



Ne'epapa Ka Hana (NKH) 2.0 | Professional Development Program

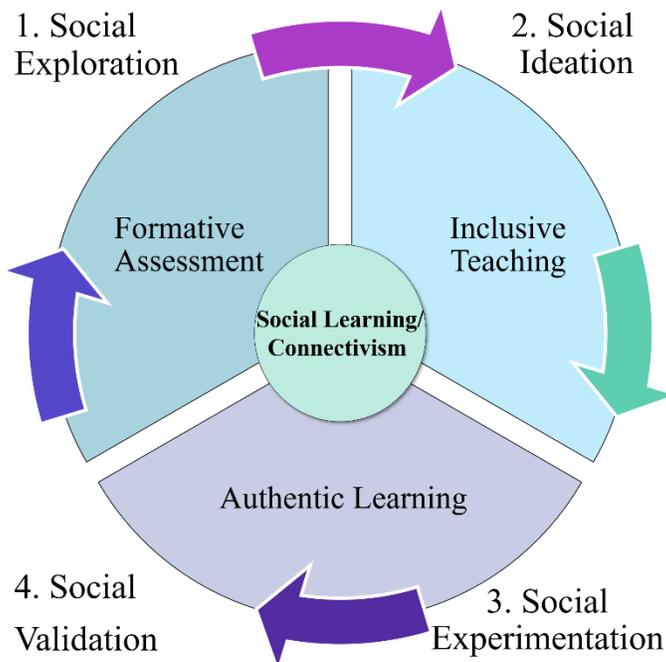
Authentic Social Learning

An Inclusive Teaching Model to Support Diverse Learners in Hawai'i

Module 2: Authentic Social Learning, A New Inclusive Teaching Model

Lecture 3:

Introducing the Authentic Social Learning Model (ASLM)



The ASLM is a teaching model that combines the best research-based practices of connectivist social learning, authentic learning, inclusive mathematics, and formative assessments. The pedagogical strategies of the ASLM work together to create an authentic social learning model for teaching diverse learners in 21st century classrooms. The ASLM is designed to provide a model for implementing research-based strategies without having to learn and attempt to implement them all separately. The research-based pedagogical strategies embedded in the ASLM work in combination to create a model for inclusive STEM instruction for your classroom. The pedagogical strategies embedded in the ASLM are:

- Authentic Learning
- Connectivism/Social Learning
- Inclusive Teaching
- Formative Assessment

The Importance of Authentic Learning in Inclusive STEM Teaching

Research suggests that inclusive mathematics teaching that increases student achievement has two central features: first, both teachers and students explicitly target conceptual development and problem-solving skills; second, teachers give students the time to wrestle with important mathematics in the classroom (Hiebert & Grouws, 2007). This NKH 2.0 training on the ASLM incorporates both of these features. The ASLM utilizes authentic learning to enable your students to wrestle with and process math concepts in a comfortable, non-threatening environment through social learning.

To improve students' general mathematical understanding, the ASLM suggests that teachers utilize real world applications for mathematical concepts in order to allow students to conceptualize the concepts. Math has traditionally been taught in a way that benefits only abstract learners. However, this generalized approach can rob your students of a deeper appreciation of why mathematical knowledge is useful and can make it difficult for them to retain math content. To help your students conceptualize math, provide a meaningful context through authentic learning.

Authentic learning is teaching through real-world problems that face real professionals of any field. Authentic learning is probably not a new concept to you, but you may have heard it referred to as project-based learning or problem-based learning which are both valid strategies for providing authentic learning tasks for your students. The goal is to provide context and rigor for mathematics. The instruction and assignments in authentic learning are designed to help your students make connections between their background knowledge and the content being taught (Preus, 2012). According to Hod and Sagy (2019), authentic learning bridges the gap between what your students learn in school and the skills and practices they will need in professional

settings. Authentic learning provides a pathway for learning mathematics for all learners, even those who traditionally struggle in math.

