Module: Introduction

Teaching Early Literacy with the Learning Toolkit+

Welcome to the CSLP's Teaching Early Literacy with the Learning Toolkit+. As you move through these modules, you will familiarize yourself with each broad literacy skill and its corresponding sub-skills, gain a deeper understanding of various teaching approaches and practical tips, and explore how the CSLP's Learning Toolkit+ also known as LTK+ supports the development of these literacy skills.

These modules can be used in a variety of settings; from asynchronous and fully online to synchronous, blended and in-person workshops. Each of the modules has a similar structure, outlined in a table of contents. All of the modules focus on explanations, practice, and interactive content to insure understanding and engagement. We hope these modules provide you with new knowledge, useful suggestions on how to integrate the various literacy tools into your teaching, and helps you develop your expertise in early literacy instruction.

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These modules can be used in a variety of settings; from asynchronous and fully online (see *Appendix A* for tips for online learning) to synchronous, blended and in-person workshops. Each of the modules has a similar structure, outlined in a table of contents. All of the modules focus on explanations, practice, and interactive content to ensure understanding and engagement. We hope these modules provide you with new knowledge, useful suggestions on how to integrate the various literacy tools into your teaching, and helps you develop your expertise in early literacy instruction.

Modules' Objectives

These learning modules will help you understand early literacy skills, and make the most of the LTK+, so that you may enhance your own teaching. At the end of these modules, you will be able to:

- Classify the different early literacy skills linked to children's reading achievement.
- Foster learner's self-regulated learning (SRL) skills, and incorporate such skills into your own practice to enhance your personal endeavors.
- Construct activities that utilize different teaching strategies, such as cooperative learning (CL).
- Incorporate the LTK+ into your lesson plans to support the development of early literacy and devise any needed interventions.
- Integrate ICT into your teaching practice.
- Use the CSLP's resources, or design your own that support the development of your learners' early literacy skills.

About these Courses

Introductory Video

In the online version of this module, there is a video that describes how the learning modules target core literacy skills. The transcript is provided in the PDF version of the module.

Welcome to the CSLP's *Teaching Early Literacy* with *the Learning Toolkit*+. As you move through these modules, you will familiarize yourself with each broad literacy skill and its corresponding sub-skills, gain a deeper understanding of various teaching

approaches and practical tips, and explore how the CSLP's Learning Toolkit+ also known as LTK+ supports the development of these literacy skills.

These modules can be used in a variety of settings; from asynchronous and fully online to synchronous, blended and in-person workshops. Furthermore, they were designed with a global audience in mind as ABRACADABRA, READS, and ePEARL are being used in a variety of countries around the world. As a result, they have been designed to promote successful practices for teachers who may face various challenges given their particular local and cultural contexts.

Each of the modules has a similar structure, outlined in a table of contents. All of the modules focus on explanations, practice, and interactive content to insure understanding and engagement. You will have opportunities to watch videos that help explain key concepts and provide examples. There are also several knowledge check activities. They are not scored as the intention is to provide an opportunity to review your understanding of some literacy skills and provide examples you can use in your class.

The modules are designed to be self-paced. When you are ready to move on, press the next button visible on the right-side of the screen. You can select the previous button to go back a slide, or click on the table of contents button to jump directly to the section that interests you the most. At every slide there is an audio button that will read the text on screen.

These modules also demonstrate how teachers can use the literacy tools within the LTK+. This software was developed by the Centre for the Study of Learning and Performance, known as the CSLP, which is a research centre based at Concordia University in Montreal, Canada.

To access the tools, sign in to your LTK+ account. From the lobby page, you will see ABRACADABRA, an early literacy tool; READS, a repository of digital books; and ePEARL, an electronic portfolio. The LTK+ lobby also provides links to teacher resources and, in the case of ABRA, teacher assessment reports.

We hope these modules provide you with new knowledge, useful suggestions on how to integrate the various literacy tools into your teaching, and helps you develop your expertise in early literacy instruction.

Individual Work vs. Group Work

There are different benefits to using these learning modules individually verses in a group setting. When working individually, you can set your own pace and focus on the content for the skills you're most eager to develop. If you choose to go through these learning modules with others, you can deepen your learning through advice,

discussions, and developing projects that incorporate many perspectives. Combining your own experiences with those of your colleagues' will enrich the activities and lesson plans you'll be asked to design throughout these modules.

You can still ask for feedback from your colleagues if you have decided to work through these modules individually. Perhaps the other teachers at your school would be interested in developing their own skills in using technology to teach early literacy. This could be a great opportunity for you to model the best practices you learned.

Learning Module Activities

There are several interactive activities within the learning modules. They are formative activities and thus not scored. They focus on one skill being learned and help identify and fill any gaps in your knowledge. These activities support you in self-regulating your learning so you can make informed decisions about when to dive deeper and when to move on to the next module. They may also provide examples of activities you can bring to your classroom.

There are also several suggested activities that ask you to apply what you've learnt to your own classroom and learners. These could be lessons, projects, or creative work.

Activity: Test your Prior Knowledge

Here is a sample activity. The questions are presented in various formats to reflect the variability you'll find in the learning modules.

Don't worry if you find this activity difficult at first. You will have the chance to explore the topics in-depth in the learning modules.

Once you have completed all modules, consider re-doing this activity so you can compare your before and after training results and see how much you've learnt.

Question 1: True or false?

Children's initial spelling attempts contain consonants and little to no vowels.

a) True
b) False

Question 2: Match
Drag and Match the Following Reading Strategies to their Definition.

Reading Strategy	Definition
Audio Assisted	The older fluent reader provides a model of fluent reading. The child rereads the text until they can read the passage fluently.
Student-Adult or Student-Reading Buddy	Two learners take turns reading passages aloud from the same book. The children provide each other help when needed.
Reader's Theatre	A child initially follows along silently with an audio recording. Then reads aloud with the audio until they can read independently.
Echo Reading	The teacher reads a passage to all learners while modeling speed and expression. Then the children repeat what the teacher just read.
Partner Reading	The learners perform a play based on a book with lots of dialogue in order to build their skills with speed and expression.

Question 3: Multiple Choice
Shyla learned to read in the early primary grades. However, both her third and fourth grade teachers have noted that she has difficulty **understanding** the books they read in class. Which of the following is the most likely cause of this?

a) Shyla likely lacks an adequate vocabulary for grade level texts.
b) Shyla probably doesn't know how to read and is just mimicking what her classmates read aloud.
c) Shyla isn't reading enough books.

Question 4: Fill-in-the-Blank
_____ assessment is carried out while the learner is engaged with the learning process. It is a means to measure the current knowledge of the learner and whether they're meeting lesson objectives.

Question 5: Sorting

The three phases of the SRL process are Plan, Do, and Reflect. Sort each action into the relevant phase:

- Consider one's enjoyment of the topic and task
- Solicit feedback from others
- Determine one's personal value of the task
- Keep a journal
- Restate the task in own words to ensure understanding
- Follow through with the strategies set to achieve goals
- Reflect on the process and the end result
- Call on prior knowledge
- Self-satisfaction with learning process and end result
- Work on a task
- Self-evaluate and self-observe
- Use a calendar to set deadlines and milestones
- Create strategies to achieve goals, and adjust as needed
- Select an appropriate place to do the work
- Consider the confidence in one's abilities & expected outcome
- Self-Monitor progress
- Create an action plan
- Plan for future work
- Incorporate teacher and peer feedback
- Find links between task and long-term goals
- Select appropriate material needed to do the task

Plan	Do	Reflect

Question 6: Select Many
Ms. Akter is planning to divide her learners into cooperative learning groups to work on a task. She wants the group members to work well together. Which of the following are appropriate actions/considerations for this task?

a) The size of the group must be appropriate for the task.
b) Allow learners to form their own groups.
c) Keep learners in groups that have worked well in the past.
d) Each learner is held individually accountable for their learning and helping their team.
e) Make a list of desired behaviour learners should demonstrate.
f) Explicitly teach learners social skills.
g) Each learner's participation is essential for the group to succeed.

Answer Key

Question 1: True or false?
Children's initial spelling attempts contain consonants and little to no vowels.

a) **True**
Yes! Children will write the more prominent sounds, such as the beginning and ending consonants. In addition, many consonants' names contain the sound of the consonant. As an interesting aside, teachers can use children's early writing attempts to assess their learners' phonemic and print awareness.

b) False
Children will write the more prominent sounds, such as the beginning and ending consonants. They may exclude vowels or write an incorrect vowel sound.
See the *Alphabetics* module to learn more about phonemic awareness.
See the *Writing* module to learn more about print awareness.

Question 2: Match
Drag and Match the Following Reading Strategies to their Definition.

- **Student-Adult or Student-Reading Buddy**: The older fluent reader provides a model of fluent reading. The child rereads the text until they can read the passage fluently.
- **Partner Reading**: Two learners take turns reading passages aloud from the same book. The children provide each other help when needed.
- **Audio Assisted**: A child initially follows along silently with an audio recording. Then reads aloud with the audio until they can read independently.
- **Echo Reading**: The teacher reads a passage to all learners while modeling speed and expression. Then the children repeat what the teacher just read.
- **Reader's Theatre**: The learners perform a play based on a book with lots of dialogue in order to build their skills with speed and expression.

Question 3: Multiple Choice

Shyla learned to read in the early primary grades. However, both her third and fourth grade teachers have noted that she has difficulty **understanding** the books they read in class. Which of the following is the most likely cause of this?

a) **Shyla likely lacks an adequate vocabulary for grade level texts.**
There are many things that could impact Shyla's understanding. Check her vocabulary knowledge. Vocabulary is often learned indirectly through oral language or reading stories. Shyla might not have gotten enough exposure and support to develop a rich vocabulary. Her teacher can help her with explicit vocabulary instruction and comprehension monitoring strategies.

b) Shyla probably doesn't know how to read and is just mimicking what her classmates read aloud.
Shyla can decode unfamiliar words but doesn't know what they mean. Consider that it is possible for you to read these gibberish words but do not understand them: dicnacts, unster, cation. See the *Comprehension* module to learn more about vocabulary skills.

c) Shyla isn't reading enough books.
If Shyla did not read many books in her early years, she may have acquired a smaller vocabulary than her peers. Asking her to read extensively at this stage may cause Shyla frustration if she isn't supported with additional vocabulary help. See the *Comprehension* module to learn more about vocabulary skills.

Question 4: Fill-in-the-Blank

Formative assessment is carried out while the learner is engaged with the learning process. It is a means to measure the current knowledge of the learner and whether they're meeting lesson objectives.

This type of assessment is called formative assessment. It helps teachers identify problems, provide feedback, and adjust their lesson plans. See the *ABRA Assessment* module to learn more.

Question 5: Sorting

The three phases of the SRL process are Plan, Do, and Reflect. Sort each action into the relevant phase:

Plan	Do	Reflect
• Call on prior knowledge • Consider the confidence in one's abilities & expected outcome • Create strategies to achieve goals, and adjust as needed	• Create an action plan • Work on a task • Follow through with the strategies set to achieve goals • Incorporate teacher and peer feedback • Keep a journal	• Plan for future work • Reflect on the process and the end result • Self-evaluate and self-observe • Self-satisfaction with learning process and end result

• Consider one's enjoyment of the topic and task • Find links between task and long-term goals • Determine one's personal value of the task • Restate the task in own words to ensure understanding • Use a calendar to set deadlines and milestones	• Select an appropriate place to do the work • Select appropriate material needed to do the task • Self-Monitor progress	• Solicit feedback from others

See the *ABRA-ePEARL Connection* module to learn how you can help learners develop these skills using the SRL process.

Question 6: Select Many

Ms. Akter is planning to divide her learners into cooperative learning groups to work on a task. She wants the group members to work well together. Which of the following are appropriate actions/considerations for this task?

a) **The size of the group must be appropriate for the task.**
Absolutely. The more members there are in a group, the more complex it is for learners to communicate. Large groups should be reserved for the more complex tasks.

b) Allow learners to form their own groups.
This is OK to do occasionally as it could increase learners' enthusiasm if they're working with friends. However, some learners will feel excluded if not chosen. It also runs the risk of creating imbalanced homogenous groups.

c) Keep learners in groups that have worked well in the past.
Each learner should have a chance to work with every other learner in the class as some point during the school year.

d) **Each learner is held individually accountable for their learning and helping their team.**
That's right! If learners don't feel individually accountable, they might put in less effort working in a group than they would when working alone.

e) **Make a list of desired behaviour learners should demonstrate.**
Yes! This will help teachers evaluate whether learners are engaged in the cooperative learning process. Invite learners to be part of the evaluation process.

f) **Explicitly teach learners social skills.**
That's right! Social skills impact learners' ability to communicate and

interact with others. Learners will find it hard to work with someone that has poor social skills.

g) **Each learner's participation is essential for the group to succeed. Yes! Each learner's contribution should have an impact on their teammates.**

These are all of the essential elements Ms. Akter needs to consider when designing a cooperative learning task. Go to the *Cooperative Learning* module to learn more, including techniques.

