

Technology Integration Plan: IXL

Thomas J. Bartholomew

Learning Design and Technology, Penn State University

LDT 440: Educational Technology Integration

Dr. Susan Land

June 28, 2022

## 1. Introduction – Purpose

The purpose of this document is to outline what I view as an important technology to integrate to improve the overall quality of student learning across the four core academic subjects: Math, Language Arts, Science, and Social Studies. This blueprint works to outline a specific program that has the potential to work in a variety of teaching and learning settings. It is adaptable to fit the needs of different organizations, unique circumstances, sets of standards, grades, and popular curriculums. For the purposes of keeping the document focused and concise I will narrow the view of my implementation through the perspective of improving Language Arts and Writing instruction with an alignment to 4<sup>th</sup> grade Pennsylvania Standards in my own school context, School A. Furthermore, I will highlight how the implementation of this program can assist students, teachers, and administrators alike throughout the Tier 2 and Tier 3 intervention process. With careful consideration to the affordances and capabilities of a new tool, sound integration procedures, and research-based instructional design ideals, the new technology tool learners will interact with aims to boost the quality of student learning across a specific student population but can be scaled to meet the needs of whatever learning context.

## 2. Teaching/learning environment description

This blueprint is designed to support a range of learners in a range of school contexts. Ideally, the environment would include a primary teacher and/or parental figure guiding the instruction. The teacher/parent provides instruction within a technology-rich learning space such as on a laptop, tablet, or smart phone. The implementation is intended to work best in a blended setting with program interaction happening daily both synchronously in-class and asynchronously out-of-class. Time allotted for self-guided learning will do well within this context as well. This blueprint works to serve as a guide for families looking to provide more opportunities for learning inside the home with technology access but are unsure exactly where to turn or what to do to support their child. In any event, the blueprint is aimed to be flexible, and work in a variety of teaching and learning environments.

The target audience for this blueprint are grades 3-8 students within technology-afforded learning environments. The program implemented provides supports for students across grade levels, sets of standards, academic capabilities, and curriculums. All students can benefit from such implementation. The integration also aims to support 3rd-8<sup>th</sup> grade teachers responsible for

instruction in the core subject areas. Beyond that, the program works to support interventionists in their quest to boost student learning for a struggling student population.

In my context, I average about 25 students in class. Many of my students come from urban settings with many reporting as low-SES. Students are eligible for free and reduced lunches, and a large chunk of them typically score below grade level expectations on benchmarks and state-assessments. Students in my context generally lack strong academic skills, so this implementation is aiming to improve their performance across the board, but I will focus in on Language Arts. Students in this learning environment require a stronger base of language arts instruction with competent teachers to aid in the implementation. With greater exposure and interaction with the program, this learning population would vastly benefit from more specific, intensive reading instruction with a personalized and grade-level aligned learning pathway.

The proposed program runs on the web and access to a reliable laptop would be optimal. A tablet would also work well. A smaller phone screen could work, but it might be less than ideal. The program also sports an app in the Google Play app store. In School A, students are provided 1:1 Chromebook access during school hours. Students grades 3-5 are not permitted to take devices home, but students grades 6-8 are permitted to transport school-provided devices home and back to school daily. Some students in class report having their own personal cell phone and other devices at home. It is within the realm of possibility that students do not have access to mobile technologies at home, which would be a barrier to work around for this implementation. The organization's student information system provides students with their own accounts with student email addresses. Student profiles can integrate into the new proposed program. Along those lines, students can be assigned to teachers' classrooms which opens lots of opportunities for accountability, data-tracking, progress monitoring and other administrative features.

### 3. Teaching/learning problem

This past school year, the school began undertaking a Universal Design for Learning (UDL) implementation initiative. Therein lies excellent opportunities to experiment reimaging classroom instructional processes and procedures. Our school's initiative for experimentation with UDL practice paired with research and background knowledge in educational technologies and instructional design allows to apply my knowledge to contribute to the organization's mission.

The response for UDL implementation stems from a Targeted Support and Intervention plan enacted by the state of Pennsylvania in Fall 2019 due to the existing school's underachievement. PSSA scores linked to this learning population show a clear deficit in on-grade-level English/Language Arts. Released PSSA scores from the 2019 & 2021 assessments show a trend of 3-8<sup>th</sup> graders attending this school generally scoring below expectations in English/Language Arts. See Table 1.

