



RESEARCH SUMMARY

(April 10, 2024)



Table of Contents

This document provides a summary of the research for each tool within the LTK and a list of published works, conferences, reports, and media articles. Each section is organized by continent in which the **study took place**. Under ABRACADABRA, third party assessments are also listed.

Learning Toolkit+.....	1
ABRACADABRA.....	2
Canadian Studies.....	2
African Studies.....	8
Asian Studies.....	12
Australian Studies.....	13
External (Third Party) Evaluations.....	14
ELM.....	16
Canadian Studies.....	16
African Studies.....	17
ePEARL.....	18
Canadian Studies.....	18
African Studies.....	24
IS-21.....	18
Canadian Studies.....	25



Publications

- 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). IGI Global. <http://dx.doi.org/10.4018/978-1-61520-781-7.ch012>
- 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), 1-19 <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+ 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 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.
- 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

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.

Media

- Lach-Aidelbaum, M. (2023, Sept.12). *Concordia's Learning Toolkit+ marks 20 years of advancing literacy and math worldwide*. <https://www.concordia.ca/news/stories/2023/09/12/concordia-s-learning-toolkit-marks-20-years-of-advancing-literacy-and-math-worldwide.html?c=/research/learning-performance/news>
- Philip Abrami and the Learning Toolkit celebrated as Robert Cassidy takes the reigns (2023, Sept. 7). *Concordia News*. <https://www.concordia.ca/cunews/artsci/learning-performance/2023/09/07/philip-abrami-and-the-learning-toolkit-celebrated-as-robert-cass.html?c=/research/learning-performance/news>





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**	0.244**	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.

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.

Canadian Studies

Journals

- Uribe-Banda, C., Wood, E., Gottardo, A., Wade, A., Iminza, R., & WaGioko, M. (2021). Evaluating teachers' learning, perceptions, and cultural differences following professional development for early literacy software. *Canadian Journal of Learning & Technology*, 47(2), 1–19. <https://doi.org/10.21432/cjlt27952>
- 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>
- Chapleau, N., Beupré-Boivin, K. & Godin, M-P. (2020). Éveiller la construction des mots dès le premier cycle du primaire. *Vivre le primaire*, 33(3), 8-10. <https://aqep.org/revue-vivre-le-primaire/>
- Chapleau, N. & Godin, M.-P. (2019, Juillet 10). Processus d'élaboration d'une activité en morphologie dérivationnelle pour la ressource en ligne ABRACADABRA. *Revue de recherches en littératie médiatique multimodale*, 9. <https://doi.org/10.7202/1062033ar>
- Long, M.-J., & Brodeur, M. (2016). ABRACADABRA : apprendre à lire et à écrire en jouant! *Canada Education*, 56(4). <http://www.cea-ace.ca/fr/education-canada/article/abracadabra-apprendre-%C3%A0-lire-et-%C3%A0-%C3%A9crire-en-jouant>
- Wood, E., Grant, A.K., Gottardo, A., Savage, R. & Evans, M.A. (2016). Software to promote young children's growth in literacy: A comparison of online and offline formats. *Early Childhood Education Research Journal*. <http://dx.doi.org/10.1007/s10643-016-0779-9>
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- Piquette, N., Savage, R., & Abrami, P. C. (2014). A cluster randomized control field trial of the ABRACADABRA web-based reading technology: Replication and extension of basic findings. *Frontiers in Psychology*, 5(1413). <http://dx.doi.org/10.3389/fpsyg.2014.01413>
- Wood, E., Grant, A., Gottardo, A., & Savage, R. S. (2014). Evaluating online and offline reading software for young learners. *Global Journal on Technology* [Online], 5, 99-104. www.awer-center.org/pitcs
- Savage, R., Abrami, P. C., Piquette-Tomei, N., Wood, E., Deleveaux, G., Sanghera-Sidhu, B., & Burgos, G. (2013). A (pan-Canadian) cluster randomised control effectiveness trial of the ABRACADABRA web-based literacy program. *Journal of Educational Psychology*, 105(2), 310-328. <http://dx.doi.org/10.1037/a0031025>