Example:

If you want to teach students to calculate the volume of a rectangular prism, you could give them a drawing of the prism and the formula to use. Taught this way, the students will learn the procedure for using the formula for a rectangular prism. Many students, particularly those with learning disabilities, will have a difficult time remembering the procedure a few days later. However, when the goal is that students develop a deeper understanding of volume and how it relates to 3-dimensional shapes, you can teach the concept of volume by using authentic learning. For example, you could ask the students to determine how many 1-foot cubes could fit into their classroom. Then, ask them how many cubes would fit if you doubled the length of the room. Ask them to compare the volume of the new room with the original. Then, ask the students to determine the volume of the room if they doubled the length and width. Again, ask them to compare the volume of the new room with the original and the one with doubled length only. Next, ask them to explore the volume if you made one of the walls shorter. By providing context for the learning, you are providing a pathway for all learners to develop an understanding of mathematics and the purpose of the formulas used to find the volume of an object.

The Importance of Social Learning in Inclusive STEM Teaching

Advances in technology and connectivity through the internet have changed the way students think and learn. Most of the students in your classroom have not known a world where they are not constantly connected to technology resources and each other. Siemens (2005) stated that technology is rewiring the brains of learners. In 2005, George Siemens coined the term connectivism to describe learning in the digital age. Connectivism is a learning approach that recognizes the learning potential of digital technology, web-based teaching, and social media for informal learning (Barnett, McPherson, & Sandieson, 2013; Siemens, 2008).

The concept of social learning emerged from connectivism. Siemens (2005) maintains that modern approaches to learning should provide new possibilities for your students to communicate through networks and to combine information. In summation, your students need to be able to talk to one another and access technology to learn new concepts. Your students should be reasonably free to work collaboratively and communicate with their classmates and you, their teacher. In an ever-changing technology dependent world, it is important that you and your students stay up-to-date with one another and communicate frequently.

It is important to remember that your students are social beings. As the instructor, you can stimulate your students' curiosities with an inspiring and energizing presentation style. Your students likely do not want to sit silently and listen to a lecture for long periods of time, which leads to a lack of engagement. By implementing activities and assignments that maximize your students' sense of control over the material, and with expertise that helps them reach just a bit beyond their current abilities, your students will be more engaged and interested in what you have to teach (Cavanagh, 2019).

In a traditional-lecture based setting, teachers spend the majority of their time trying to get students to be quiet, behave, and listen. Brophy (1986) included guidance, modeling, enthusiasm, provision of choice, sincere praise, reinforcement, and curiosity-, dissonance-, and interest-induction as a way to maintain student engagement. Social learning in the ASLM takes advantage of the students' social nature and utilizes peer networks to create classrooms where all students are engaged in the learning process. The social aspect of a student is a valuable and untapped resource. In social learning networks, your students contribute their individual knowledge to create shared knowledge among group members. Chung and Paredes (2015) explained that social networks connect learners to new sources of information through meaningful dialogue that enhances learning and provides new opportunities for collaboration. It is important to note, though, that social learning is not just having students work in a group.

Examples of collaborative learning vs. social learning

Social learning is collaborative learning in a social environment. Social learning expands collaborative learning to encompass a network of students who can rely on one another within and beyond the classroom boundaries. The students learn to rely on one another for shared learning and support. Most teachers today use some type of collaborative learning. Some teachers plan specific lessons every week that incorporate collaborative learning. But, if you think of the teachers at your school who are most effective, they are probably the ones who use collaborative learning every day; it is not just a teaching strategy, it is their teaching style. The students in these classrooms are most likely already utilizing some of the aspects of social learning even if the teacher does not know it. The question is, what distinguishes social learning from collaborative learning.

1. In social learning, the students create and maintain their networks.

The first distinguishing factor between social learning and collaborative learning is who is in charge of the group creation. In collaborative classrooms, the teacher forms collaborative groups. Most of these groups are assigned for a specific length of time (for the quarter, project, or some other time frame). However, social networks are created and maintained by the students themselves. Social networks are groups of students who rely on one another for support. To be effective, your students should have control over their social networks. Social learning networks can be anywhere from two students to the

whole class. These groups are fluid, meaning students can move in and out of social networks several times a day. The students will move networks based on the support they need. Social learning networks build student-student relationships in the classroom which increases inclusion. Students need the freedom to form their social networks and build those relationships for the best academic results.