Table 1: School A Language Arts PSSA Performance 2019 & 2021

School Name	Subject	Grade	Year	Number Scored	Percent Advanced	Percent Proficient	Percent Basic	Percent Below Basic
SCHOOL A	English Language Arts	3	2019	84	2.4	39.3	44.0	14.3
			2021	65	0.0	32.3	46.2	21.5
SCHOOL A	English Language Arts	4	2019	83	6.0	38.6	44.6	10.8
			2021	66	4.5	33.3	42.4	19.7
SCHOOL A	English Language Arts	5	2019	77	6.5	28.6	48.1	16.9
			2021	12	0.0	8.3	50.0	41.7
SCHOOL A	English Language Arts	6	2019	81	2.5	38.3	54.3	4.9
			2021	14	7.1	7.1	57.1	28.6
SCHOOL A	English Language Arts	7	2019	69	2.9	30.4	63.8	2.9
			2021	6				
SCHOOL A	English Language Arts	8	2019	72	2.8	33.3	43.1	20.8
			2021	15	0.0	40.0	60.0	0.0

*This table has been adapted from analysis into the [2019 PSSA School Level Data](#) and [2021 PSSA School Level Data](#)*

From this table we can conclude that a substantial portion of the student population grades three through 8 score more in the basic or below basic brackets as opposed to the proficient or advanced designation both before and after the pandemic's impact on student learning. the school serves an underperforming population of students deficient in strong literacy skills, so immediate intervention to support is necessary.

PSSA data from across the state also shows a student population deficient in their Language Arts skills. While a bit more than 50% of students in each grade level score proficient or advanced, roughly 40% still score in basic or below basic categories.

Table 2: PSSA English Language Arts Results

## 2021 PSSA English Language Arts Results

Grade	Total Number	% Below Basic	% Basic	% Proficient	% Advanced	% Proficient and Above
3	90980	14.0	27.7	44.1	14.2	58.3
4	91862	11.9	31.5	35.2	21.4	56.6
5	91028	10.6	34.4	46.4	8.6	55.0
6	90232	7.1	35.6	39.8>	17.5>	57.3
7	90515	3.9	42.8	43.5	9.8	53.3
8	85686	11.4	36.0	41.7	10.9	52.6

Picture taken from Pennsylvania Department of Education Website: [PSSA Results \(pa.gov\)](https://www.pdesas.org/PSSA/Results/PSSA-Results-PA)

#### 4. Selection of technology to integrate


To try and remedy the school population's existing underachievement, I recommend implementation of IXL, a high-quality teaching and learning program with a range of functionality that can boost student learning. From their design principles: "IXL is a personalized learning platform, built on four components that work together to provide an engaging, empowering, and effective personalized learning experience to all students: Comprehensive Curriculum, Real-time Diagnostic, Actionable Analytics, and Personalized Guidance" (Bashkov, Mattison, Hochstein; 2021).

IXL's complete, comprehensive curriculum houses over 8,000 skills aligned to Common Core standards, numerous states' standards, and popular curriculums across the four core subjects as well as Spanish. The images below highlight some of IXL's affordances that could be beneficial to this specific teaching and learning context.

Figure 1: A skill plan alignment to the current curriculum at School A – Wonder 2020

Recommendations
Skill plans
Math
Language arts
Science
Social studies
Spanish
Standards
Awards

View by:
Grades
Topics
Weekly plans
Skill plans



4th grade

## Skill plan for Wonders 2020 - 4th grade

IXL provides skill alignments with recommended IXL skills for each unit. Find the IXL skills that are right for you below!

---

Unit
1
2
3
4
5
6

Print skill plan

1
Unit 1

Weeks 1 and 2: How do people respond to natural disasters?

Vocabulary

1. Multiple-meaning words with pictures

Comprehension

2. Compare and contrast in informational texts
3. Identify the purpose of a text
4. Read about famous places

Phonics and spelling

5. Use spelling patterns to sort long and short vowel words
6. Spell the long a word: silent e, ai, ay

Writing

7. Identify time-order words
8. Identify subordinating conjunctions
9. Sort sensory details

Grammar and mechanics

10. Is the sentence declarative, interrogative, imperative, or exclamatory?
11. Is it a complete sentence or a fragment?
12. Identify the complete subject of a sentence
13. Identify the complete predicate of a sentence
14. Identify the simple subject or predicate of a sentence

Weeks 3 and 4: How do your actions affect others?