- Di Stasio, M., Savage, R., & Abrami, P. C. (2012). A follow-up study of the ABRACADABRA web-based literacy intervention in grade 1. *Journal of Research in Reading, 35*(1), 69-86. <https://doi.org/10.1111/j.1467-9817.2010.01469.x>
- Savage, R. S., Erten, O., Abrami, P. C., Hipps, G., Comaskey, E., & van Lierop, D. (2010). ABRACADABRA in the hands of teachers: The effectiveness of a web-based literacy intervention in grade 1 language arts programs. *Computers & Education, 55*(2), 911-922. <https://doi.org/10.1016/j.compedu.2010.04.002>
- Wood, E., Anderson, A., Piquette-Tomei, N., Savage, R., & Mueller, J. (2011). Evaluating teachers' support requests when just-in-time instructional support is provided to introduce a primary level web-based reading program. *Journal of Technology and Teacher Education, 19*(4), 499-525. <http://www.editlib.org/p/34599>
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Books

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- 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). IGI Global. <https://www.igi-global.com/gateway/chapter/42453>
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- Savage, R. & Abrami, P. C. (2007). ABRACADABRA: Progress in the development, implementation and effectiveness of a web-based literacy resource. In Association for the Advancement of Computing in Education (AACE), *E-Learn 2007: World Conference on E-Learning in Corporate, Government, Healthcare, & Higher Education* [Compact disc]. AACE.
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Conferences

- Chapleau, N., Godin, M.-P., Brodeur, M., Laplante, L., et Turcotte, C. (2017). ABRACADABRA : une technologie éducative pour apprendre à lire et à écrire. Communication proposée dans le cadre du 30e congrès de l'Association québécoise des enseignantes et des enseignants du primaire. Montréal, QC, Canada.



- 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.
- Brodeur, M., St-Pierre, L., & Charland, M. (2013, November). ABRACADABRA : une ressource pour les parents qui accompagnent leur enfant dans l'apprentissage de la lecture. Paper presented at the Grandes rencontres sur la persévérance scolaire (GRPS), 3e édition, Montreal, QC, Canada.
- Savage, R., Abrami, P. C., Piquette-Tomei, N., Wood, E., Deleveaux, G., & Sanghera-Sidhu, B. (2011, April). A cluster randomized control trial of the ABRACADABRA web-based literacy program. Invited presentation presented at the Council for Exceptional Children Convention & Expo, National Harbor, MD, USA.
- 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.
- Abrami, P. C., Savage, R., Wade, A., Deleveaux, G., & Lebel, C. (2010, March). ABRACADABRA: An evidence-based tool for early literacy. Seminar presented at the 35th Learning Disabilities Association of Quebec (LDAQ) annual conference, Montreal, QC, Canada.
- 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, Canada.
- 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, Canada.
- Abrami, P.C., Deleveaux, G., & Savage R. (2009, March). ABRACADABRA: A literacy resource for Aboriginal learning. Paper presented at the 2009 Aboriginal Policy Research Conference, Ottawa, ON, Canada.
- 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, Canada.
- Sanghera-Sidhu, B., Rocchi, J., Di Stasio, M., & Savage, R. S. (2009, March). Exploration of ABRACADABRA a web-based literacy tool & an examination of the practical implications of conducting a Pan-Canadian study. Paper presented at the Education for a Diverse World: Addressing Equity & Human Rights Eighth Annual Education Graduate Students' Society (EGSS) Conference, Montreal, QC, Canada.
- Savage, R., Abrami, P. C., Piquette-Tomei, N., Wood, E., & Deleveaux, 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, USA.
- 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. Paper presented at the 6th Annual Canadian Language and Literacy Network (CLLRNet) Conference, Calgary, AB, Canada.
- Zhou, M., Muzard, R., Therrien, M., Hipps, G., & Abrami, P. C. (2005, July). ABRACADABRA: A rich internet literacy application. Paper presented at the EDMedia Conference, Montreal, QC, Canada.
- Zhou, M., Muzard, R., Therrien, M., Hipps, G., & Abrami, P. C. (2005, May). ABRACADABRA : A rich internet literacy application. Paper presented at the 4e Colloque annuel Développement, intégration et évaluation des technologies de formation et d'apprentissage (DIVA), Montreal, QC, Canada.
- Zhou, M., Muzard, R., Therrien, M., Hipps, G., & Abrami, P. C. (2005, April). ABRACADABRA: A rich internet literacy application. Paper presented at the American Educational Research Association, Montreal, QC, Canada.