2. Social networks are more inclusive and encourage the participation of all members.

In an attempt to help students build relationships, teachers will often form groups for their students. Despite their best intentions, teachers who assign collaborative groups in their classrooms limit inclusion and effective collaboration. In most collaborative classrooms, the teacher will assign a specific number of students to the group and base their selection of group members on the students' academic levels (Rice, 2018a). Teachers often feel that they must assign groups to ensure equality, by grouping struggling students with higher-achieving students with the assumption that the struggling student will receive help. This type of teacher intervention inadvertently isolates struggling students and is detrimental to inclusive practices. The struggling students quickly realize that they were placed in the group to receive help and do not feel they have anything to contribute, so they will just shut down and refuse to work. In social learning, when the students select their networks they most often select heterogeneous networks that are based on the needs of the assignment and the attributes of their classmates (Rice, 2018a). Students do not base their selections on academic achievement as teachers do. Rather, they select their groups based on the strengths their classmates bring to the team so everyone feels important and included and the students will work to support their teammates.

3. Social networks improve the academic achievement of all students.

Another distinguishing factor between social learning and collaborative learning is the resulting academic achievement of the students. Despite the advantages of collaborative learning, several limitations create inconsistent results in the classroom (Hod & Sagy, 2019; Kirschner et al., 2018). Many teachers are dismayed to find that not all groups of learners collaborate effectively. Even when collaboration successfully facilitates knowledge acquisition, it falls short in supporting knowledge processing and knowledge creation that is required for complex problem solving (Kirschner et al., 2018). Social learning networks create effective problem solvers because the group members create a shared group knowledge. Social learning requires students to be active participants in learning as they explain their ideas and question their peers. When students are actively involved in classroom activities their confidence in their abilities improves (Velauyatham & Aldridge, 2013). Rice (2018) found that middle school teachers who utilized social learning strategies felt that their students showed improved self-regulation behaviors.

Students who utilized social networks became more engaged in the learning process and they were 75% more likely to have higher grades and outperform their peers on assessments (Ardito, 2015; Shan et al., 2014).

4. Social networks utilize social technologies.

While collaborative learning has become a common practice in most classrooms, it often does not utilize technology. The ASLM encourages the use of technology in social learning if and when it is available. Social technologies are a part of social learning in which students utilize technology to communicate, share ideas, and learn new concepts. Social technologies include applications that promote communication among students, including blogs, wikis, and social networking sites. Social learning incorporates technology in a meaningful way to enhance collaboration among students (Abhari, 2017). Social technologies extend learning by altering collaboration from being limited to face-to-face interactions and expanding to virtual collaboration. Experiment with a variety of platforms to engage your students through social technologies. Just ensure that you inform your administration before incorporating social technologies to ensure the safety and security of your students.

5. Social networks incorporate the principles of connectivism.

From its origins as a network for sharing data and software amongst scientists, the Internet has become commonplace in everyday life for your students. Connectivism is a theoretical framework for understanding learning in a digital age (Siemens, 2005). Social learning networks are more effective than traditional collaborative groups because they integrate the four key components of healthy networks: autonomy, diversity, resource openness, and connectedness (Downes, 2012). Since most teachers use collaborative learning regularly, you are probably already using some aspects of social learning. The shift from collaborative learning to social learning is not painful or time-consuming. But, you will need to be very deliberate about instituting the principles of connectivism that are explained below to shift to social learning with the ASLM.

The Importance of Formative Assessment in Inclusive STEM Teaching

The way you assess student performance influences, either determined as beneficial or harmful, affect the lives of your students with or without disabilities. By using assessment techniques carefully, cautiously, and correctly, you support the rights of students and their families to receive appropriate educational assessment and services. The goal of formative assessment is to monitor student learning so you can provide ongoing feedback to improve your teaching and your students can improve their learning. The Authentic Social Learning Model (ASLM) utilizes formative assessments to empower the teacher to monitor and adjust their teaching to make changes in the classroom that result in higher academic achievement. Students need constant

assessment and feedback through formative assessments to advance their thinking and progress toward mastery. Educational consultant Rick Stiggins (2005) suggests that you teach your students to strive to understand what success looks like and to use each assessment to try to understand how to do better the next time. The goal of assessment is to guide instruction, so the ASLM encourages the use of formative assessment data to differentiate your instruction. Formative assessment data should be used to provide both corrective activities and enrichment activities for your students who need them. An important caveat to keep in mind, however, is that corrective instruction must present concepts in new ways and engage your students in different learning experiences that are more appropriate for them (Guskey, 2008). The challenge is to find a new and different pathway to understanding; this can involve a change in format, organization, or method of presentation. The ASLM encourages the use of social learning and social technologies to implement these changes.