Vocabulary

1. Determine the meaning of idioms from context: set 1
2. Homophones with pictures

Comprehension

3. Make predictions about a story
4. Identify story elements
5. Read realistic fiction with illustrations

Phonics and spelling

6. Spell the long e word
7. Spell the long i word: silent e, ie, y

Writing

8. Choose the best concluding sentence

Grammar and mechanics

9. Is the sentence simple or compound?
10. Create compound sentences
11. Identify dependent and independent clauses

Week 5: How can starting a business help others?

Vocabulary

1. Determine the meaning of a word with -ful or -less
2. Determine the meaning of a word with -ly or -ness

Comprehension

3. Use key details to determine the main idea
4. Determine the order of events in informational texts
5. Read about business and technology

Phonics and spelling

6. Spell the long o word: silent e, oa, ow

Writing

7. Add imagery to stories
8. Choose reasons to support an opinion

Grammar and mechanics

9. Is it a complete sentence or a run-on?
10. Is it a complete sentence, a fragment, or a run-on?



Figure 2: Skill alignment to each of the Pennsylvania Core English/Language Arts Standards

Recommendations | Skill plans | Math | **Language arts** | Science | Social studies | Spanish | Standards | Awards

View by: **Grades** | Topics | Weekly plans | **Skill plans**

 **Language arts**

Language:  | 4th:

 [Print skill plan](#)

**1.1 Foundational Skills**

**Phonics and Word Recognition**

**CC.11.4.D** Know and apply grade-level phonics and word analysis skills in decoding words.

**CC.11.4.D.1:** Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology to read accurately unfamiliar multisyllabic words.

**Prefixes**

1. Determine the meaning of a word with pre-, re-, or mis-
2. Use the prefixes pre-, re-, and mis-

**Suffixes**

3. Determine the meaning of a word with -ful or -less
4. Determine the meaning of a word with -ly or -ness
5. Determine the meaning of a word with -able or -ment
6. Determine the meaning of a word with a suffix: review

**Prefixes and suffixes**

7. Determine the meanings of words with prefixes and suffixes: review
8. Sort words with shared prefixes and suffixes by meaning