Dissertations and Reports

- Uribe-Banda, C. (2019). Learning, attitudes, and perceptions: Evaluating teachers acquiring competence with online literacy programs for children. [Master's thesis, Wilfried Laurier University]
<https://scholars.wlu.ca/etd/2166>



- Chapleau, N., et Beupré-Boivin, K. (2018). Des mots rapides. Activité pour reconnaître les mots globalement. Document inédit. Université du Québec à Montréal.
- Flis, A. (2018). ABRACADABRA: The effectiveness of a computer-based reading intervention program for students at-risk for reading failure, and students learning English as a second language [Doctoral dissertation, University of British Columbia].
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- Savage, R. S., Abrami, P., Piquette-Tomei, N., Wood, E., & Delevaux, G. (2008, August). ABRACADABRA: A study in the development, implementation and effectiveness of a web-based literacy resource. A research progress report. Report of pan-Canadian research data analysis submitted to the Canadian Council for Learning and the Canadian Language and Literacy Research Network.
- Hipps, G., Wade, A., & Abrami, P. C. (2004, March). Abracadabra: A literacy resource Schoolnet final report. Centre for the Study of Learning and Performance: Montreal, QC, Canada.

Media

- Brennan, J. (2020, Apr. 9). Concordia's literacy tools are a key part of the Government of Quebec's new online learning portal for the pandemic. [Wade quoted]. *NOW News*. Available:
<http://www.concordia.ca/news/stories/2020/04/09/concordias-literacy-tools-are-key-to-the-government-of-quebecs-new-online-learning-portal-for-the-pandemic.html?c=/research/learning-performance/news>
- Barr, M. (2017, Sept. 25). 'We aim to bolster foundational skills': Concordia and UQAM receive support to develop a new digital literacy tool for members of the Quebec workforce.
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<http://www.concordia.ca/cunews/main/stories/2017/09/06/sshrc-grants-concordia-2-5-million-for-education-tech-in-sub-saharan-africa.html?c=news/stories>
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<http://affaires.lapresse.ca/tetes-daffiche/201611/03/01-5037430-600-000-pour-concordia.php>
- Morgan, B. (2016, Aug.). A reading and writing tool - ABRACADABRA [P.C. Abrami interviewed]. Montreal, QC: CJAD.
- Quin, L. (2016, Aug.). ABRACADABRA helps autistic children read. *Concordia News*.
<http://www.concordia.ca/alumni-friends/cunews/offices/vpaer/aar/2016/08/22/abracadabra-helps-autistic-children-read-.html>
- Léger, M.-F. (2015, Sept. 14). ABRACADABRA Apprendre à lire en ligne. *La Presse*.
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<http://www.concordia.ca/now/what-we-do/teaching/20110517/educational-software-wins-national-award.php>
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African Studies (Cote d'Ivoire, Kenya, Morocco, Rwanda, Senegal)

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- Chapleau, N. et Santos, E. (under review). Apprendre à lire et à écrire en Afrique francophone : une étude de cas rapportant des pratiques d'enseignants à Dakar. *Éducation comparée et internationale*.
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- Leblanc, A., Chapleau, N., Laplante, L., Lachance, M. (under review). Retombées d'une recherche collaborative sur le développement professionnel d'enseignantes au premier cycle du primaire au Maroc. *Revue hybride de l'éducation*. Canada.
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Conferences

- Abrami, P.C., Wade, A., Lysenko, L. & Head, J. (2024, March). Educational technology as a catalyst for change in the Global South. Paper presented at the Comparative and International Education Society (CIES) annual meeting, Miami, FL.
- Abrami, P.C. & Wade, A. (2023, Sept.). Using interactive multimedia for teacher and primary student learning in the Global South. Panel discussion. [UNESCO Digital Literacy Week: Steering Technology for Education conference]. <https://www.unesco.org/sites/default/files/medias/fichiers/2023/09/2023-digital-learning-week-agenda-en.pdf>
- Lysenko, L. (2023, Sept.). What does it take to scale effective reading instruction? Lessons from a technology-driven innovation going to scale in LMIC. The invited presentation at the III Jornadas de Educación a Distancia y Tecnología Educativa. Universidad Nacional de Asunción, Paraguay.