What are the Course Notebooks?

Each Module has a *Course Notebook*. These documents contain the *Pause and Think* reflection prompts. In some modules, they also contain space for you to record your answers or notes for the activities. These are also useful to jot down any ideas or questions you have as you move through the learning modules. They are personal documents, so you may fill them out as you see fit. You can determine if you want to keep them as a private place for your work and reflections, or if you want to share with colleagues.

You can print the course notebooks (see *Appendix B* for a compiled course notebook) and fill them out as you move through the modules. ePEARL users may prefer to do this reflection and attach work in their account instead.

Pause and Think

Individual Activity

Here is an example of the reflection questions and course notebook you encounter throughout the learning modules.

Use your course notebook (see *Appendix C*), or sign in to ePEARL, to reflect on the following:

- What influenced you to take this training?
- Describe your own ability or confidence in teaching early literacy and incorporating technology in your classroom.
- Which early literacy skill are you most interested in learning more about? Why?
- How will you evaluate and track your own growth?

Certificates

There are two certificates that you can earn from these modules:

The **Completion** certificate is awarded if you pass the quiz at the end of all the learning modules. This is the only quiz that is scored, and passing it will automatically generate a certificate.

The **Mastery** certificate can be awarded after you've demonstrated your ability to incorporate the skills taught in each of the learning modules. This can be demonstrated through comprehensive lesson plans or filming a portion of your class. Your LTK+ contact can provide details about who you'll need to communicate with if you are interested in attaining this certificate.

Parent Resources

Several of the LTK+ tools have a *Parents Resources* website. These sites contain information about the tool and how it helps foster the skills being taught. They also contain tips and activities parents can do at home to support their child's learning. You can print and send parents a Parent Flyer (see *Appendix D*) to inform them about the LTK+ tools you will use throughout the school year.

- ABRA: https://literacy.concordia.ca/resources/abra/parent/en/index.php
- ELM: https://literacy.concordia.ca/resources/elm/parent/en/
- IS-21: https://literacy.concordia.ca/resources/is21/parent/en/index.php

Our partners at Wilfrid Laurier University have developed several parent modules, titled "Shared Book Reading", "Phonological Awareness", "Alphabet Knowledge", "Vocabulary" and "Children and Technology". These modules aim to inform parents, and support their efforts in fostering the development of early literacy skills at home. Check out their website to learn more.

About the LTK+

What is the LTK+?

The CSLP team has developed the Learning Toolkit (LTK+) a suite of five evidence-based and evidence-proven web-based tools designed to support the development of literacy (**ABRACADABRA** and **READS**), numeracy (**ELM**), inquiry (**IS-21**) and other competencies within an environment that encourages self-regulated learning and student ownership (**ePEARL**). The LTK+ is available without charge to the educational community.

Overview of LTK+ Tools

ABRACADABRA, *A Balanced Reading Approach for Children Always Designed to Achieve Best Results for All*, is a highly interactive, early literacy web-based tool that supports beginning readers through 33 engaging activities linked to 20 digital stories.

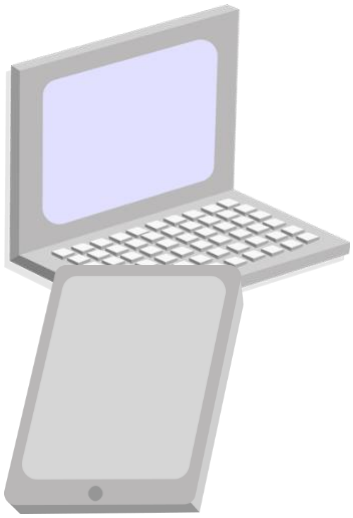
READS, *Repository of Ebooks And Digital Stories*, is a multilingual catalog of digital books. These books can be used to complement the skills being taught in ABRA.

ELM, *Emerging Literacy in Mathematics*, is a digital tool for helping early elementary learners develop their number sense and avoid math anxiety.

IS-21, *Inquiry Strategies for the Information Society of the Twenty-First Century*, was created to help learners develop their information literacy skills by guiding them through the inquiry process.

ePEARL, *Electronic Portfolio Encouraging Active Reflective Learning*, is a portfolio designed to encourage and support learners as they develop their SRL skills. There are three levels of ePEARL in the LTK+; each level is designed to support learners at an appropriate pace and depth for their developmental stage.

System Requirements



The LTK+ is designed to be stored on a server with end-user access via a browser through desktops and tablets, so the minimum screen size is 1024 x 768. Both online and offline installations require an internet browser to access the tools. To see the minimum requirement for browsers and operating systems, please refer to our End User Support page.

Ensure your learners have headphones as they engage with these tools. The activities and stories contain audio files to support learners' progress. This can be disruptive when many learners are working at the same time.

Account Generation

Typically, your LTK+ contact will set up your installation and generate individual accounts for each teacher and learner. They should also link the learner accounts to their teacher's classroom. Prior to using the tools with your learners, ensure all of them have an account.

If you have been given an administrator or sub-administrator account, go to the online version of this module to see a video about creating classes and accounts.

If you do not see the learner you're looking for in the list, ensure that learner is linked to your class. Go to Manage > My Students > Link/Unlink > select your class from the dropdown menu, and then click on the broken link icon (🔗) to assign that learner to the selected class. If the learner is not on the list at all, contact your administrator to generate an account for that learner.

How to Access the Tool

Access the LTK+ by entering its URL in your browser.
Tip: It is a good idea to bookmark this URL for future reference.

Sign in using your personal credentials.
Once signed in, you will be taken to the LTK+ lobby page. If you are not sure what your username or password is, ask your LTK+ contact to help you find this information.

Look for the logo of the tool you want to access. If you do not see the tool you want on your lobby page, your account might not be set to level 1 or 2. To change your level, go to Manage > My Account > My ePEARL Account (follow the troubleshooting instructions below to see how this looks*). If the tool is still not shown on the lobby page, please contact the system administrator as it may be turned off at the administrator level.

Click on the tool's logo to go to the software.

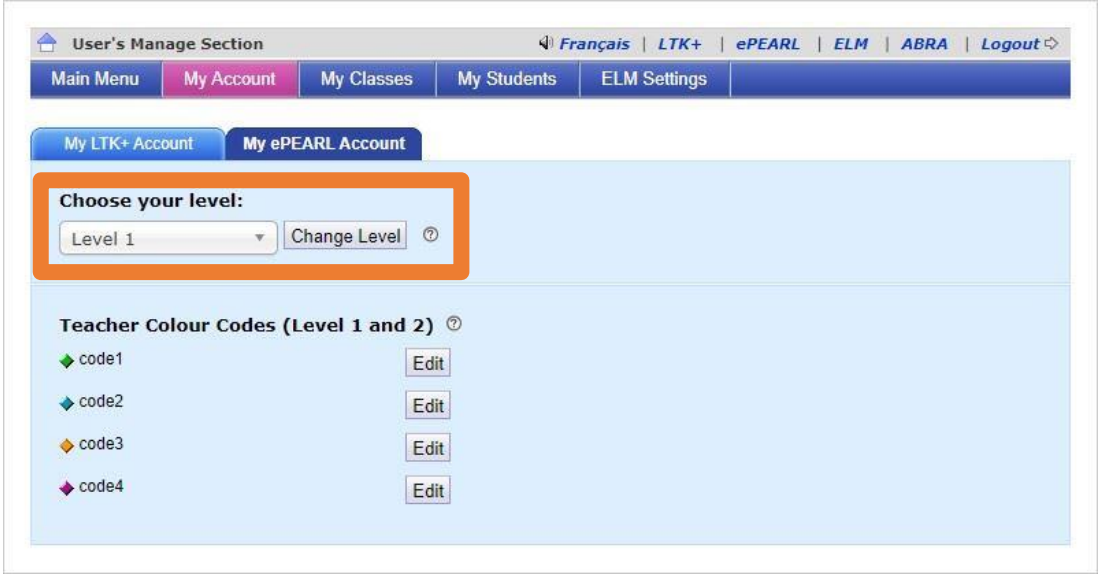
**Troubleshooting for LTK+*
To change your level:

1. Click on **Manage** in the LTK+ Lobby.

2. You should see the following screen. Click on **My Account**.

3. Click on the **My ePEARL Account** tab.

4. Select the desired level from the **Choose your level** dropdown.



Teacher Accounts

The teacher accounts can access all of the learner content but have some additional features. As a teacher, you will be able to view and edit your learner's account information.

On the LTK+ lobby page, teachers will see a *Resources* icon (R). Clicking on this will open the *Teacher Resources* website for the tool. These sites contain a multitude of paper-based and multimedia resources intended to help teachers implement the tools effectively in their classroom.

ABRA and ELM also have an *Assessment* icon, which looks like a cog ( ). This feature provides details about of the learners' progress in the tool.

Teacher accounts also have the ability to view their learners' portfolios and provide feedback.

Because learner accounts are generated automatically, they often long and complicated usernames or passwords. Young children may find it difficult to type them. The teacher accounts have a manage feature that allows them to give learners a nickname and change their password to make the log in process less cumbersome. This 'Quick Tips' document (see *Appendix E*) explains the steps to do this.

A nickname can only be used once for the whole installation. So, if there are two learners named Rose, one could use the nickname “Rose” but the other would have to choose a different nickname, like “Rose2” or include their initials.

Global Reach

The CSLP is invested in making the LTK+ available to a global audience. Over the years, our tools have been used by thousands of learners from countries around the world including: Australia, Canada, China and Hong Kong, Kenya, the United Kingdom and more. The tools will soon be used in Rwanda and Bangladesh. Much of the success of such initiatives was due to the local network of key stakeholders. The efforts of local teams of LTK+ coordinators and ambassadors, with the support of our partners, have trained and supported hundreds of teachers and thousands of boys and girls.

Our partnerships have grown substantially over the years and include an international collection of scholars (Chinese University at Hong Kong, Shanzu Teachers Training College, Thogoto Teachers College, Université du Québec à Montréal, University of British Columbia, University of Nairobi, Wilfrid Laurier University), graduate students, and educational practitioners and policy-makers, the latter including government agencies (Kenya, Rwanda and Bangladesh Ministries of Education and its agencies), international development agencies (Aga Khan Academies, Aga Khan Foundation Canada, Aga Khan Foundation East Africa, World Vision Canada, World Vision Kenya, World Vision Rwanda), and others (Camara Education, I Choose Life, SAIDE), with a particular focus on the uses of technology to improve the teaching and learning of essential educational competencies.

Our vision for the future is to explore the scalability in current locations while sustaining the support of existing initiatives. We also plan to expand the global reach of LTK+ by supporting additional countries’ endeavors to use technology for teaching and learning.

Evidence-Based Practice

The CSLP is dedicated to ensuring the LTK+ tools deliver on the promise that they support early literacy education. In addition to being designed using existing evidence from the field and consultation with subject matter experts, the CSLP has implemented several studies over the years to measure the impact of the tools.

This document (see *Appendix F*) contains a comprehensive list of journal articles, book chapters, conferences, reports and dissertations, and news reports that the CSLP has conducted. It also contains a list of external (third party) evaluation of the effectiveness of using ABRA in early literacy instruction.

Awards

Over the years, various institutions have recognized the merit of the LTK+ and have granted the following awards:

- UNESCO. (2017, Sept.). UNESCO King Sejong Literacy Prize.
- Canadian Network for Innovation in Education (2011). *Award of Merit for Excellence and Innovation in Overall Use of Technology for Learning*
- Association for Educational Communications and Technology Design & Development (2010). *Outstanding Practice Award.*

Who We Are

Contributors

Hosted by **Concordia University** and based in Montreal, Canada, the mission of the **Centre for the Study of Learning and Performance (CSLP)** is to advance scholarship on teaching and learning processes, and to develop new pedagogical tools based on this new knowledge.

Visit our website to learn more.

Any questions may be emailed to info.ltk@concordia.ca.

Team

These learning modules were designed and develop with the support and contributions of the following people:

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Appendices

A: Tips for Online Learning
B: Compiled Course Notebook
C: Introduction Course Notebook
D: Parent Flyer (in English and French)
E: Quick Tips
F: Research Summary

Tips for Online Learning

There are many benefits to working in an online environment, but some people may find it challenging. If you haven't learned in this type of environment before, or you've found it challenging, here are some tips to help you navigate this kind of training.