Your formative assessment data should be used to help you differentiate instruction and improve student achievement. Many teachers have been trained to think of formative assessments as short 5-question quizzes that are given on Fridays to see if the students learned the concepts from the week. While this is one method used for formative assessment, it should not be the only one. Your most effective tools for assessing your students' mathematical understanding are your ears. Your students should be discussing math and developing ideas for solutions. Simply listen to the students as they discuss their thoughts on how to solve the problem. You will learn valuable information about their level of understanding, their background knowledge, and their needs. You can pose questions to the students to assess this information and write down a grade based on their responses. You can also use questions to help your students discover errors in their mathematical thinking. The ASLM strategies introduced in this module embed this type of assessment and help you learn to use formative assessment to guide your students to mathematical mastery.

Practical Strategies and Examples for Implementing the ASLM Using the Principles of Connectivism

The ASLM is designed to be an inclusive model for teaching diverse learners. The model is based on the principles of connectivism: autonomy, diversity, openness, and connectedness. To summarize, the components of connectivism mean that to learn in networks, we need to feel motivated and in control (autonomy), be open to seeking, receiving, creating, and sharing ideas and information (openness), have access to many sources of information and ideas (diversity), and have a pathway for information and ideas to spread across the entire network (connectedness)It uses these principles of connectivism to increase student engagement, motivation, and achievement. The ASLM is not a strategy you will use to teach your students on specific lessons or days, it is a strategy that will transform your classroom into an inclusive 21st-century learning environment. Incorporate autonomy,

diversity, openness, and connectivity into your classroom to transform your teaching and your classroom into a social learning environment that is conducive to 21st-century learning through the ASLM.

Strategy 1: Focus on autonomy to motivate and engage diverse learners.

Autonomy is achieved when your students feel a sense of freedom and control over their learning. Providing students with choices about their education increases the students' sense of control and improves motivation. Students who feel they are given autonomy become more intrinsically motivated to succeed (Gillard, Gillard, & Pratt, 2015). The following are examples of ways you can use the ASLM to increase learner autonomy in your classroom.

Give your students ownership over their social learning networks.

A major difference between collaborative learning and social learning is who has control over the student networks. To transform from collaborative learning to social learning, students need to be given autonomy over their social learning networks. In true social learning, students contribute to the network because they want to, not because they are being coerced by an external force (Downes, 2012). When students are given the autonomy to form their networks, they will form groups naturally and organically. Social learning is more successful when your students are given autonomous control over their social networks (Rice, 2018b). Providing your students with choices about their education increases their sense of control and improves motivation because it empowers them.

Incorporate authentic learning and facilitate autonomous learning by providing expertise and guidance.

Although unguided or minimally guided instructional approaches are very popular and intuitively appealing, these approaches ignore evidence from empirical studies that consistently indicate that minimally guided instruction is less effective and less efficient than instructional approaches (Kirschner et. al, 2006). As the teacher, it is imperative that you place a strong emphasis on guidance of the student learning process in order to positively impact the dynamics in the classroom and subsequently optimize your students' learning capabilities.

Your students learn through active participation, not solely by listening to you speak or show them how to solve a problem. Limit the amount of time you spend lecturing to your students. Teach your students how to search and obtain valid information from reliable resources. Teach your students how to use their curriculum, textbooks, and online resources to guide them in solving problems. Introduce your students to helpful sources

that they can access in the future. Give your students authentic learning problems that allow them to grapple with the math concepts to develop their mathematical understanding. Learning is strengthened when students understand why they are performing a task because it motivates them to complete the work. Give them a reason, a ‘why’, to solve the problem by offering them a real-world tangible example. Your students’ responses, whether right or wrong, do not reveal much about student thinking and the processes they utilized in order to reach their conclusion. Instead of providing answers to problems, ask guiding questions that will lead the students to resources that they can use to find answers. Then, teach students how to evaluate their answers in collaboration with other students. Use the supplemental NKH 2.0 materials to help with authentic learning tasks.

Use formative assessment to provide options for your students to demonstrate their learning.