- Battaglia, N., Wood, E., & Gottardo, A, Vogel, N. , Ghaa, C., Chovu, L., & Maniraguha, JB. (2023, June). Discrepancies in teacher's self reported and actual early literacy knowledge and pedagogical domains. Paper presented at the World Congress on Education (WCE-2023), Toronto ON, Canada.
- Chapleau, N. et Leblanc, A, (2023, juin). Soutenir la réussite des premiers apprentissages en lecture et en écriture avec ABRACADABRA au Maroc. Communication présentée à la Journée de formation des inspecteurs et des enseignants de Rabat, Maroc. Conférencière invitée.
- Zahrai, E., Patel, G., Gottardo, A., Wood, E., Ghaa, C., WaGioko, M., Iminza, R., Chova, L., Shivachi, A. & Wade, A. (2023, June). Assessing early language and literacy classroom environments in Kenya. Paper presented at the World Congress on Education 2023, Toronto, ON, Canada.
- Battaglia, N. (2023, March). TPACK in Kenya: Trends in teacher knowledge [Poster presentation]. FOSSA Undergraduate Research Conference, Waterloo ON, Canada.
- Lysenko, L., Sugimaru, C. & Turner, J. (2023, March). Lessons in leveraging digital education, technology, and innovation for gender equality in the Global South. The IDRC panel at the UN Commission on the Status of Women. New York, NY.
- Chapleau, N. (2023). ABRACADABRA : une ressource pour apprendre à lire et à écrire en français. Communication présentée au colloque en hommage à Jacques Ginestié. France : Marseille.
- Chapleau, N., Laplante, L., & Leblanc, A. (2023). Et si l'enfant apprenait à lire et à écrire tout en s'amusant. Communication acceptée Biennale internationale de l'Éducation. Paris, France.
- Leblanc, A., Chapleau, N. & Laplante, L. (2023). Un partenariat évolutif pour soutenir la réussite des premiers apprentissages en lecture et en écriture avec ABRACADABRA en Afrique francophone, Communication présentée au 90^e congrès de l'ACFAS, Montréal, QC, Canada.
- Santosh, E., Wood, E., Gottardo, A, Vogel, N. , Battaglia, N., Ghaa, C.& Chovu, L. (2023). Investigating differences across Kenyan rural, peri-urban, and urban settings for teachers participating in an online teacher professional development program. Paper presented as the World Congress on Education (WCE-2023)
- Chapleau, N. (2022, nov.). Soutenir la réussite des premiers apprentissages en lecture et en écriture avec ABRACADABRA en Afrique francophone. Communication présentée à la Journée de formation des inspecteurs et des enseignants de Rabat, Maroc. Conférencière invitée.
- Chapleau, N. (2022, nov.). Soutenir la réussite des premiers apprentissages en lecture et en écriture avec ABRACADABRA en Afrique francophone. Communication présentée à la Journée de formation des inspecteurs et des enseignants de Rabat, Maroc. Conférencière invitée.
- Lysenko, L., Marsh, J. & WaGioko, M. (2022, Nov.). ABRACADABRA scaling experience in Kenya. Invited presentation at the KIX ROSIE global and regional projects conference. Nairobi. Kenya.
- Lysenko, L., Marsh, J. & WaGioko, M. (2022, Nov.). ABRACADABRA scaling experience in Kenya. Invited presentation at the KIX ROSIE global and regional projects conference. Nairobi. Kenya.
- Gottardo, A., Wood, E., Wade, A., Head, J., Maniraguha, J.B., Chovu, L., Ghaa, C., Iminza, R., WaGioko, M., Abrami, P.C. (2022, Oct.). Incorporating the concept of Universal Design for Learning in a teacher professional development program in Rwanda targeting early literacy instruction. Paper presented at the 44th Annual International Academy for Research in Learning Disabilities Conference, Oviedo, Spain (virtual format).
- Kiforo, E. (2022, Oct.). Transformative learning through the use of technology. Invited keynote address at the University of Nairobi Faculty of Education 4th Annual International Conference [online].
- Gottardo, A., Wood, E., Biddle, J., Kiforo, E., Iminza, R., Wade, A & Abrami, P.C. (2022, July). Back to paper. When technology is not an option. Paper presented at the Society for the Scientific Study of Reading Annual Meeting 2022. Newport, CA.
- Uribe-Banda, C., Spencer-Mueller, K., Wood, E., Gottardo, A., Iminza, R. & Kiforo, E. (2022, June). Literacy development in Kenyan educators: Examining the impact of professional development formats on educator perceptions. Poster presented at Development 2022. Calgary , AB, Canada.
- Uribe-Banda, C., Wood, E., Gottardo, A., Iminza, R. & Wade, A. (2022, May). Examining teachers content knowledge gains after piloting a 12-week professional development course. Paper presented at the annual meeting of the Canadian Society for the Study of Education (CSSE). Waterloo, ON, Canada.



