Universal Design for Learning Promotes Student Engagement – An Action Research Project at Island View School

By: Jana Nicol

Abstract

This paper will present the findings of an action research project on Universal Design for Learning (UDL) that was undertaken by a team of four elementary school teachers at Island View School in Saint John, New Brunswick. The goal of this project was to determine *what tools will help facilitate teacher buy-in and the implementation of Universal Design for Learning in elementary school classrooms to improve student engagement?* To answer this question, team members completed a review of current research, conducted surveys, collected student work samples, and created and executed universally designed lesson plans and templates.

Results indicated that teachers have positive feelings toward UDL, but that more professional development and access to resources was needed to facilitate implementation of UDL on a wider scale. Team members adopted UDL practices gradually throughout the 2013-2014 school year. Teacher observations and reflections, and student data indicate that it positively impacted student engagement.

Keywords: Universal Design for Learning, action research, elementary education

Universal Design for Learning Promotes Student Engagement – An Action Research Project at Island View School

This action research project on Universal Design for Learning (UDL) was undertaken by a team of teachers at Island View School in Saint John, New Brunswick. Island View School is an elementary school (kindergarten to grade five) with an enrollment of over 300 students from urban, suburban, and rural areas. Every classroom is equipped with a SMART board, and students have access to netbook computers. They also engage in learning through hands-on activities, an outdoor classroom, cross-curricular activities, and guest speakers.

The action research team included four teachers and represented a diverse range of grade levels (grades 2-5), disciplines (elementary education, special education, and administration), and levels of experience with UDL (ranging from novice to proficient). From October 2013 to May 2014, the team explored the following question through action research: *what tools will help facilitate teacher buy-in and the implementation of Universal Design for Learning in elementary school classrooms to improve student engagement?*

Current Research on Universal Design for Learning

Universal Design for Learning (UDL) is not a single practice, but rather a framework that utilizes existing methods relevant to its principles for enhancing the learning of all students (Jiménez, Graf, & Rose, 2007). It encompasses three guiding principles: *multiple means of representation* – the 'what' of learning, *multiple means of expression* – the 'how' of learning, and *multiple means of engagement* – the 'why' of learning (CAST, 2011). These principles are

based on extensive research on the cognitive sciences and learning theory to make learning accessible to the maximum number of students (Stockall, Dennis, & Miller, 2012).

UDL values diversity; individual differences are not only expected, but celebrated. Lessons are designed to meet the needs of students with a wide range of linguistic, sensory, motor, cognitive, and intellectual abilities and disabilities (Strobel, Arthanat, Bauer, & Flagg, 2007). UDL acknowledges the diverse ways that the brain processes information in the process of learning, which creates opportunities for all learners to experience success (Ender, 2007). This is accomplished through the use of "materials and activities that make learning goals achievable by individuals with wide differences in their abilities to see, hear, speak, move, read, write, understand English, attend, organize, engage, and remember" (Doyle & Giangreco, 2009, pg. 27). It is no longer adequate to design instruction for two groups – 'regular' and 'special', as this oversimplifies the differences that exist within classrooms (Meo, 2008).

UDL represents a paradigm shift from accommodation to full inclusion. Meeting the educational needs of a diverse student population allows all students to participate in the common learning environment with fewer special accommodations. This saves teachers the time and effort needed to arrange accommodations for specific students who have learning difficulties (Shaw, 2011). Implementing accommodations that are accessible to everyone will not eliminate the need for special supports, but it is more inclusive than the traditional accommodations process (Izzo et. al., 2008). If a lesson is designed with diverse learning styles, interests, and abilities in mind, the need for special accommodations will be reduced or even eliminated, resulting in increased student understanding and engagement (Shaw, 2011).

Instruction can be made more accessible to students by scaffolding learning, which engages students because it builds on background knowledge (Flores, 2008). It is not unusual for learners to have gaps in background knowledge. Information is more likely to be assimilated when it is presented in ways that activate and build upon prior knowledge. Teachers can scaffold learning by pre-teaching vocabulary, breaking down complex terms into simpler words or symbols, and using illustrations and videos (CAST, 2011). Tasks are simplified when needed, helping students develop more confidence to take risks in their learning. Scaffolds are gradually withdrawn as students develop a better understanding of content (Coyne et. al., 2010).

UDL includes the use of technology to engage students in the delivery of curriculum, and as one of many tools used to demonstrate their learning (Ender et. al., 2007). Technology is not synonymous with UDL; however, technology plays a valuable role its implementation (CAST, 2011). Technology is an integral part of UDL because it enables teachers to present information to students in multiple ways, while increasing their independence and engagement, thus positively impacting the learning of all students (Stockall et. al, 2012).

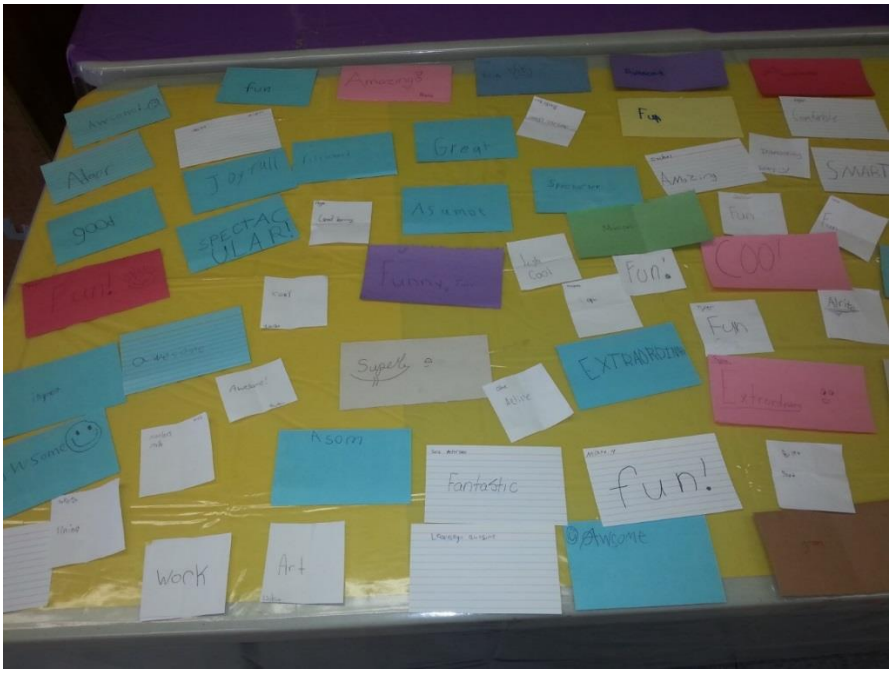
Offering choice in how students express their learning is a key component of UDL. Students are given choices how to best express their learning in a variety of formats, such as: essays, speeches, scrapbooks, art work, videos, or any format that fits their interests (Morra & Reynolds, 2010). Students are more likely to experience success if they are free to choose among "learning modalities that capitalize on their individual strengths" (Izzo et. al., 2008, pg. 68). According to CAST (2011), it is vital to provide a variety of instructional strategies to attract the attention of students and engage them in learning.