Communicating Online

- When using social media platforms such as WhatsApp, make sure to check in regularly to the groups and participate in the discussion.
- Only post messages that relate to the course and are not off-topic.
- Only post select photographs or videos from your classroom. Make sure posted material is clear and in focus (try to take close-up shots). Make sure to caption the posting with the class name and activity.
- Make sure to reply to the specific postings to ensure the thread remains intact.

Time Management

Your success will depend on your own organization and time management skills. You will be covering the material within each lesson at your own pace, but you still want to keep up with the course's progress.

- Enter due dates into your personal calendar.
  To help meet these deadlines:
  - Breakdown large assignments into smaller and more manageable tasks.
  - Create a daily to-do list and prioritize the more essential items.
  - Give tasks a time limit. Larger tasks may feel daunting. Try setting a time limit. If you reach this limit and the task is not finished, take a break, and come back refreshed.
  - Evaluate your progress towards completing a task before the set deadline. Create an action plan for completing the work, especially if you find yourself falling behind.
- Abide by the office hours when communicating with facilitators and/or teacher assistants.

Individual Work

- Set long-term and short-term goals.
  Use SMART goals: Specific, Measurable, Attainable, Realistic, and Time-bound.
- Determine the personal value of assignments. For example, ask yourself: *How will this task relate to what I am doing in my own practice? Will it help me reach my goals?*
- Create a study space with few distractions. If you're limited to a shared space, try using headphone to eliminate some background noise.
- Establish a routine. Set aside time on certain days when you can work on the coursework.

Tips for Online Learning

Working with Peers

- Schedule a date and time when you can check in weekly through the chosen platform (ex: WhatsApp) or in person with a peer.
- Collectively set objectives and ground rules. Make sure everyone is clear on these and has agreed to them.
- Share tasks equitably within the team and hold everyone accountable for the completion of tasks they agreed to complete.
- When providing feedback to your peer, make sure to provide constructive feedback that is relevant to course content. Here are some suggested ways to do this:
    1) Review the task requirements and the expectations.
    2) Collect specific and descriptive pieces of feedback, based on the task requirements and expectations.
    3) Offer your feedback using the sandwich technique: Start with a positive comment, then suggest something to work on, and finally end with an encouraging comment.
    4) Check that the feedback was clear and was well received.
    5) Look at your own work to see if you can see it differently now.

Work Submissions

- Include your name, the date, teacher identification number (ex: TSC or SDMS), your school name, and relevant social media handles (ex: WhatsApp handle) on all submissions so it is clear to the facilitators who has submitted the work.
- If you have taken a photograph of the work, make sure the image is clear (including the above information of name, identification number etc.).
- Make sure all files that are submitted have the correct filename.
- Complete all the required tasks on or before their due date.
- Proof-read your work. Whenever possible, set aside your work for a couple of days and then return to proofread it. You'll catch more errors.
- Submit only work that is your own.
  See plagiarism video: https://library.wlu.ca/help/tutorials/understanding-plagiarism

Accessing Online Material: Data Usage

- Always switch off all updates for better data management (alternatively you could allow updates over WIFI only).
- Switch off automatic downloads for video and picture and set to download only selected media.
- Turn your data saver on.
- Avoid streaming apps or use them in moderation.
- Limit data usage for specific apps (e.g., YouTube) by turning off allow background data usage.
- Set data limits for your device by turning on limit data usage.

Course Notebook

Teaching Early Literacy with the Learning Toolkit+

Learning Modules

- Introduction
- Getting Started with ABRA
- Alphabetics
- Fluency
- Comprehension
- Writing
- ABRA Assessment
- READS
- ABRA-ePEARL Connection
- Cooperative Learning

Course Notebook: Introduction

Reflect on Your Motivations

What influenced you to take this training?

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Describe your own ability or confidence in teaching early literacy and incorporating technology in your classroom.

Teaching early literacy	Incorporating technology
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Which early literacy skill are you most interested in learning more about? Why?

How will you evaluate and track your own growth?

Additional Notes

Write any questions or thoughts you have as you go through the module.

Reflect on Your Expectations

What do you think the role technology has in the classroom?

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What do you hope to get out of the ABRA software?

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Course Notebook: ABRA

ABRACADABRA: Watch the Video

What did I learn from this video?

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What questions do I have after watching this video?

How do you see ABRA being used in your classroom context?

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What barriers do you anticipate? How can you overcome them?

How can ABRA help you provide differentiated instruction to your learners?

Which of the key literacy skills are you most interested in learning more about? Why?

Additional Notes

Write any questions or thoughts you have as you go through the module.

Reflect on Your Past Experiences

As a child, how did you learn to speak, read, and write?

How easy or hard was it to connect spoken to written language?

How have those early experiences shaped how you teach reading and writing?

Course Notebook: Alphabetics

Alphabetics: Watch the Videos

What did I learn from these videos?

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What questions do I have after watching these videos?

ABRACADABRA

Which alphabetics skills (your top 2-3) would most benefit your class? Why?

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Which 2-3 ABRA activities could you use to build these skills?

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How can you use these activities? Make a specific plan.

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What challenges do you see in carrying out this plan? How can you overcome them?

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NOTE: If possible, meet with your colleagues to go over your plan.

Additional Notes

Write any questions or thoughts you have as you go through the module.

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Course Notebook: Fluency

Reflect on Your Past Experiences

Why is fluency important?

What are some challenges you've faced implementing fluency instruction in your classroom?

What strategies have you used to overcome these difficulties?

Course Notebook: Fluency

Fluency: Watch the Video

What did I learn from this video?

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What questions do I have after watching this video?

Scenario: John takes his time to sound out words until he says them correctly. As he is focused on decoding the words, he reads each word slowly and with the same inflection in his voice. He does not pause for punctuation. Often, John has trouble connecting the words together in order to understanding the full text

What problems can you identify in John's fluency skills?

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How would you help John develop his fluency skills?

ABRACADABRA

Which fluency skills do your learners struggle with the most?

Which ABRA activities could you use to build these skills?

How can you use these activities? Make a specific plan.

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What challenges do you see in carrying out this plan? How can you overcome them?

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NOTE: If possible, meet with your colleagues to go over your plan.

Additional Notes

Write any questions or thoughts you have as you go through the module.

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Reflect on Your Past Experiences

How can you tell if a child has understood what they read?

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What teaching strategies have you tried in your classroom to foster learners' comprehension skills? What worked and what didn't?

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How are your learner's comprehension skills impacted by their vocabulary knowledge?

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What questions do you have about comprehension and vocabulary instruction?

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Understand Text: Watch the Videos

What did I learn from these videos?

Comprehension: _____

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Vocabulary: _____

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What questions do I have after watching these videos?

Course Notebook: Comprehension

ABRACADABRA

Which comprehension skills do your learners struggle with the most?

Which ABRA activities could you use to build these skills?

How can you use these activities? Make a specific plan.

What challenges do you see in carrying out this plan? How can you overcome them?

NOTE: If possible, meet with your colleagues to go over your plan.

Additional Notes

Write any questions or thoughts you have as you go through the module.

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Reflect on Your Past Experiences

Think back to when you were learning how to write? What motivated you to develop this skill?

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What is still difficult about writing?

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How skilled are your learners at typing? Do you have any strategies to help children develop this skill?

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Course Notebook: Writing

What teaching strategies have you tried in your classroom to foster learners' writing skills? What worked and what didn't?

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What questions do you have about writing and typing instruction?

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Writing: Watch the Video

What did I learn from this video?

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What questions do I have after watching this video?

Course Notebook: Writing

What motivated you to develop your own printing or typing skills?

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How will your learners benefit from developing their printing or typing skills?

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What barriers or limitations are there for teaching your learners printing or typing skills? How can you overcome them?

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What words do you have difficult spelling?

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What words do you notice your learners struggling with?

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Story Prompts

Individual Activity – Random Words

Write down the list of random words you'll use in your story:

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Write your short story:

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What inspired you?

What was challenging about this task?

How would you adapt this task for young children? Try it in your classes!

Group Activity – One Sentence at a Time

Write down the story starter your group selected:

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Write the story your group created:

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How did your group members inspire your creativity?

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What addition to the story surprised you the most?

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Did the story end the way you thought it would?

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How would you adapt this task for young children? Try it in your classes!

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Group Activity – Compare Beginnings

Write down the story starter your group selected:

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Write the first paragraph of your story:

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What inspired you?

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How do you picture your story continuing?

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Are there any similarities between the stories?

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What inspired each of you?

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How would you adapt this task for young children? Try it in your classes!

ABRACADABRA

What are some ways your learners struggle with writing and/or typing?

How can the ABRA activities help build these skills?

How can you use these activities? Make a specific plan.

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What challenges do you see in carrying out this plan? How can you overcome them?

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NOTE: If possible, meet with your colleagues to go over your plan.

Additional Notes

Write any questions or thoughts you have as you go through the module.

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Reflect on Your Past Experiences

How do you normally evaluate whether your learners are attaining alphabetics, fluency, comprehension and writing skills?

How often do you track your learners' work?

Activity: Explore the Reports

What is your impression of the class achievement when viewing the class portrait of *Word Families*?

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Which leaners, if any, require additional support from Ms. Akter to understand word families?

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Which leaners, if any, may benefit from enrichment activities after doing the *Word Families* activity?

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What do the reports of *Tracking* tell you about Ms. Akter's class?

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_____

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What suggestions do you have for how Ms. Akter can use the word list in the *Tracking* reports with her class/leaners?

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Which leaners, if any, should Ms. Akter meet with individually after she views the reports on *Tracking*?

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What is your impression of the class achievement when viewing the class portrait of *Story Elements*?

Which leaners, if any, require additional support from Ms. Akter to understand story elements?

Which leaners, if any, may benefit from enrichment activities after doing the *Story Elements* activity?

Course Notebook: Assessment

How does examining the class portrait help you assess leaners' understanding?

How does examining the individual leaners' reports help you assess leaners' understanding?

What is your overall assessment of Fatima Nyakio?

What is your overall assessment of Junior Sokoro?

Course Notebook: Assessment

What is your overall assessment of Manu Levy?

What is your overall assessment of Sophia Dewan?

What should Ms. Akter's next steps be?

ABRACADABRA

What are your thoughts on formative assessment?

Would you use this feature in your classroom? Why or why not?

Additional Notes

Write any questions or thoughts you have as you go through the module.

Reflect on Your Experiences and Expectations

Reflect on any challenges you faced finding resources for your classroom. What are the biggest ones?

What do you hope to get out of the READS tool?

READS

How do you see READS being used in your classroom context?

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What barriers do you anticipate? How can you overcome them?

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How can READS help you provide differentiated instruction to your learners?

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Think of an upcoming theme you will explore in your classroom. Search READS to find a book that relates to that theme. How do you see this book fitting in to your lesson?

Additional Notes

Write any questions or thoughts you have as you go through the module.

Reflect on Your Thoughts and Experiences

In your own words, state the purpose of creating a portfolio.

Have you ever created your own portfolio? If so, how did it help you work towards your personal or professional goals? If not, what steps can you take to find out more about the benefits of portfolios?

Are portfolios suitable for your class? Why or why not?

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Self-Regulated Learning (SRL): Watch the Video

What did I learn from this video?

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_____

What questions do I have after watching this video?

Self-Regulated Learning (SRL)

In your own words, state the importance of the *Plan* phase in the SRL process.

In your own words, state the importance of the *Do* phase in the SRL process.

In your own words, state the importance of the *Reflect* phase in the SRL process?

In your past experiences, which SRL skill has been the most difficult for your leaners to develop? Why?

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ePEARL

How do you see ePEARL being used in your classroom context?

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What barriers do you anticipate? How can you overcome them?

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How can ePEARL help you provide differentiated instruction to your learners?

Additional Notes

Write any questions or thoughts you have as you go through the module.

Reflect on Your Past Experiences

How do you use group work in your classroom?

What considerations do you use when grouping learners?

How effective has this been?

In what ways is cooperation a means to learning?

In what ways is cooperation the end goal?

What was the most challenging aspect of working with others? Were you able to work around it? Why or why not?

What were you able to gain from working with others that you don't think you would have been able to do if you worked alone?

Course Notebook: Cooperative Learning

Cooperative Learning: Watch the Video

What did I learn from this video?

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What questions do I have after watching this video?

Cooperative Learning

Describe a situation in your class where one type of dependence can be observed. How might this be a positive or negative aspect of your class?

