Integrating technology in the classroom – Project analysis – COMPLETE REPORT

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Executive Summary

This two-year professional development initiative at a K-5 school aimed to support teachers in integrating newly acquired classroom technology. A technology mentor was hired to guide teachers in adapting their instructional pedagogy through a focus on technology. The project goals were rooted in Mouza's six principles for effective professional development, emphasizing teacher skill-building, creating a collaborative community of practice, aligning with curriculum goals, fostering active learning, providing sustained support, and encouraging reflective practice. The mentor played a critical role in overcoming technical challenges and establishing resources at the institution.

Goals of the Initiative: The primary goals of the initiative were to:

1. Equip teachers with the skills to integrate technology into their instruction effectively.
2. Establish a collaborative, sustainable community of practice.
3. Offer tailored professional development in alignment with curriculum goals.
4. Enable active learning environment that included co-development, and peer coaching.
5. Provide support throughout the program.
6. Promote reflection of individual teaching practice and to encourage educators to evaluate and adapt their use of technology.

Key Highlights: The initiative demonstrated several strengths:

- **Mentorship and Professional Growth**: The program offered both collaborative and individualized mentorship, fostering a supportive environment that encouraged growth and shared learning. This approach helped teachers build their confidence in using new technology tools and enabled the development of their individual skills with incorporating technology in their lesson plans.
- **Enhanced Technology Understanding**: Teachers reported a better understanding of existing or new technology and how to integrate it into their teaching practice effectively. This affirmed or increased their belief in technology's potential to support student learning. This was supported by observational data of improved student engagement and student learning.
- **Positive Shifts in Teacher Beliefs**: Through the program, teachers expressed a greater belief in their ability to adopt and adapt technology, which will contribute to a more innovative, tech-savvy educational environment.

Gaps Identified: Despite these successes, several gaps were identified:

- **Time Constraints for Collaboration**: The survey revealed that 80% of teachers felt they lacked time to share technology-integrated lessons. This conflicts with the program's goal of collaborative digital lesson sharing. This gap between intended and actual collaboration was reinforced by time limitations that impacted participation in discussions and lesson planning.
- **Visibility of Technology Leaders**: Although technology leaders were appointed to sustain the community of practice, survey and interview responses focused only on the role of the mentor, suggesting limited visibility and perceived impact of these leaders on day-to-day practices.
- **Development of Course Materials**: It was unclear whether course materials were to be developed during professional development sessions or in the teachers own time which may

have led to teachers' survey feedback about lack of time. This could impact consistency in planning and lesson implementation.

- **Administrative Support and Vision**: Data from interviews was very minimal about explicit communication from administration to align teachers' understanding of the program's vision with its implementation.

Recommendations: To enhance the program's effectiveness, several recommendations are suggested:

1. **Maintaining Collaborative Mentorship**: Hiring of more than one mentor for a longer period would aid in continued offering of collaborative and individualized mentorship, a core strength that supports teacher confidence and competency in technology integration.
2. **Allocate Dedicated Time for Collaboration**: To bridge the gap between planned and actual collaboration, designating time within training sessions specifically for sharing and discussing technology-integrated lesson plans will foster meaningful engagement and support a cohesive approach to lesson planning.
3. **Enhance Technology Leaders' Visibility**: Increasing the visibility and support for technology leaders, will ensure they have an active role in mentoring their peers. Additionally, reinforcing the program's vision through regular, clear administrative communication will align all participants with program goals.
4. **Collect Additional Data on Implementation**: Gathering further data on the following key areas will ensure better alignment of teachers' needs and optimize the collaborative practice environment.
    1. Whether teachers develop course materials during training or in their own time,
    2. Time taken for each teacher in developing a lesson module for their class, based on their current technology skill level
    3. The extent of technology integration by individual teachers, and the opportunities for collaboration among teachers who teach similar content.
    4. The contribution of technology leaders in each individual teachers' pilot and implementation initiatives.

In conclusion, by addressing the identified gaps and reinforcing its strengths, the program can further promote effective, technology integration and foster a sustainable dynamic community of practice among their teachers.

