

Emerging Technology Adoption Framework: For PK-12 Education

Introduction to the Framework

This framework was created with education community members to help ensure that educational leaders, technology specialists, teachers, students, and families are *all part of the evaluation and adoption process* for placing emerging technologies in PK-12 classrooms. We engaged an [Emerging Technology Advisory Board through Educator CIRCLS](#) based out of [The Center for Integrative Research in Computing and Learning Sciences \(CIRCLS\)](#) and gathered additional feedback from researchers, policy experts, the edtech community, educators, and families to ground our work through a community of experts. This framework is specifically designed to include community members in the process of making informed evaluation and procurement decisions and outlines the important criteria to consider during three stages of [emerging technology](#) implementation: (1) initial evaluation, (2) adoption, and (3) post-adoption. Each criterion has specific questions that can be asked of decision makers, district leaders, technology researchers and developers, educators, and students and families, as well as resources and people who might serve as resources when answering these questions. Please note that not all of these questions will apply in every context. Additionally, it may be beneficial to ask some questions to multiple members of the community. For example, questions listed under the procurement decision makers and district leaders section can usually also be asked of educators.

This is a living document to help guide evaluation and procurement processes — it is intended to evolve and inspire discussions. We seek feedback on the framework to inform future iterations of the guidance it contains. Please fill out this [feedback form](#) or [contact us](#) with your thoughts or if you would like to use this framework.

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Initial Evaluation

Objective	Criteria	Questions to Evaluate the Objective's Criteria
Accessibility & Equity	<p>Investigate if this tool/system is FERPA, PPRA, CIPA, HIPAA, and COPPA compliant.</p> <p>Ensure emerging technologies are equitable for all students by cultivating a culturally responsive learning environment with specific considerations for student neurodiversity and accessibility.</p> <p>Investigate what barriers there may be for students and teachers within your context to use this tool/system.</p> <p>Investigate if there are any supports or modifications for this tool/system that could be used to mitigate these barriers for users in your context.</p>	<p>For Procurement Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> How will this technology meet the needs of all of our students, particularly those with IEPs or 504 plans, and Emergent Multilingual students? How will the district be able to manage and/or provide equitable access to this tool and promote equity? Does this technology provide support with implementation and have a designated contact/support for the district up to and including additional professional learning that includes equity and accessibility? Will students be using this technology at home? If so, will they need internet access or a device to use it? What population of students or teachers within your context is this tool/system pedagogically and/or developmentally appropriate for? <p>For Researchers/Developers:</p> <ul style="list-style-type: none"> Are you compliant with the required accessibility laws and best practices? <ul style="list-style-type: none"> What additional measures do you take to make your product more accessible for all users? If applicable: are you compliant with the Individuals with Disabilities Education Act (IDEA) and the Health Insurance Portability and Accountability Act (HIPAA)? What assumptions does the tool make about students' access to the Internet, technology, or culture? Which of those is applicable to your context? What's missing? Were learners, families, and educators involved at any stage of the development and design processes of this technology? What was their level of involvement? Were their demographics similar to yours? Does this tool/system support students in collaboration? If so, what are the expectations of students or the built-in supports for students who might require accommodations in order to participate in collaborative work? <p>For Educators:</p> <ul style="list-style-type: none"> Are there any barriers that might make this tool inaccessible or challenging for you or any of your students? If so, what supports or accommodations might be helpful? Do you know of other educators using this tool/system in their classrooms? What are some of your biggest challenges in supporting student learning? Do you think this tool/system would help to address some of those challenges? <ul style="list-style-type: none"> Does this tool/system align with your priorities around supporting students? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> If relevant, how do you see this tool/system fitting into the needs of families, caregivers, and students in your context?
	<p>Investigate what specific data is being collected from users, how safely that data is stored, and what is done with that data (i.e., who it is shared with, is it deidentified, what can it be used for).</p> <p>Ensure that there is no extraneous data</p>	<p>For Procurement Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> What data does a tool/system with this purpose need to collect (Answering this question will help to determine what will help to determine if elements of data collection might be extraneous)? Where will the data be stored, and how will the district manage/access them? If a student moves schools/districts, do they have ownership of their data? (e.g., do you provide them a copy of their data/delete it from your systems) What happens to the data after students have graduated? Is this tool/system designed to be accessed outside of school, if so are there any data collection concerns to consider when it is used in a home setting? What rules or policies are in place for when, how, and under what conditions can data be shared with police? <p>For Researchers/Developers:</p> <ul style="list-style-type: none"> Are you compliant with existing privacy laws? If so, which ones and why?