- Head, J., Biddle, J. Wade, A., Lysenko, L., Abrami, P.C., & Iminza, R. (2022, April). 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.
- Chapleau, N., Laplante, L. et Leblanc, A. (2022). ABRACADABRA! Pour soutenir l'apprentissage de la lecture et de l'écriture. Communication présentée au V^e Congrès de la commission du monde arabe, Hammamet, Tunisie.
- Iminza, R., Gottardo, A., & Wood, E. (2021, April). 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].
- Chapleau, N. (2019, juin). ABRACADABRA : une technologie éducative pour apprendre à lire et à écrire. Communication proposée dans le cadre du XII^e congrès de l'Association des Professeurs de Français D'Afrique et de l'Océan Indien (APFA-OI). Dakar, Sénégal.
- Chapleau, N., Laplante, L., Brodeur, M., Charland, P. et Beaupré-Boivin, K. (2019, mai). Les défis de la réalisation d'une étude en milieu scolaire francophone en Côte d'Ivoire. Communication proposée à La Conférence annuelle de l'Association canadienne des Études africaines, Montréal, QC, Canada.
- Gottardo, A., Wood, E., Abrami, P.C., Wade, A., WaGioko, M., Iminza, R., & Kiforo, E. (2019, May). Collaborating to develop optimal training for educators using software as an instructional tool: The Kenyan context. Paper presented at the Annual Conference of the Canadian Association of African Studies, Penser l'Afrique-Monde : Originalité et pratiques innovantes, Montreal, QC, Canada.
- 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, Canada.
- 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.
- Abrami, P. C., Gioko, A., Wade, A., & Marsh, J. (2015, Feb.). The Role of ICT in literacy development. Paper presented at the Digital Learning Day, Annual Research Institute, Aga Khan University, Tanzania.
- Kiforo, E. K., Gioko, A. M., Waga, R. (2014, July). How does the implementation of a literacy Learning Toolkit influence Early Literacy Skill acquisition? In Key Competencies in Informatics and ICT (KEYCIT 2014) Conference, Potsdam University, Berlin, Germany.
- Abrami, P. C., Wade, A., Lysenko, L., Marsh, J., Gioko, A., & Angondi, E. K. (2014, May). A study of ABRACADABRA early literacy software in Mombasa, Kenya. Paper presented at the eLearning Africa, 9th International Conference on ICT for Development, Education, & Training, Kampala, Uganda.

