular in the press and at school board meetings, but many of them fail to make a substantial impact on students.

The *Guiding Actions* in Figure 0.3 are in fact underdog strategies; the strategies that don't fit in with the current buzzwords or popular

Figure 0.3 **The 5Cs: Guiding Actions for Developing Student Expertise**

Clarify—Students must constantly know where they are going in their learning, where they are currently in their learning, and what next steps they need to take. Students should have a clear sense of varying levels of complexity in the core knowledge and skills they are working toward. Ideally, teachers use a variety of strategies to ensure learners have the ability to meet such learning requirements.

Challenge—Student prior knowledge is tested and then changed by identifying and describing ideas, comparing and contrasting ideas, and exploring contextual differences between problems. Teachers use various strategies to activate challenges and support learners in welcoming and meeting such challenges.

Check—Teachers are constantly checking in on learner progress toward curricular goals as well as learners' abilities to check their own understanding. This checking supports students and teachers in identifying next steps to improve learning.

Communicate—A plethora of research has articulated the amount of conversation that occurs amongst students regardless of a teacher's actions. Teachers use a variety of strategies to capitalize on the demands and attractiveness of socialization as well as the research on dialogue as a key factor in developing expertise.
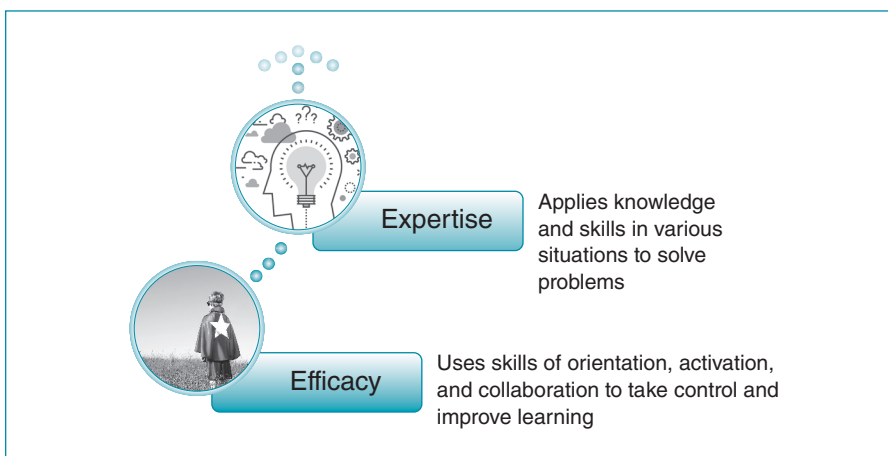
Cross Contexts—Students must be able to address problems across contexts to meet transfer-level demands. Teachers support students in seeing similarities and differences between problems.

trends in education but actually are incredibly effective in building student expertise. Underdog strategies are built on the ideas that students are not experts (but they can be over time with the right interventions), that learning is anchored to fundamental principles of how the mind works, that students need to be involved in their learning with teachers, and that student thinking must be actively displayed in classroom activities so that the right interventions can move learning forward. Underdog education strategies have the ability to substantially promote meaningful learning and develop student expertise. Do we have the courage to say "no" to magic potions and stay focused on those strategies that are not very popular but make a huge impact on learning? If you do, then this is a book that will enable you to effectively and efficiently build student efficacy and expertise.

A Profile: An Efficacious and Expert Learner

Boser (2018) stated in his *Harvard Business Review* article entitled "Learning Is a Learned Behavior. Here's How to Get Better" that the ability to learn requires the cultivation of specific knowledge and skills through deliberate and intentional teaching. Boser (2018) goes further to state that educational institutions and companies don't focus much time on the idea of learning how to learn and this is an opportunity to fundamentally enhance the learning of children and adults. Figure 0.4 represents my attempt to illustrate a profile of the knowledge and skills learners must develop to become experts (surface, deep, and transfer) and efficacious (orientation, activation, and collaboration) in schools and careers.

Figure 0.4   The Efficacious and Expert Learner

Expertise — Applies knowledge and skills in various situations to solve problems

Efficacy — Uses skills of orientation, activation, and collaboration to take control and improve learning

Efficacy icon: RichVintage/iStock.com; Experise icon: vasabii/iStock.com

An Example: Developing an Efficacious and Expert Learner

Imagine a young learner who is attempting to learn how to apply multiplication of fractions. In order to apply multiplication of fractions, this learner must first know how to multiply fractions and understand the definition of the multiplication of fractions. Furthermore, the learner must be able to justify and estimate the products of two fractions.