**Word patterns**

9. Word pattern analogies
10. Word pattern sentences

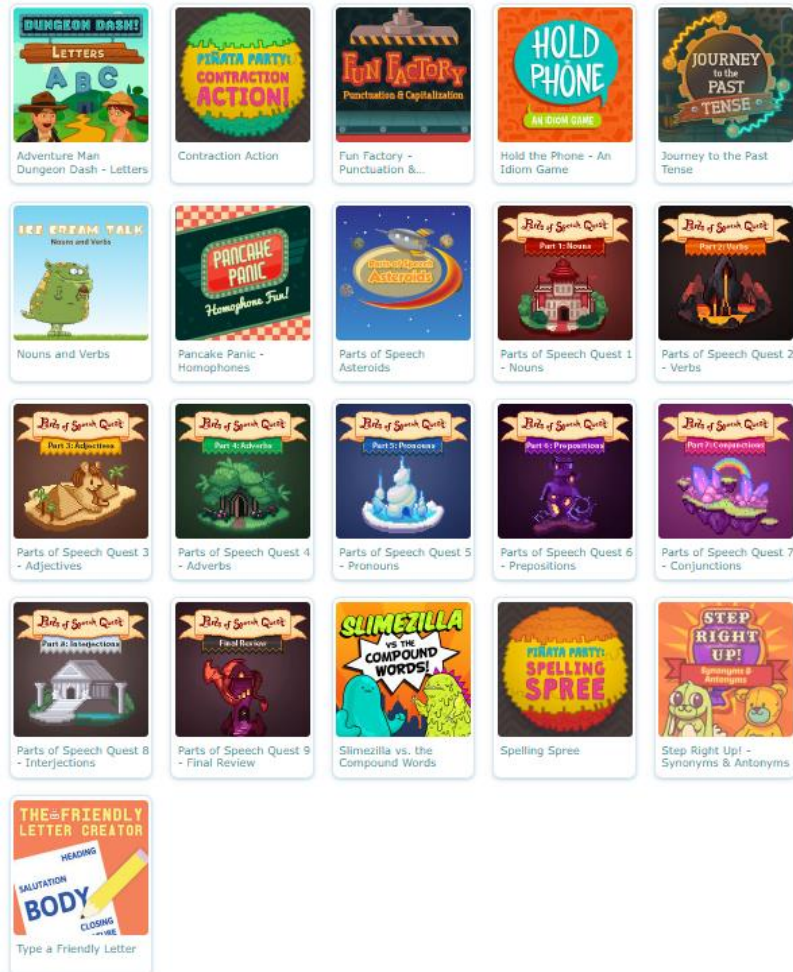
1.4 Writing	
Informative/Explanatory	
CC.14.4.A Write informative/explanatory texts to examine a topic and convey ideas and information clearly.	
Informative/Explanatory Focus	
CC.14.4.B Identify and introduce the topic clearly.	<ol style="list-style-type: none"> <li>1. Determine the main idea of a passage</li> <li>2. Choose the best topic sentence</li> </ol>
Informative/Explanatory Content	
CC.14.4.C Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic; include illustrations and multimedia when useful to aiding comprehension.	<p><b>Text structures</b></p> <ol style="list-style-type: none"> <li>1. Determine the order of events in informational texts</li> <li>2. Compare and contrast in informational texts</li> <li>3. Match causes and effects in informational texts</li> <li>4. Match problems with their solutions</li> </ol> <p><b>Visual elements</b></p> <ol style="list-style-type: none"> <li>5. Read graphic organizers</li> </ol> <p><b>Facts and opinions</b></p> <ol style="list-style-type: none"> <li>6. Distinguish facts from opinions</li> </ol> <p><b>Supporting details</b></p> <ol style="list-style-type: none"> <li>7. Compare information from two texts</li> <li>8. Choose reasons to support an opinion</li> <li>9. Identify supporting details in literary texts</li> <li>10. Identify supporting details in informational texts</li> </ol>
Informative/Explanatory Organization	
CC.14.4.D Group related information in paragraphs and sections, linking ideas within categories of information using words and phrases; provide a concluding statement or section; include formatting when useful to aiding comprehension.	<p><b>Main idea</b></p> <ol style="list-style-type: none"> <li>1. Determine the main idea of a passage</li> </ol> <p><b>Organization</b></p> <ol style="list-style-type: none"> <li>2. Match causes and effects in informational texts</li> <li>3. Order items from most general to most specific</li> <li>4. Organize information by main idea</li> </ol> <p><b>Sequence</b></p> <ol style="list-style-type: none"> <li>5. Determine the order of events in informational texts</li> <li>6. Put the sentences in order</li> </ol> <p><b>Transitions</b></p> <ol style="list-style-type: none"> <li>7. Choose the best transition</li> </ol> <p><b>Conclusion</b></p> <ol style="list-style-type: none"> <li>8. Choose the best concluding sentence</li> </ol>

Pictures taken from IXL Website: [IXL Skill Plan | Pennsylvania Core Standards: Grade 4](#)

