CASE STUDIES 2025

CELEBRATING ACADEMIA-INDUSTRY COLLABORATIONS IN EDTECH

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INTERNATIONAL CENTRE
FOR EDTECH IMPACT
WiKIT

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CELEBRATING RESEARCH-INDUSTRY COLLABORATIONS IN EDTECH

FOREWORD

Collaboration between academia and industry is common in many sectors, but education has long been seen as a "Cinderella sector," where such partnerships are viewed with caution: academic researchers are sometimes seen as needing to remain removed from commercial interests, with concerns that partnerships might dilute scholarly independence or compromise rigour. Although this perception is starting to shift, successful examples in EdTech remain limited.

This collection of case studies seeks to challenge that narrative. It is a modest but meaningful effort to highlight the potential and value of partnerships between academic institutions and industry actors in education technology. The case studies present a diverse set of collaborations, showcasing different models of engagement and the mutual benefits achieved—from co-developing tools grounded in learning science to generating new evidence that strengthens both product design and educational impact. These examples are not meant to be exhaustive, but illustrative: a snapshot of what is already happening and a prompt for what more could be done. Our hope is that this collection becomes a living resource—one that grows over time and inspires more scholars and practitioners to work together in pursuit of better learning outcomes.

Professor Natalia I. Kucirkova,
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May 2025

CASE STUDY 1

**Dr. P. Anand Rao
Professor of
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DebaterHub
Where Dialogue Drives Discovery

1, What was the core problem the company faced, and how did your project address it?

DebaterHub was founded in 2021 by John Hines and Devin Gonier, two former teachers with a vision to make debate education more accessible to underserved learners. While the founders possessed a deep understanding of education, debate, and the technological tools they planned to use, they struggled to secure partnerships with schools and debate leagues willing to try out their platform. Simply, they were unproven as EdTech entrepreneurs and had limited experience and expertise in outlining a research agenda that would demonstrate the efficacy of their approach.

A year later, ChatGPT was released. My colleagues and I realized the profound impact of Generative AI on education and labor markets in the not-so-distant future. As we investigated, we concluded that integrating AI and debate in the classroom offers a valuable opportunity to enhance assessment integrity, support personalized instruction, engage students, foster human interaction, and advance education. It is also an accessible starting point for educators learning about AI's impact (Bauschard et al., 2023). Shortly after we published our "Beyond Algorithmic Solutions" paper, John and Devin contacted me to ask if my fellow researchers and I would be interested in a joint study based on their vision of the DebaterHub platform. Together, we formed the DebaterHub Research Group and began developing a research agenda for what we now term "Augmented Debate-Centered Instruction."

2, How did the collaboration unfold? Were there any challenges or notable moments?

We began collaborating after recognizing our shared experiences in debate, either as participants or as coaches. This common ground led us to explore how AI could influence both education and the field of debate. Initially, our work centered around developing a panel proposal for a conference, where we found our research interests and goals were naturally aligned. As our collaboration continued, we held weekly meetings to develop frameworks for an augmented debate-centered educational model.

This model was designed to integrate debate into classroom settings, not only as a tool for assessing student work but also as a way to address potential misuse of AI by students. A subgroup within our team presented this model at a conference, further refining our approach.

When we joined forces with the Debater Hub research group, we built on this foundation to produce a paper accepted for poster presentation at the AAAI AI for Education workshop in Vancouver, Canada, in February 2024. This was a notable milestone since the workshop primarily attracts computer science researchers. Our paper brought a fresh perspective from the debate and humanities disciplines, illustrating how debate could serve as a model for fostering more constructive interactions between students and AI in educational settings.

3. How did you select your research method and approach?

Our research approach consists of two main components. First, we focused on understanding how students learning debate can use AI tools and how those tools impact their development of key skills. We based this approach on existing research on how high school debate programs enhance communication, critical thinking, and research skills. We closely modeled our method on the protocols used by the Richmond Forum Speech and Debate Initiative. Since one of our research group members is also part of that initiative's research team, we had permission to follow their established pre- and post-test survey approach. These surveys assess communication apprehension, civic engagement, resilience, critical thinking, and a logic section that evaluates reasoning skills. This method also aligns with the ongoing NSF-funded research at Debater Hub, enabling us to build on a strong foundation of existing studies on the educational impact of debate.

The second component of our approach involves exploring the broader relationship between AI and education, particularly through the lens of AI pluralism. Here, we have drawn on other research into AI in educational settings. Still, we've extended it by investigating how debate can serve as a framework for both assessing student work and cultivating durable skills that are crucial beyond the classroom. This dual focus—both the debate-based skill development and the broader implications of AI in education—reflects a comprehensive approach to understanding and enhancing the use of AI in learning environments.