1. Background and Context

This project involved a two-year professional development initiative at a K-5 school, which was motivated by the school acquiring new technology in their classrooms.
To support the initiative a technology mentor was hired to support teachers in integrating new technology into their classroom instruction. The project goals were based on Mouza's six principles for effective professional development outlined below in the context of this program.

Project Goals based on Mouza's principles

1. Provide teachers with the skills and knowledge needed to integrate technology in their instruction
2. Create a collaborative community of practice to sustain the use of technology over time
3. Situate activities based on teacher needs and aligned with their curriculum goals
4. Provide opportunities for active learning
5. Provide professional development over an extended duration of time with support.
6. Create opportunities for a reflective practice.

The mentor began by addressing technical barriers, establishing reliable access to resources, and ensuring that systems for technical support were setup. Over the first year, teachers received training to build basic technical skills, with a focus on active learning through modeling, co-development, and peer coaching.
The mentor also reinforced teachers' instructional beliefs and supported lesson integration.
In the second year, the mentor helped form teacher-led communities of practice by selecting technology leaders from grades 3-5. These leaders were planned to facilitate peer coaching, collaboration and classroom observations, in view of enabling teachers to sustain the integration of technology and improve their instructional practices through shared experiences.

1. Participant description

The 20 teachers involved in this project had little experience or professional development in using technology as part of their instruction. They had a wide range of teaching experience, ranging from 3 to 30 years.
Five teachers taught at grade level 1, three teachers taught grade 2, five teachers taught grade 3, four teachers taught grade 4 and the remaining three teachers taught grade 5.
Their mentor was a public-school teacher with experience in training teachers to use technology for instruction.
Below is the description of the three primary instruments used to collect the data.

2. Data collection instrument description

The feedback related to the project's goals, vision, setup and implementation were obtained using a mixed methods approach including both quantitative and qualitative data collection methods. Below is the description of each data collection instrument used.

a. Survey instrument

The survey was used to examine the teacher's perceptions of common barriers in integrating technology and was based heavily on Clark's (2006) Delphi study. The original study had 58 teachers and other stakeholders identifying 32 key practices and issues associated with effective integration of technology in K-12 education. A standard five-point Likert-type scale ranging from strongly agree (4) to strongly disagree (0) was used in this project.

b. Interview instrument

The interview instrument was used to assess the teachers experience over the past two years of professional development. The interview protocol included five brief questions around this topic.

c. Observations instrument

Teacher observations were conducted by videotaping the delivery of lessons including technology. A 20-item observation protocol as identified by Mouza (2006) was used to assess the use of technology, student and teacher related behaviors. The items were scored on a 5-point Likert type scale, from strongly agree (4) to strongly disagree (0). A total of 8 teachers took part in the observation, among which six were videotaped two or more times. The lessons ranged between 10-60 minutes with students primarily using wireless laptop computers.

3. Data Analysis and reflections - A microscopic view

Presented in tables 1 through 4 is a microscopic analysis of data obtained from each of the data collection instruments.

a. Survey data analysis

Table 1A: Survey Data Items and Descriptive Statistics

Item	**Frequency**		**Mean**	**Median**	**Mode**	**Skewness**	***Std dev***
Access	Score	Freq					
1. I received help fixing technology problems in a timely manner.	4	9	3.35	3.00	4.00	-0.55	0.671
	3	9					
	2	2					
	1	0					
2. The technology available was, for the most part, reliable.	4	5	2.75	3.00	3.00	-0.59	1.07
	3	9					
	2	2					
	1	4					
3. The technology available was, for the most part, useful for teaching.	4	11	3.50	4.00	4.00	-0.78	0.61
	3	8					
	2	1					
	1	0					
	Frequency		**Mean**	**Median**	**Mode**	**Skewness**	***Std dev***
Vision							
4. The demands/goals placed on me for using technology were reasonable.	4	4	3.00	3.00	3.00	**-1.40**	0.79
	3	14					
	2	0					
	1	2					
5. There was strong administrative backing for using technology.	4	11	3.35	4.00	4.00	**-1.67**	0.93
	3	7					