Reports

- Chapleau, N., Leblanc, A. & Skelling-Desmeules, Y. (2024, en préparation). Rapport des résultats de la recherche de l'étude réalisée en 2023 au Maroc. *Soutenir l'apprentissage de la lecture et de l'écriture au royaume du Maroc avec ABRACADABRA*. Document inédit.
- Abrami, P. C., Bhuiya, M., Chovu, L., Del Col, N., Ghaa, C., Gottardo, A., Iminza, R., Kiforo, E., Lysenko, L., Maniraguha, J.-B., Marsh, J., Mithani, F., Shivachi, A., Wade, A., WaGioko, M., & Wood, E. (2023, Nov.30). Using technology to improve literacy in the Global South. International Development Research Centre (IDRC) Final Report.
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- CSLP, World Vision, Aga Khan Academy & Wilfrid Laurier University. (2020, Nov. 26). Using ABRACADABRA @ Home in a remote region of Kenya: Response to the pandemic. Report.



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- Abrami, P. C., Wade, A., Lysenko, L., Marsh, J., & Maina, G. (2016). The effects of ABRACADABRA early literacy software on the learning of Kenyan elementary school students: 2014-2015 study (SSHRC Partnership Development Final Report). Montreal, QC: CSLP.
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Media

- Lysenko, L. & Wade, A. (2023, July 20). *ABRA Professional development of Kenyan teachers: What their students learned*. GPE KIX. <https://www.gpekix.org/blog/abra-professional-development-kenyan-teachers-what-their-students-learned>
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- Wade, A., Abrami, P.C., & Durand, C. (2023, April 11). *Expectancy-value: How motivated Kenya teachers are transforming early literacy instruction*. [Blog post]. GPE KIX. <https://www.gpekix.org/blog/expectancy-value-how-motivated-kenya-teachers-are-transforming-early-literacy-instruction>
- International Development Research Centre. (2021). *Scaling Digital Learning in Kenya - Dorothy Mariga* <https://www.youtube.com/watch?v=lbZr9VEyvZU>
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Asian Studies (Bangladesh, China, Hong Kong)

Journals and Dissertations

- 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*. <https://doi.org/10.1007/s11423-023-10185-5>
- Gu, H., Yao, J., Bai, P., Zhou, L., Cheung, A. C., & Abrami, P. C. (2021). Does ABRACADABRA help improve the English reading ability of Chinese elementary school students? A quasi-natural experimental study. *Science Insights Education Frontiers*, 9(2), 1221-1240. <https://doi.org/10.15354/sief.21.or041>
- 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>
- Mark, B.S.Y., Cheung, A., Guo, X., Abrami, P.C., & Wade, A. (2017). Examining the impact of of the ABRACADABRA (ABRA) web-based literacy program on primary school students in Hong Kong. *Education and Information Technologies*, 22(6), 2671- 2691. <https://doi.org/10.1007/s10639-017-9620-3>



- Cheung, A., Mak, B., Abrami, P. C., Wade, A. & Lysenko, L. (2016). The effectiveness of the ABRACADABRA (ABRA) web-based literacy program on primary school students in Hong Kong. *Journal of Interactive Learning Research*, 27(3), 219- 245.
- Guo, X. (2018). Examining the impact of ABRACADABRA (ABRA), a web-based literacy program, on primary school students in Hunan, China: A mixed method study (Doctoral thesis, Chinese University of Hong Kong).

Media

- AKA Dhaka hosts closing ceremony of KIX project. (2023, September 27). <https://www.agakhanacademies.org/dhaka/aka-dhaka-hosts-closing-ceremony-kix-project>
- AKA Dhaka welcomes back government school teachers for PD session (2023, August 7). <https://www.agakhanacademies.org/dhaka/aka-dhaka-welcomes-back-government-school-teachers-pd-session>
- AKA Dhaka hosts government officials to observe the KIX project (2023, July 31). <https://www.agakhanacademies.org/dhaka/aka-dhaka-hosts-government-officials-observe-kix-project>
- Aga Khan Dhaka organized Teacher Professional Development on Alphabetic Module under KIX program (2023, May 26). <https://www.agakhanacademies.org/dhaka/aka-dhaka-organises-pd-session-teachers-under-kix-project>

Australian Studies

Journals

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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.

Canadian Studies

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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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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.

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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.

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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.

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