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What steps can you take to avoid learners becoming ‘free riders’? How should you address social loafing if you see it happening?

Should individual learners’ grades be influenced by their group’s performance? Why or why not?

Activities: Grouping Learners | Assign Roles in Groups

Start by creating groups and providing your rationale. Later you will be asked to assign roles to each learner.

Group 1	
Learner	Role
1.	
2.	
3.	
4.	
5.	
What is the rationale behind how you grouped the learners?	What was your rationale for assigning the roles you did?

Group 2	
Learner	Role
1.	
2.	
3.	
4.	
5.	
What is the rationale behind how you grouped the learners?	What was your rationale for assigning the roles you did?

Group 3	
Learner	Role
1.	
2.	
3.	
4.	
5.	
What is the rationale behind how you grouped the learners?	What was your rationale for assigning the roles you did?

Group Discussion: Consider the similarities and differences between your groups and other teachers'.

If the other teachers' grouping was similar to yours, did they have the same reasoning?

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If the other teachers' grouping was dissimilar to yours, what was the main difference you noted?

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Do you want to adjust your original groups? Why or why not?

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Write down any techniques for grouping learners that the teachers shared. Would you use these in your own classroom?

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What type of group dynamics do you see going on?

What sort of cues can get interpreted from the learners' body language?

What should Ms. Akter say to these learners to foster positive interdependence?

Group Discussion: What problems can be inferred in the picture?

What you would do to address the noted problems?

How can a learners' group members possitively impact their attitude, motivation, and work ethic?

How can a learners' group members negatively impact their attitude, motivation, and work ethic?

What can teachers do to reduce prejudice between learners working in a group?

Which social skills do you think are the most important for your learners to develop and why?

Go back to the groups you created earlier, and assign roles to each of the learners.

Pick one of your groups. If you kept them together for another assignment, list what roes you would give each learner. Explain your rationale for either keeping the same roles, or why you'd chosen different ones for some or all learners.

Create your own LTK+ Cooperative Learning Activity

Keep track of your ideas here.

Additional Notes

Write any questions or thoughts you have as you go through the module.

Course Notebook: Introduction

Reflect on Your Motivations

What influenced you to take this training?

_____

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_____

Describe your own ability or confidence in teaching early literacy and incorporating technology in your classroom.

Teaching early literacy	Incorporating technology
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
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Which early literacy skill are you most interested in learning more about? Why?

How will you evaluate and track your own growth?

Additional Notes

Write any questions or thoughts you have as you go through the module.

Learning ToolKit

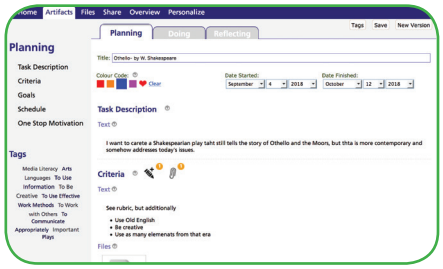
The Centre for the Study of Learning and Performance (CSLP) based at Concordia University, in partnership with several Canadian school boards and LEARN has developed the Learning Toolkit (LTK). This web-based software is designed to support the development of literacy, numeracy, inquiry and various cross-curricular competencies within an environment that encourages self-regulated learning, an essential strategy for effective, lifelong learning. It is offered to the educational community at no charge.

ePearl

Electronic Portfolio Encouraging Active Reflective Learning

1. Is the heart of the LTK (links to other tools).
2. Encourages Active Reflective Learning.
3. Is designed for use in K-12 classrooms.
4. Encourages goal setting, reflection and continuous improvement.

website: http://grover.concordia.ca/epearl



Abracadabra

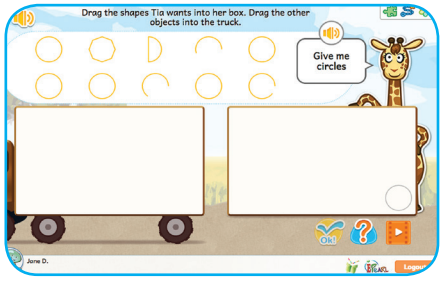
1. A highly interactive and flexible early literacy resource for beginning readers.
2. Uses a balanced literacy approach.
3. Consists of dozens of engaging activities and digital stories.
4. Provides access to READS a Repository of Ebooks and Digital Stories.

website: https://grover.concordia.ca/resources/abra/parent/en/

ELM

1. A highly interactive and flexible early numeracy resource.
2. Develops foundational skills in mathematics.
3. Increases numeracy proficiency.
4. Decreases math anxiety in students.

website: https://grover.concordia.ca/resources/elm/parent/en/



IS 21

1. Designed for use in late elementary-early secondary classrooms.
2. Supports students as they work through the inquiry process from start to finish.
3. Develops foundational information literacy skills.
4. Teaches strategies to successfully identify, search for, and creatively use information.

website: https://grover.concordia.ca/resources/is21/parent/en/

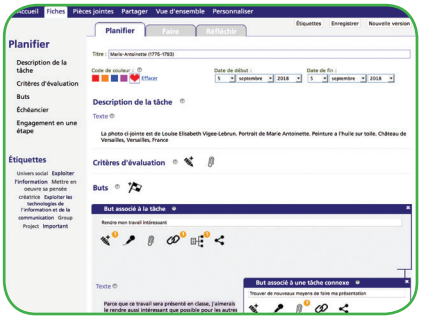
La trousse d'apprentissage

En partenariat avec plusieurs commissions scolaires du Canada, ainsi que LEARN, Le Centre d'Études sur l'Apprentissage et la Performance (CEAP) basé à l'Université Concordia a développé La Trousse d'Apprentissage (LTA). Ce logiciel Web est conçu pour soutenir le développement de la littératie, de la numératie, du processus d'enquête et autres compétences transversales dans un environnement qui encourage l'auto-régulation, une aptitude essentielle pour l'apprentissage continu. Il est offert gratuitement à la communauté éducative.

PERLE

Portfolio Électronique Réflexif pour L'apprentissage des Élèves

1. Conçu pour les classes de Maternelle au Secondaire.
2. Portfolio Électronique Réflexif pour L'Apprentissage des Élèves.
3. Encourage l'établissement de buts, la réflexion, le développement et l'amélioration continus.
4. Considéré comme le cœur de LTA (tous les outils sont reliés à PERLE).

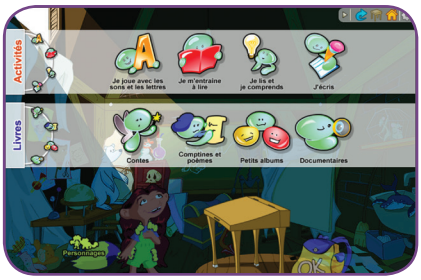


Site Web: http://grover.concordia.ca/epearl/promo/fr/parents.php

Le développement de la version française de cet outil a été dirigé par une équipe d'experts de l'**UQAM**.

ABRACADABRA

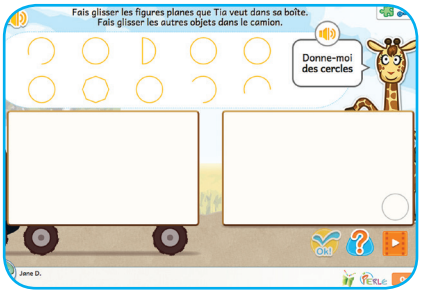
1. Ressource d'alphabétisation très interactive et flexible pour les lecteurs débutants.
2. Approche alphabétique équilibrée de la lecture.
3. Comprend des douzaines d'activités et d'histoires numériques engageantes.
4. Accès en ligne à LIRE , Livres Intégrés dans un Répertoire pour Élèves.



Site Web: http://grover.concordia.ca/resources/abra/parent/fr/

ORME

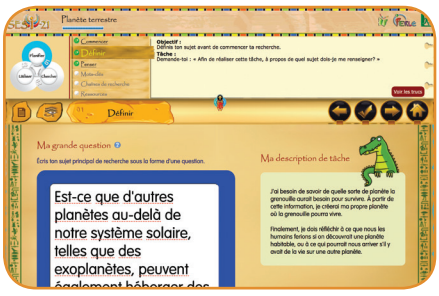
1. Ressource de numératie très interactive et flexible pour les jeunes enfants.
2. Développe les compétences fondamentales en mathématiques.
3. Augmente la maîtrise de la numératie.
4. Réduit l'anxiété chez les élèves.



Site Web: https://grover.concordia.ca/resources/elm/parent/fr/

SESAMI-21

1. Conçu pour les élèves de cinquième année jusqu'au Secondaire 3.
2. Soutient les élèves du début à la fin du processus d'enquête.
3. Développe les compétences en maîtrise de l'information.
4. Enseigne aux élèves des stratégies pour identifier, rechercher et utiliser l'information de façon créative.



Site Web: En développement

Université Concordia University

CSLP • CEAP

QUICK TIPS

Create a Shortcut

You can create a shortcut on your desktop for quick access to the LTK.

1) Click on the URL.

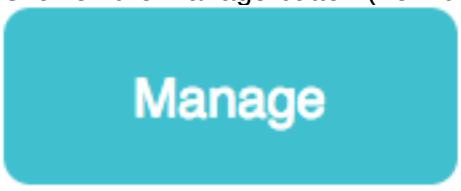
2) Drag the URL to the desktop.

Teacher Instructions for Changing Learners' Username or Password

As a teacher, it is possible for you to view and edit learners' account information. Note that usernames may not be changed as these are set by the software. However, nicknames are defined by the learner and also may be changed by the teacher.

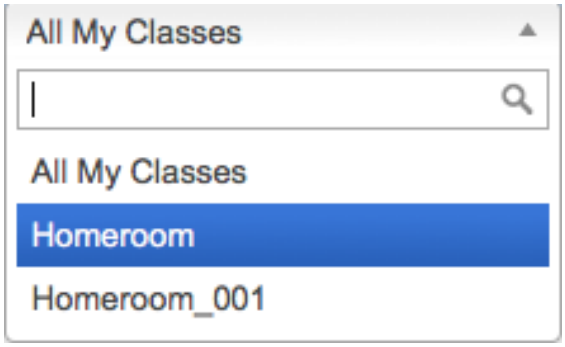
IF YOU WANT TO CHANGE THE NICKNAME OR PASSWORD OF ONE LEARNER…

1) Click on the Manage button (from the LTK lobby).



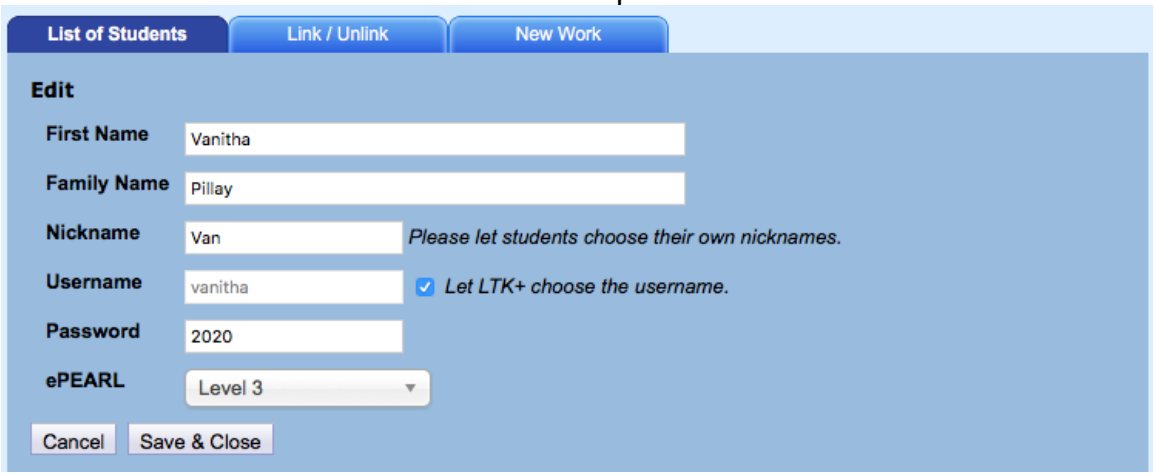
2) Click on the *My Students* button.

Note: You can filter the list of learners by class.



Don't see a learner's name in your list?
You must be linked to the class the learner is in, in order to view their details. Contact your administrator if there is a problem.

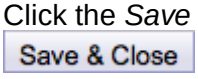
3) Click on the pencil icon. Next to the learner's name.
The learner's information is loaded at the top of the screen.



4) Type a new username in the *Nickname* textbox.