	2	0					
	1	2					
6. I was expected to use technology to support content objectives.	4	8	3.40	3.00	3.00	0.44	0.5
	3	12					
	2	0					
	1	0					
	Frequency		**Mean**	**Median**	**Mode**	**Skewness**	***Std dev***
Time							
7. I was given time to learn to integrate technology into my lessons.	4	1	1.85	2.00	1.00	0.08	1.14
	3	6					
	2	4					
	1	7					
8. I had enough time to plan and prepare lessons that use technology.	4	0	1.50	1.50	1.00	0	0.95
	3	3					
	2	7					
	1	7					
9. Integrating technology took less time than I thought it would.	4	1	2.20	2.00	2.00	-0.43	0.89
	3	6					
	2	10					
	1	2					
	Frequency		**Mean**	**Median**	**Mode**	**Skewness**	***Std dev***
Professional Development							
10. I felt adequately trained on the skills needed to use technology.	4	4	2.75	3.00	3.00	-0.61	0.97
	3	10					
	2	3					
	1	3					
11. I had enough opportunity to share technology lessons with other teachers.	4	0	1.75	2.00	1.00	0.50	0.79
	3	3					
	2	7					
	1	9					
12. The training I received could be easily applied in my classroom.	4	2	2.95	3.00	3.00	-0.11	0.51
	3	15					
	2	3					
	1	0					
	Frequency		**Mean**	**Median**	**Mode**	**Skewness**	***Std dev***
Beliefs							
13. I believe using computers with students increases their learning.	4	11	3.5	4.0	4.00	-0.78	0.61
	3	8					
	2	1					
	1	0					
14. It is easy to design learning activities that incorporate computers.	4	6	3.05	3	3.00	-0.72	0.83
	3	10					
	2	3					

	1	1					
15. I believe that technology makes my job as a teacher easier.	4	6	2.80	3.00	2.00	0.03	0.95
	3	5					
	2	8					
	1	1					

Table 1A Reflection

Tabulated in Table 1 are the descriptive statistics of frequency, centers as well as skewness and variation in the responses for the survey data.
Most of the survey responses are symmetrical with skewness between -1 to 1.
The response scale is defined as 0 = Strongly disagree, 1 = Disagree, 2 = Neither, 3 = Agree and 4 = Strongly Agree.

Access

Many of the teachers agree that the technology available has been reliable, useful for teaching and they received timely technical support.

Vision

While many of the teachers agreed that they were expected to use technology to support content objectives the survey responses were particularly left skewed in terms of
a) whether instructors felt the demands placed on them was reasonable and
b) if there was strong administrative backing.
Teachers 13, 11 and 7 disagreed that the demands were reasonable and that they had strong administrative support. These three instructors had 8 and above years of experience teaching in grades 1-3. It would be beneficial to reach out to these teachers to understand their reasoning further.

Time

This theme had a few responses with a zero score.
Two respondents strongly disagreed that they had enough time to integrate technology into their classrooms, three respondents strongly disagreed that they had enough time to prepare lessons using technology and 1 respondent strongly disagreed that it took less time to incorporate technology than they had thought.

Most of the respondents either responded neither or agreed to these survey prompts. Further consideration needs to be given about the amount of time given to teachers for the development of classroom activities between workshops and implementation, considering that most teachers came with little or no prior experience with using technology in the classroom.

Further interviews or follow up feedback is needed from respondents who either strongly disagreed or responded neither.

Professional development

Most of the respondents agreed that they received enough training and could see those training elements applicable in the classroom. But, 45% of the participants didn't think they had enough opportunities to share their technology lessons with other teachers.

Beliefs
55% of the teachers believed that technology aided student learning and 50% of the participant teachers agreed that it was easy designing technology related learning activities.
55% believe technology makes their life easier as a teacher.

Table 1B: Survey Data Items and Overall descriptive statistics by theme vs teachers' years of experience.