Provide your students with a menu of ways that they can show their learning process. Provide several different suggestions on ways your students can demonstrate their learning. Below is an example menu list you can use in your math classroom to increase autonomy. All of the options require the students to provide the same information, but they can present it in a manner that is comfortable or fun for them, so they feel they had control over their learning and their success. Keep in mind that these are just suggested ideas and you are free to create your own options that you and your students would be comfortable with.

Write a short essay about how you solved the problem. Include the equations you used to solve the problem. For each equation explain why you chose that method.

Create a group presentation that you will give to the class that explains how you solved the problem. In the presentation, include any mathematical equations you used and why you used them.

Create a group skit about the problem and your solutions. Be sure you include any mathematical equations you used in your skit.

Create a puppet show about the problem and your solutions. Be sure you include any mathematical equations you used in your show.

Come up with your own (teacher approved) idea about how you will present your solution. Make sure to have it approved by the teacher before you begin.

Strategy 2: Create a classroom that celebrates diversity.

Diversity of opinions is achieved when students have the opportunity to work with diverse individuals with differing opinions and perspectives. Effective networks consist of diverse

individuals who interpret information differently and share diverse perspectives on a topic (Downes, 2012). Diversity is achieved when your students have the opportunity to work within their networks and access different opinions and perspectives on a topic. Social learning exposes students to the diverse opinions of other students, promoting problem-solving and social skills. Through social learning, your students will learn to work with students with diverse backgrounds to achieve a common goal (Abhari, 2017). The following are examples of ways you can use the ASLM to increase diversity in your classroom.

Encourage a diversity of opinions through authentic learning.

Teach your students how to respectfully share divergent and conflicting opinions. Using authentic learning, help your students identify different solutions to the same problem. Provide your students with strategies for having respectful and productive group discussions about their math. Teach your students to defend their explanations constructively and respectfully. Help your students understand that mathematics is a creative process, and they can take different routes to the same destination. Challenge your students to create and share different strategies for solving the same problem.

Celebrate diversity and encourage an inclusive environment.

Your students are from diverse backgrounds and diverse cultures. Teach your students to accept and celebrate diversity. Provide authentic learning opportunities that encourage students to share their cultural backgrounds and knowledge. Help your students form diverse social networks. It is important that students have the opportunity to meet and work with all of their classmates in the beginning so they can find the students they work best with. At the beginning of the year provide students opportunities to work with other students that are not their friends. First, ask your students to work with different people for different assignments. After your students have worked with most of the other students, continue to coach the students on choosing peers with whom they work well and will benefit them for the particular assignment. Students should be free to think aloud and provide suggested solutions in a safe environment.

Find authentic learning opportunities that will connect your students to diverse, outside real-world experts.

Invite community members, businesses, and government officials into your classroom as often as you can. Think about inviting engineers, mathematicians, scientists, university professors, woodworkers, welders, and construction managers to work with your students. You might be surprised by the number of people who would be willing to come and work with your students if they are invited. Make your classroom walls more

permeable by exposing students to new role models and practical applications of mathematics. For instance, students can learn from someone who makes surfboards how it is related to Science, Technology, Engineering, and Math. They can begin to see how mathematics can be applied to the real world, even after graduation. Use video technology to connect with experts in the classroom if they cannot physically come to the classroom.

Remember that collaboration and oral communication competence can contribute to students' social adjustment and participation in the classroom.

Competence in speaking and listening is a prerequisite to students' academic, personal, and professional success in life. Indeed, teachers deliver most instruction for classroom procedures orally to students, which can negatively impact students with ineffective listening skills, as they may fail to absorb much of the material in the lecture (Morreale et. al, 2000). Students' problems are intensified when they respond incorrectly or inappropriately because of poor speaking skills. Students who struggle with mathematical terminology and equations may fear that they are being judged as perceived as uneducated or poorly informed. Communication competence continues to be essential and is required in most occupations.

Strategy 3: Individualize learning through resource openness.

Resource openness is achieved when your students have access to a variety of technological and social resources for learning. Resource openness is enhanced when your students communicate through networks to share ideas and expertise to gain knowledge (Abhari, 2017). Through social learning networks, your students share mathematical knowledge and resources with their peers. Access to technology resources allows your students to build their individualized library of math resources that suits their learning style. When your students have access to various resources, they can find resources that allow individualized access to the curriculum. The ASLM encourages students to access a variety of resources for learning, including other individuals and online resources. The following are examples of ways you can use the ASLM to increase openness in your classroom.