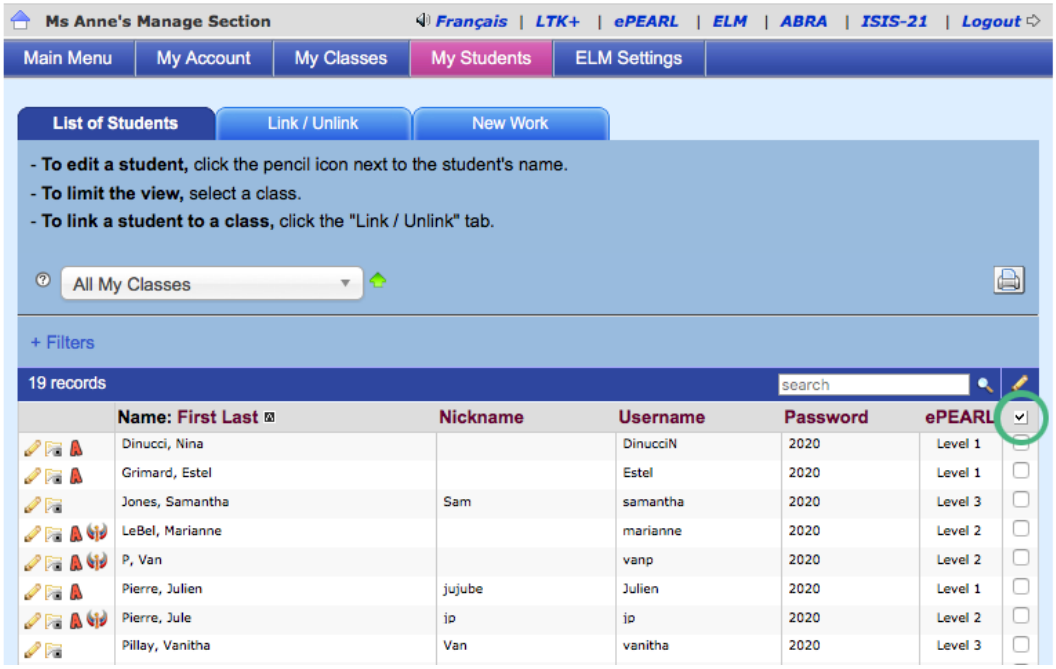
5) Type a new password in the *Password* textbox.

6) Click the *Save & Close* button to make changes.



IF YOU WANT TO CHANGE THE PASSWORD FOR ALL OF YOUR LEARNERS…

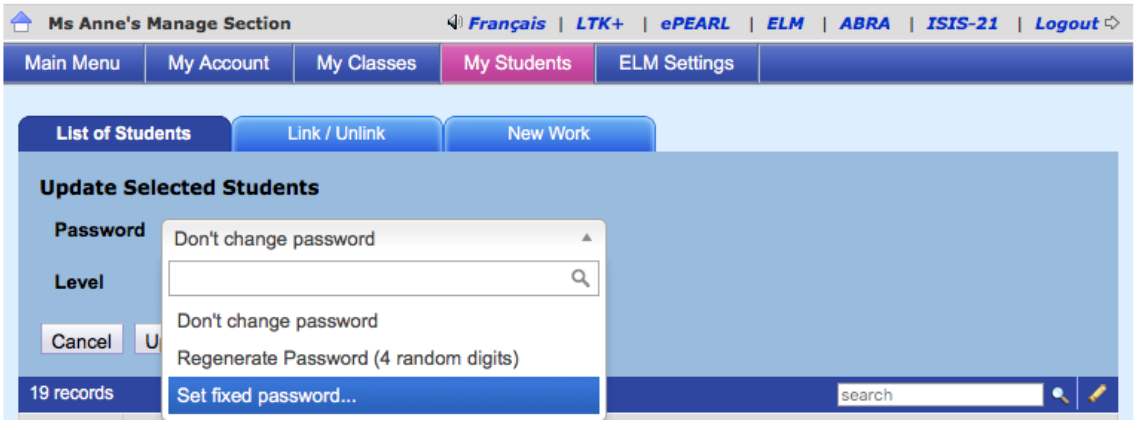
1) Click on the *Select All* button ☑



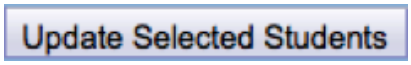
2) Click on the *Update Selected Students* button ✎ (just above *Select All*).

3) Click on the password dropdown menu.

4) Select the “Set fixed password” option.



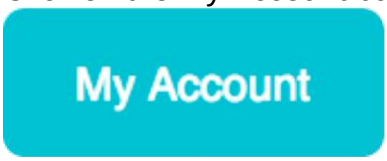
5) Type in a new password for your learner.
“123” will appear by default but you can adjust this.

6) Click on the *Update Selected Students* button  to implement changes.

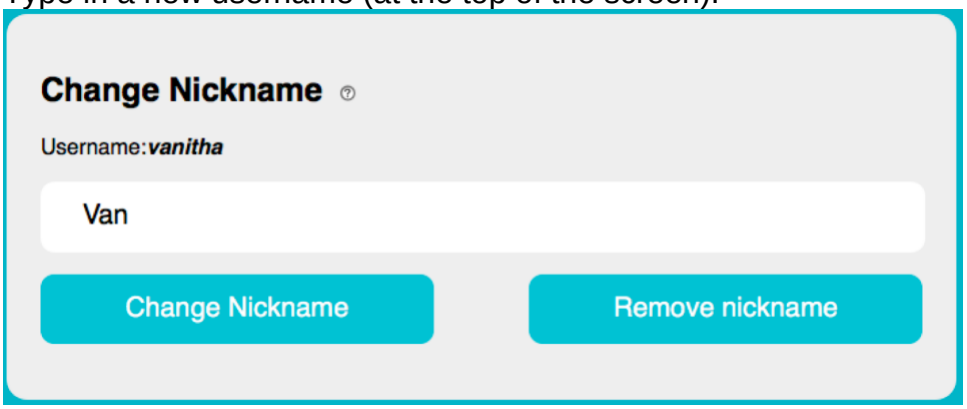
Learner Instructions for Changing Their Own Username or Password

You can guide your learners on how they can edit their own username or password.

1) Click on the My Account button (from the LTK lobby).

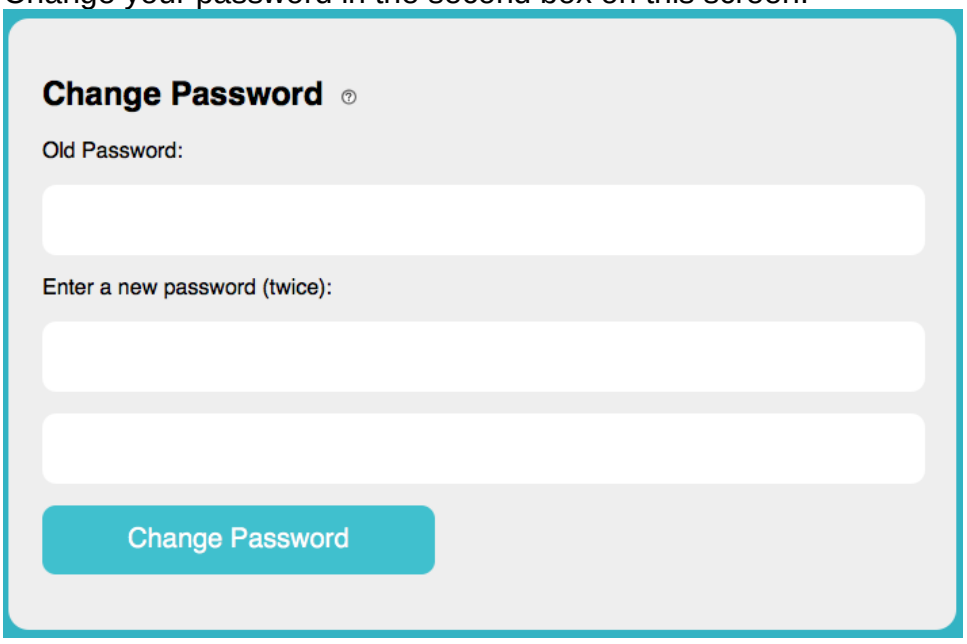


2) Type in a new username (at the top of the screen).

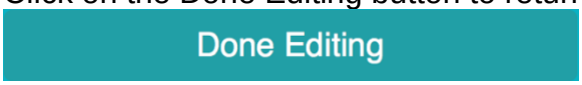


3) Click on the *Change Nickname* button when done.

4) Change your password in the second box on this screen.



5) Click on the Done Editing button to return to the LTK+ lobby.



RESEARCH SUMMARY (MARCH 2, 2023)

Table of Contents

This document provides a list of all of the conference presentations, reports, published works and media reports on the LTK+ generally, followed by items that are specific to a tool. **Items that are in blue represent non-Canadian studies.**

Learning Toolkit+

Abrami, P. C. (2011). A toolkit for learning: Using technology to close the gap. *Education Canada*, 51(2), 54-57. http://www.cea-ace.ca/education-canada/article/toolkit-learning-using-technology-close-gap

Abrami, P.C., Savage, R.S., Deleveaux, G., Wade, A., Meyer, E. & Lebel, C. (2010). The Learning Toolkit: The design, development, testing and dissemination of evidence-based educational software. In P. Zemliansky & D.M. Wilcox (Eds.), *Design and implementation of educational games: Theoretical and practical perspectives* (pp. 168-187). Hershey, PA: IGI Global. http://dx.doi.org/10.4018/978-1-61520-781-7.ch012

Abrami, P.C., Wade, A., Lysenko, L., WaGioko, M., Kiforo, E., Iminza, R. & Marsh, J. (2020). The Learning Toolkit Plus: An overview. [Manuscript under review]. *Canadian Journal of Learning and Technology.*

Arshad-Ayaz, A, Ayaz Naseem, M., & Inyega, J. (2022). Using technology for learning: Generalizable lessons from educational technology integration in Kenya. *Canadian Journal of Learning and Technology, 48*(2). https://cjlt.ca/index.php/cjlt/article/download/27957/20639/75447

Lysenko, L., Abrami, P.C., & Wade, A. (2022). Sustainability and scalability of digital tools for learning: The Learning Toolkit Plus in Kenya. *Canadian Journal of Learning and Technology. 48*(1), 1-29. https://doi.org/10.21432/cjlt27961

Conferences

Abrami, P.C. (2019, May). Organizer and chair of the panel "The Learning Toolkit + in Kenya" at the Annual Conference of the Canadian Association of African Studies, Penser l'Afrique-Monde : Originalité et pratiques innovantes, Montreal, QC

Amaro, D., Buchbinder, N., Castillo-Canales, D., Comba, R., Janigan, T., **Lysenko, L.,** …… (2022, April 18). Adaptation of education innovations in the Global South: Reflections from Knowledge and Innovation Exchange projects. Preconference workshop at the the annual conference of Comparative and International Education Society. Minneapolis, MN

Del Col, N., Wade, A., & Changamire, V. (2022, April 21). Academic-NGO Research Partnerships in International Development: Two case studies in Africa, Asia and America. Paper presented at the annual conference of Comparative and International Education Society. Minneapolis, MN.

Reports

Abrami, P. C., Lysenko, L., Wade, A., Marsh, J., Del Col, N., WaGioko, M., & Head, J. (2020, Dec. 31). Teaching and learning with technology in Sub-Saharan Africa. International Development Research Centre (IDRC) Final Report. Montreal, QC: CSLP.

Abrami, P. C., Wade, A., Marsh, J., WaGioko, M., Lysenko, L., Wachinga, A., Del Col, N. & Head, J. (2019, October). Teaching and learning with technology in Sub-Saharan Africa. (IDRC, Interim Report). Montreal, QC: CSLP.

LTK Promotional Site: https://www.concordia.ca/ltk

ABRACADABRA

Awards

UNESCO. (2017, Sept.). *UNESCO King Sejong Literacy Prize*.
https://en.unesco.org/news/technology-helps-develop-literacy-and-numeracy-sub-saharan-africa

Canadian Network for Innovation in Education (2011). *Award of Merit for Excellence and Innovation in Overall Use of Technology for Learning*

Association for Educational Communications and Technology Design & Development (2010). *Outstanding Practice Award*.

SUMMARY OF RESEARCH

ABRACADABRA is based on the best available research on how children learn to read and the best available research on using technology for learning. Research is the bedrock on which ABRA, and our other tools, were designed and developed. ABRA has also been the subject of extensive efforts at validation over the years. Consequently, it is fair to claim that ABRA is both evidence-based *and* evidence-proven.

