Contextualized CALL Products: A Case Study of CALL Academic Entrepreneurs

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ABSTRACT

Despite numerous entrepreneurial products and services capitalizing on the opportunities afforded by CALL, there is a noticeable lack of entrepreneurial perspectives and analyses in CALL-related literature. This study explores four CALL academic entrepreneurs and the CALL products they developed. It aims to identify the distinctive products generated, the target customer base, and the entrepreneurial goals of the academic entrepreneurs. The study highlights that CALL products are highly contextual and are influenced by personal experiences, interests, and professional expertise. The study's findings were utilized to create a CALL entrepreneurial products model. These findings have the potential to inform future research in this area and offer valuable guidance to policymakers and stakeholders seeking to support and foster the development of CALL academic entrepreneurship in diverse settings.

Keywords: Computer-Assisted Language Learning, Academic Entrepreneurship, CALL Products, Entrepreneurial Goals, Target Customers

Introduction

This study aims to employ entrepreneurial approaches to explore four CALL academic entrepreneurs and the CALL products they developed. The central focus of this study is to examine the kinds of products the CALL academic entrepreneurs developed, in addition to investigating their entrepreneurial goals and target customers. In the present study, a CALL academic entrepreneur refers to any individual associated with a university – including faculty members, staff, and students – who has played a major role in the creation of one or more CALL products (Lubua & Kessler, 2022). A CALL product is any tool or service that harnesses the power of cutting-edge technology to facilitate language learning and teaching. This study aims to address the following fundamental queries:

1. What are the products generated by CALL academic entrepreneurs?
2. Who constitutes the target customer base of these entrepreneurs?
3. What are the ultimate entrepreneurial goals of CALL academic entrepreneurs?

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By addressing these essential research questions, this study hopes to contribute to the broader understanding of CALL academic entrepreneurship and to provide invaluable insights into the unique products, target customers, and entrepreneurial objectives of this specialized group of entrepreneurs.

Literature Review

Over the decades, CALL practitioners have shown a remarkable curiosity in leveraging the expanding market by adapting to the ever-evolving technology (Beatty, 2013; Kessler & Hubbard, 2017; Levy, 1997). To meet the emerging instructional needs of 21st-century language learners and instructors, both commercial and non-commercial CALL products have been developed. While many of these products have been created by industrial innovators and entrepreneurs, university-based CALL practitioners have also been involved in developing entrepreneurial CALL products. Well-known examples of CALL products that originated from academic entrepreneurship include Duolingo, Quizlet, Rosetta Stone, Fluenz, Athena Language-Learning Project (ALLP), and Hot Potatoes (Lubua & Kessler, 2022).

Despite the fact that some of the most prominent CALL products have been developed by university faculty and students, there is a notable absence of entrepreneurial perspectives and analyses in CALL literature concerning these products (Lubua & Kessler, 2023). In fact, the majority of publications related to these products do not even acknowledge that they were developed by CALL academic entrepreneurs. Although leading CALL journals prioritize research on product efficacy, there is a dearth of emphasis on the process of bringing the products to market. For instance, a recent editorial in the CALICO Journal highlights a disconnection between research on second language acquisition and the technological products available for language learning (Vorobel & Smith, 2020), despite the projected exponential growth of the online language-learning market (Meticulous Research, 2022). However, the editorial only advocates for CALL product research to focus on the effectiveness of the tool or tools in an authentic language learning context. This perspective limits the potential to motivate CALL practitioners to take on roles as developers of CALL products, instead of solely being consumers.