Methodology and Data Collection

In our team's efforts to answer the question *what tools will help facilitate teacher buy-in and the implementation of Universal Design for Learning in elementary school classrooms to improve student engagement?*, we created universally designed lessons, facilitated the lessons in our classrooms and evaluated their effectiveness through observations, reflections, and feedback from students. We searched for tools and materials online and through resource catalogues. We also created lessons plans, supporting materials, and a lesson plan template designed to help teachers create lessons and materials that follow the principles of UDL. All of the materials that we created can be found on our website http://theudlproject.com. We also wrote reflective journals about our experiences throughout this project.

Student Engagement

In efforts to measure student engagement, we collected data from students in our own classrooms (88 students). In November 2013 and in April 2014, students were asked to describe how they felt about school and/or learning in one word, which they recorded onto an index card. They were asked for only one word to make it easier to tabulate their responses as quantitative data. In November 2013 students were also given the following writing prompt: 'describe what the best day would look like in your favourite subject'. When we collected data again in April, instead of repeating the writing prompt from November 2013, students were asked to 'describe what the best day would look like in your Math/Language Arts/Science/Social Studies classes'. The purpose of changing the writing prompt was to find out which aspects of these subject areas students found most engaging.



Sample of student responses to prompt "How do you feel about school/learning in one word?"

Colleague Readiness

The team wanted to determine our colleagues' level of readiness for implementing UDL in their own practices. We felt that this was important to examine, as readiness is a vital prerequisite to executing any given teaching practice. We collected data through an online survey using Survey Monkey, and emailed it to teachers in our school in November 2013. Most teachers (85%) responded to the survey. Teachers were asked about their level of knowledge about UDL, how often they implement UDL in their practices, perceived obstacles to implementing UDL, whether or not they would implement UDL more often if they had sample lessons to follow, and their feelings about UDL. Another online survey was administered in January 2014 to obtain more information about the obstacles faced by teachers in the areas of planning and preparation, which were identified in the results of the previous survey.

Findings

When students were asked to describe how they felt about learning in one word in both the November and April surveys, 85% reported having positive feelings. More than half used words that were synonymous with ‘awesome’, a quarter of the students used words synonymous with ‘fun’, and five percent used words synonymous with ‘creative’. Five percent of students found school to be difficult, and the remaining students used words which were unclear (e.g. ‘busy’, ‘math’). Results were almost identical in both sets of data (collected in November 2013 and April 2014), but more students used the word ‘fun’ to describe learning in the second data set. It is noted that students who reported positive feelings about school used better quality words in the second data set. While many students used words like ‘good’ in November, this word was rarely used in April, and was replaced by words like ‘spectacular’, ‘fantastic’, and ‘interesting’. This data may indicate that students were more engaged in learning in April 2014 than they were in November 2013.

In November 2013, students engaged in a writing activity responding to the prompt ‘describe what the best day would look like in your favourite subject’. Most students wrote about Physical Education or Art. It is noted that there was a gender divide among the responses. Students who wrote about Physical Education were generally boys, and students who wrote about Art were generally girls. Many upper elementary students wrote about cross-curricular activities (some used creative words like ‘Mart’ for Math/Art). Students across all grade levels expressed a desire to have choices in what they were doing and/or who they could work with.

In April 2013, students engaged in a writing activity responding to the prompt ‘describe what the best day would look like in your Math/Language Arts/Science/Social Studies classes’. The team decided to use this writing prompt to help students focus on specific subject areas to determine what students found most engaging about these subjects, and also to guide our instruction so that we could increase engagement in all areas of the curriculum. Recurring themes across all grade levels included preferences for: partner and group activities, having choices of activities, using manipulatives, technology, hands-on activities, playing games, and reading.

Students using manipulatives to sort geometric solids by a given set of attributes.

Students engaged in hands-on activity for Science class.

Students participating in the Hour of Code – learning how to use coding.

According to the results of the online teacher surveys, most teachers (83%) believed that UDL is a step in the right direction, while the rest thought of it as just another passing fad. Levels of knowledge about UDL and how to implement it in teaching practices varied, ranging from knowing a little bit about UDL (12%) to being very knowledgeable about UDL and how to

implement it in the classroom (29%). The majority fell in the middle, reporting that they had a good understanding of UDL but were unsure of how to effectively implement it in their teaching practices (59%). All respondents implement UDL in their teaching practices at least some of the time, and indicated that they would implement UDL practices in their classrooms more often if they had sample lessons to follow. Time, planning and preparation were considered to be the largest obstacles to implementing UDL (indicated by 90% of respondents). This included: finding, creating, and adapting resources, collaborating with colleagues, teaching to diverse learning styles, and finding or creating templates to facilitate the implementation of UDL.