The most recent systematic review by Abrami, Lysenko and Borokhovsky (2020) summarizes substantial validation research on ABRA from 17 rigorous studies conducted between 2006 and 2019 in North America, the UK, Australia, Asia, and Africa. Including also true experimental randomized control trials and third-party assessments conducted, this research demonstrates uniformly positive effects of ABRA and, more recently, READS. Overall, the average adjusted effect size based on 91 comparisons and 7,388 students is +0.256 with the range of positive effects in all reading-related skills. The effects are generalizable across country contexts and measurement approaches. Importantly, ABRA research is ongoing and the results of a few more studies have been published since 2019 (for instance, Arciuli & Bailey, 2021; Gu et al., 2021) and are waiting to be incorporated into effect size estimates.

Population Estimates by Outcome Category	***k* (# of comparisons)**	$\bar{g}$ **Average Effect Size**		***Percentile Advantage (adjusted ES)***
		Non-adjusted	**Adjusted[c]**	
Phonics	23	**0.187****	**0.263*****	10

Phonemic Awareness	23	**0.378*****	**0.299*****	12
Reading Fluency	7	**0.088**	**0.181****	7
Reading Comprehension	11	**0.180****	**0244****	9
Listening Comprehension	9[b]	**0.274***	**0.313****	12
Vocabulary Knowledge	18	**0.080**	**0.183****	7
Overall	91	**0.200*****	**0.256*****	10

*** p < .001, ** *p* < .01, * p < .05
[a] *Weighted Average Effect size (random effects model) for Major Reading Outcome Categories and Heterogeneity Analysis (fixed effect model)*
[b] One outlier removed
[c] HLM-based effects were used to predict the effect sizes from the non-HLM studies

Since 2012 other research projects on the impact of ABRA have been unfolding in Hong Kong, China, Kenya, the United Kingdom and Australia. Most recently, the feasibility of ABRA and READS implementation is being piloted in primary schools in Rwanda and Bangladesh. See for example: http://www.concordia.ca/research/learning-performance/tools/learning-toolkit.html#international

In Kenya, eight ABRA-READS studies were completed between 2012 and 2019. The results of five quasi-experiments conducted with the total sample of 2,740 primary school students in grades 1 to 3 yielded the overall adjusted effect size of +0.427. The specific effects sizes were +0.417 for listening comprehension, +0.365 for vocabulary knowledge and +0.527 for reading comprehension (Abrami et al., 2020). The primary research (Abrami et al., 2016; Lysenko et al., 2019) shows that ABRA-READS benefitted students across grade levels and genders about equally. While all students learned, low-performing students and struggling readers were often able to learn the most. The improvements also often transferred to other subject areas.

In 2022-2023, an important validation study of the ABRA program is being completed in Kenya and Rwanda. This research investigates the effects of the ABRA teacher professional development and subsequent implementation of ABRA in on the students' English literacy skills. The Kenyan arm of this research has been completed and the data are being analyzed whereas the research arm in Rwanda is still in progress.

SCHOLARLY WORKS

External (Third Party) Evaluations of ABRA

Arciuli, J., & Bailey, B. (2019). Efficacy of ABRACADABRA literacy instruction in a school setting for children with autism spectrum disorder. *Research in Developmental Disabilities, 85*, 104-115. https://doi.org/10.1016/j.ridd.2018.11.003

Arciuli, J., & Bailey, B. (2021). The promise of comprehensive early reading instruction for children with autism and recommendations for future directions. *Language, Speech and Hearing Services in Schools, 52,* 225-238. https://doi.org/10.1044/2020_LSHSS-20-00019

Bailey, B., Arciuli, J., & Stancliffe, R. J. (2016, June). Effects of ABRACADABRA literacy instruction on children with autism spectrum disorder. *Journal of Educational Psychology*. Advance online publication. 109(2), 257-268.http://dx.doi.org/10.1037/edu0000138

Bailey, B., Arciuli, J., & Stancliffe, R. J. (2017). Effects of ABRACADABRA instruction on spelling in children with autism spectrum disorder. *Scientific Studies of Reading*, 21(2) 146-164. http://dx.doi.org/10.1080/10888438.2016.1276183

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Ehrich, J., Wolgemuth, J. R., Helmer, J., Oteng, G., Lea, T., Bartlett, C., Smith, H., & Emmett, S. (2010). Attendance, Performance and the Acquisition of Early Literacy Skills: A Comparison of Indigenous and Non-Indigenous School Children. *Australian Journal of Learning Difficulties, 15*(2), 131-149. http://www.informaworld.com/openurl?genre=article&id=doi:10.1080/19404150903524580

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Harper, H. (2012). Teachers' Emotional Responses to New Pedagogical Tools in High Challenge Settings: Illustrations from the Northern Territory. *Australian Educational Researcher, 39*(4), 447-461. http://dx.doi.org/10.1007/s13384-012-0075-7

Harper, H., Helmer, J., Lea, T., Chalkiti, K., Emmett, S., & Wolgemuth, J. (2012). ABRACADABRA for magic under which conditions? Case studies of a web-based literacy intervention in the Northern Territory. *Australian Journal of Language and Literacy 35*(1), 33-50. http://www.academia.edu/1436079/ABRACADABRA_for_magic_under_which_conditions_Case_studies_of_a_web-based_literacy_intervention_in_the_Northern_Territory

Helmer, J., Bartlett, C., Wolgemuth, J. R., & Lea, T. (2011). Coaching (and) Commitment: Linking Ongoing Professional Development, Quality Teaching and Student Outcomes. *Professional Development in Education, 37*(2), 197-211. http://www.informaworld.com/openurl?genre=article&id=doi:10.1080/19415257.2010.533581

Helmer, J., Harper, H., Lea, T., Wolgemuth, J. R., & Chalkiti, K. (2014). Challenges of Conducting Systematic Research in Australia's Northern Territory. *Asia Pacific Journal of Education, 34*(1), 36-48. http://dx.doi.org/10.1080/02188791.2013.809692

McNally, S., Ruiz-Valenzuela, J., & Rolfe, H. (2018, March). ABRA: Online reading support (Evaluation report and executive summary. Addendum added). London, UK: Education Endowment Foundation. https://educationendowmentfoundation.org.uk/our-work/projects/online-reading-support/

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Sha, K., & Savage, R. (2020). Separating the Medium from the Message: Effects of Web- Versus Pencil and Paper- Delivery of the ABRACADABRA Intervention on Literacy, Motivation and Self-Esteem. *Journal of Interactive Learning Research, 31*(4), 283-317. https://www-learntechlib-org.lib-ezproxy.concordia.ca/primary/p/210443/

Vousden, J. I., Cunningham, A. J., Johnson, H., Waldron, S., Ammi, S., Pillinger, C., Savage, R., & Wood, C. (2021). Decoding and comprehension skills mediate the link between a small-group reading programme and English national literacy assessments. *British*

Journal of Educational Psychology, Advance online publication. https://doi.org/10.1111/bjep.12441

Journal Articles

Abrami, P. C., Borokhovski, E., & Lysenko, L. (2015). The effects of ABRACADABRA on reading outcomes: A meta-analysis of applied field research data. *Journal of Interactive Learning Research 26*(4), 337-367. Chesapeake, VA: Association for the Advancement of Computing in Education (AACE).

Abrami, P. C., Lysenko, L. & Borokhovski, E. (2020). The effects of ABRACADABRA on reading outcomes: An updated meta-analysis and landscape review of applied field research. *Journal of Computer-Assisted Learning.* https://doi.org/10.1111/jcal.12417

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Comaskey, E., Savage, R., & Abrami, P. C. (2009). A randomized efficacy study of web-based synthetic and analytic programmes among disadvantaged urban kindergarten children. *Journal of Research in Reading, 3*2(1), 92-108. doi: 10.1111/j.1467-9817.2008.01383.x

Deault, L. Savage, R., & Abrami, P. C. (2009). Inattention and response to the ABRACADABRA web-based literacy intervention. *Journal of Research on Educational Effectiveness* 2(3), 250-286. doi.: 10.1080/19345740902979371

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Gu, H., Yao, J., Zhou, L., Cheung, A.C.K., & C. Abrami, P. (2021). A quasi-experimental study of a web-based English literacy tool for Grade 3 students in China. *ECNU Review of Education, 4*(1), 84-107. https://doi.org/10.1177/2096531120972709

Gu, H., Yao, J., Cheung, A. C. K., Zeng, Z. & Abrami, P. (2020). Can computer-assisted-learning help? A meta-analysis on the effects of ABRACADABRA on K-3 non-native English speakers. [Manuscript in preparation]

Guo, X., Cheung, A., Abrami, P. C., & Wade, A. (2023). Examining the impact of the ABRACADABRA (ABRA), a game-based online literacy programme on primary school students in rural Hunan, China. *Educational Technology Research and Development*. ttps://doi.org/10.1007/s11423-023-10185-5

Guo, X., Cheung, A., Abrami, P.C., & Wade, A. (2022). Teachers' perceived challenges of using technology to teach through the lens of activity theory: Lessons from rural China. [Manuscript submitted]. *Teacher and Teaching.*

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Chapleau, N, Laplante, L., et Brodeur, M. (2018, avril). *Soutenir les apprentissages en lecture et en écriture auprès des élèves débutant dans l'écrit avec la ressource en ligne ABRACADABRA.* Communication présentée aux étudiants du master en éducation à l'Université Félix Houphouët-Boigny, Abidjan, Côte d'Ivoire. Conférencière invitée.

Deleveaux, G., & Wade, A. (2010, May). *ABRACADABRA: 21st century evidenced-based software designed to assist children develop literacy skills and to provide support for teachers and parents who guide them.* Paper presented at the Association of Early Childhood Educators of Quebec, Montreal, QC.

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Head, J., Biddle, J. Wade, A., Lysenko, L., Abrami, P.C., & Iminza, R. (2022, April 22). *Scaling up a Literacy Educational Innovation: A Comparison of Teacher Education Models.* Paper presented at the annual conference of Comparative and International Education Society. Minneapolis, MN

Iminza, R., Gottardo, A., & Wood, E. (2021, April 29). *Partnering in response to COVID-19: ABRA@Home community-based literacy program in Kenya.* Paper presented at the Comparative and International Education Society annual conference [online].

Kiforo, E. (2022, Oct. 27). *Transformative learning through the use of technology.* Invited keynote address at the University of Nairobi Faculty of Education 4th Annual International Conference [online].

Lebel, C. (2009, September). *ABRACADABRA*. Workshop presented at the Commission Scolaire de Montréal, Montreal, QC.

Lysenko, L., & Abrami, P. C. (2014, April). *Promoting reading comprehension with the use of technology*. Paper presented at the American Educational Research Association (AERA) Annual meeting, Philadelphia, PA.

Lysenko, L., Marsh, J. & WaGioko, M. (2022, November). *ABRACADABRA scaling experience in Kenya.* Invited presentation at the KIX ROSIE global and regional projects conference. Nairobi. Kenya.

Lysenko, L., Wade, A., & Abrami, P.C. (2019, May). *Teaching with LTK+. Preliminary lessons about sustainability and scale-up in Kenya schools.* Paper presented at the Annual Conference of the Canadian Association of African Studies, Penser l'Afrique-Monde : Originalité et pratiques innovantes, Montreal, QC.

Lysenko, L., Wade, A., & Abrami, P.C. (Accepted). *Building scalable model of technology-based TPD in LMIC.* Paper prepared for the Seventh Biennial Conference of the World Federation of Associations for Teacher Education (WFATE) to take place in July 2023.

Sanghera-Sidhu, B., Deleveaux, G., Abrami, P. C., & Savage, R. (2009, June). *Measuring treatment integrity of an evidence-based intervention study: Practical implications examined for the 2007-2009 Pan-Canadian, ABRACADABRA web-based literacy study*. Poster presented at the annual convention of the Canadian Psychological Association, Montreal, QC.

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Savage, R. & Abrami, P. C. (2008, March). *ABRACADABRA: A Web-based literacy program*. Paper presented at the American Educational Research Association, New York, NY.

Savage, R., Abrami, P. C., Comaskey, E., Hipps, G., & Wade, A., (2007, June). *ABRACADABRA: An evidence-based approach to early literacy instruction through web software*. Workshop presented at the 6th Annual Canadian Language and Literacy Network (CLLRNet) Conference, Calgary, AB.

Savage, R., Abrami, P. C., Piquette-Tomei, N., Wood, E., & Deleveax, G. (2009, June). *ABRACADABRA: An effective web-based literacy resource: Evidence from a randomized control trial with classroom teachers*. Paper presented at the Society for the Scientific Study of Reading (SSSR), Boston, MA.