Figure 0.5 illustrates the goal of learning (i.e., learning intentions) and the expectations of meeting that goal (i.e., success criteria). Figure 0.6 illustrates the type of work that this learner may do to ensure an equal level of understanding at surface, deep, and transfer. At the surface level, the learner would calculate the product of $7/8 \times 1/3$. As the learner moves to the deeper level of understanding, they would justify the answer to $7/8 \times 1/3$ (this example illustrates the justification on a number line). The student would then apply their understanding in different contexts.

The path the learner can take to meet these expectations can vary. For example, the learner may first encounter the transfer-level problem and then, working with their teacher, develop surface and deep understanding to meet such a challenge. Regardless of the pathway, the teacher must work with the learner to provide the best interventions to serve the learner where they are in their learning.

This learner would go through this process over and over again, year after year, in every subject at school. As they learn surface, deep, and transfer expectations, their teachers would also be providing them with direct guidance on how they measure their own learning over time (i.e., orientation), how to apply strategies that enable them to continue to learn when they face setbacks (i.e., activation), and how they work with others to solve complex tasks (e.g., the dimensional analysis

Figure 0.5   Learning Intentions and Success Criteria

Learning Intention: I will apply multiplication of fractions		
Surface	**Deep**	**Transfer**
• Multiply fractions • Define multiplication of fractions	• Justify and estimate the products of two fractions	• Apply multiplication of fractions in different contexts

Figure 0.6 Example of Work

$7/8 \times 1/3 = 7/24$		

$$\frac{10 \text{ yds}}{1 \text{min}} \to \frac{\text{ft}}{\text{min}}$$

$$\frac{\text{yds}}{\text{min}} \cdot \boxed{\frac{\text{ft}}{\text{yds}}} = \frac{\text{ft}}{\text{min}}$$

$$\frac{10 \text{ yds}}{1 \text{min}} \cdot \frac{3 \text{ft}}{1 \text{yd}} = \frac{10 \cdot 3 \text{ft}}{1 \text{min} \cdot 1} = \frac{30 \text{ft}}{1 \text{min}}$$

What's the car's rate in feet/hour?

$$\text{Rate} = \frac{72 \text{ mi}}{1 \text{hr}} \qquad 1 \text{mi} = 5280 \text{ft}$$

$$\boxed{\frac{5280 \text{ft}}{1 \text{mi}}} \text{ or } \frac{1 \text{mi}}{5280 \text{ft}} \qquad \frac{\text{mi}}{\text{hr}} \cdot \frac{\text{ft}}{\text{mi}} = \frac{\text{ft}}{\text{hr}}$$

$$\frac{72 \text{ mi}}{1 \text{hr}} \cdot \frac{5280 \text{ft}}{1 \text{mi}} = \frac{72 \cdot 5280 \text{ft}}{1 \text{hr} \cdot 1}$$

$$= \boxed{380{,}160 \text{ft}}$$

task in Figure 0.5) and give and receive feedback (i.e., collaboration). Over time, this learner would have the knowledge, skills, and dispositions to own their own' learning and have a robust understanding of core academic content.

After reading this book, you will be able to

Develop unit and lesson plan prototypes that maximize your impact on student learning while minimizing the amount of time you need to spend planning so that you can focus your time and energy on developing student expertise.

Implement classroom management strategies that enhance student individual and collective efficacy.

Align teaching practices to ensure students gain more in meeting core outcomes across levels of complexity (surface, deep, and transfer).

Support students at transfer-level learning by developing tasks, creating teams, and utilizing teaching strategies that move students to advanced levels of understanding.

Develop teacher collective efficacy to ensure that teachers use the most effective practices for advancing students and adult learning.

Special Features

- **5Cs:** The 5Cs provide a framework for teachers to develop a system of planning, classroom culture, and instructional approaches to advance student learning over time.

- **Researched-based strategies:** Each section of the book is thoroughly research based, providing multiple sources to substantiate the benefits and successful strategies of teachers and students.

- **Vignettes:** Educators who are interested in implementation can find valuable insights from the vignettes that illustrate where educational practitioners and students reflect on their experience teaching and learning in the classroom or provide concrete examples of how expertise and efficacy is developed over time.

- **Activities:** These will help you create your own next steps in designing plans, building a strong efficacious classroom culture and developing your instructional skills.

- **Examples, tables, checklists, protocols, rubrics, and images**: These facilitate understanding and application of the material.