		THEMES				
EXPERIENCE		**ACCESS**	**VISION**	**TIME**	**PROF DEVELOP**	**BELIEFS**
0-9 YRS	**Overall mean**	2.86	3.19	2.05	2.57	3.33
	Overall median	3.0	3.0	2.00	3.0	3.0
	Overall mode	3.0	3.0	2.00	3.0	4.0
10 -19 YRS	**Overall mean**	3.29	3.25	1.92	2.5	3.25
	Overall median	4.0	3.5	2.00	3.0	3.00
	Overall mode	4.0	4.0	3.00	3.0	4.00
>20 YRS	**Overall mean**	3.53	3.33	1.47	2.33	2.6
	Overall median	4.0	3.0	1.00	3.0	3.0
	Overall mode	4.0	3.0	1.00	3.0	3.0

Teachers with 10 and more years of experience seemed to agree more about access to technology and associated help.
For most part all of them seemed to agree on

a) the leadership's vision for the use of technology in the classroom,
b) the support of leadership of their efforts,
c) added value in the professional development training and its applicability in the classroom.

Teachers from the varied range of experience also seemed to agree overall on the belief that technology does aid in student learning and eases their life as a teacher.

Teachers with over 20 years of experience who were teaching mostly grades 4 and 5 strongly disagreed on the aspect of time. This was related to NOT having enough time to prepare and incorporate technology in their classroom. This needs further investigation.

b. Observations data analysis

Table 2: Observation Data Items and Descriptive Statistics by Item

Item	Frequency		Median	Mode	Range
1. The objectives for the lesson were clearly stated or obvious from the lesson	4	17	4	4	1
	3	1			
	2	0			
	1	0			
2. The directions / procedures for completing the lesson were clearly stated for the students.	4	16	4	4	2
	3	1			
	2	1			
	1	0			
3. The lesson objectives were assessed in some way by the teacher.	4	18	4	4	0
	3	0			
	2	0			
	1	0			
4. The students were actively engaged for most of the lesson.	4	12	4	4	2
	3	5			
	2	1			
	1	0			
5. The students were on-task for most of the lesson.	4	11	4	4	1
	3	7			
	2	0			
	1	0			
6. The major student activity required them to create a new product that demonstrated their knowledge of a subject or topic.	4	14	4	4	3
	3	3			
	2	0			
	1	1			
7. Students were able to continue with the lesson without repeated intervention by the teacher.	4	5	3	3	3
	3	9			
	2	0			
	1	2			
8. Student activity had focus on higher-order thinking skills (creating, organizing, synthesizing, analyzing).	4	13	4	4	1
	3	5			
	2	0			
	1	0			
9. The teacher handled technology issues in a timely manner.	4	13	4	4	3
	3	1			
	2	3			
	1	1			
10. The teacher handled technology issues in an appropriate manner.	4	12	4	4	3
	3	2			
	2	3			
	1	1			

11. The use of technology helped students meet the objectives in a way that would not be possible without the technology.	4	15	4	4	1
	3	3			
	2	0			
	1	0			
12. Technology skills were taught in the context of a specific subject area or content-related topic.	4	18	4	4	0
	3	0			
	2	0			
	1	0			
13. The technology was used in this lesson for problem solving and/or critical thinking.	4	11	4	4	3
	3	5			
	2	0			
	1	2			
14. The main activity performed by the students required them to create persuasive arguments.	4	3	1	1	3
	3	0			
	2	2			
	1	11			
15. For the most part, the technology worked correctly during this lesson.	4	15	4	4	3
	3	1			
	2	0			
	1	2			
16. The teacher appeared to have planned this lesson well.	4	17	4	4	1
	3	1			
	2	0			
	1	0			
17. The teacher appeared to have the skills needed to use the technology.	4	16	4	4	3
	3	1			
	2	0			
	1	1			
18. The teacher looked comfortable teaching with technology.	4	16	4	4	3
	3	1			
	2	0			
	1	1			
19. The teacher was enthusiastic about using technology in this lesson.	4	15	4	4	3
	3	1			
	2	0			
	1	2			
20. The students appeared to know the basics (start-up, running software, using programs, etc.) of using the laptop computers.	4	15	4	4	1
	3	3			
	2	0			
	1	0			

Table 2 Reflection

The teachers were observed in their classroom towards the end of the second year. The video taped observations were graded on a Likert scale for a 20-question instrument. All teachers received ratings predominantly between 3 – 4 which indicates a positive outcome with applying newly learned technology skills in the classroom.
However, a notable gap was observed across all classes around having students create persuasive arguments, as reflected in Item 14. The observational sample included 11 classes from teachers with 0-9 years of experience, 4 classes from those with 10-19 years of experience, and only 1 class from a teacher with over 20 years of experience.