The creation of value is the ultimate goal of entrepreneurial activities, and some intend to generate monetary value or profit while others are designed to create social values (Kang & Uhlenbruk, 2006; Venkataraman, 1997). The notion of ‘value’, however, is highly unique, subjective, and context-dependent, varying significantly across different entrepreneurial fields (Ardichvili, Cardozo, & Ray, 2003; Baron, 2006). Therefore, only individuals who have immersed themselves in the intricacies of the CALL field can truly comprehend what is considered valuable within that sphere. The literature presents several challenges in CALL, including a shortage of resources, limited opportunities for social interaction, varying learning styles, underutilization of resources, and inefficient deployment of CALL resources (Beatty, 2013; Levy, 1997; Levy & Stockwell, 2013). Lubua and Kessler (2022) argue that rather than fixating on these challenges, educators and learners should concentrate on devising solutions to overcome them, which aligns with the core principles of entrepreneurship that take challenges as opportunities (Baron, 2006; Rose & Patterson, 2016). Skillful and innovative use of computers and technology provides multiple opportunities to address challenges in language learning. Computers and technology can act as personal tutors, teacher's aides, interactive and collaborative tools, and facilitators of meaning-focused learning (Beatty, 2013; Davies et al., 2013), and these are also the key areas where academic entrepreneurship in CALL can be applied (Lubua & Kessler, 2022).

Lubua and Kessler (2022) identify seven areas with great potential for CALL academic entrepreneurship. These include funded CALL-based projects, local language resource centers (LRCs), games and simulations, addressing diverse learners' needs, less commonly taught languages (LCTL), CALL training and workshops, and the rapid technological revolution and the digital divide. CALL projects receive significant funding from government agencies and NGOs, providing resources for creating learning materials, teacher training, and technology for language instruction (Garret, 2009; Kessler, 2017). Language resource centers and labs provide a platform for creating language learning tools and customized equipment (Sebastian, 2020). CALL experts design games and simulations for specific languages and diverse learners' learning styles (Lai, Ni, & Zhao, 2013; Sykes, 2018). Academic entrepreneurs in CALL can also create innovative solutions for addressing the unique challenges facing LCTL, targeting limited resources and technology in this subfield (Robin, 2013). Digital technologies are constantly evolving, making existing learning tools quickly outdated and unusable (Beatty, 2013; Hubbard, 2019; Mose & Lubua, 2017). This creates a continuous need for CALL training to address the frustrations caused by technological changes. It also surges the digital divide, particularly in low-tech contexts, providing an opportunity for CALL innovators and entrepreneurs to create cost-effective, context-sensitive CALL tools that can be modified to meet the changing technological needs (Lubua & Kessler, 2022).

Notwithstanding the prevalence of CALL academic entrepreneurial products in the market, a noteworthy portion of CALL-related research does not incorporate entrepreneurial methodologies in their examination but rather concentrates solely on the practical applications of these products within the CALL domain (Lubua & Kessler, 2022). This is not necessarily a negative thing, as such research can still provide valuable insights into the use and effectiveness of CALL products in language learning contexts. However, it is also important to consider the potential entrepreneurial opportunities that may arise from such research findings, such as the development of new or improved CALL products that better meet the needs and preferences of language learners and instructors. The university plays a crucial role in nurturing new entrepreneurial ideas (Åstebro et al., 2019; Shane, 2004), and as such, should encourage fields such as CALL to take a proactive approach in generating innovative products, exploring untapped markets, and adopting entrepreneurial approaches to study the success of those products (Rose & Patterson, 2016; Shane, 2004). Although CALL has already established itself as a strong field that examines the applications of computers in language teaching and learning (Levy, 1997), the integration of entrepreneurial methods into the study of CALL tools and practices would offer a considerable boost to the field, driving more innovation and productivity (Lubua & Kessler, 2022).