Figure 3: Learning Games available through IXL

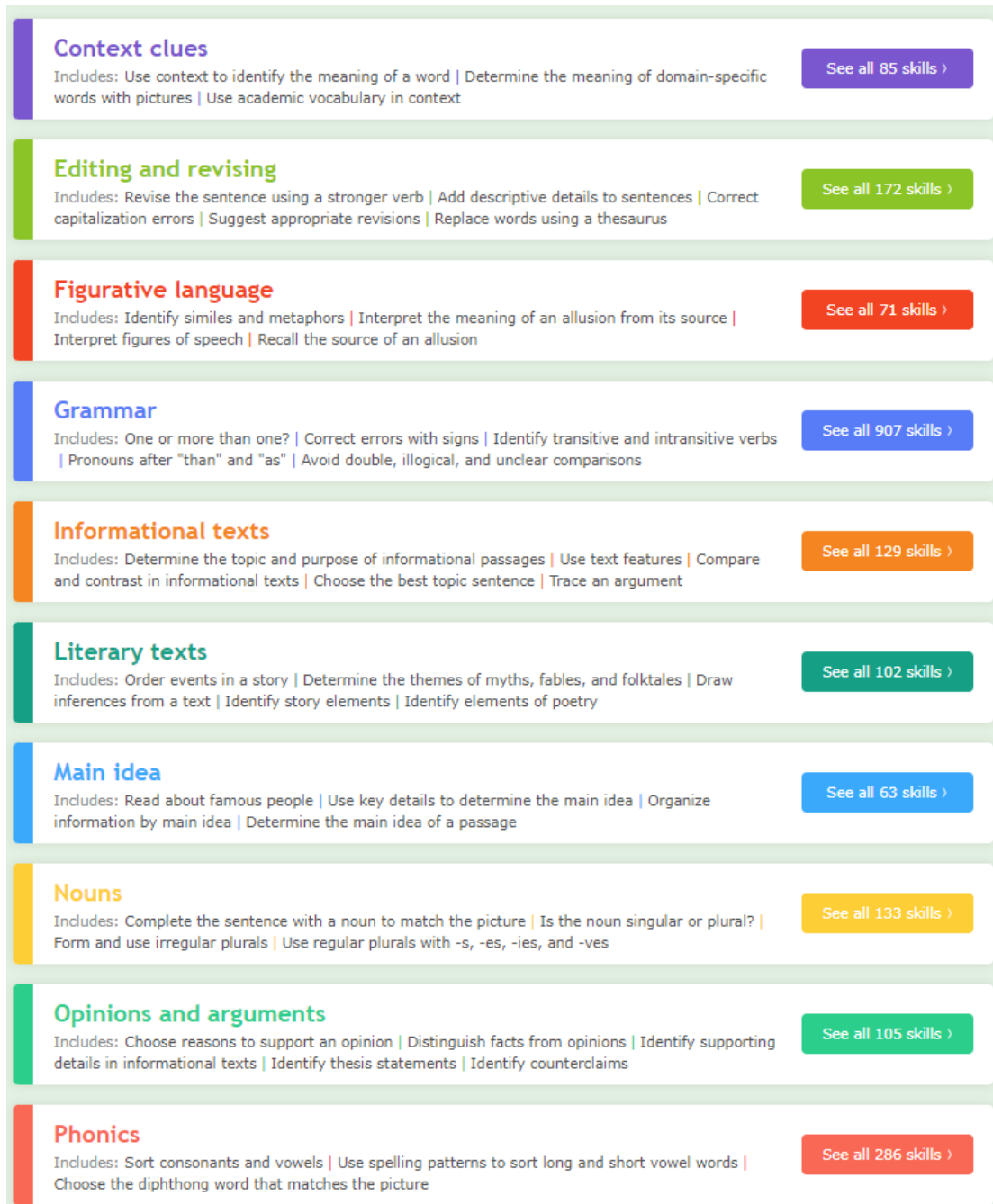
### Fourth grade games

Make learning fun with these educational language arts games!



Picture taken from IXL Website: [IXL | Learn 4th grade language arts](https://www.ixl.com/learn/4th-grade-language-arts)

Figure 4: Range of Language Art Skills with Number of Related Skills



Picture taken from IXL Website: [IXL Language Arts | Topics for pre-K to 12th grade](#)

Real-Time Diagnostics works constantly behind the scenes in real time to provide the most up to the minute analytics on student performance. The designers' decision to include diagnostic stems from extensive research on interim assessments and their effectiveness in promoting learning.

Item response theory also helps pinpoint where students are struggling, what they know, and what they are ready to move on to.

Personalized guidance uses insights from student work in the curriculum along with the ongoing diagnostic to help personalize the learning experience for each student. The program generates recommendations for what the students should move on to. IXL emphasizes “Microskills” that help break down concepts into smaller components. The Real-Time Diagnostic can pinpoint precise areas where knowledge breakdown may occur.

The program’s actionable analytics feature allows for data driven instruction at every level. Analytics provided by IXL give teachers actionable next steps to impact student learning. The affordances of curriculum, ongoing diagnostic assessments, personalized guidance, and actionable analytics will be of the utmost importance to help boost student learning.