Objective	Criteria	Questions to Evaluate the Objective's Criteria
	<p>being collected, data is surviving its intended purpose, and that data is not retained beyond its useful life.</p>	<ul style="list-style-type: none"> • What data will be collected about users? • How is collected data secured? • Is any extraneous data being collected that is unnecessary for the tool/system to perform its purpose? • Will anyone outside of the school/district have access to this data, and if so, for what purposes? • How is data sharing managed, and what structures are in place to ensure that data sharing within the product/platform is deliberate and transparent to all parties (i.e., educators, families, students)? • How is the company that owns/controls this tool/system allowed to use collected data? • What forms of communication are accessible for educators, families, and students to understand the data they agree to share? <p>For Educators:</p> <ul style="list-style-type: none"> • Does the data collected and what is inferred by this tool/system (i.e., suggestions/ recommendations made about users of the tool/system) align with teaching and learning efforts in your context? • Do you feel that you will be able to use this tool to collect the data needed to support teaching and learning in your context? • Is this an appropriate and usable tool/system for your context/students when it comes to student and staff privacy? Do you feel that you can explain this to your students and parents? • If students opt out of using this tool/system, what does this mean for you and them? Will students miss out on something if they don't participate? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> • What processes/resources are in place to ensure that families, caregivers, and students are aware of data that will be collected through this tool/system and have control, to a reasonable and appropriate extent, of the use and storage of data? • Does this tool/system collect any data that families, caregivers, and students are uncomfortable with being collected and/or shared with the developers of this tool/system? Is there a way to opt out? • What forms of communication are most accessible for families, caregivers, and students when sharing information about data privacy (i.e. email, in-person support, language, etc.)?
<p>Function of Tool/System</p>	<p>Investigate who is included in the creation, design, development, and management of this tool and system.</p> <p>Investigate how the tool/system was trained and tested.</p> <p>Investigate what professional learning and training are available for this tool/system.</p> <p>Ensure that this tool/system is appropriately designed and</p>	<p>For Procurement Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> • What would you consider the successful adoption and use of this tool/system to look like? • Does your district pre-approve vendors or developers? If so, is this tool/system made by a pre-approved vendor? If not, what will be the process to get this improved? • Is your tool/system compatible with different devices? What are the hardware, operating system, or software requirements? • How would you use this tool in the school/district system to achieve teaching or learning goals? • Do you think that this tool/system is designed with the families and students in your school's context in mind? • What information about this tool/system should be shared with students and families? • What are the long-term effects of using this system, and how can the instructor be connected to or have visibility into the system's decision making process? • How long will the process of getting this tool/system approved take? Does this timeline align with your goals of using this tool/system? • How long would the contract be in order to use this tool/system within your context (for instance, a one-year pilot or a multi-year access contract)? • Do you believe that using AI tools/systems could deliver strategic educational value and capability or a new insight into teaching and learning?