Research Framework

The present study applies the conceptual frameworks of Venkataraman (1997) and McKenzie, Ugbah, and Smothers (2007) to examine the products developed by academic entrepreneurs in the field of entrepreneurship. Venkataraman (1997) argues that entrepreneurship extends beyond the boundaries of the business field. Thus, expanding entrepreneurial studies to encompass other fields, like CALL, should not be seen as creating a territory of the ‘field of entrepreneurship’ that is separate from the ‘sister fields in the business school’. Rather, he suggests that entrepreneurship is a scholarly field that seeks to understand how individuals discover and exploit opportunities to create future goods and services, and what are their resulting socio-economic implications. Similarly, McKenzie, Ugbah, and Smothers (2007) assert that entrepreneurship is primarily concerned with individual actions and the pursuit of economic opportunities within their respective social, political, and economic contexts. Their

framework highlights that entrepreneurial capacity, which encompasses knowledge, resources, and skills, coupled with the drive to exploit opportunities, both influences and is influenced by the actors' intentions and the mode of exploitation employed.

These two frameworks highlight a critical aspect that is also emphasized in numerous other studies: entrepreneurship seeks to provide solutions to existing problems or needs in the community and the products created must fulfill this objective (Ardichvili, Cardozo, & Ray, 2003; Manion, 2002). Additionally, there is a significant correlation between opportunities, objectives, and outputs, which holds immense significance in entrepreneurship (Manion, 2002). This research employs these theoretical underpinnings to scrutinize the products engendered by CALL academic entrepreneurs. The study aims to provide a deeper understanding of the nature of CALL academic entrepreneurship products by exploring the factors that contribute to their development.

Research Design

This study employed a case study technique which is deemed appropriate for an inquiry whose goal is to provide an in-depth understanding of the phenomenon (Yin, 2014). The study utilized purposeful sampling strategies, including criterion, convenience, and snowball sampling, to select four participants from language-based departments and other academic units in USA universities who are or had been successful CALL entrepreneurs. A triangulation of diverse data collection instruments was utilized, including interviews, direct observation of CALL products, and collection and analysis of physical artifacts and documents. This study utilized semi-structured interviews, which were designed to be fluid and not rigid. The interview questions were adapted from Lindsey (2009), and interviews were conducted for between 90 and 180 minutes. Observations of the products and analysis of physical artifacts were used for getting a broader perspective of the CALL products. Overall, this study's rigorous methodology provided valuable insights into the products developed by the selected CALL academic entrepreneurs.

The study utilized inductive data analysis techniques for qualitative data analysis. After the interviews were transcribed and data in other forms were digitized and converted into texts, they were coded thematically using MAXQDA to condense raw textual data into a concise and manageable summary and link findings to research objectives. Each participant in this multi-case study was treated as an individual case, and the study employed the Yin (2014) multiple-case analysis model which suggested a two-phase analysis of multi-case studies. The first phase involved a case-by-case analysis, and the second phase involved a cross-case analysis of data which involved drawing significant theme-based similarities and conclusions. Validation strategies including triangulation, member checking, and peer debriefing were utilized to ensure the results were well-founded and trustworthy.

Research Findings

Brief Description of Participants and Their Entrepreneurial Engagements

This section provides an overview of each of the four CALL academic entrepreneurs who took part in this study. These entrepreneurs represent a diverse range of backgrounds, expertise, and products or services offered. Despite their differences, they share a common goal of leveraging their knowledge and skills to create innovative and effective language-learning tools.

Nuru

Nuru is an accomplished professor at a prominent US institution who has made significant contributions to the development of African language learning resources. Recognized as one of the pioneers of the field of African language pedagogy in the US, Nuru's expertise in African languages, African studies, and linguistics is evident through extensive research, publications, and engagements as a speaker. Despite having no formal background in business or economics, she considers herself a self-made academic entrepreneur. She is involved in academic entrepreneurship related to languages, including CALL activities for Swahili and Yoruba digital resources. The Swahili multimedia language learning program, her first CALL-based product in the early 2000s, received a grant from the Department of Education.