John Hines, Co-Founder of DebaterHub:

"Partnering with Dr. Anand Rao and the DebaterHub Research Group (DHRG) was instrumental in transforming our vision into a research-backed solution. Their expertise and collaborative approach helped us refine augmented debate-centered instruction (ACDI) and provided the rigor and credibility needed to secure a substantial NSF-SBIR research grant. This grant will allow us to deploy and test ACDI on a larger scale, a milestone we could not have achieved without Dr. Rao and the research team's invaluable guidance and support. Their contributions have positioned us to make a meaningful and lasting educational impact."
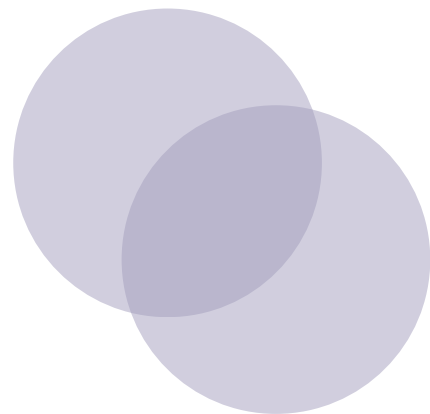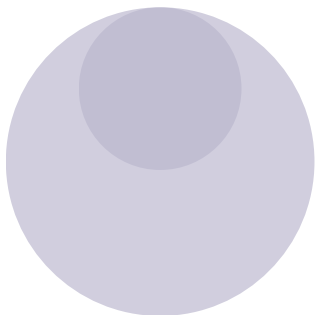
CASE STUDY 2

Dr Helen Ross

1. What was the core problem the company faced, and how did your project address it?

I was contacted by one of the UK distributors of Lili for Life, Douglas Stewart, with a view to carrying out a small-scale study to demonstrate how the lamp can work for students with literacy challenges and who have visual stress. I had previously done some work with colleagues from Douglas Stewart on another product, which had been viewed favourably and generated some really useful data that could be used for marketing.

Given that I had done this work, Lili for Life hoped to work with me to explore the benefits of reading using the lamp. The focus was on how the 'stroboscopic effect' impacted both on students' experiences of reading as well as any effects on their reading attainment.

We also wanted to explore children's feelings about the lamp, and where possible their family's/teacher's views. This project was undertaken to develop case studies about the lamp which could be then used in marketing activities; while 'big data' is important in understanding quantitative impacts of products, having personal stories is also helpful for practitioners when deciding whether to embrace those products. This project hoped to fill that gap.

2. How did the collaboration unfold? Were there any challenges or notable moments?

After I had been introduced to Bertrand and Hafed at Lili for Life, the project developed organically. After a little to- and fro-ing about what they wanted to explore, we defined the project brief, set the timeline and budget, alongside the outputs at the end of the project. I am lucky enough to have a few contacts in a few schools, so I was able to contact them to arrange to talk to a few families about participating in the project, and then I spoke to a few students. One student and their family declined to participate, which I always few favourably. Where people say they don't want to participate in a project, it says to me that they are not feeling coerced or pressured; ethically I really value people saying no! One student was ill for a session so we had to work online with them, but they and their family were incredibly gracious about that! Aside of that, the project was great and ran smoothly, to time and with the expected outputs. We were even able to present the project and findings for the first time live at the Dyslexia and Dyscalculia Show 2023, in Birmingham, UK, which was a huge privilege.

3, How did you select your research method and approach?

This project was a small-scale project, which aimed to explore young people's views, so a child-friendly approach was taken. The method and underpinning ethos of all the work I do is grounded in empowering young people with special educational needs, to be able to express their needs, preferences and goals; this was the case in this project. Pia Hardrup Christensen's 'friendly adult' approach was taken, so that I was differentiated from the young people's teachers, but still was acting in the 'expected' role of an adult in their school setting. The project was not a long-term project, with closely controlled teaching input a relatively simple data construction method was developed.

Young people's reading attainment (rate, accuracy and comprehension) was explored both without the lamp and using the lamp with the 'stroboscopic effect' activated. Young people's reading fluency with the lamp on, using and without the stroboscopic effect was also noted to delineate how the stroboscopic effect impacted reading. A Likert scale-based questionnaire allowed for a brief overview of young people's views, which alongside a semi-structured interview gave good insight into their response to the lamp so that case studies could be developed.

4, What was the added value for the company as a result of your work?