Objective	Criteria	Questions to Evaluate the Objective's Criteria
	<p>trained to be used in your context, with your population, and for your desired purposes.</p>	<p>For Developers:</p> <ul style="list-style-type: none"> For whom was this tool/system developed for (context, use, and population)? <ul style="list-style-type: none"> Who was on the team that designed and developed this tool/system? How did you train and test this tool/system? Does this system delegate decision-making authority to an algorithm? If so, which decisions? Are teachers able to override such decisions? Who else is using this tool/system? Can you connect us with other districts using your tool? <p>For Educators:</p> <p>If provided with the training and resources:</p> <ul style="list-style-type: none"> Are you willing and able to use this tool/system? Why or why not? How does this tool/system fit into and complement your classrooms? Can you anticipate any problems with the implementation of this tool/system based on current pedagogical practice? Might this tool/system present any obstacles for you? For your students? Is the tool/system replacing something else? What trade-offs do you see? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> If applicable, do families, caregivers, and students understand the tool/system's function and design in relation to the learning goal or purpose? What additional information or support will families, caregivers, and students need to be able to feel successful in using this tool/system?
Standards/Goal Alignment	<p>Investigate the specific usage and intentions of this tool/system in regard to your desired purposes.</p> <p>Ensure that this tool/system is appropriately aligned with state learning frameworks as well as district and school goals and community culture.</p>	<p>For Procurement Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> Does this tool/system fit our needs? If it appears that it might not fit the needs of our context: <ul style="list-style-type: none"> a) Find out for sure whether that's the case, and determine whether there are ways we can modify or supplement a tool/service to address those deficiencies. How is the tool/system being adapted to the needs of your student population? Is the design of this tool/system in alignment with the goals of the district? <p>For Educators:</p> <ul style="list-style-type: none"> What does this tool track (i.e. student performance, engagement, etc.)? Does it track the things that could be helpful in your context? Is the tool capable of creating personalized learning paths? Is this always positive? What are the trade-offs? Can the collected data improve the types of assessments used to guide students in their learning? Will the information, inferences, predictions, insights, analytics, or suggestions made by this tool/system be useful in your classrooms and in regard to the standards you are responsible for? How will this tool/system be administered, and how do the administration details differ from existing tools/systems/assessments? Does the amount of administration time this requires outweigh the pedagogical benefits? What are the learning goals of this tool/system and how effective are they? <p>For Sales Reps/Developers:</p> <ul style="list-style-type: none"> What content standards and/or pedagogical strategies did you use in your product development process? How is growth measured? Are there any additional supports available for students and educators? What curricular structures/goals are assumed in the design of this tool/system? If there is personalized learning, how much influence does a teacher have over any given students' personalization? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> When applicable and available, what information about learning outcomes would families, caregivers, and students like to attain from these tools/systems? Is the design of this tool/system in alignment with the learning goals? Are families, caregivers, and students comfortable with the learning goals of this tool/system and do they believe the goals will be effective in this context?

Adoption

Objective	Criteria	Questions to Evaluate the Objective's Criteria
Data Privacy	<p>Investigate how the tool/system will specifically be implemented in your context and what data will be collected from which parties for what purposes.</p> <p>Ensure that no extraneous data is being collected, data is not surviving the intended purpose, and that data is not retained beyond its useful life.</p>	<p>For Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> What data will need to be collected within different classrooms or settings in order to use this tool/system as intended? What are the merits and metrics for success with this tool/system? Are all community members okay with how the company that owns/controls this tool/system is allowed to collect and use collected data? How long is the development/training period for the tool/system? Do you feel that this is enough for your context? Will this tool/system be used/accessed only from the school environment, or will it also be used from home? Are there any differences in what data is collected or how it is used in the school and home setting? <p>For Researchers/Developers:</p> <ul style="list-style-type: none"> What are the protocols for notification of any data breaches? What options are available to modify the implementation of this tool/system in a different district, school, and classroom context? How will teachers and educators remain in control of this tool/system? Will updates to the tool/system impact privacy? How long will shared data be stored? Who will have access to the data, and for what purpose? Does your tool/system model different modalities (e.g., speech, text)? What will the range of languages be? What are the accessibility options available for users? <p>For Educators:</p> <ul style="list-style-type: none"> Do you understand the data that is/has been collected? Do you feel that you will be able to appropriately use the data being collected or inferred by this tool/system? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> How is family, caregiver, and student data stored? Is it secure? How can families, caregivers, and students check or receive updates about the most current privacy policies? What technical support is in place to support family, caregiver, and student adoption of the tools? <ul style="list-style-type: none"> How will you help families, caregivers, and students understand the privacy and safety implications when using this tool/system? With whom can families, caregivers, and students share concerns and/or questions?
Learning & Training	<p>Determine who needs professional learning and training and to what degree they need it within your context for implementing this tool/system.</p> <p>Ensure professional learning and training is available for your context and schedule appropriate training.</p>	<p>For Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> What training and resources exist for educators in the implementation phase and ongoing use of the tool/system? What is the cost, monetarily and in regards to time, of training all necessary staff to use this tool/system? Are these costs prohibitive (can you afford the time or financial burden of the tool/system but not of training or of replacing lost or broken tools/systems)? <ul style="list-style-type: none"> Do not continue until an adequate and sustainable funding source is identified. Does the school/district have plans for and capacity to deliver required professional learning and/or training to support the implementation of this product/service? How does the learning/training address the different learning needs of teachers? How do the learning/training help teachers to address the particular needs of your students (e.g. emergent multilinguals, students with disabilities, etc.) If pre-implementation and/or consistent training is not available, what learning will you provide your teachers/staff use this tool/system effectively?