James

James is an adjunct instructor in the instructional technology program at a public university in the mid-west, and his research interests are in edutainment, CALL, and digital game-based language learning. He has an MA in Linguistics with a concentration in CALL and has worked as an associate director of the Language Resource Center (LRC) and a visiting ESL instructor at his university. It was during this time that he pursued a Ph.D. in instructional technology, which he completed a year before being interviewed for this study. He became involved in CALL entrepreneurial activities during his MA program and continued during his time in the LRC and as a visiting lecturer. To focus on these activities and his Ph.D. studies, he decided to quit teaching and become a full-time student. His research interests include edutainment, CALL, and digital game-based language learning. James created robotic resources and simulations to teach English and provided training to help bridge the technology gap for marginalized areas. He collaborated with five other faculty members to develop VISIT (pseudonym), an augmented immersive simulation technology for learning languages. James provided teacher training for language games and CALL, including a Google Plus Minecraft server for English language teachers. He aimed to help teachers with limited creativity in technology-rich environments.

Vana

Vana is an experienced ESL/EFL teacher with over 40 years of experience in CALL training, software development, and education technology innovation. He advocates for transformative changes in higher learning and staying up-to-date with advancements in information and communication technology. After working as an ESL instructor in Texas and a CALL coordinator in the Middle East in the 1980s, he completed an MA in ESL with a focus on computer systems and language learning in Hawaii. After that, he continued working in the Middle East as an English instructor while holding CALL-related positions in software design and curriculum development. Vana considers himself a CALL entrepreneur and offers web-based CALL training, online communities of CALL practice, eLearning, and computer software. Vana's entrepreneurial journey started by developing a text manipulation program for language learners and founded an online community of English teachers and learners, which later became a community-based entrepreneurial initiative. He also started a course on social media-assisted language learning (SMALL), organized online international conferences, and introduced an online writing network and a professional development podcast series. His latest initiative is a Massive Open Online Course (MOOC) to help language teachers develop game-based teaching skills. Vana's entrepreneurial passion is to bring together CALL practitioners to share their experiences, challenges, and concerns in language teaching and learning.

Jane

Jane is an associate professor of applied linguistics and the director of a National Resource Center (NRC) focused on innovation and innovative pedagogy in language teaching and learning. She earned a master's degree in linguistics in 2002, during which she also worked as a Spanish instructor. She later completed a Ph.D. in Second Language Acquisition in 2008 while continuing to teach Spanish. Jane's academic interests are focused on designing, building, implementing, and evaluating digital language learning platforms and augmented-reality digital games for use in institutional and non-institutional language learning contexts. Jane develops language learning products through her NRC and finds partner organizations to fund them. She has developed about 22 language learning products, including mobile language learning apps and online portfolios on which this study will focus. Jane's focus is on providing immersive communicative language learning and pragmatics, as well as standard-based online tools for student portfolios and self-reflection.

CALL Academic Products

The research examined CALL academic products tailored to meet diverse needs, such as professional development, self-instruction, robotic instruction, and online learning resources. Categorically, these CALL products can be grouped into two major categories and four subcategories based on the methods by which their intended customers access them. This categorization is as follows:

Tool-based CALL Academic Entrepreneurial Products

Type I/Mobile CALL Product. The tools under this category offer users unrestricted access across physical locations, and they include mobile apps, games, web-based language learning, and other digital resources such as CDs, which are portable and transferable. These products provide customers with complete flexibility of use, whether through mobile devices, computers, classrooms, or language labs. These tools are designed to be accessed and used by learners in accordance with their individual learning needs and goals. Falling under this category, are Nuru's web-based courses which were also made accessible through CDs and other digital means to customers who did not have constant internet access. She says, "As I said they were used by the military or in the field. At that time technology was not so good that you could easily access the material online. If they had the CDs, they could just use the CDs instead of worrying about connecting to the internet. They can have the CDs in their car, and they can listen to them." Jane's web-based and mobile apps also belong to this type of CALL products. Her mobile app for learning Spanish offers mini-games and digital materials for engaging learning, while her e-portfolio tool helps learners set goals, track progress, and showcase their language skills and intercultural competence. It is adaptable to different language backgrounds and skill levels, built on the NCSSFL-ACTFL Can-Do Statements framework.