Moreover, the repetitive nature of many teachers observed suggests that the data may not fully capture the breadth of how professional development impacted teaching practices and the transfer of information to the classroom. To get a comprehensive understanding of the professional development's effectiveness, the survey should investigate variable teaching approaches and diverse classroom experiences.

Table 3: Observation Data Items and Descriptive Statistics by Lesson

Item	Frequency		Median	Mode	Range
Book Reports	4	17	3	4	3
	3	8			
	2	2			
	1	13 (32.5%)			
Energy Hogs -- Online Interactive	4	17	4	4	3
	3	2			
	2	0			
	1	1			
Expository Writing	4	15	4	4	3
	3	2			
	2	2			
	1	1			
Research on Arizona	4	13	4	4	2
	3	6			
	2	1			
	1	0			
EdHeads -- Simple Machines	4	32	4	4	3
	3	6			
	2	0			
	1	2			
Sharks Webquest 1	4	31	4	4	2
	3	6			
	2	3			
	1	0			
Sharks Webquest 2	4	35	4	4	3

	3	2			
	2	2			
	1	1			
US States Research and PPT -- 1	4	32	4	4	3
	3	5			
	2	0			
	1	3			
US States Research and PPT -- 2	4	29	4	4	3
	3	9			
	2	0			
	1	2			
Knowledge Box Software: Volcanos	4	15	4	4	3
	3	4			
	2	0			
	1	1			

Table 3 Reflection

Considering the 20-point item observational study for the lesson on "Book reports" which received a score of 1, reflects that 32.5% of the time the rater disagreed with several items related to the integration of technology.
Specifically,
7. Students were able to continue with the lesson without repeated intervention by the teacher.
9. The teacher handled technology issues in a timely manner.
10. The teacher handled technology issues in an appropriate manner.
13. The technology was used in this lesson for problem solving and/or critical thinking.
14. The main activity performed by the students required them to create persuasive arguments.
15. For the most part, the technology worked correctly during this lesson.
17. The teacher appeared to have the skills needed to use the technology.
18. The teacher looked comfortable teaching with technology.
19. The teacher was enthusiastic about using technology in this lesson.

It is important to note here that not all lesson benefit from technology integration. Its to the advantage of the learner, if the teacher evaluates the course material being delivered and considers alternative method of facilitation that would be more effective.

c. Interview data analysis

Table 4: Interview Data Items and Frequencies

	Theme	Frequency
1	Improved use of technology such as smart boards, streaming videos and interactive resources	3
2	Challenges from technology disrupting class time, such as technology not working, interrupted WIFI, untimely updates etc.	6
3	Increase in time to prepare lessons due to the learning curve in learning new technology.	5
4	Increased comfort level in incorporating technology.	6
5	Belief that technology improves student learning and classroom experience	6
6	Technology needs to be chosen based on the course material	3
7	Incorporating technology takes more time	4
8	Mentorship improves learning and ideas on how to incorporate technology	6