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Savage, R. S., Ozlem, E., Abrami, P. C., Hipps, G., Comaskey, E., & Van Lierop, D. (2010, May). *ABRACADABRA in the hands of teachers: The effectiveness of a web-based literacy intervention in Grade 1 language arts programs.* Paper presented at the Canadian Society for the Study of Education (CSSE) and the Canadian Association of Educational Psychology (CAEP) Annual Conference , , Montreal, QC.

Savage, R., Piquette-Tomei, N., & Wesley, D. (2011, April). *School-based effectiveness of the ABRACADABRA web-based literacy program: A randomized control trial with school professionals*. Paper presented at the British Dyslexia Association.

Wolgemuth, J., Abrami, P. C., Helmer, J., Savage, R., Harper, H., Lea, T., et al. (2012, April). *A multisite randomized control trial to examine the impact of ABRACADABRA on early literacy in Northern Australia: An analysis of implementation fidelity*. Paper presented at the American Educational Research Association (AERA) annual meeting, Vancouver, BC.

Wolgemuth, J., Ehrich, J., Helmer, J., Emmett, S., Lea, T., Savage, R., et al. (2010, May). *Using computer-based instruction to improve indigenous early literacy in northern Australia*. Poster presented at the American Educational Research Association (AERA), Denver, Colorado.

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Xin, S., Cheung, A., & Mak, B. (2019, May). Activity theory as a framework for understanding teachers' perceptions of the use of ABRACADABRA (ABRA) at primary schools in

Kenya. Paper presented at the Annual Conference of the Canadian Association of African Studies, Penser l'Afrique-Monde : Originalité et pratiques innovantes, Montreal, QC.

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University of Nairobi, Centre for the Study of Learning and Performance, Unicef, & University of York: IEE. (2015). *Using cross-age peer tutoring in the teaching of reading in Kenyan primary schools* (National study).

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ePEARL

SUMMARY OF RESEARCH

The CSLP researchers have examined the effects of ePEARL digital portfolio on learning of students and teachers in Canada and Kenya.

In Canada, the impact of ePEARL digital portfolio on students’ learning has been in focus of the two major quasi-experimental studies involving 618 older elementary students (Meyer et al., 2010; Abrami et al., 2013). This research consistently found important gains in writing and metacognitive skills for the students who completed their English Language Arts class assignment with ePEARL compared to those who did not use ePEARL. Namely, the effects of ePEARL were demonstrable on students’ writing skills such as writing content (+0.13) and content management (+0.33) measured on a standardized test of achievement (CAT-4, 2008). The improved students’ self-regulation skills were setting process goals (+0.42), selecting task strategies (+0.43), and using their teachers’ and peers’ feedback (+0.47) and self-observations (+0.23) to improve their work.

Another Canadian study examined the combined use of ePEARL and ABRACADABRA on early elementary students’ reading comprehension skills (Lysenko & Abrami, 2014). Twenty-six grade 1 and 2 teachers and their 517 students from six English school boards participated in this quasi-experiment. The findings showed that the students who learnt with ePEARL and ABRA significantly outperformed students from the control classes in terms of reading and written expression as measured by the standardized tests. In particular, the gains of ePEARL and ABRA students were most important in vocabulary skills, reading comprehension and writing skills including conventions, linguistics, and content.

In Kenya, the initial validation of ePEARL in secondary schools also yielded promising results (Lysenko et al., 2022). Unfolded in two phases and involving 201 students, the study demonstrated the practicality of implementing the digital process portfolio in the Kenyan context and captured positive impact of the tool on student learning outcomes. The findings of this pilot consistently show that students who used ePEARL to complete their project work in Biology, Physics, Business Studies or English outperformed their peers who had hardly used the portfolio for their class assignments or did not use it all on their school exams and their self-reported self-regulation skills. Further, more frequent and comprehensive use of portfolio features translated into higher student achievement in the relevant subject area. On average, one unit increase in using ePEARL improved a student’s exam results by +0.39 and +0.30 standard deviations in phases 1 and 2 respectively.

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Davidson, A.-L., Lysenko, L., Bures, E., Abrami, P. C., Wade, A., & Idan, E. (2012, May). *The design, development and implementation of an electronic portfolio-ePEARL Level 4, to help the professionalization of teachers/Le design, le développement et l'implantation d'un portfolio éléctronique pour appuyer la formation des enseignants et favoriser leur professionnalisation*. Paper presented at the International Scientific Conference on ICT and Education: past, current and future trends, Montreal, QC.
Egland, T., Zazula, D., & Wade, A. (2008, April). ePEARL – *Starting the electronic portfolio in your elementary classroom*. Workshop presented at the Digital Denizens: Keying into the 21st Century conference, Calgary, AB.
Idan, E., Abrami, P. C., Wade, A., & Meyer, E. (2011, March). *Designing for the development of self-regulation: A web-based electronic portfolio for adult learners*. Paper presented at the International Technology, Education and Development conference, Valencia, Spain.
Lebel, C., & Bernath, L. (2009, December). *ePEARL*. Workshop presented at the MATI meeting on portfolio standards, Montreal, QC
Lebel, C., & Pillay, V. (2010, January). *ePEARL*. Workshop presented at the Département d'éducation, Université de Québec à Montréal (UQAM), Montreal, QC.
Lysenko, L., Bures, E., Idan, E., Wade, A., Abrami, P. C., & Meyer, E. (2012, October). *An electronic portfolio for teachers: Design and preliminary assessment*. Paper presented at the 17th Annual E-Learn World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education, Montreal, QC.
Lysenko, L., Venkatesh, V., Kiforo, E., & Gatende, A. (2019, May). *Electronic portfolios in Kenyan secondary classrooms: results of the ePEARL pilot study.* Paper presented at the Annual Conference of the Canadian Association of African Studies, Penser l'Afrique-Monde : Originalité et pratiques innovantes, Montreal, QC.
Meyer, E., Abrami, P. C., & Wade, A. (2010, May). *Improving teaching strategies and learning outcomes with Electronic Portfolios.* Paper presented at the American Educational Research Association (AERA), Denver, Colorado.
Meyer, E., Abrami, P.C. & Wade, A. (2009, April). *Electronic portfolios in the classroom: Factors impacting teacher's integration of new technologies and new pedagogies*. Paper presented at the annual meeting of the American Educational Research Association (AERA), San Diego, CA.
Meyer, E.J., Abrami, P.C. & Wade, A. (2009, May). *Improving teaching and learning with electronic portfolios.* Paper presented at the Canadian Society for the Study of Education (CSSE), Ottawa, ON.
Morris, K. L. (2006, March). *Digital portfolio workbook for pre-service teachers*. Paper presented at the Society for Information Technology and Teacher Education (SITE) International Conference (pp. 2295-2298), Orlando, FL.
Stenzel, T., Diner, L., & White, B. J. (2010, June). *ePearl: Portfolios in the classroom*. Paper presented at the International Society for Technology in Education (ISTE), Denver, CO.
Stenzel, T., Diner, L., & White, B. (2011, June). *ePEARL: E-Portfolio encouraging active reflective learning K-12*. Poster presented at the 32nd annual conference of the International Society for Technology in Education (ISTE), Philadelphia, PA.
Upitis, R., & Abrami, P. C. (2013, October). Towards developing independent musicians. Paper

presented at the Ireland International Conference on Education (IICE), Dublin, Ireland.
Upitis, R., & Abrami, P. C. (2010, May). *Developing ecological habits of mind through the support of electronic portfolios.* Paper presented at the American Educational Research Association (AERA), Denver, CO.
Upitis, R., Abrami, P. C., Brook, J., Troop, M., & Varela, W. (2010, November). *Using ePEARL for music teaching: A case study*. Paper presented at the International Association for the Scientific Knowledge conference, Oviedo, Spain.
Upitis, R., Abrami, P. C., Elster, A., Varela, W., & Brook, J. (2012, April). *On the importance of self-regulation in learning to play a musical instrument: A theoretical basis for designing iSCORE, a digital tool for music learning*. Paper presented at the International Organization of Social Sciences and Behavioral Research (IOSSBR) conference, Atlantic City, NJ.
Upitis, R., Abrami, P. C., Varela, W., & Elster, A. (2013, January). *iSCORE: A web-based tool for enhancing music learning*. Paper to be presented at the 11th Annual Hawaii International Conference on Arts & Humanities, Honolulu, Hawaii.
Upitis, R., Brook, J., & Abrami, P. C. (2014, January). Enhancing music learning with digital tools: A case study of a student using iSCORE. Paper presented at the Hawaii International Conference on Education (HICE), Honolulu, Hawaii.
Upitis, R., Brook, J., & Abrami, P. C. (2014, January). Enhancing music learning with digital tools. Paper presented at the Hawaii International Conference on Arts and Humanities (HICAH), Honolulu, Hawaii.
Upitis, R., Brook, J., & Abrami, P. C. (2013, April). *iSCORE: A web-based tool for music learning*. Paper presented at the American Educational Research Association (AERA) annual meeting, San Francisco, CA.
Upitis, R., Brook, J. & Abrami, P.C. (2012, November). iSCORE: *Providing effective professional development for users of an online music education tool*. Paper presented at the fifth international conference of Education, Research and Innovation, Madrid, Spain.
Upitis, R., Brook, J., Abrami, P. C., Varela, W., & Elster, A. (2012, July). *Revitalizing studio music learning through digital portfolios*. Paper presented at the ISME Commission for Research in Music Education, 24th International Seminar, University of Macedonia, Thessaloniki, Greece.
Upitis, R., Patteson, A., & Abrami, P. C. (2010, May). *Developing ecological habits of mind*. Paper presented at the Canadian Society for the Study of Education (CSSE) and the Canadian Association for Curriculum Studies annual conference, Montreal, QC.
Upitis, R., Patteson, A., & Abrami, P. C. (2010, May). *E-learning, ecology and an arts education institutional partnership*. Paper presented at the Canada International Conference on Education (CICE), Toronto, ON.
Wade, A. (2009, June). *Using ePEARL in the classroom*. Workshop presented at the Lester B. Pearson School Board K4 teachers, Dorval, QC.
Wade, A. & Abrami, P. C. (2008, May). *Encouraging self-regulated learning through electronic portfolios* [Keynote speakers]. Digital Portfolio as a strategy for teachers' professional development: International seminar, Helsinki, Finland.
Wade, A., Abrami, P. C., White, B., Nicolaidou, I. & Morris, K. (2006, October). *ePEARL: Electronic portfolio encouraging active reflection learning*. Paper presented at the European Institute for E-Learning (EIFEL) – Oxford ePortfolio Conference, London, England.
Wade, A., & Deleveaux, G. (2009, October - November). *Using ePEARL in the classroom*. Three workshops presented at the English Montreal School Board (EMSB) Pedagogical Services ICT Day, Montreal, QC.

Wade, A., Idan, E., Abrami, P. C., & Lebel, C. (2007, October). *Electronic Portfolio Encouraging Active Reflective Learning Software (ePEARL)*. Paper presented at E-Learn 2007, Quebec City, QC.

Wade, A., & Upitis, R. (2010, February). *Using electronic portfolios in the arts: An introduction to ePEARL.* Workshop presented at the Royal Conservatory of Music, Toronto, ON.

ePEARL IN THE NEWS

Colloque Scientifique TICE. (2012, April). "PERLE" au Programme du colloque scientifique international sur les TIC en éducation : bilan, enjeux actuels et perspectives futures. http://www.youtube.com/watch?v=mGUnt8Ofj9c&context=C4370409ADvjVQa1PpcFPr6W8imprspLLKozaPjTDLtRjCJfpR6wY .

ePEARL to shine at Congress: Montreal high school students and CSLP investigating human rights (2010, Jan.14). *Concordia Journal*. http://cjournal.concordia.ca/archives/20100114/epearl_to_shine_at_congress_2010.php

Venkatesh, V., & Abrami, P. C. (2012). Academic self-regulation in online learning environments: Research on electronic portfolios and Topic Map indexing tools. *Newsletter of the Studying and Self-Regulated Learning Special Interest Group.*, 4-5. http://uhaweb.hartford.edu/ssrl/Newsletters/2012_Spring_SSRL_Newsletter_3_19_12.pdf

Warwick, L. (2009, April). Student portfolios can measure progress. *Montreal Families*. http://www.montrealfamilies.ca.sslpowered.com/articles/09_apr/ed_portfolios.htm

IS-21

SUMMARY OF RESEARCH

All CSLP tools are built on a foundation of solid research evidence and IS-21 is no exception: research on information literacy and the use of technology in learning provided the foundation for the tool's development.