From my perspective, as an individual working in the dyslexia/specific learning difficulties and inclusion 'space' in the UK, as well as globally, it was great to be able to present positive findings at a renowned show and to be able share very clear benefits of using the Lili Lamp. The case study approach allowed these positive experiences to shine through. I have been able to share about the product subsequently in both my private practice as a Dyslexia/Specific Learning Difficulties Assessor, consultant and researcher; having outputs and findings from formal study is great because I have been able to share those.

I would say that this is also the case for Lili for Life: having a well-known, independent scholar evaluate their product has been helpful from a marketing perspective, particularly for sharing about the Lilil Lamp with practitioners on the ground.

CASE STUDY 3

Dr. Tahereh Pazouki

1. What was the core problem the company faced, and how did your project address it?

As a solo founder with no team and limited funding in the beginning, the core challenge I faced was gaining visibility and traction for our innovative and inclusive approach to early childhood education. To address this, I actively participated in various competitions and conferences, using these platforms to present our research, the results of Magrid Learning Solution, and its potential impact on young learners.

This strategy not only allowed me to share our story, vision, and mission but also helped to attract significant attention. It enabled me to find my co-founders, win awards that provided essential financial resources, and gain visibility that led to our first and second clients. These efforts laid the foundation for securing investors who believed in Magrid's mission to transform learning outcomes for children with diverse needs.

2. How did the collaboration unfold? Were there any challenges or notable moments?

The collaboration for Magrid Learning Solution unfolded gradually. While we faced challenges in the beginning, we made significant strides thanks to the scientific studies and findings we had gathered. These results were instrumental in building trust and establishing partnerships with educational institutions.

Notable moments included presentations at conferences where we showcased our research and impact of Magrid on early childhood education. These opportunities helped us gain visibility, attract interest, and foster collaborative relationships that were crucial for our growth as a startup. Overcoming the initial hurdles proved rewarding, as it laid the groundwork for successful partnerships that continue to drive our mission of enhancing learning outcomes for all children.

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3. How did you select your research method and approach?

In selecting the research method for Magrid Learning Solution, we opted for a controlled trial using a pre-post test methodology to evaluate our impact effectively. This approach allows us to compare outcomes between an intervention group, who received Magrid training, and a control group that continued with business as usual. The reasoning behind this choice is that it enables us to assess the specific effects of our program on cognitive development, Maths and learning outcomes. By measuring the students' skills before and after the training, we can determine how much progress can be attributed to the use of Magrid.

Furthermore, our methodology is grounded in the Science of Learning, which highlights the importance of utilizing evidence-based practices that are tailored to how children learn best. This ensures that our research not only provides valuable data but also informs ongoing improvements to the Magrid program based on proven learning principles.

4. What was the added value for the company as a result of your work?

The added value for the company as a result more than 6 years of research and development can be encapsulated in a powerful quote from Anna Scannell, the Mathematics Specialist Teacher at the International School of Luxembourg. She remarked, "People who made Magrid really deeply understand the conceptual landscape of early mathematics. They know each step on the journey that a learner needs to make as they encounter these ideas, and they do that using research-based best practices, the kind that we hope to have in our classrooms. Magrid is occupying a really special space and would make a really great addition to any concept-based mathematics classroom."

This testimony highlights how our efforts have significantly enhanced the learning experience and effectiveness of our program.

You can find her testimony on the Magrid Youtube Channel.

CASE STUDY 4

**Smart Kidz Club
Adrian Pasquarella, Ph.D.,
Associate Professor of
Literacy Education, School
of Education, University of
Delaware, USA**

1. What was the core problem the company faced, and how did your project address it?

Smart Kidz Club, a Delaware edtech company, in collaboration with researchers at the University of Delaware and education stakeholders, sought to address a persistent challenge in early language and literacy development: ensuring equitable access to high-quality, engaging, and research-based reading materials for young learners, particularly in underserved and linguistically diverse communities.

Many children in low-resource settings lack access to age-appropriate and culturally relevant books. Limited exposure to print-rich environments significantly impacts their vocabulary acquisition, comprehension, and overall literacy skills. Additionally, educators and parents often struggle to find interactive and developmentally appropriate digital resources that support early literacy and language development without distractions from ads, animations, or games.
To address these challenges, two major initiatives were launched: Early Learning Library, launched in 2024 and Namibia Reads, which celebrates 5 years in March 2025. Both projects leverage digital technology to provide curated, interactive, and accessible eBooks, enabling children to engage in self-directed reading while also supporting educators and families in creating robust home-literacy environments.

The Early Learning Library focuses on bridging the digital divide in the U.S. by providing a mobile library aligned with early learning principles and educational standards that connects teachers and parents in a virtual library. Namibia Reads, on the other hand, is a nationwide initiative providing open-access digital books to improve literacy outcomes in Namibia. Both projects support English acquisition and content knowledge learning.