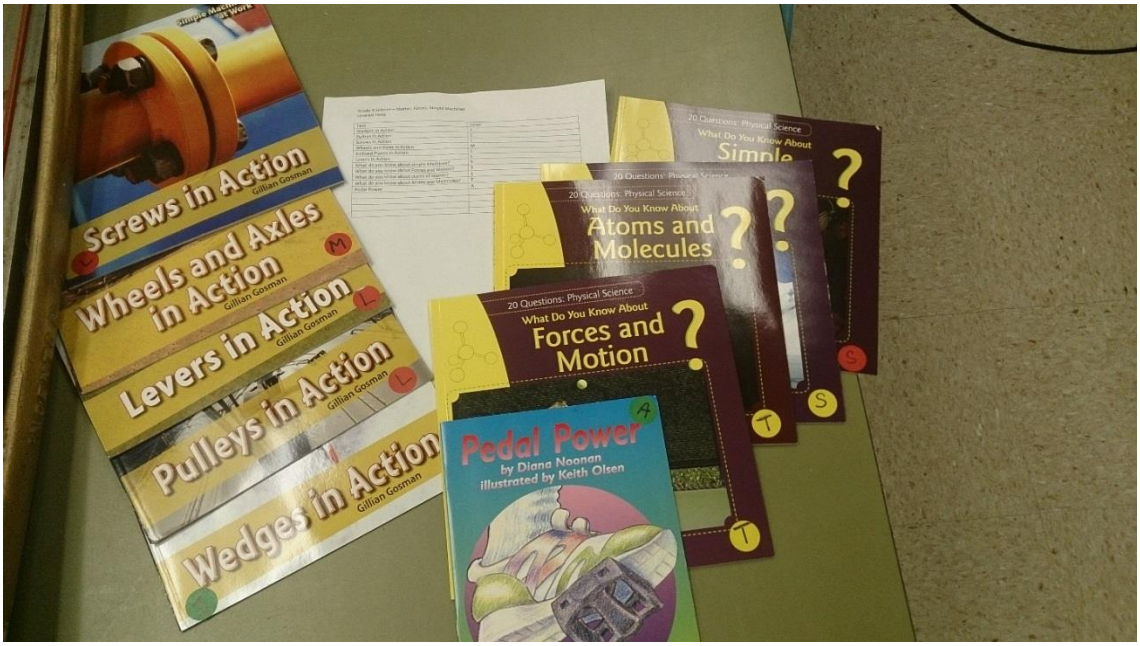
In order to facilitate the implementation of UDL practices among our colleagues, team members created sample lessons, gathered supporting materials, and made them available to all staff. We posted all of the materials that we created on our project's website (http://theudlproject.com). We found many activities and readings that are in digital format online, and placed them in an electronic library that can be accessed by all staff on a shared drive. We were also able to purchase books in a wide range of reading levels to supplement our Science and Social Studies units, so that the content could be more accessible to students whose reading levels vary. Team members found that having access to these resources made it much easier to plan lessons that followed the principles of UDL, and that students were more engaged when participating in these lessons. Additionally, the increased availability of UDL resources in the school made it easier for other teachers in the school to implement them into their own lessons.

Recommendations

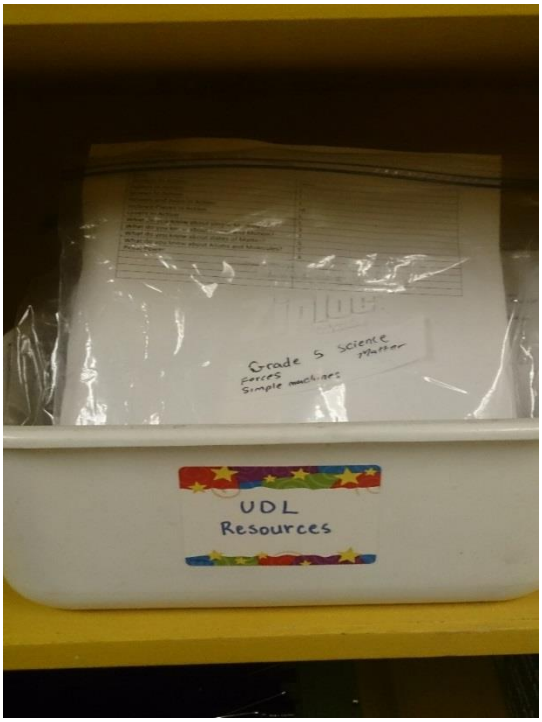
Teachers can promote student inclusion and engagement through a UDL framework by integrating opportunities for arts-based education and physical activity in all subject areas. It is recommended that lessons and activities appeal to different sensory modalities, and multiple intelligences/learning styles. Team members observed that students seemed more engaged when movement and arts were integrated into lessons of all subject areas. Students commented that they enjoyed being provided with choices in activities and assessments. They should also be given opportunities to learn individually, in partners, and in small groups. Therefore, offering choice helps promote engagement in learning. It is recommended that teachers integrate technology throughout the curriculum into lessons (e.g. videos, SMART board activities) and activities (e.g. online games, PowerPoint presentations, photo editing, etc.).

Efforts to increase teacher readiness for implementing UDL can be enhanced by improving access to resources and professional development. School resources, such as manipulatives, artifacts, and visual aids should be well-organized, and be kept in known locations that are easily accessible by all teachers. It is also suggested that schools create data-banks of digital and web-based resources, which are categorized by grade level, subject, and unit. Resources for each unit of study should be accessible to students of diverse abilities to facilitate differentiating instruction. For example, students can access books to read about any given Science unit at a variety of reading levels so everyone can access the content whether they are an emerging or proficient reader. Teachers should be able to easily access UDL lessons, instructional materials and templates to help facilitate the implementation of UDL in their

classrooms. Many such tools and sample lessons have been compiled and published on our website (http://theudlproject.com), and it is recommended that this website be shared with teachers.



Books for grade 5 Science units (simple machines, forces, and matter) – reading levels range from A-T.



UDL library of books for Science and Social Studies (grades 3-5) in multiple learning levels. Library is accessible to all teachers in our school.

Teachers would also benefit from more professional development on UDL and multiple intelligences. Results from the teacher surveys also indicate a need for more time to plan and collaborate. It is vital that teachers are given adequate time to plan, so that they may incorporate this new learning into their teaching practices, and so they can plan effective lessons and create assessments that follow the principles of UDL.

Limitations

Our main limitation was time. A significant amount of time needs to be spent planning UDL lessons, and finding and creating materials to facilitate the implementation of UDL in classrooms. This can be challenging to accomplish, considering that teachers already have many

demands on their time. Having such demanding schedules can make it difficult for some teachers to buy-in to taking on new things.

Teachers do not have much access to professional learning opportunities about Universal Design for Learning. Increased access to professional development on UDL may increase teacher comfort with implementing UDL in their own classrooms. Even when teachers are willing to adopt more UDL practices in their own classrooms, they are more likely to experience success with this endeavour after having exposure to quality professional learning opportunities on the topic.