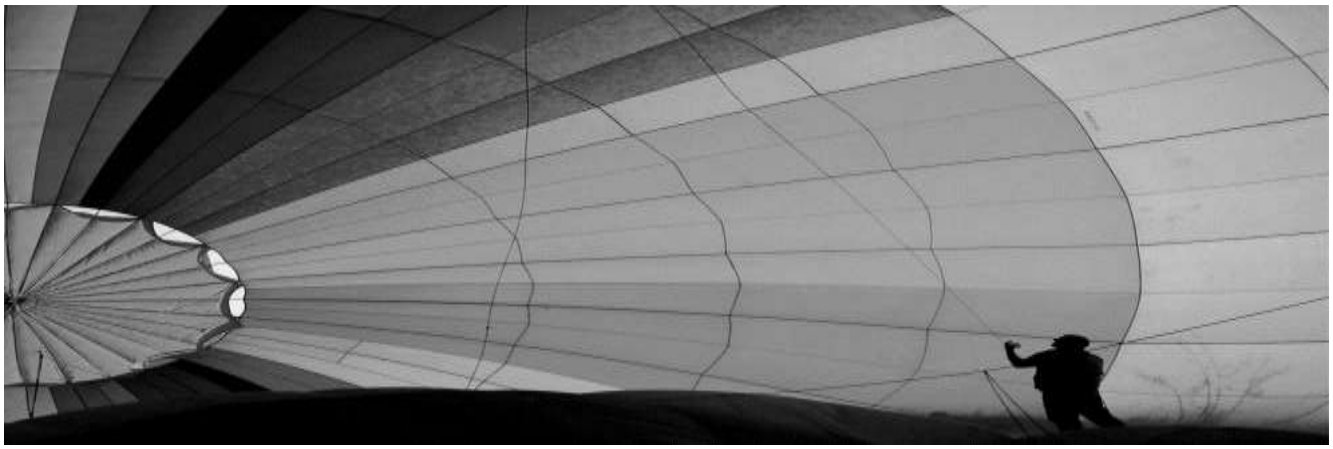
Table 4 Reflection

Of the 20 teachers who participated in the professional development, only 10 took part in the interviews. While 50% is a generally acceptable response rate, the teachers who participated in the interview were eight with 10 or more years of experience, teaching mostly grades 3 and 5, and the remaining two with experience less than 10 years taught grade level 3. This may not represent a broader perspective.

A wider response rate will provide a better understanding of the professional development training if there were a wider response rate.

Additionally, it is unclear from the interviews how administration communicated the vision statement or its impact on the teacher's participation and implementation. Providing this detail will add more insight about the alignment between administration and the teachers.

4. Contextual Analysis – A big picture view



The major findings from the survey, observational and interview data are summarized below by mapping them to the project goals where applicable. The explanation for each finding is provided in the context of the findings from one or more data instruments used.

TABLE 5: Summary of major findings - Data a: Survey; Data b: Observation; Data c: Interview

PROJ GOAL	MAJOR FINDING	DATA			EXPLANATION
		a	b	c	
1	a) Teachers reported a better understanding of available technologies	x	x	x	70% of survey respondents agreed they had adequate training to use technology. All teachers observed had a rating predominantly between 3-4 in their use of technology and its incorporation. Most interviewees reported a better understanding of technology
	b) Teachers believed that using technology supported student learning and supported their teaching	x	x	x	95% of the survey respondents agreed that technology increased student learning. 90% of the classroom observations showed technology used helped students meet their objectives and engaged them in higher order thinking. 60% of the interviewees believed that technology improved student learning.
2	a) Mentorship improved ideas, learning, development of classroom material and its incorporation		x	x	All teachers received ratings predominantly between 3-4 indicating a positive outcome of mentorship in incorporating new ideas. 60% of the interviewees who responded stated that the mentor played a critical role in this aspect.
	b) Not enough time provided to share individual lesson plans	x			80% of the survey respondents were neutral or disagreed that they had an opportunity to share their technology lessons with other teachers.
3	a) Technology use was aligned with content goals	x	x		All survey respondents agreed that use of technology is to support content objectives. In 90% of the observed classrooms these objectives

					were clearly stated implicitly seen from the lesson.
	b) Technology glitches disrupt class time			x	60% of the interviewees highlight that unexpected technology glitches disrupted the flow of the class.
	c) Received timely support or were able to resolve technology issues during preparatory/pilot phase.	x	x		90% of survey respondents received timely support with technology issues. Classroom observations showed that 70% of the time, technology issues were resolved by the teacher in a timely and appropriate manner.
4	a) Challenge with available time to delve into the various resources and explore its extension in the classroom	x		x	55% - 70% of survey respondents disagreed that enough time was available to learn, plan and integrate technology. Almost 50% of interviewees reported that it was a challenge to find time to learn, explore and incorporate new technology in the classroom.
6	a) Change in beliefs encouraging use of technology in the classroom			x	60% of the interviewees reported a positive change in their belief in using technology in the classroom.
	b) Teachers reflect on choosing technology appropriate to content or lesson instead of a one-size fits all approach.		x	x	Peer observations noted that using technology did not support student creation of persuasive arguments in 65% of the classes. This was specifically noted on the lesson, "Book Reports". 3/10 interviewees reported that use of technology a) did not support student learning in more hands-on classes, b) did not teach essential skills such as looking up a dictionary or c) did not help improve their handwritten skills.