2. How did the collaboration unfold? Were there any challenges or notable moments?

The collaboration between Smart Kidz Club, the University of Delaware, and educational stakeholders is iterative and dynamic, ensuring that the digital libraries meet the real and evolving needs of children, parents, and educators.

In the Early Learning Library, designed with a home-school connection, the partnership involved co-developing the app with families and teachers in Head Start programs and community centers. Initial pilot programs revealed the importance of usability, parental engagement, and mobile accessibility. Smart Kidz Club adapted the library's interface and features based on teacher and caregiver feedback, ensuring an intuitive and inclusive experience. Pilot studies are on-going with a plan to scale.

Namibia Reads began as a response to the COVID-19 pandemic when school closures highlighted the need for equitable access to educational resources. The partnership is spearheaded by Namibia's Minister of Education, Innovation, Youth, Sport, Arts & Culture (formerly Ministry of Education, Arts and Culture), with active engagement from teachers, librarians, and policymakers. The project encountered challenges such as limited access to hardware (e.g., tablets and smartboards), as well as a strong demand for materials on research-based assessments and instructional practices, and materials in indigenous languages. These challenges are leading to innovative solutions such as professional development resources, multilingual books, and more locally relevant content.

3. How did you select your research method and approach?

We adopted a mixed-methods approach to provide a comprehensive and holistic understanding of how educational technology can support learning communities. Our goal was to understand users' strengths and needs while collecting evidence on usability, feasibility, and the potential impact on language, literacy, and content knowledge. By integrating multiple data sources, we aimed to develop an inclusive and scalable model for digital literacy interventions.

The methodology included:

- Usage and Engagement Metrics: Tracking the number of users, reading frequency, book selection patterns, and session duration to assess adoption and engagement.
- Qualitative Data Collection: Conducting semi-structured interviews and focus groups with educators, librarians, and parents to gather insights on app usability, feasibility, and impact.
- Experimental and Longitudinal Evaluations (in development): Assessing gains in vocabulary, comprehension, and early literacy outcomes through structured intervention studies.

In the Early Learning Library, the approach was informed by research on shared reading and home literacy environments, with a strong focus on increasing time spent reading and fostering meaningful parent-child interactions. The app is being co-developed with educators and families to create an equitable and sustainable educational toolkit, ensuring that all children, regardless of background, have access to high-quality literacy resources.

For Namibia Reads, the project focused on open access for all citizens, conducting a comprehensive needs assessment, and fostering partnerships with different regions to co-create a plan for supporting language and literacy instruction in schools and libraries. The research team is collaborating with local stakeholders to ensure the initiative is tailored to the specific educational and linguistic needs of communities across Namibia.

4. What was the added value for the company as a result of your work?

Smart Kidz Club gained significant educational validation and impact-driven insights through this research partnership. The findings directly influenced product development, user experience enhancements, and strategic expansion efforts.

4, What was the added value?

Refined Content and Features: Insights from educators and parents led to app improvements such as connected teacher-parent interface and interactive learning activities.

Stronger Market Positioning: Being recognized as a research-based ed-tech solution has bolstered credibility and positioned Smart Kidz Club as a leader in digital literacy innovation.

Increased Engagement and Adoption: The research findings informed marketing and implementation strategies, leading to higher adoption rates in Head Start centers, libraries, and schools.

Grant and Funding Opportunities: The evidence supporting the impact of these digital libraries has strengthened funding proposals, leading to major grant applications (e.g., NSF DRK-12, IES, foundation grants).

TESTIMONIAL FROM OUR RESEARCH PARTNER IN NAMIBIA

"Namibia Reads has made a profound impact on literacy development in our schools and libraries. By providing offline access to a wealth of high-quality reading materials, we are transforming early literacy support for thousands of children. Every day, teachers and librarians witness firsthand how this resource is fostering a love for reading among students who previously had limited access to books and technology."

– Namutenya Hamwaalwa (Deputy Director) & Aletta Dunn (Chief Librarian for Public Libraries), Namibia Library and Archives Service

The Early Learning Library and Namibia Reads projects exemplify how research-industry partnerships can drive innovation in EdTech, ensuring that technology serves as a scaffold rather than a substitute for meaningful learning experiences. By leveraging Science of Reading and Learning principles, co-developing with communities, and using data-driven refinements, these digital libraries are reshaping access to literacy education for children worldwide.