Objective	Criteria	Questions to Evaluate the Objective's Criteria
		<p>For Developers:</p> <ul style="list-style-type: none"> • Is there an additional cost for professional learning or training? • For how long before and after development does your professional learning or training continue to be provided? • How do you deal with failures in or issues with the tool/system? How are failures in the tool/system communicated to users, and on what timeline? • Are there any credits or badges for professional learning in learning how to use this tool/system? <p>For Educators:</p> <ul style="list-style-type: none"> • What kind of training or professional learning would support you in consistently implementing this tool/system? • Is the kind and amount of training required accessible for you? • Do you believe that the resources that are provided for this tool/system can easily be implemented into the content area or the current curriculum? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> • Is there available ongoing training for families, caregivers, and students to help them understand the tool/system? If not, will we have to create them? • What kind of information or training would families, caregivers, and students be interested in? • Do families, caregivers, and students prefer this information to be shared in their home language?
Standards/Goal Alignment	<p>Investigate how the tool/system aligns with current teaching and learning practices within your context.</p> <p>Ensure that this tool/system can be implemented in ways that are beneficial and minimally disruptive to teaching and learning.</p>	<p>For Adoption Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> • What standards are addressed by this tool/system? Is there a document or resource that shows alignment with state/national standards? • Why are you using this tool/system? What are your goals? How can you use this tool/system to reach or expand those goals? <p>For Researchers/Developers:</p> <ul style="list-style-type: none"> • How have other schools in this state and/or with similar contexts aligned this tool/system to their standards and goals? • How can the tool/system be customized for our standards/goals/students? <p>For Educators:</p> <ul style="list-style-type: none"> • Do you feel that using this tool/system will be helpful or redundant in efforts to teach specific standards or reach specific goals? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> • How might this tool/system support families, caregivers, and students (at home and/or in the classroom)? • How will families, caregivers, and students be made aware of the tool/system's usage and effectiveness? • If families, caregivers, and students are allowed to access this tool/system outside of school, what do they need to have at home to be able to use this tool/system successfully? <ul style="list-style-type: none"> ○ Will this be feasible for all families, caregivers, and students?