A field trial of the IS-21 software was conducted in Canadian schools to test the feasibility of using this tool to promote the development of students' information literacy skills (Wade et al., 2020). This was a two-phase study where 189 elementary and early secondary students used IS-21 to complete an inquiry project. The project topics included Recycling, Natural Disasters and Advertising. The results from both phases consistently show that learning with IS-21 had a number of benefits for students. Primarily, the students' gains were significant for overall and specific information literacy skills such as planning inquiry, searching and using information to generate knowledge. Further, after using IS-21, students improved their self-regulation skills of reflection and self-efficacy. Teachers' accounts of their experience of IS-21 research projects were positive. They reported that their students learnt how to do research with IS-21 and would be willing to use IS-21 in future. Notably, the most valuable aspect of completing IS-21 project was exposing students to the diversity of sources and making them apply meaningfully the criteria for selecting pertinent and high-quality sources to create their own knowledge on the topic of interest to them. The comprehensiveness of the tool was also praised by the teachers; on the other hand, the teachers agreed that it was overwhelmingly long to complete all twelve

steps of IS-21. The issue of time was raised when teachers referred to pre-teaching the concepts and steps of research and providing necessary guidance to students to complete these steps in IS-21.

SCHOLARLY WORKS

Journal Articles & Other Publications

Wade, A., Lysenko, L., & Abrami, P.C. (2020). Developing information literacy skills through the inquiry process. *Journal of Information Literacy*. *14*(2). 96-127. http://dx.doi.org/10.11645/14.2.2754

Wade, A., Abrami, P. C., White, B., Baron, M., Farmer, L., & Van Gelder, S. (2009). Information literacy: An essential competency in the twenty-first century. *L'Association des bibliothécaires du Québec Library Association (ABQLA) Bulletin*, 50(2), 20-23.

Wade, A., Abrami, P. C., White, B., Baron, M., Farmer, L., & Van Gelder, S. (2008, December). Information literacy: An essential competency in the twenty-first century [Electronic Version]. *Newsletter for IFLA: School Libraries and Resource Centers*, 47, 15-18. Retrieved May 4, 2009, from http://www.ifla.org/en/publications/newsletters-13

Conferences

Abrami, P. C., Wade, A., Savage, R. S., Deleveaux, G., & Meyer, E. (2009, May). *The learning toolkit (LTK): Evidence-based educational software.* Paper presented at the thirty seventh annual Canadian Society for the Study of Education (CSSE) conference, Ottawa, ON.

Abrami, P. C., Wade, A., Farmer, L., Philips, J., Huebner, C., Baron, M., White, B., Peters, S., & Van Gelder, S. (2008, April). *IS-21: Information skills for the information society in the twenty-first century.* Poster presented at the Annual Meeting of the Quebec Library Association, Montreal, QC.

Wade, A. (2010, March). *Information literacy for 10-14 year olds: The IS-21 project*. Paper presented at the Quebec Librarians' Roundtable, Portes Ouvertes, Montreal, QC.

Wade, A. (2009, October). *Developing inquiry strategies using IS-21 in the classroom.* Workshop presented at the English Montreal School Board (EMSB) Pedagogical Services ICT Day, Montreal, QC.

Wade, A., & Abrami, P. C. (2010, March). *Information literacy for 10-14 year olds: The IS-21 project.* Online presentation presented at the Advanced Broadband Enable Learning (ABEL).

Wade, A., & Abrami, P. C. (2010, February). *Information literacy for 10-14 year olds: The IS-21 project.* Online presentation presented at the Canadian Network for Innovation in Education (CNIE) Wise & Witty Wednesday online seminar, Montreal, QC.

Wade, A., Abrami, P. C., Farmer, L., Henry, L., & Venkatesh, V. (2010, May). *Inquiry strategies for the information society in the twenty-first century (IS-21).* Paper presented at the Fifth International Conference of Learning International Networks Consortium (LINC), The Massachusetts Institute of Technology, Cambridge, MA.

Wade, A., Abrami, P. C., & White, B. (2010, November). *Inquiry strategies for the information society in the twenty-first century (IS-21)*. Paper presented at the second conference of the library and information community of Québec, Montreal, QC.

Wade, A., Abrami, P. C., & White, B. (2009, May). *Inquiry strategies for the information society in the twenty-first century (IS-21): A resource for schools*. Paper presented at the annual conference of The Workshop for Instruction in Library Use (WILU), Montreal, QC.

Wade, A., & Baron, M. (2009, April). *Developing inquiry skills through the use of IS-21*. Workshop presented at the professional development day for library staff, English Montreal School Board, Montreal, QC.
Wade, A., Baron, M., & Van Gelder, S. (2008, December & October). *Developing inquiry skills through the use of IS-21.* Workshop conducted at the professional development day for library staff. Workshop presented at the English Montreal School Board with the pilot teachers, Montreal, QC.
Wade, A., Locke, J., & Devey, P. (2012, Aug.). *An online information literacy course for undergraduates: Early experiences.* Paper presented at the 2012 WLIC Conference Session “Information literacy meets E-learning", Helsinki, Finland.
Wade, A., Locke, J., & Devey, P. (2013, April). A*n online information literacy course for undergraduates: Some lessons learned.* Presentation at the eScape: Technology in teaching conference, Concordia University, Montreal, QC.

Reports

Wade, A. Abrami, P. & MacDonald, M. (2008, February) *Inquiry strategies for the information society in the twenty-first century (IS-21).* Final report prepared for Inukshuk Wireless. Montreal: Centre for the Study of Learning and Performance.

IS-21 IN THE NEWS

Warwick, L. (2011, Nov.). Program teaches kids valuable research skills. *Montreal Families*, p.23. http://www.montrealfamilies.ca/Montreal-Families/November-2011/Program-teaches-kids-valuable-research-skills/
Zarzour, K. (2011, Feb. 16). *Tackling tech temptations* [Wade quoted]. York Region.com. http://www.yorkregion.com/news/article/955780--tackling-tech-temptations
Zarzour, K. (2011, Jan. 12). *It’s wireless world in today’s classrooms* [Wade quoted]. York Region.com. http://www.yorkregion.com/news/article/928416--it-s-wireless-world-in-today-s-classrooms
Amend, E. (October 3, 2007). Internet help for parents. *The Chronicle*. Article on Information Literacy parent workshops given by Wade and Baron at Pierrefonds Public Library.

ELM

SUMMARY OF RESEARCH

Since 2014, we have studied the impact of ELM on grade-one student learning of mathematics in various contexts and have obtained positive results.

Canadian tests of ELM with 450 students demonstrated ELM impacts on students’ learning and affective outcomes. After having learnt with ELM for about one term, the experimental students considerably outperformed their peers exposed to traditional instruction with the effect sizes of +0.22 (Lysenko et al., 2016) and +0.29 (Abrami et al., 2018) on the overall skills respectively measured by the standardized tests of mathematics CAT-4 (2008) and GMADE (Williams, 2004). In addition, the effects of ELM were observable on a set of affective outcomes. Students in classes where ELM was part of math instruction reported more enjoyment from learning math and less anxiety and boredom than their peers in the control group.

Consistent with the Canadian findings are the results from Kenya feasibility study (Lysenko et al., 2022) conducted in 2019 in 14 classrooms of 7 primary public schools. The results of this research suggest that the use of ELM to teach math significantly improved young students' mathematical abilities over their peers from control classes. After the students worked in dyads or triads on ELM activities in the school computer lab during one weekly math lesson for a few months, the total effect size was +0.37 on the GMADE-tested skills of mathematics. We found particularly strong impact of ELM on the students' abilities to take language and concepts of mathematics and apply appropriate operations and computations to solve word problems. On this set of skills, the magnitude of difference between the experimental and control groups was +0.77.

The ELM validation study is currently unfolding in the primary schools of the Mombasa County, Kenya. Together with replicating the results of earlier research, this study aims to explore the conditions for ELM sustainable implementation.

SCHOLARLY WORKS

Journal Articles

Lysenko, L., Abrami, P.C., Wade, A., Kiforo, E., & Iminza, R. (2022). Emergent Literacy in Math (ELM): Learning numeracy with interactive technology in Kenya grade-one classes. *International Journal of Innovation in Science and Mathematics Education. 30*(5), 1-19. https://doi.org/10.30722/IJISME.30.05.001

Lysenko, L., Rosenfield, S., Dedic, H., Savard, A., Idan, E., Abrami, P. C., . . . Naffi, N. (2016). Using interactive software to teach foundational mathematical skills. *Journal of Information Technology Education: Innovations in Practice, 15*, 19-34. http://www.jite.org/documents/Vol15/JITEv15IIPp019-034Lysenko2154.pdf

Reports

The effects of ELM software on the learning mathematics in Kenyan elementary: A brief report on the 2019 study (Brief Report). Montreal, QC: CSLP.

Abrami, P. C., Wade, A., Marsh, J., WaGioko, M., Lysenko, L., Wachinga, A., Del Col, N. & Head, J. (2019, October). Teaching and learning with technology in Sub-Saharan Africa. (IDRC, Interim Report). Montreal, QC: CSLP.

The Centre for the Study of Learning and Performance. (January, 2015). Developing Foundational Skills in Quebec Students: *Orienter la réussite des mathématiques émergentes* (ORME) software. Final Report submitted to the Ministère de l'Économie, de l'Innovation et des Exportations. https://www.concordia.ca/content/dam/artsci/research/cslp/docs/tools-software/learning-toolkit/elm_mdeie_final-report.docx

Conferences

Savard, A., Dedic, H., Rosenfield, S., & Naffi, N. (2013, September). *Developing number sense with a digital tool*. Symposium at the Advancing Learning in Differentiation and Inclusion (ALDI) Symposium, Dorval, QC.

Savard, A., Dedic, H., Rosenfield, S., Idan, E, & Head, J. (2014, November). *Developing number sense with a digital tool*. Workshop conducted at the annual QPAT convention, Montreal, QC.

ELM IN THE NEWS

Vidija, P. (2015, September 30). English and Mathematics classes for Mombasa public teachers [ELM]. *The Star Newspaper, Kenya*. http://www.the-star.co.ke/news/english-and-mathematics-classes-mombasa-public-teachers#sthash.zMGydH6s.HXWeFWVe.dpuf

Introduction Module Glossary

ABRACADABRA (ABRA): a tool in the LTK+ suite that is designed to support children's acquisition of early literacy.

Asynchronous: learning takes place within a set timeframe, but the instructor and learners engage with the content at different times. This allows the learner to move at own pace, set their own schedule and communicate with the instructor and peers on their own time.

Comprehension Monitoring: periodically checking that a learner understands what they've read while they are reading a text.

Cooperative Learning (CL): a teaching strategy that helps learners work together to achieve a common goal. The work is structured so that every learner, regardless of temperament or ability, must participate and reap the benefits.

ePEARL: a web-based portfolio software, offered within the LTK+ suite. It is designed to support children's acquisition of self-regulated learning (SRL) skills.

Expression: when a reader changes their voice (meaningful pauses, emphasizing words, and appropriate tone and pitch) to help convey feelings and meaning.

Formative Assessment: measures the current knowledge of the learner while the learner is engaged with the learning process. It is a means to highlight knowledge gaps and achievements, and adjust instruction rather than grading the learner's performance.

General Goals: long-term goals that require planning, time, and multiple attempts or steps to accomplish.

Homogenous Groups: groups composed of people that are very similar in a significant way. For example, in terms of ability, gender, or personality.

Individual Accountability: each learner is responsible for his or her own learning and contributes meaningfully to the group's goal.

Learning Toolkit+ (LTK+): a suite of tools designed to support the development of literacy (ABRACADABRA and READS), numeracy (ELM), inquiry (IS-21) and self-regulated learning and portfolio development (ePEARL).

Phonemic Awareness: identifying and manipulating the smallest units of spoken language (sounds).

Prior Knowledge: the knowledge learners already have before learning about a topic.

Glossary

READS: a multilingual catalogue of digital books offered as part of the LTK+ suite of tools.

Self-Regulated Learning (SRL): the ability to control your learning environment through an awareness of how people generate the thoughts, actions, and emotions necessary to attain their personal goals.

Social Skills: the ability to communicate and interact with others both verbally and non-verbally. Good social skills help children develop the proper etiquette needed for group work.

Speed: refers to how fast a child can read. Reading speed is calculated by the number of words per minute (WPM) someone can correctly read.

Synchronous: the instructor and learners follow a set schedule to engage with the content together in real time, even if they are attending online from different locations.

Task Goals: short-term goals are things you want to accomplish in the near future.

Vocabulary: the words we use to communicate successfully. An individual's vocabulary can help their ability to comprehend what they hear or read.