Smart Kidz Club and the research team continue to seek new partners, grants, and research collaborations to further expand and enhance these transformative literacy initiatives.
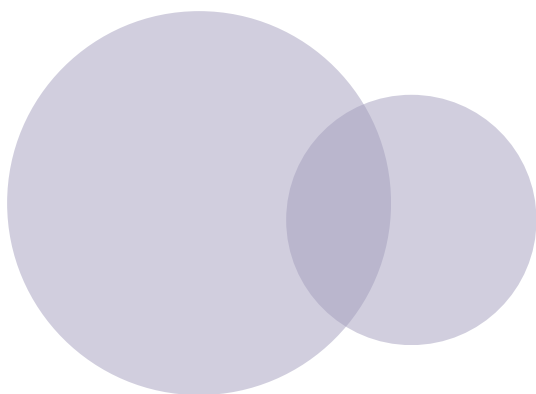
CASE STUDY 5

Adam K. Dubé, Director of the Technology, Learning, & Cognition Lab, McGill University, Canada and Chu Xu, Robin Sharma, Tania Tan

1. What was the core problem the company faced, and how did your project address it?

Ubisoft's Discovery Tour games—educational versions of the popular Assassin's Creed series—are among the most richly developed commercial games with historical and educational value.

Despite their potential, Ubisoft faced a significant barrier: the widespread adoption of these games in formal education was limited. While the games were well-received by the public and educators conceptually, actual classroom use remained low. Teachers reported a lack of confidence and clarity on how to meaningfully integrate the games into curriculum-aligned lessons.

Our project addressed this problem by creating and testing three comprehensive, theory-driven digital curriculum guides for Discovery Tour: Ancient Egypt, Discovery Tour: Ancient Greece, and Discovery Tour: Viking age. These guides were designed to support teachers in building the knowledge (TPACK) and acceptance (TAM) necessary for adopting game-based learning. They mapped game content to specific learning outcomes across subject areas and grade levels, offered customizable lesson plans, and provided scaffolding to navigate the games' features effectively.
They are freely available to educators here:

https://www.ubisoft.com/en-us/game/assassins-creed/discovery-tour/curriculum-guide/curriculum-guide

2. How did the collaboration unfold? Were there any challenges or notable moments?

The collaboration with Ubisoft was structured, iterative, and highly productive. The project was initiated through a Mitacs Accelerate grant, which supported two graduate researchers to work alongside Ubisoft's Montreal-based team. Ubisoft provided unprecedented access to internal documentation, design schematics, and expert insights from the game development team, which enabled an in-depth analysis of learning mechanics within the games.

One notable moment was the collaborative creation of the web-based curriculum platform. Ubisoft not only supported the project with technical documentation and playtest access but also contributed their web development resources to transform the static curriculum into a fully interactive digital tool. This joint effort led to a "first-of-its-kind" experience for teachers, allowing them to create custom lesson plans directly on the Ubisoft platform.

Challenges emerged primarily around aligning educational research methodologies with the production timelines and user experience expectations of a commercial game developer. However, the shared goal of increasing the educational value and accessibility of Discovery Tour helped both teams find common ground.

3. How did you select your research method and approach? Please describe the reasoning behind your choice.

Our approach was explicitly grounded in the Science of Learning, particularly in how teachers acquire technological pedagogical content knowledge and build confidence in using educational tools. We structured our project around three key theoretical frameworks: TPACK (Technological Pedagogical Content Knowledge), TAM (Technology Acceptance Model), and LM-GM (Learning Mechanic–Game Mechanic framework).

We chose a mixed-method, sequential explanatory design to capture both measurable impacts and nuanced teacher perceptions. This involved:

- Quantitative Phase: Between-subjects experiment with ~200 teachers in total who either used the curriculum guide or did not, followed by standardized surveys measuring TPACK-G and TAM.
- Qualitative Phase: Semi-structured focus groups to explore how teachers interpreted and experienced the guides and how these influenced their instructional intentions.

This dual-phased method allowed us to assess not only whether the guides improved teacher self-efficacy and acceptance of Discovery Tour, but also why and how this happened from the teachers' perspectives.

We also applied the LM-GM framework to identify learning-rich activities within the games. This structured analysis enabled us to extract gameplay elements with pedagogical potential and organize them into curriculum-aligned experiences that facilitated knowledge transfer—an essential goal of effective educational design.

4. What was the added value for the company as a result of your work?

The project created significant value for Ubisoft in several key ways:
- Increased Accessibility: By translating complex gameplay into teacher-friendly, curriculum-aligned materials, the project opened the door to classroom adoption, particularly by educators with limited gaming experience.
- Scalable Design: The modular structure of the guides and their integration into Ubisoft's online ecosystem created a scalable tool that can support educators globally.
- Market Differentiation: The project provided Ubisoft with empirical evidence of the educational value of Discovery Tour, supporting its positioning as not just a game developer but a leader in digital learning innovation.