- **Appendix:** The appendix offers resources mentioned in the book along with tools and exemplars for supporting teachers in their own practice.

- **Reflective questions:** Questions at the end of each chapter will assist you in thinking about how these strategies apply to your own teaching practices within your unique context and role.

- **Next steps:** Each chapter ends with Next Steps that encourage you to apply the content of each chapter to get you started in improving your teaching and learning practices.

Conclusion

This book is about the strategies teachers can use to ensure high levels of learning for every student. This outcome is reached by

integrating the 5Cs Guiding Actions through unit and lesson planning, instruction, and cultural development. The book begins with an overview of the 5Cs Guiding Actions that enable teachers to illuminate the hidden lives of learners and develop expertise over time. Chapter 2 focuses on the classroom culture that ensures learners and teachers engage in the work of learning. Chapter 3 focuses on teacher preparations in unit and lesson design. Chapter 4 focuses on routines that teachers may use to intervene during classroom learning to most effectively support student learning. Chapter 5 focuses on developing collective teacher efficacy to continually monitor and support student efficacy and ultimately expertise. In the appendix, you will find several resources referenced throughout the book to help you accomplish these goals. Your major challenge throughout this book will be to focus on the 5Cs Guiding Actions and develop your own expertise. You will have to make a conscious decision to let go of practices that don't lead to developing student expertise. It is that simple and that hard.

REFLECTION QUESTIONS

1. What are your key takeaways from this chapter?

2. After reviewing the 5Cs, which one stands out for you? Why?

3. How do your students, colleagues, parents, and administration talk about depth of complexity (surface, deep, and transfer)? What steps are you going to take to begin discussing depth of complexity with learners?

4. How do your students, colleagues, parents, and administrators talk about student efficacy (orientation, activation, and collaboration)? What steps are you going to take to begin discussing a shared responsibility for developing student ownership over time with learners?

5. What steps could be taken to stay small and stay focused on a few initiatives that make a substantial impact?

6. What are key strategies that you, students, colleagues, parents, and administrators talk about in terms of making a substantial impact on student learning? What steps are you going to take to focus on learning in daily conversation and practice?

ACTIVITIES

ACTIVITY 0.1
OUR STORY OF EFFICACY AND EXPERTISE IN SCHOOL

Think through the story(ies) that permeates your classroom and your school about student efficacy and expertise. How would you describe a student developing expertise and efficacy in your school? How does this relate with the introduction of this book? What steps would you need to ensure that your narrative is of building student expertise and efficacy over time?

As a way of thinking about your story, ask yourself and your colleagues the following questions:

- How do our students learn?

- How do we talk about levels of complexity? Do we expect students to learn at each level? What levels do we prioritize?

- How do we teach at each level of learning? What does feedback look like at each level?

- How do students talk about their learning?

- How do we currently support our students in owning their own learning?

After discussing these questions, have the group read the introduction and Chapter I of this book and discuss the similarities and differences between what was discussed and what is presented in this book.

ACTIVITY 0.2
DEVELOPING A GRADUATE PROFILE FOR LEARNING

Find a small team of teachers and brainstorm the specific dispositions and skills you want to see from learners by the time they leave your grade level and/or school. Next read the introduction of this book and ask the team to highlight those dispositions and skills that are centered on efficacy and expertise.

Next present to the team the following question:

- Assume that students do not yet have the dispositions or skills you have listed. How would we ensure students learn these dispositions or skills in our grade level and/or school?

Have the team then brainstorm specific actions they could take in their planning, teaching, and classroom environment that would ensure (not just promote) students learn how to develop as experts.

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ACTIVITY 0.3
EVIDENCE OF STUDENT EFFICACY

Find a small team of teachers and find out what students think about their own learning and how they focus on developing their expertise. From here, identify next steps to improve. One way to engage in this process is through "Learning Rounds." Please see the process below.

Learning Rounds

(Activity adapted from McDowell, *The Lead Learner,* 2018)

Guideline

- Speak to learners, listen to learners.
- Don't look at the adults (other than saying hello and goodbye).
- Provide your notes to the adults in the classroom (with no judgment).

Process

- Divide the questions below (see Figure 0.8) among a group.
  - The questions are based on orientation (a learner's ability to understand their performance and next steps relative to a goal), activation (a learner's belief in themselves to grow as a learner and a learner's actions in taking next steps), collaboration (a learner's ability to give and receive feedback), and relationships (a learner's perspective of the relationship with adults in the room).
- When you go into a classroom, write down only observations—What did you see or hear?
- After visiting several classrooms, find a place to meet together to discuss the observations, identify inferences, and determine next steps.