5. Highlights and Recommendations

Program Strengths:

The program demonstrated several key strengths, particularly in its approach to mentorship and professional development. It offered collaborative and one-on-one mentorship for all teachers, creating a supportive environment for individual growth and shared learning. (ProgramStrengthMentorship, Table4mentorship).

Additionally, it focused on enhancing teachers' understanding of available technology, equipping them with the knowledge needed to effectively integrate these tools in their teaching.

This initiative reinforced teachers' beliefs in the potential of technology to aid and support student learning. Furthermore, it fostered confidence in teachers' own ability to adapt, learn new skills, and successfully incorporate new technologies into the classroom, contributing to a more resilient and tech-savvy educational environment. (Table5UnderstandingTechnology, Table4ImprovedUseofTech, Table2ComfortLevelwithTech, Table1AdequateTraining,)

Gaps identified:

The survey findings for item #11 revealed that 80% of teachers felt they lacked enough time to share their technology-integrated lessons, which contrasts with the program documentation emphasizing collaborative work and the digital sharing of lesson plans and activities. (Table1APeerShare)

This discrepancy suggests a gap between the planned collaborative practices and teachers' actual experiences. Time constraints, as noted in both survey and interview responses (Table1ALackOfTime) may have restricted teachers from engaging meaningfully in the sharing and discussion of lesson plans, potentially contributing to the low participation rate of 40% in the classroom observational study.

A primary objective of this professional development initiative was to establish a sustainable community of practice. To support this, three teacher leaders—one per grade level—were appointed to mentor their peers. However, the survey and interview responses referenced only the role of the mentors, with no mention of these designated technology leaders. This absence of feedback on the technology leaders' impact indicates a gap in their perceived visibility and influence, which could hinder the long-term effectiveness of sustaining a community of practice.

An important aspect of the professional development program was determining whether teachers developed course materials during the training sessions or if this work occurred in their own time. Additionally, understanding how the administration communicated and reinforced the workshop's vision to teachers is crucial in assessing the alignment between program goals and implementation. Another key question is the extent to which each teacher incorporated technology into their teaching, which could vary significantly depending on individual comfort levels and subject demands. For teachers who taught similar content, it would be beneficial to explore whether they were given opportunities to collaborate during the professional development sessions, as such collaboration could enhance consistency and innovation in lesson delivery across classrooms.

Program recommendations

To strengthen the professional development program, several recommendations emerge based on its strengths and identified gaps.
First, the program should continue to provide collaborative and one-on-one mentorship for all teachers, which has proven valuable in fostering individual growth and confidence in using technology (ProgramStrengthMentorship, Table4mentorship). It is recommended that additional personnel are hired as mentors to support this effort and a parallel training for peer technology leaders be included. Building on this, enhancing teachers' understanding of available technology and reinforcing their belief in its potential to support learning are essential aspects to retain (Table5UnderstandingTechnology, Table4ImprovedUseofTech).
However, adjustments are needed to address time constraints, which prevented 80% of teachers from sharing technology-integrated lessons despite the program's emphasis on collaboration. Allocating dedicated time within training sessions for lesson sharing and discussion could bridge the gap between planned and actual collaborative practices (Table1AdequateTraining).

Additionally, more visible support from the appointed technology leaders, alongside clear regular reinforcement of the program’s vision by the administration, would strengthen teachers’ perceptions of support and enhance the community of practice’s sustainability.

It is also recommended to collect data on whether teachers are developing course materials during training or in their own time, the specific extent of technology integration by each teacher, the time required by each teacher to build their pilot lesson and the extent of participation in collaborative opportunities among teachers working on similar content. Gathering this information will help tailor support to individual teachers' needs, improve alignment with program goals, and ensure that collaborative opportunities are fully optimized.