Moreover, the academic validation of the guides through peer-reviewed publication strengthened Ubisoft's credibility in the educational sector and expanded their ability to participate in teacher professional development events and policy conversations about educational games.

"This collaboration allowed us to bridge the gap between game design and classroom practice. The guides are more than teaching tools—they're a gateway for educators to see how entertainment media can drive meaningful learning."

Antoine Guignard, Ubisoft's education lead

CASE STUDY 6

**Adam K. Dubé,
Sabrina S. Alam**

1. What was the core problem the company faced, and how did your project address it?

Zapzapmath, a developer of educational math games, recognized a significant challenge in the educational app market: many existing math apps lacked grounding in educational theory and were not aligned with core curriculum standards.

This gap particularly affected children with math learning difficulties, as most apps focused on rote skills and included distracting animations, offering limited pedagogical value. To address this, Zapzapmath and our team aimed to create a high-quality, theory-driven educational game that would support children aged 5–8 in developing foundational numeracy skills, specifically magnitude representation (MR).

Our project collaborated with Zapzapmath to design an app rooted in the learning sciences, aligning game mechanics directly with evidence-based principles. We integrated meaningful MR tasks, clear feedback, progression systems, and engaging—but not distracting—rewards to support skill acquisition through repeated practice.

2. How did the collaboration unfold? Were there any challenges or notable moments?

The collaboration between our academic research team and Zapzapmath was both iterative and productive. Early in the partnership, both parties agreed on the importance of creating an app that was not only commercially appealing but also adhered strictly to research-based design principles. This commitment marked a departure from many industry-led projects where learning outcomes are often secondary to engagement metrics.

A key challenge was balancing the demands of educational rigor with the commercial realities of monetization. For instance, while Zapzapmath required in-app purchases and ad-based models, we negotiated to ensure that the educational core of the app remained freely accessible. A particularly meaningful milestone was the co-development of the app's progression system, which increased difficulty based solely on MR ratio complexity, ensuring that the skill being trained remained central throughout the game.

Additionally, we collaborated on crafting the app's App Store description, drawing from prior research on app discoverability and quality indicators to transparently communicate the app's theoretical basis and developmental goals—an uncommon practice in mainstream app listings.

3. How did you select your research method and approach?

Our approach was explicitly grounded in the Science of Learning. We adopted a multi-level theoretical design framework that incorporated several key educational principles. The Learning Mechanics–Game Mechanics (LM–GM) framework ensured that every game element served a pedagogical function. We employed direct instruction as the pedagogical model, based on evidence that MR skills improve through repeated exposure with reinforcement. Cognitive load theory guided us to minimize distractions and focus children's attention on core numerical concepts.

Furthermore, we adhered to principles of math accuracy and richness to ensure tasks were developmentally appropriate and conceptually grounded. Further, we published a paper as a design case and the app was developed with built-in analytics to allow for future studies assessing engagement, learning outcomes, and usage patterns. Starting with a theory-driven design was intentional; our goal was to demonstrate how learning theories can be practically applied in a commercial product—a step often overlooked in the rush to market.

4. What was the added value for the company as a result of your work?

The collaboration added substantial value to Zapzapmath in several key areas.

Firstly, the app distinguished itself in a crowded market by being grounded in the Science of Learning and aligned with Common Core mathematics content, providing Zapzapmath with a unique value proposition for school partnerships and parent-focused marketing.

Secondly, the detailed documentation produced through our collaboration, published in Educational Technology Research and Development, outlined how every design decision aligned with evidence-based practices. This transparency positioned Zapzapmath as a credible player in the educational tech space.

Lastly, the inclusion of a data tracking backend and notification system allowed for longitudinal engagement and opened the door to future A/B testing and research collaborations, critical for the app's sustainability. As the development team at Zapzapmath noted, working with educational researchers enabled them to shift from merely building engaging games to creating effective educational tools, bringing long-term value not only to the app but to their future product line.
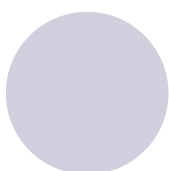
CASE STUDY 7

**Adam K. Dubé,
Run Wen**

1. What was the core problem the company faced, and how did your project address it?

Ululab, a Montreal-based developer of the Math Makers game, was committed to improving children's math learning experiences through digital games. However, despite high-quality animation and curriculum-aligned content, the company faced a critical challenge: how to systematically design game features that not only improved math performance but also positively shaped students' attitudes toward mathematics. This was especially urgent given evidence that children's math attitudes tend to decline as early as elementary school, negatively affecting performance and long-term academic choices.