- Elect someone to jot down notes in the following table (Figure 0.7):
  - Begin with writing down the observations (What?).
  - Next, write down any inferences (So What?).
  - Finally, write down potential suggested next steps (Now What?). Only provide next steps for those who were being observed if they are in the room and are actively participating. If they are not in the room, next steps should be directed toward those who were observing (i.e., What are our next steps?).

Figure 0.7   What? So What? Now What?

	What?	So What?	Now What?
Orientation			
Activation			
Collaboration			

Figure 0.8   Questions for Learning Rounds

#1 Orientation	#2 Activation	#3 Collaboration
• Where are you going in your learning right now? • What is your goal? • Where are you now in your learning? How do you know your performance level? • What next step do you need to take to improve your learning? • How do you improve your learning? How do you know if you are improving? • How will you know you learned something? • What do you need to do next in order to learn _____?	• What does a good learner look like in our class? • What happens if you make a mistake in your class? • Are you a good learner? Why or why not? • If you're not a good learner, can you become one? • What do the best learners in our class do differently from other learners? • How can you recognize the best learners in the class?	• How do you prefer to learn—on your own or with your peers? • Do you help others with their learning? How? • How do you know that the feedback you are giving is accurate? • How do you know the feedback you are receiving is accurate? • How do you feel about feedback? • How do you work with others to solve problems together? • How do you feel about being in teams or groups? Why?

#1 Orientation	#2 Activation	#3 Collaboration
• Do you understand how your learning is assessed?	• Are the best learners the same as the people who get the highest marks?	• Are there any things that your peers could do to help you learn more?
• Do you always know what you are learning and why?	• Should learning be easy or hard? Why?	• Are there any things that you could do to help your peers learn more?
• What are you learning to do in art/health/math/English/science/etc., at the moment? How will you know when you have learned it?	• What do you do when you get stuck?	• Can you tell me about a time when your peers really helped you learn something?
• How do you track your performance?	• What happens if you make a mistake in class?	• How can others push my thinking?
• How do you talk about different levels of difficulty in learning?	• What strategies do you use when you're lost? What do you do when you don't know what to do?	• What feedback can I seek to improve my learning?
• What are the expectations at each level of complexity (surface, deep, transfer)?	• What strategies do you use when you're first learning something (surface)?	• How can others strengthen or challenge my ideas?
• Do I really get this idea?	• What strategies do you use when you're proficient (deep)?	• How do I push someone's thinking forward without telling them what I want them to do?
• Could I explain it to a friend?	• What strategies do you use to go beyond or to apply your learning (transfer)?	• How do we collectively press forward and co-construct new ideas and solutions?
• What are my goals?	• What enables learners to persevere?	• How do we celebrate and challenge our individual ideas to create a better solution together?
• Do I need more surface level (or background) knowledge?	• How do you learn?	• How do I support others in pulling their thinking forward?
• Do I need more practice? Do I need to practice differently?	• What enables learners to recognize their successes and challenges?	• How do I pull someone's learning forward?
	• What helps learners stay focused?	• How do we pause our thinking and listen to others?
	• What strategies do you use when you're bored? Are you bored often?	

(Continued)

Figure 0.8   (Continued)

#1 Orientation	#2 Activation	#3 Collaboration
		• How do we pause on our first response and think deeply about supporting others? • How do we "stay soft on people and hard on content"? • What strategies do you use when you disagree? Or feel indifferent? • How do you support others in pulling their thinking forward? • How do you pull someone's learning forward?

Figure 0.9   Prompts for Discussion

What?	So What?	Now What?
• What did you notice about their understanding about where they were in their learning? • What did you notice about their ability to self-regulate their learning? • What did you notice about their attitudes toward getting something wrong or not understanding?	• What story are you telling yourself right now about these learners? What is another narrative we could be telling right now? • What inferences can we draw about student orientation, activation, and collaboration?	• In light of this data, what next steps can we take? • Who will do _____ (what) by when? • Do we need to stop doing something good to do these next steps? What will we stop doing?

What?	So What?	Now What?
• What did you notice about their feelings and ability to give and receive feedback? • What strategies emerged from learners in taking ownership over their own learning? • What stood out for you regarding student and teacher relationships?		

NEXT STEPS

• Ask colleagues to identify potential next steps they can take to maintain certain practices and change practices to improve learning.

	Current Practices	Next Steps
Practices to Maintain		
Practices to Change		