Post-Adoption

Objective	Criteria	Questions to Evaluate the Objective's Criteria
Monitoring	Investigate how this tool/system is being used within different contexts of your district/school.	<p>For Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> Is the successful adoption as you defined at the outset happening? What systems ensure this? Is the tool/system being used with fidelity? If not, how is it being used in unexpected ways? Does teaching and learning data suggest that this tool is supporting students and teachers equitably and as intended? If not, investigate why. Does the teaching and learning data match what families/caregivers, students, and teachers are saying? Once the development/training period for the tool/system provided by the developers has ended, do you feel this was enough for your context, or is more needed? Is there a transparent alert when students are being monitored while using your tool/system, if applicable for the tool/system? How does the tool/system protect users' identities? How frequently will you collect and examine data about the implementation of this tool/system (e.g. 1 month, 3 months, 6 months, etc)? <p>For Researchers/Developers:</p> <ul style="list-style-type: none"> What support is in place during the post-adoption phase, such as monitoring checklists or supporting resources? How would you define the successful use of this tool/system, and is our context meeting your definition? What kind of feedback (positive, negative, specific problem-solving suggestions) does this tool typically give students or teachers? <ul style="list-style-type: none"> Is the feedback personalized and/or adaptive? <p>For Educators:</p> <ul style="list-style-type: none"> How do you feel that the implementation of this tool/system is going? What can be done to support you in using this tool/system? Is this tool/system supporting teaching and learning? If not, what changes could be made in terms of training or support? What positive or negative effects are you seeing in students? Is there a way to share student feedback? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> How are families, caregivers, and students being kept aware of the monitoring of this tool/system, especially as it relates to the use of our identities? Do families, caregivers, and students have the ability to consent to and opt out of monitoring? Do families, caregivers, and students have information on how to access and review the data being collected by the tools?
	<p>Determine where this tool/system is being beneficially implemented with fidelity and where it is not.</p> <p>Ensure that teachers and students are using this tool/system with enough fidelity to ensure successful adoption.</p>	

Objective	Criteria	Questions to Evaluate the Objective's Criteria
On-Going Support	<p>Investigate any additional needs or difficulties with tool/system use within your context.</p> <p>Ensure that teachers and students have the resources and information needed to use the tool/system, including onboarding new for students and teachers, and continue to use the tool as it updates and changes.</p> <p>Ensure the training includes a post-training assessment to identify appropriate ongoing support for all users and address any issues that arise.</p>	<p>For Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> How are updates or changes to the tool/system pushed out to devices Do they need to be individually updated by each user? <ul style="list-style-type: none"> How far in advance should updates be communicated to educators, students, families, and caregivers? Are the updates compatible with the devices that educators, students, families, and caregivers have? How are new users of this tool/system being onboarded? Are those onboarding efforts working to support new staff or students? If the tool/system is not being used with fidelity, what are the next appropriate steps (i.e. re-training the whole context or support for a specific group of users)? When the tool/system is changed or updated, are users still comfortable using it, or do they need additional support? When the tool/system is changed or updated, is it still beneficial to teaching and learning in our context? When the tool/system is changed or updated, is it collecting any additional data or making any new inferences with student data that should be examined as a data privacy concern? <ul style="list-style-type: none"> If it is collecting additional data, how has this been communicated to the school and educators, students, families, and caregivers? Who is responsible for communicating these changes? Has a new privacy agreement been reviewed and signed? Are there patterns of use or disuse (i.e. places or students/teacher groups where usage is high or low)? Do we notice any patterns that indicate inequities? If so, how can we solve those discrepancies? If the tool/system goes home, families and caregivers may play a large part in supporting adoption. Are there resources for them to be trained to use the tool/system? <p>For Developers:</p> <ul style="list-style-type: none"> How will we be notified of any updates or changes to your system, algorithmic, or user experience? When changes or updates are made to the tool/system, do you provide resources or additional training to schools? When changes or updates are made to the tool/system, will we be notified if different data is being collected, different inferences are being made, or if the process of making inferences has changed? How can you address or support our context with the issues that we have identified with using this tool/system? <p>For Educators:</p> <ul style="list-style-type: none"> How is this tool/system supporting teaching and learning? <ul style="list-style-type: none"> For example, how is it being used to promote high-level interactions with content, such as analysis, creation, and evaluation? What professional learning do you think other educators would need in order to implement this tool/system well? What could be done to make this tool/system better from a teacher and student perspective? How do you think other educators should be using this tool/system? How are educators being recognized for implementing effective and pedagogically sound use of tools (e.g. certifications, micro-credentials, compensation)? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> Are there any regular updates for families, caregivers, and students about the usage and effectiveness of this tool/system? <ul style="list-style-type: none"> How are these updates and changes communicated? Do families, caregivers, and students have the opportunity to consent or opt-out when the policies change? Is this tool/system positively impacting teaching and student learning as it relates to our district's goals and community needs?