Analytics from IXL helps teachers examine student learning activities and progress. Regular feedback from IXL helps teachers be more in-tune with student successes and shortcomings. One of IXL’s primary features is to provide teachers with all the information necessary to make sure students are progressing against their grade-level expectations. The insights from IXL give teachers a clue into a student’s Zone of Proximal Development, a Vygotskyian theory. Assuming that each student has their own unique Zone of Proximal Development relating to different skills, students need appropriate, personalized, and differentiated assistance to help them achieve their learning goals (Bashkov et al, 2021).

According to “The SAGE Encyclopedia of Educational Technology,” “...both policy makers and teachers need to develop an eclectic paradigm that not only integrates new pedagogies with emerging technologies in educational settings but also adopts a visionary approach to doing so to develop those settings into adaptive, authentic, and interactive environments.” This quote calls for a more forward-thinking approach to integrating emerging educational technologies.

Adapting a visionary mindset to enhance learning with technology only serves to benefit the users.

By promoting agency and choice, students are responsible for their learning with plenty of opportunities to engage. The onus of responsibility lands on the learner’s plate. In guiding students to seize control over their learning by making choices to help them achieve learning

goals, students are engaged in a form of Self-Directed Learning (Garrison, 2003). Garrison highlights that “the foundation of the interest and movement in SDL was a focus on the freedom and responsibility of the individual learner to construct their own learning experiences. It was also a rejection of an excessively teacher-centered traditional educational experience.” (pg. 162). Garrison goes on to mention that “the concept of an educated person as one who has learned how to learn” (pg. 162). Another goal of this integration is to push students towards autonomous learning, and self-regulation. Students are encouraged and provided opportunities to self-advocate and act in their own best interest. Students can interact with IXL practice problems and checks to monitor their own learning. IXL will be instrumental in teaching students how to learn on their own. Rather than waiting for teacher feedback and building misconceptions, the immediate feedback slyly keeps students motivated and engage. Students do not want to feel like they do not know what they are supposed to be able to do, and if they are consistently answering questions incorrectly, they’re likely to seek help to clarify misconceptions or scale back the instruction with one of IXL’s suggested foundational skills to help clarify. Technology that provides students with immediate, instantaneous, and corrective feedback leads students to self-reflect and self-assess their own progress. Feedback from technology provides guidance at a rate much faster than teachers are able to provide by grading papers.

## 5. RIPPLES Matrix:

### A. Resources:

IXL sports a variety of different payment packages scaling from family-usage all the way to district-level implementation. More robust packages require a quote put together by the IXL sales team. When looking at the family plan it is \$159 for one year for all the core subjects a combo package of \$129 per year is available for only math and language arts and a single subject package also exists for \$79 per year these costs are just for one child so increasing the number of children scales up the cost. a one-year classroom license for up to 25 students across the core four subjects’ costs roughly \$600. based on these prices I would assume a district license would cost at least over \$1000 at the minimum. The school has different revenue streams and money pipelines, so it is important to know how to budget for the cost of implementing the new

program. Both where the money is coming from, and how the cost fits in with the other expenses.

#### B. Infrastructure:

The current systems and processes in place would allow for integration with the pre-existing hardware in the school. However, the laptops are aged and warm period Internet access is mostly reliable in the school and some students report having access to the Internet outside of school. In my opinion and upgrade to both hardware and software would make integration easier but could be doable with the current circumstances.

#### C. People

with the IXL implementation initiative there are many stakeholders at play first our chief school director and directors of curriculum and instruction Will need to be in constant communication with the excel team. These school leaders will handle much of the communication with IXL, and then ultimately the school staff. IT departments would handle the student information systems integration. Speakers would manage the integration and oversee students working with the program and managing classroom expectations processes and procedures for using excel. IXL is also a program that can be accessed at home. parent support for the program could lead to use at home as well.

#### D. Policies:

A lot of the policies will revolve around the hardware and whether students will be permitted to take devices home currently students grades K through five do not transport laptops to and from school also I'm sure there will be new policies for how to implement excel and usage expectations in my assumption student data collected from excel will be analyzed in some form or capacity by both teachers and administrators. this data can also be used to share with parents during conferences or as an important data piece to discuss student growth.