Conclusion

The participants in this project learned more about UDL, and we are gradually incorporating more UDL lessons and practices into our teaching. Students have benefited from this shift in our teaching practices and are engaged in learning. We have shared our learnings with colleagues, and made all of the materials we found and created available to them. In order to maximize teacher buy-in, it is strongly recommended that teachers start small as they begin to adopt UDL practices into the design of lessons, materials, and activities. More professional development opportunities on UDL, and time to collaborate and plan is vital to help teachers effectively implement UDL into their practices.

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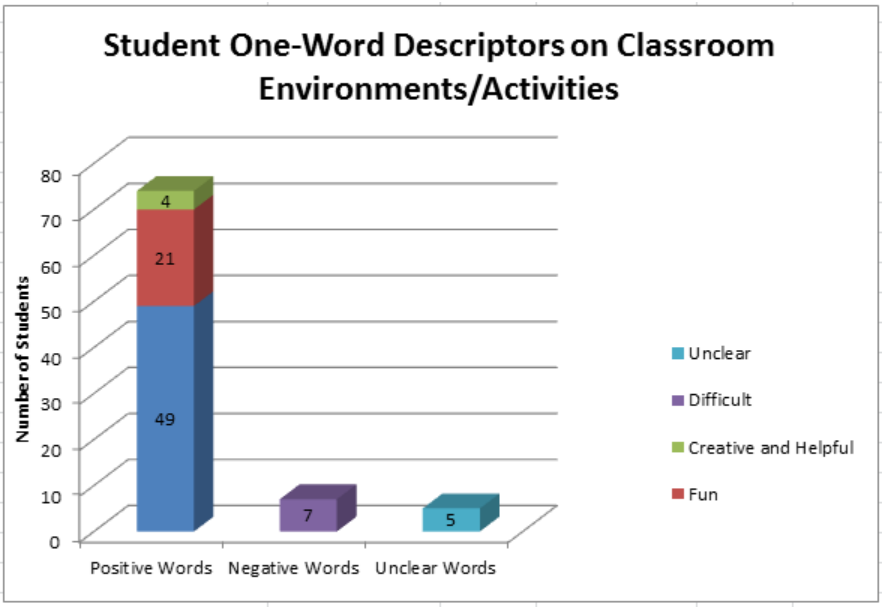
Appendices

Appendix A – Student Data – Collected November 2013



Student Data – Recommendations – November 2013

Students responded to the following writing prompt: *Describe what the best day would look like in your favourite subject*

Recurring themes:

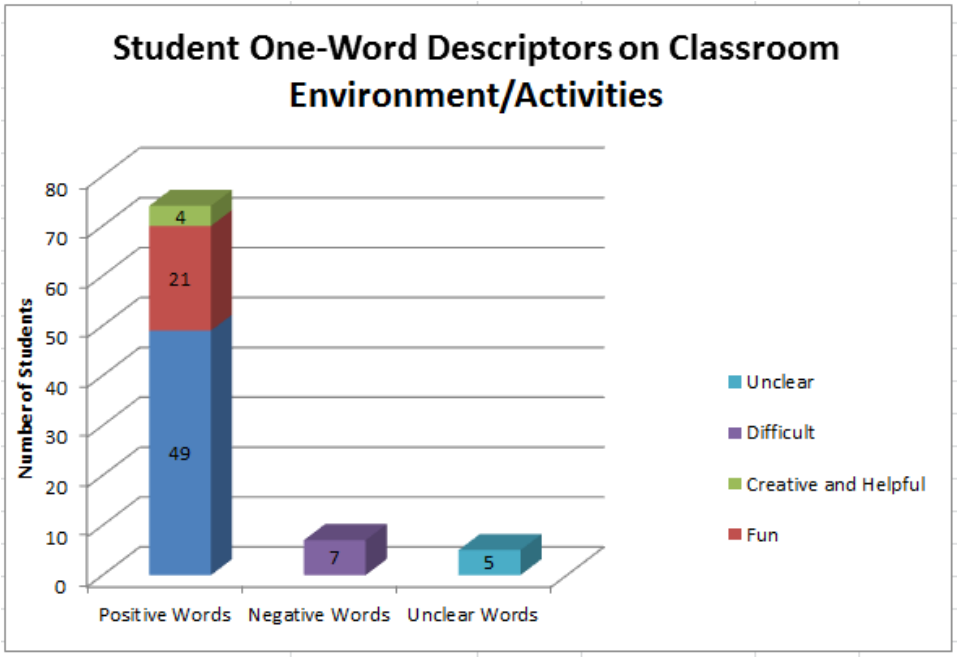
- Most students wrote about Art or PE (gender divide)
- Many students wrote about wanting to choose their activities or who they could work with
- Some students expressed a desire to win (a game), and/or wanted their work to be 'the best in the class'
- Upper elementary students expressed interest in cross-curricular activities

As a result of student data that was collected, here are some recommendations that will promote student engagement:

- Design lessons to incorporate more opportunities for art-based learning (in all subjects)

- Integrate Physical Education into other subjects
- Take time to showcase student work
- Acknowledge individual students' accomplishments to the class
- Provide choices in how students demonstrate learning
- Consider differences based on gender in the lesson planning process (e.g. majority of students who preferred Physical Education were boys; majority of students who preferred Art were girls)

Appendix B – Student Data – Collected April 2014



Student Data – Recommendations – April 2014

Student data collected:

- Students were asked to write one word on an index card that indicated how they felt about learning in school
- Students* responded to the following writing prompt: *Describe what the best day would look like in Math, Language Arts, Science, and Social Studies***

  *Grade 2-4 classrooms participated in this activity. Although Grade 5 students responded to the writing prompt in November 2013, they did not this time because this class is now in Intensive French, therefore they have a different teacher.

  **The writing prompt was changed because when it was open-ended – describing the best day in their favourite subject – most students wrote about Art or Physical Education. We changed the writing prompt to determine which parts of Math, Language Arts, Science, and Social Studies students found most engaging to guide our instruction in those subject areas.