Coach your students on how to use various resources to solve authentic learning problems.

When your students have questions about a problem, encourage them to discuss the topic with their peers or search online for information from reliable sources. Provide your students with technology and resources but give them the freedom to figure out how to use the resources. Encourage your students to become self-directed learners who are resourceful in seeking answers and critical of the information they receive. Resources can include elders in your community, libraries, magazines, and past experiences, so you are

not limited to technology resources. If you do have technology resources, teach your students how to find information themselves using accurate and reliable sources. Talk to your students about how to find reliable information and how to incorporate that information into their assignment. Provide opportunities for your students to practice seeking, filtering, and evaluating information from peers and technology during group learning. You may want to give students a particular topic that you know will have a variety of reliable and unreliable sources. Use that topic to discuss how they can determine which resources are valid.

Incorporate authentic 21st-century teaching even if you don't have access to technology.

Some teachers believe that if the classroom is not equipped with enough computers for every student, they cannot implement 21st-century skills. Your goal is to meet the needs of 21st-century learners, and this can be done with or without technology. Lack of technology may limit your ability to use social technologies but does not limit your ability to incorporate social networks, problem-solving, and collaboration. For example, you could provide your students with topics that are controversial and have a lot of misinformation on both sides of the argument. You can initiate a class discussion on how to find reliable or unreliable information. If you want to include technology resources, keep in mind that many students have cell phones or tablets that can be utilized in the math classroom. Teaching your students to use these devices for educational purposes has benefits for your classroom and the future. Closely monitor the use of personal devices to ensure your students are only using them appropriately. If your students do not have personal devices and if your Wi-Fi network can support it, request that parents, teachers, or community members donate old cell phones, tablets, or computers to be used in the classroom for those students who do not have them.

Strategy 4: Create connections to enhance learning.

Connectedness is achieved when students connect with other students and resources and use those connections to learn. According to Chung and Paredes (2015), when students have stronger connections with one another, knowledge exchange is better. In classroom networks, the interaction between members does not just send information from one student to another, but it allows students to create new knowledge that did not exist before the interaction (Downes, 2012). Network connectivity is achieved when your students gather and assimilate information in their networks to create new knowledge that is shared among the group members. Students use their networks to make connections between fields, ideas, and concepts to create meaningful learning (Abhari, 2017). Through social learning, your students can create connections with other students and their ideas. Encouraging your students to utilize networks allows diverse

students to access the curriculum. The following are examples of ways you can use the ASLM to increase connectivity in your classroom.

Use authentic learning to ensure all of your students collaborate, research, communicate, and contribute to the group.

Incorporate complex authentic learning problems into your classroom to improve collaboration. If your mathematics tasks are too simple, one student can solve the problem and the students will not need to collaborate. To encourage full participation of every student, choose rigorous authentic learning problems that will ensure that all of your students will be engaged and have the opportunity to build upon their background knowledge so they can contribute to the group collaboration. Help your students identify one another's strengths so everyone can contribute to the final product. One way to do this is by having the students take a personality test. Help your students use this information to determine the roles they are best suited to perform. This helps to instill confidence that they can contribute to the group and increases engagement.

Use formative assessments to ensure your students make connections through authentic learning.

To learn effectively, your students need to make connections among concepts and various subjects and fields. Your students should understand not only the topic of the lesson but also how the concepts relate to what they already know. You also want your students to connect math concepts with real-world applications. Authentic learning provides the ideal opportunity to make real-world connections. Using videos or talking to experts outside the classroom can help your students make connections. Then, use formative assessments to check your students' level of understanding. Use formative assessment to not only assess their understanding of the content but also their ability to make connections to create a deeper understanding. The ASLM strategies will help you integrate these strategies.

Adopt social technologies.

Students are familiar with using social technologies in their personal lives, but often do not know how to use them for educational purposes. There are several sites available for this type of interaction, so find one you like and start using it with your students. Find a site that allows your students to send messages, post their work, and receive feedback. The NKH 2.0 site is a great site to use and is provided with this training. This type of student-to-student interaction can occur among students within a classroom, across multiple classrooms in a school, and throughout a network of participating schools. Always make your administration aware of your plans and get permission to use the resources to avoid any breach of privacy. All teachers, administrators, and students need to be very mindful of FERPA regulations.

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