Objective	Criteria	Questions to Evaluate the Objective's Criteria
Providing Feedback	<p>Investigate how the use of this tool/system is going in your context: identify strengths and challenges.</p> <p>Share strengths and challenges with researchers and developers to facilitate addressing any issues and building on strengths.</p>	<p>For Decision Makers and District Leaders:</p> <ul style="list-style-type: none"> • What is the procedure for users to submit feedback related to the adoption of emerging technology? • When feedback is received, how are you managing the collection of feedback? • At what point in post-adoption is feedback shared with the researchers or developers, and also with educators and families? <p>For Researchers/Developers:</p> <ul style="list-style-type: none"> • What information from our implementation and use of this tool/system in our context would be beneficial to you for researcher or development purposes? • How is our district, school, and/or classroom using this tool? <p>For Educators:</p> <ul style="list-style-type: none"> • What are your favorite aspects of this tool/system? • How is this supporting your most marginalized students? <ul style="list-style-type: none"> ○ Who is this tool doing a good job of supporting? ○ Who is not getting the support they need with this tool? • In what areas is the tool/system lacking? • What are the success stories? • Why are those people/classrooms successful, and can this be replicated? • What feedback mechanisms exist in your classroom for learners and families to share their experiences accessing the tool? <p>For Families, Caregivers, and Students:</p> <ul style="list-style-type: none"> • Will families, caregivers, and students be asked for feedback on the tool/system? How will family, caregiver, and student feedback be incorporated? • How will families, caregivers, and students be trained to use this tool? • If applicable: what are some success stories of family, caregiver, and student feedback that are being incorporated into your tool?

Guidelines to Consider and Resources

Initial Evaluation: Guidelines to Consider		Adoption/Post Adoption: Guidelines to Consider	
<p>Consider the parent, family, teacher, or student groups whose opinions about this tool/system should be consulted.</p> <p>Consider the training or professional learning that is offered by the developers to determine if the tool/system fits the needs of your context.</p> <p>Consider the specific places where it might be beneficial to pilot this tool/system within your school and district.</p> <p>Consider the educators in your context and discuss with them how well this tool/system might align with their standards, practices, and needs.</p> <p>Consider if other districts, states, and schools have adopted this tool/system.</p>		<p>Consider how other districts and schools supported the implementation of this tool/system.</p> <p>Consider the goals, previous decisions, and overarching policies around data privacy/safety of the school board and other oversight group(s) for your context.</p> <p>Consider if classrooms, grade bands, or parts of the district are having success with this tool/system.</p> <p>Consider if classrooms, grade bands, or parts of the district are struggling with the tool/system.</p> <p>Consider the specific details of any changes or updates to the tool/system.</p> <p>Consider who within the school and district would benefit from having access to this data collected by or inferences this tool/system makes.</p>	
Equity Resources	Research-based Resources	Privacy Resources	Teaching with Emerging Technologies Resources
Conducting a Needs Assessment AI in Education Toolkit for Racial Equity School Procurement Guide: The Edtech Equity Project Equity and Accessibility Considerations for Digital Learning Using Research in Edtech Research Map Teachers Partnering with Artificial Intelligence: Augmentation and Automation	Research-Based Learning An Overlooked Indicator for Edtech Quality: The Use of Learning Sciences Research Be Transparent: Share the Research Behind Edtech Learner Variability Certified Products Research-Based Certified Products - Product Certifications EdSurge Product Index Designing Edtech that Matters for Learning: Research-based Design Product Certifications	Blueprint for an AI Bill of Rights - The White House Privacy.a4l.org Safe Use of Technology and Digital Data Family Educational Rights and Privacy Act (FERPA) Protection of Pupil Rights Amendment (PPRA) Children's Internet Protection Act (CIPA) Children's Online Privacy Protection Act (COPPA) State Report Card for Student Privacy	Professional Learning - Office of Educational Technology Teaching with Digital Learning Tools Artificial Intelligence 101: Covering the Basics for Educators Glossary of Artificial Intelligence Terms for Educators I'm a Teacher. Will Artificial Intelligence Help Me? How Can AI Systems Support Teachers: 5 Big Ideas Integrating Micro-credentials into Professional Learning