Our project, in collaboration with Ululab, addressed this gap by investigating the effects of specific game features—particularly incentive systems—on children's math attitudes.

Drawing from Run Wen's dissertation, we employed a rigorous, theory-based value-added approach to test whether integrating a reward system into Math Makers could measurably improve students' confidence, enjoyment, and engagement with mathematics. Two versions of the game were developed and tested: a base version and a version enhanced with a carefully designed incentive system. This allowed us to evaluate whether the added feature led to meaningful improvements in math attitudes and in-game performance.

2. How did the collaboration unfold? Were there any challenges or notable moments?

The collaboration between the academic team and Ululab was close and productive, with mutual respect for each other's expertise. Ululab provided essential development support, including creating and modifying two game versions to enable experimental testing. They also implemented backend analytics to track detailed in-game behaviours, which proved invaluable for the study.

One of the most notable moments in the collaboration came during the early playtesting phase. While the research team had hypothesized that incentive systems would boost motivation, early data revealed that not all reward systems were equally effective—some could even distract from learning. This led to a series of redesigns where Ululab adapted the visual and audio feedback of rewards to ensure they enhanced rather than disrupted the math learning experience. The company's openness to iterative design based on educational data was key to the project's success.

Challenges emerged primarily around aligning the academic timeline (ethics approvals, school recruitment, and publication processes) with Ululab's agile development cycles. Nevertheless, both sides worked flexibly to maintain the research rigor while accommodating real-world production constraints.

3. How did you select your research method and approach?

The research design was directly informed by the Science of Learning, with particular attention to Control-Value Theory (Pekrun, 2006) and the tripartite model of attitudes (affective, cognitive, behavioural). We adopted Mayer's (2019) value-added design method, which involves comparing a base version of an educational game to a version that includes one additional feature—in this case, an incentive system. This approach allows researchers to isolate the impact of that specific feature with high internal validity.

To assess outcomes, we used Run Wen's validated Tripartite Math Attitudes Scale, which measures students' beliefs (e.g., confidence, perceived value), emotions (e.g., enjoyment, anxiety), and behavioural intentions (e.g., willingness to engage in math tasks). This framework allowed for a nuanced analysis of how incentive systems influence various components of math attitudes—not just whether students performed better, but whether they felt better about math.

The study combined pre-post attitude surveys with log-file analysis of in-game behaviours to examine both attitudinal change and learning progress. This dual method approach grounded the findings in both self-reported experiences and objective performance data.

4. What was the added value for the company as a result of your work?

The collaboration delivered several layers of value to Ululab.

First, it provided empirical validation of one of their core game design strategies: using positive reinforcement to improve engagement and learning. By confirming that the addition of incentive systems improved both in-game performance and students' math attitudes, Ululab gained a research-backed justification for expanding such features in future titles.

Second, the findings strengthened Ululab's positioning as a leader in evidence-based educational games. The use of peer-reviewed research methods and validated scales added credibility in conversations with educators, school boards, and potential funders.

Third, the collaboration produced actionable design insights. For example, the study found that visual incentives were most effective when they were tied to task completion and supported feelings of control and competence—an insight Ululab could apply to refine the user experience in Math Makers and other products.

Ultimately, the project advanced both the scholarly understanding of math attitudes and the practical effectiveness of digital games in promoting them.

"This research gave us clear data on what works and what doesn't when it comes to engaging kids in math.
It's a rare opportunity to build directly from academic insights while still shipping great games."

Ululab Development Team
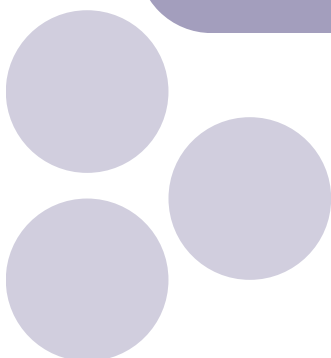
CASE STUDY 8

**Todd Cherner
Program Director, Master of Arts in Educational Innovation, Technology, and Entrepreneurship, Chapel Hill, North Carolina, USA**

INTUIT

1. What was the core problem the company faced, and how did your project address it?

College seniors and recent graduates need essential financial knowledge as they transition from campus life to professional contexts.

The problem they face is that while their institution equipped them with the knowledge, skills, and dispositions needed for professional success, there are gaps in their financial literacy, such as their understanding and ability to navigate student loan repayment options, decide how to invest for their future, and make life decisions that will impact their future financial wherewithal.

Because these individuals are at inflection points where they will begin making these decisions, they need support in these areas.