Recurring themes:

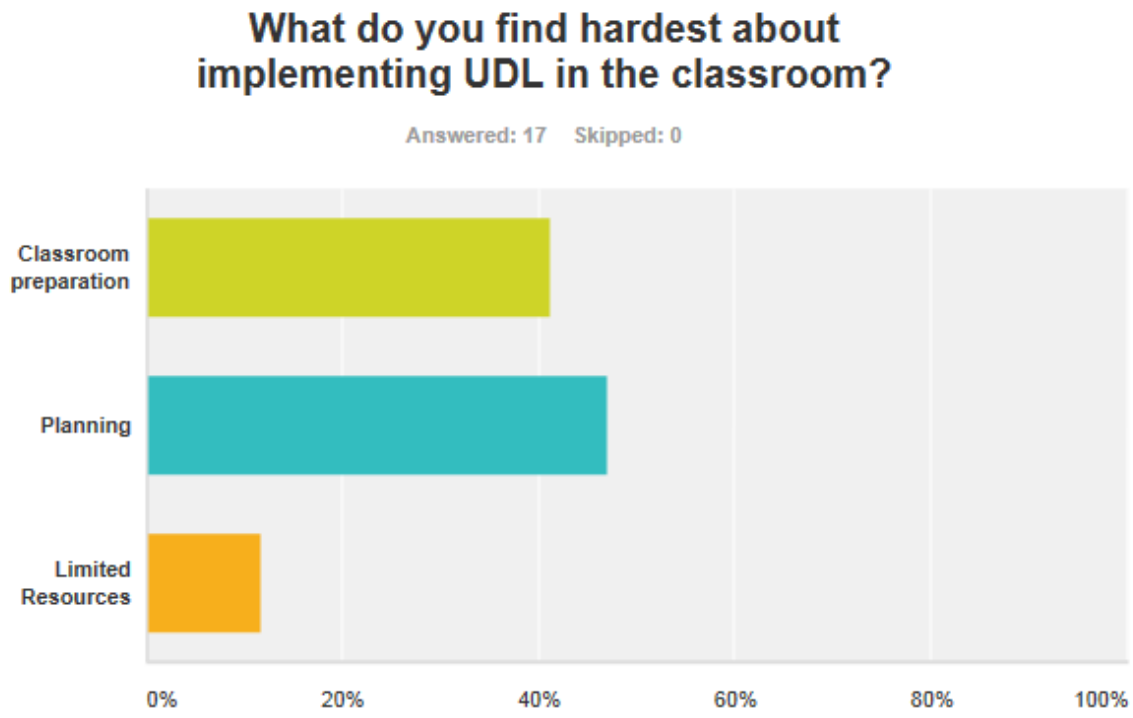
Students wrote about the best day in their Math/LA/Science/Social Studies classes:

- Many students expressed an interest in working with partners and groups
- Most students enjoyed having choices between activities
- Many students enjoyed hands-on activities and using manipulatives
- Most students like to learn with technology (videos, computers, SMART board, digital microscope, etc)
- Most students like to play games (online games, board games, card games)
- Most students love to read (to self or to someone)

As a result of student data that was collected, here are some recommendations that will promote student engagement:

- Integrate opportunities for movement in all subject areas
- Integrate arts (visual, music) in all subject areas
- Provide choices in how students demonstrate learning
- Incorporate games cater to different sensory modalities (auditory, visual, tactile) and multiple intelligences/learning styles
- Provide opportunities for students to learn individually, in partners, and in small groups
- Incorporate technology into lessons (e.g. instructional videos, SMART board activities) and into activities (e.g. online games, PowerPoint presentation)

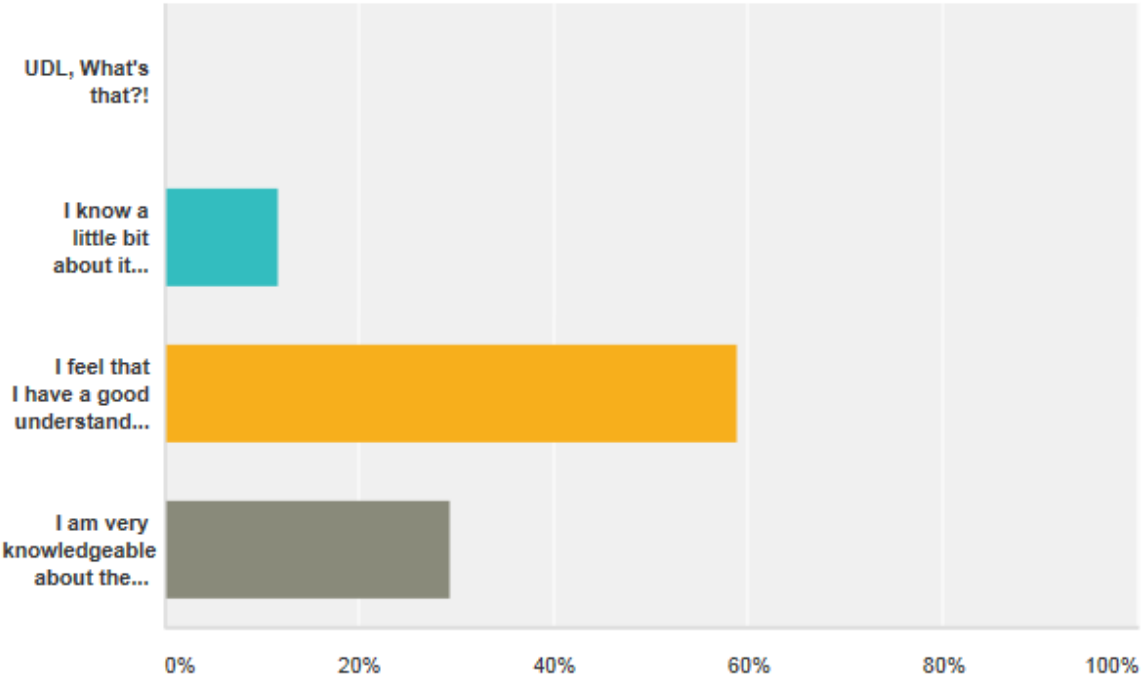
Appendix C – Teacher Data – Collected November 2013 – Online Survey



Answer Choices	Responses	
Classroom preparation	41.18%	7
Planning	47.06%	8
Limited Resources	11.76%	2
Total		17

How would you best describe your knowledge about UDL?