#### E. Learning:

“Learning, refers to the need for technology to enhance the educational goals.” (Surry, Ensminger, Haab). The program's aim is to increase student learning performance generally students perform below grade level expectations. The programs features are innovative and

progressive. In my observations IXL's learning features align solidly with instructional design principles and even universal design for learning guidelines.

#### F. Evaluation:

Ongoing assessment and scrutiny of the program will help in the evaluation process. we won't be able to know about IXL's full impact until its full implementation in a given school year however I can make some guesses I predict teachers and administrators will use data collected from IXL to gauge its effectiveness in student learning outcomes other learning programs will still be used but I excel should jump to the front of the line as the primary teaching and learning resource the way I see it used is a supplement or alternative to our current curriculum teachers will need to get students familiar with the program and try to gauge student feedback not until we establish a baseline will we be able to tell if the technologies integration and return on investment is worthwhile All in all I excel impact in the classroom and toward school culture will be closely monitored.

#### G. Support:

reporting the IXL implementation will require efforts from across the board as a staff we need to receive training from an IXL representative to bring everybody onto the same page I can hope for a lot of support implementing IXL however I predict a lot will land on teacher shoulders the teachers will be the ones on the front lines working with students and the program together at the same time so the teachers will need to be well versed themselves in order to support students familiarity were billed the more teachers use and implement the program IT support will be relied upon heavily for hardware and software complications lastly administration will need to work to oversee and support teachers and students with the new learning program.

#### Conclusion:

Technology advancement will inevitably continue to reinvent learning to by introducing new pedagogies to improve instruction and align learning with 21<sup>st</sup> century skills and modern trends



in society. By implementing a mobile technology program that works across so many learning contexts, educators can more effectively impact student growth. IXL removes the guessing from what teachers need to teach, and learners need to learn. It is my forthright opinion that careful implementation of IXL has the potential to positively impact student learning growth and outcomes. IXL's affordances provide new, unique opportunities to teachers and learners to reimagine learning in efficient ways unforeseen before the technology integration.

## References:

- Altinay, Z., & Altinay, F. (n.d.). *Technology, Pedagogy, and the Learning Society* (J. M. Spector, Ed.) [Review of *Technology, Pedagogy, and the Learning Society*]. The SAGE Encyclopedia of Educational Technology; SAGE Publications. Retrieved June 22, 2022, from <https://sk-sagepub-com.ezaccess.libraries.psu.edu/reference/download/the-sage-encyclopedia-of-educational-technology/i9686.pdf>
- Atwell, G., & Hughes, J. (2010). Pedagogic approaches to using technology for learning; literature review. Life Long Learning UK. Retrieved from <http://webarchive.nationalarchives.gov.uk/20110414152025/http://www.lluk.org/wp-content/uploads/2011/01/Pedagogical-approaches-for-using-technology-literaturereview-january-11-FINAL.pdf>
- Bashkov, B., Mattison, K., & Hochstein, L. (2021, March). *IXL Design Principles Core Features Grounded in Learning Science Research*. IXL. [https://www.ixl.com/research/IXL\\_Design\\_Principles.pdf](https://www.ixl.com/research/IXL_Design_Principles.pdf)
- CAST (2018). Universal Design for Learning Guidelines version 2.2. Retrieved from <http://udlguidelines.cast.org>
- Garrison, D. R. (2003). Self-Directed Learning and Distance Education. In M. G. Moore, & W. Anderson (Eds.), *Handbook of Distance Education* (pp. 161-168). Mahwah, New Jersey: Lawrence Erlbaum.
- Horton, W. K. (2012). *E-learning by design* (2nd edition). Pfeiffer. ISBN: 978-0470900024
- Moore, Michael, and William C. Diehl. *Handbook of Distance Education*, 4th ed. New York. Routledge. 2019
- Spector, J. Michael. (2015). *Foundations of Educational Technology : Integrative Approaches and Interdisciplinary Perspectives*, Taylor & Francis Group, ProQuest Ebook Central, <https://ebookcentral.proquest.com/lib/pensu/detail.action?docID=3569617>.

Surry, D.W., Ensminger, D.C. and Haab, M. (2005), *A model for integrating instructional technology into higher education*. *British Journal of Educational Technology*, 36: 327-329. <https://doi-org.ezaccess.libraries.psu.edu/10.1111/j.1467-8535.2005.00461.x>