This partnership between Intuit for Education and The University of North Carolina at Chapel Hill's Master of Arts in Educational Innovation, Technology, and Entrepreneurship (MEITE) program sought to address this challenge by developing a prototype for a game that aims to support individuals when they begin making post-graduation financial and life decisions.

2. How did the collaboration unfold? Were there any challenges or notable moments?

This project unfolded through a collaborative effort between Dr. Lynn Letukas, Intuit's Head of Strategic Programs and Partnerships; Mr. Jared Davidove, Intuit for Education's Head of Product; and Dr. Todd Cherner, Director of the MEITE program. Drs. Letukas and Cherner met through a local professional networking group focused on educational technology and developed a relationship. As they learned about their work in their respective organizations, Dr. Letukas ideated an opportunity for Dr. Cherner's students, who specialize in educational technology with a slant toward product development and design thinking. The idea was to create a role-playing game that simulated recent college graduates' financial decisions as they enter the workforce. Dr. Cherner's program and students aligned well with this opportunity because it offered them a chance to develop a product for a leading company, bolstering the students' credentials for the job market. For Intuit, partnering with Dr. Cherner provided student access, allowing them to gain relevant perspectives on recent graduates' real-life money experiences while also getting critical product feedback. While the stakeholders agreed that the project was well-aligned to the instructional context, some challenges needed to be addressed.

First, because Dr. Cherner's students were novices to product development, Mr. Davidove and Dr. Letukas shared the design thinking methodology used at Intuit and offered best practices they use to develop some of the most widely used products in the United States. This effort helped Dr. Cherner's students understand why it is important to focus on the problem and not just identify a solution.

Second, Intuit provided examples of prior games they have developed to assist students in conceptualizing what a game of this type would look like and how it would function. Dr. Cherner also located other example games online that students played to deepen their understanding.

Third, a well-defined scope of work was needed to minimize "project creep" and ensure that Intuit and Dr. Cherner's students understood the task and deliverables. Mr. Davidove and Dr. Cherner collaborated on drafting the scope of work, which Dr. Letukas then approved. Students read the scope of work, which created clear expectations for the job and set them up for success.

Fourth, selecting technologies that both Intuit and Dr. Cherner's students could access was paramount. That way, when the students completed developing the game, the Intuit team could further evolve and brand it to meet their requirements. This selection included building the game prototype in Figma and using multiple genAI tools to create the content for the game. These choices were intentional because they allowed students to build and develop skills using tools that are commonly employed in industry for product development.

Fifth, the students needed to create realistic and engaging scenarios because these would be the driving force behind the game. In response, Dr. Cherner led his students through rounds of iterative prompting and testing, resulting in the students developing scenarios appropriate for the game.
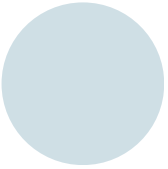
3. How did you select your research method and approach?

Dr. Cherner, his teaching assistant, Ms. Jamie Elsner, and his students used design thinking as the primary method for developing the game, and he divided his students into five teams. Each team started the project by building empathy to understand the problem from multiple perspectives, and the teams studied how individuals worked to navigate financial decisions early in their professional careers. To deepen their understanding, the teams constructed personas of these individuals and empathy maps, allowing them to define the problem further. Next, the teams ideated the form and content of the game while staying within the parameters specified by the scope of work. They then prototyped the game using Figma to build wireframes and conducted user testing internally with the other teams before expanding to their on-campus peers. Dr. Cherner and Ms. Elsner gave extensive feedback during this process. As the teams conducted the user testing, they refined and retested their prototypes based on feedback from their peers, Dr. Cherner, Ms. Elsner, and Mr. Davidove. The project concluded with the students formally presenting their prototypes to Dr. Letukas, Mr. Davidove, and Intuit for Education team members.

### 4. What was the added value for the company as a result of your work?

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""By Partnering with Dr. Cherner and his students, it allowed our team to better understand the daily financial experiences of college students. Because we are not present on campus every day, we do not always have direct insight into how college and graduates interact with money on a daily basis. This collaboration gave us valuable insight and a first-hand perspective that helped us identify and begin to address some of the most pressing financial needs students face as they graduate and start their adult lives."

Jared Davidove
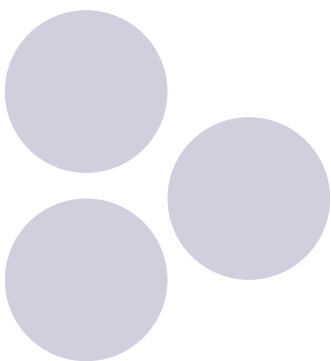
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