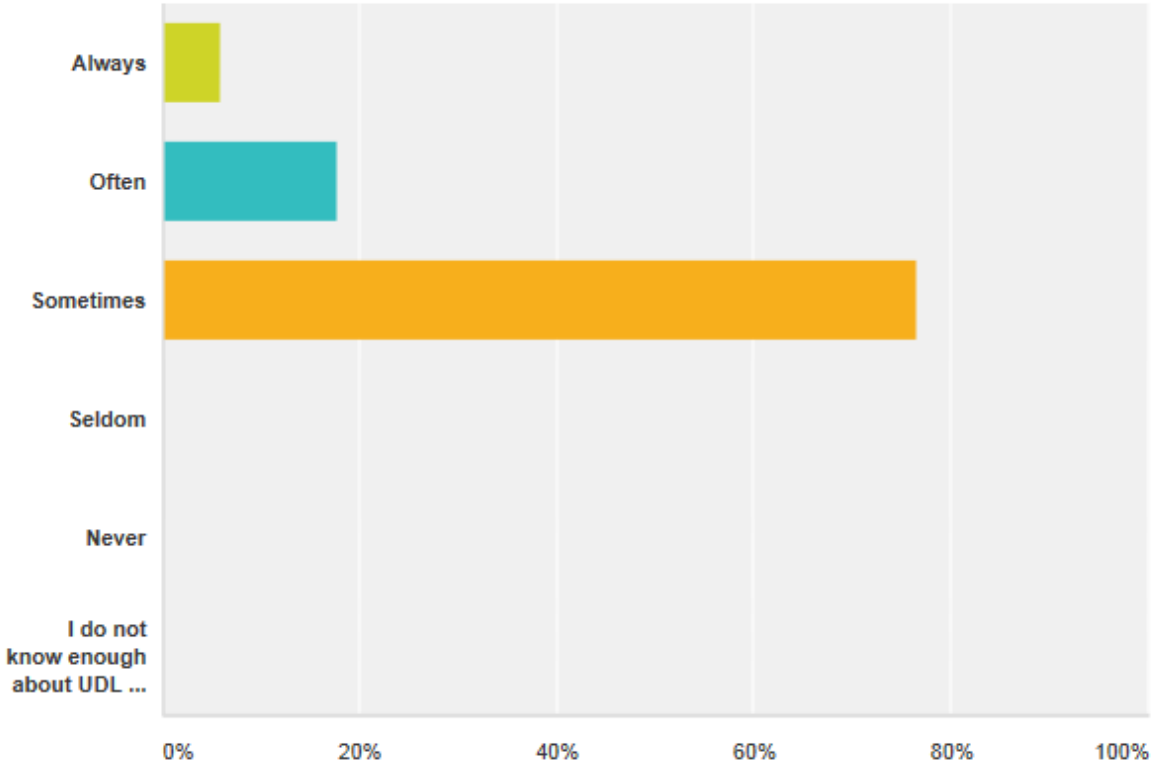
Answered: 17 Skipped: 0



Answer Choices	Responses	
UDL, What's that?!	0%	0
I know a little bit about it...	11.76%	2
I feel that I have a good understanding of UDL but I'm unsure of how to implement it in my classroom.	58.82%	10
I am very knowledgeable about the principles of UDL and how to implement it in my teaching.	29.41%	5
Total		17

How often would you say you currently implement UDL in your planning and/or teaching?

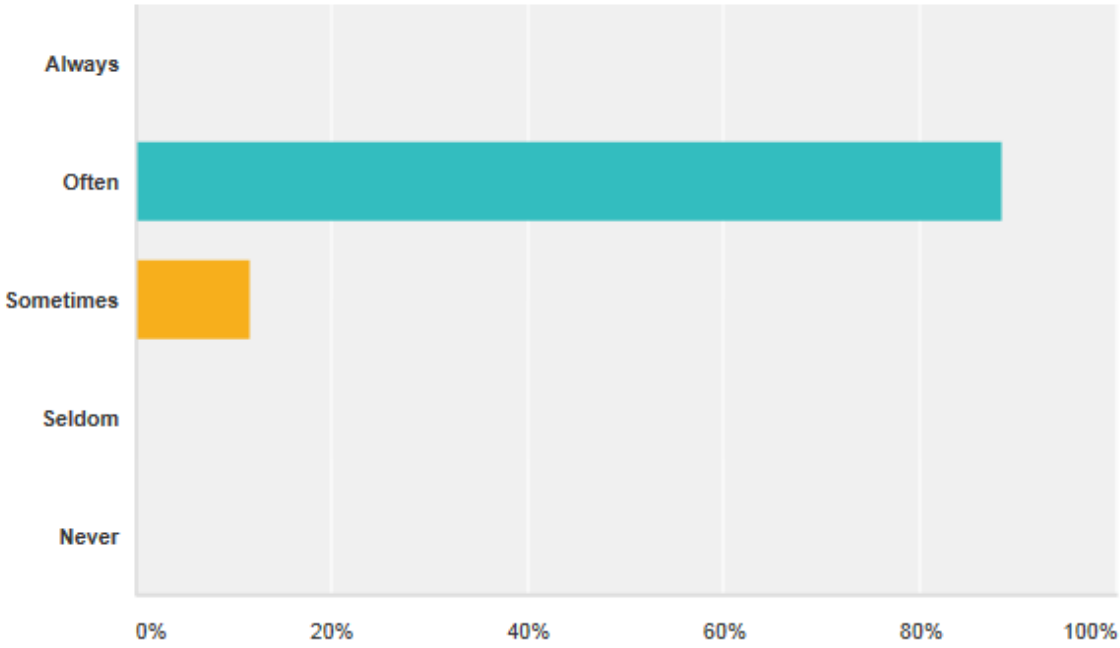
Answered: 17 Skipped: 0



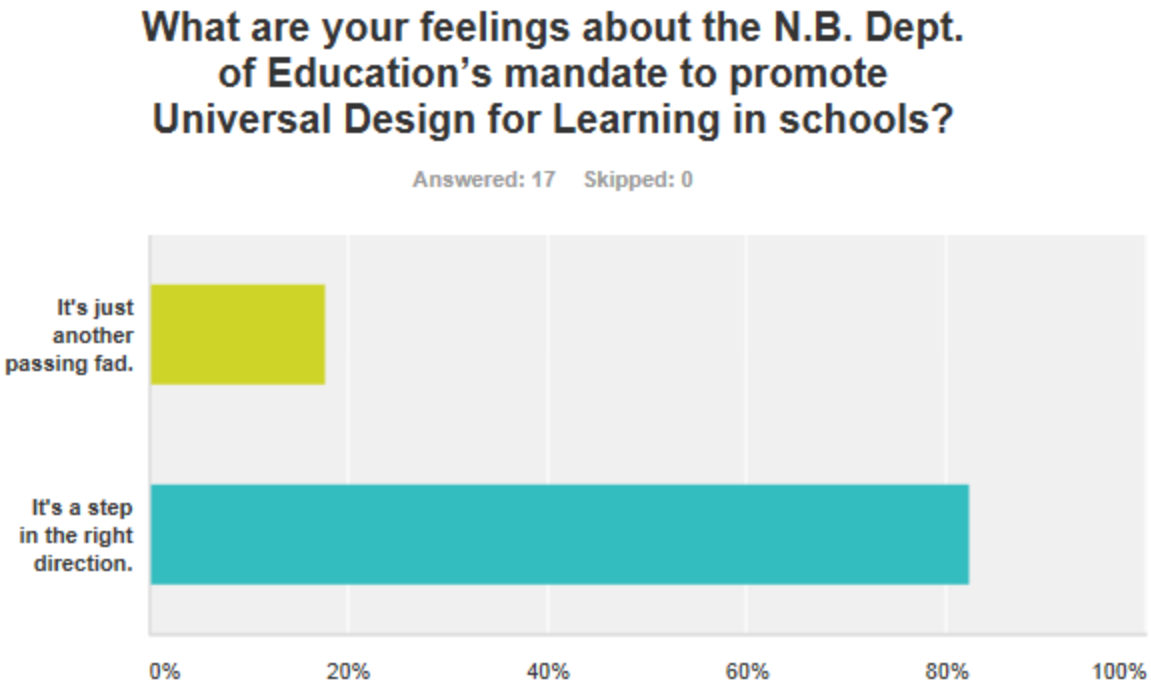
Answer Choices	Responses	
Always	5.88%	1
Often	17.65%	3
Sometimes	76.47%	13

How likely would you be to implement UDL in your classroom planning and instruction if you had sample lessons to follow?

Answered: 17 Skipped: 0



Answer Choices	Responses	
Always	**0%**	0
Often	**88.24%**	15
Sometimes	**11.76%**	2
Seldom	**0%**	0
Never	**0%**	0
Total		17



Answer Choices	Responses	
It's just another passing fad.	17.65%	3
It's a step in the right direction.	82.35%	14
Total		17

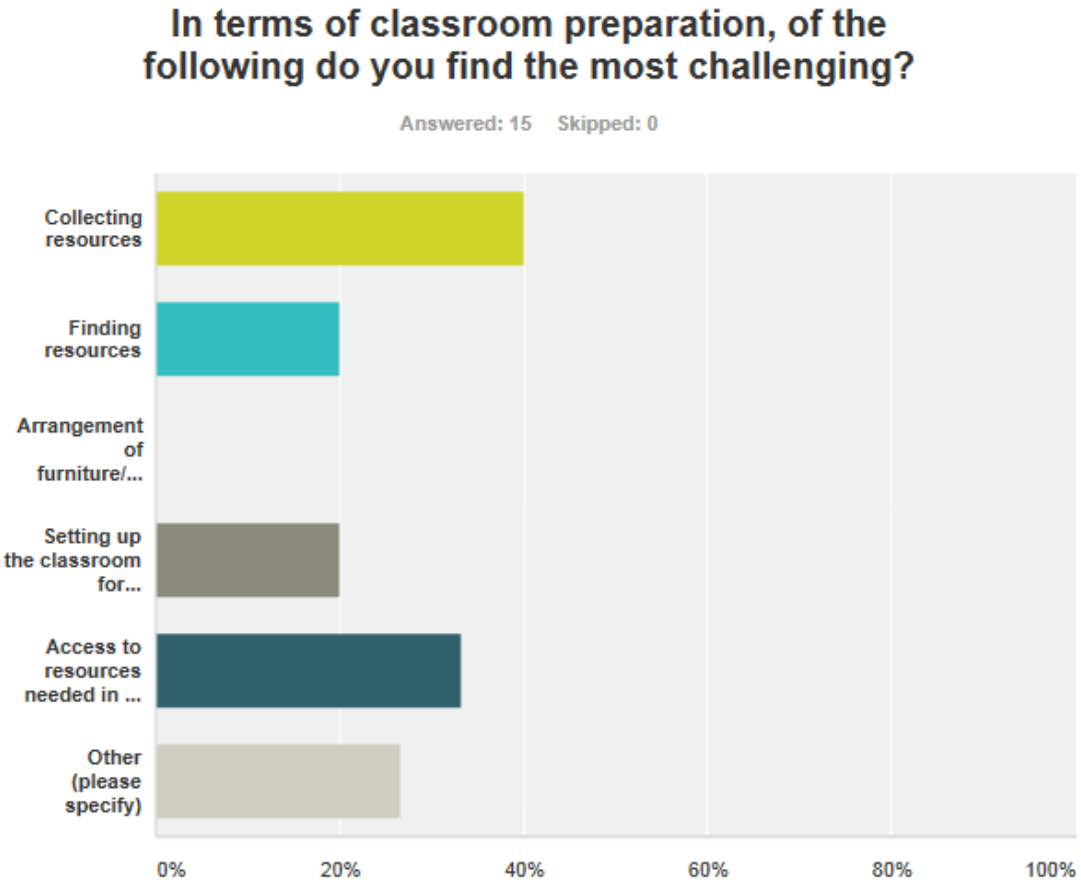
Teacher Data – Recommendations – November 2013

- Classroom preparation and planning were both considered to be large obstacles to implementing UDL. We would like to further probe this question – to determine what the specific needs of teachers are in the areas of classroom preparation and planning. To this end, we will create another survey, which asks teachers to complete a checklist of what things would help them in terms of classroom preparation and planning. We will create the survey during our next meeting in January, and send it to teachers.
- Overall, staff are willing and ready to implement UDL. It is noted that 58% of respondents are not quite sure of how to implement UDL, even though they have a good understanding of the principles of UDL. Teaching staff requires support and/or professional development to help them effectively plan and implement UDL practices in their teaching.

- 88% of respondents indicated that they would find it helpful to have sample lessons to follow in implementing UDL in their own classrooms. We will continue to create universally designed lessons and share them with colleagues.

Appendix D – Teacher Data – Collected January 2014 – Online Survey

In the previous survey, when asked, “What do you find the hardest about implementing UDL in the classroom?”, most respondents identified “classroom preparation” and “planning” as obstacles.



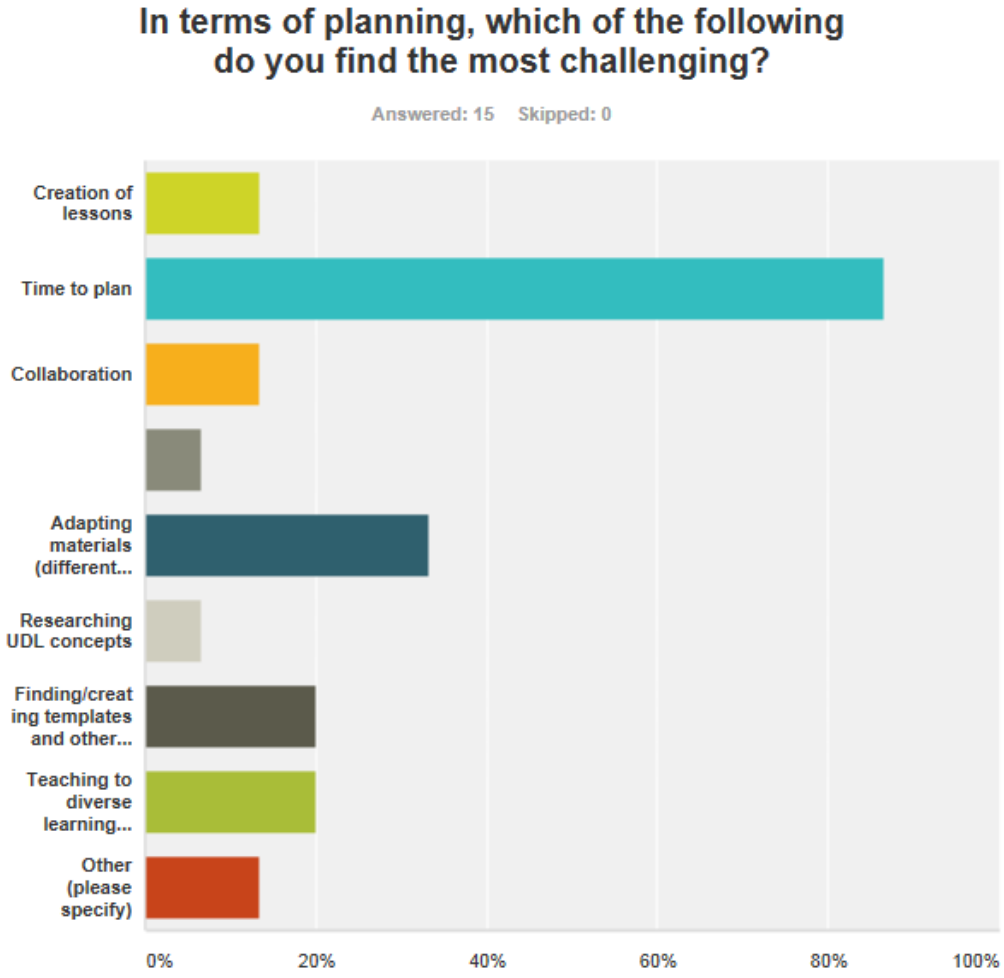
Showing 4 responses

Time to do all of the above.
1/28/2014 6:17 AM View respondent's answers

finding time to create individualized resources
1/27/2014 7:42 PM View respondent's answers

Time
1/27/2014 1:36 PM View respondent's answers

The resources are in the school but have to be hunted down in many cases. Not enough organization/consistency in org.
1/27/2014 11:22 AM View respondent's answers



Showing 2 responses

especially with teams
1/27/2014 2:50 PM View respondent's answers

assessment
1/27/2014 11:22 AM View respondent's answers

UDL Action Research – Teacher Data – Recommendations – January 2014

- Most respondents expressed that finding and collecting resources to use in their classroom was a challenge. It is strongly recommended that we better organize the resources we already have in the school so that teachers can easily find what they need. This would reduce time spent on planning and looking for resources, so that teachers could better focus on instruction.
    - School staff should collaborate to determine which resources need to be kept in every single classroom, and find a centralized location for resources that we do

not need to use frequently, and also create an efficient sign-out system for those resources.

- The majority of respondents (86.67%) indicated that time to plan was a challenge. In the first question, in response to "Other", 20% of respondents voiced that time to plan was an area of concern. At the school level, there is little that can be done to give teachers more time to plan.
- 20% of respondents indicated that they found it difficult to find or create UDL templates and tools. It is recommended that the action research team share the lessons, tools, and templates that they have found or created with the staff. We can direct teachers to the website http://theudlproject.com to locate all the resources.
- 20% of respondents found it challenging to teach to diverse learning styles. We could refer colleagues to http://theudlproject.com to find resources on Multiple Intelligences (MI). It is also recommended that staff members who use MI share ideas at staff meeting and PLCs, and that professional development opportunities on MI are offered to all staff.

Appendix E – Recommendations from Island View School

Based on Student Data	Based on Teacher Data
Promoting Student Engagement • Integrate opportunities for movement in all subject areas • Integrate arts (visual, music) in all subject areas • Provide choices in how students demonstrate learning • Incorporate games cater to different sensory modalities (auditory, visual, tactile) and multiple intelligences/learning styles • Provide opportunities for students to learn individually, in partners, and in small groups • Incorporate technology into lessons (e.g. instructional videos, SMART board activities) and into activities (e.g. online games, PowerPoint presentations, using engaging websites for writing such as http://storybird.com and http://thinglink.com)	Schools should develop a bank of resources that support the implementation of Universal Design for Learning • School resources are in known locations and easily accessible to all teachers • A list of resources (manipulatives, artifacts, varied levels of books, instructional videos, digital resources, and online resources) is made available to teachers UDL Instructional Materials and Practices • Share our website with teachers http://theudlproject.com, because it features a variety of UDL resources • Teachers would benefit from professional development on Multiple Intelligences and UDL practices • Teachers can gather information on students' learning styles and interests early in the school year to create lessons that incorporate their interests and learning styles More time is needed for teachers to plan and collaborate. Together they can plan lessons and find/create materials that will help them implement UDL in their own practices.