Type II/Immobile CALL Products. The tools in this category include those that are stationed at a specific site, rendering their utilization subject to the presence of their users in that actual location. This category encompasses all the tools that are intended solely for use within the confines of classroom settings or laboratories. In the study, James and his associates built a simulation structure, VISIT, within one of the language labs, thereby restricting the target audience's accessibility to the site's actual location. The simulation was exclusive to his university, and any other interested customer would need to build a simulation structure of their own. James says, "It's a little alcove in one of the rooms, and we have projectors on all three walls, so students can kind of step into that space, and they're surrounded by a giant computer screen." According to James, several other robotic tools that he has created fall also

into this category. Vana also created computer software that could only be at the university computer lab with a local-area network (LAN) or installed on a personal computer. Vana says, "people could download the zip files through FTP. This allowed anyone with an internet connection to get the shareware version of our software. Not everyone was on the Internet back then, so this whole collection was put on CD-ROMs distributed at TESOL conferences at the CALL-IS EV."

Service-based CALL Academic Entrepreneurial Products

Type III/CALL Training Services. This category of CALL products/services primarily comprises informal CALL training and professional development initiatives and projects, which are organized in small groups to tackle specific or general CALL issues. Vana and James have ventured across various countries to offer such entrepreneurial services. James says, "Usually I end up in South America, and I go down there, and I work with teachers on using technology in the classroom. I did a project in October where I was in the Czech Republic doing the same thing."

Type IV/Community-Based CALL Services. In this type, we find all the collaborative communities of CALL practices, including online communities of teachers and students, social groups, and other groups of teachers and learners. These products and services bring together CALL stakeholders to discuss, learn, and share their CALL experiences and challenges with one another. By doing so, these tools and services help CALL instructors learn about new instructional tools that could be valuable in their language classrooms while also sharing the tools that they have found to be useful. The entire learning process is informal, with no hierarchy among members. All members help each other to learn and share their knowledge, allowing for a non-hierarchical learning experience. Vana is an excellent example of an entrepreneur who created services that fall under this category. As Vana describes, his products brought "communities to learn from each other in a community-based effort."

Table 1 summarizes the CALL product categorization by CALL academic entrepreneurs who participated in the present study.

Table 1.

A Summary of Types of CALL Entrepreneurial Products

Group	Brief Description	Example
Type I CALL Products (Mobile CALL)	The products whose usage is not limited to specific locations. They can be used in the classroom, in the language lab, at home, and anywhere students feel convenient.	Nuru's web-based language courses, Jane's web-based and mobile games, Vana's online courses
Type II CALL Products (Immobile CALL)	The products whose usage is limited to a fixed physical location like in classroom or language lab.	James's robotic tools and simulation structures.
Type III CALL Products (CALL Training Services)	Online and face-to-face CALL services such as informal CALL training and workshops.	James and Vana's CALL Training Services.
Type IV CALL products (Community-based CALL services)	Online and traditional social groups for sharing CALL experiences and challenges. No principal trainers, but all the members participate in informal knowledge acquisition and sharing.	Vana and James' online communities of CALL practice.

Product Cost

A noteworthy finding in the present study is that the majority of CALL products developed by the CALL academic entrepreneurs were offered to users free of charge or just for a very little fee. Nuru's web-based Swahili language learning product was sponsored by the Department of Education, making it publicly accessible. James likewise offered his services on a pro bono basis, although he occasionally received a modest honorarium and charged fees for third-party materials utilized in his services. He asserts that he harbors no intention of commercializing his materials, perhaps due to his limited understanding of their market value. James derives inspiration for the majority of his projects from the online community of practice, where individuals readily share their ideas with him without charge. This collaborative ethos underscores the collective endeavor to enhance computer-assisted language learning (CALL) outcomes and reflects a laudable commitment to the principles of knowledge sharing and open access. James says:

> I'm very like let's share everything sort of mindset. Also, one of the reasons I like to give my things away is I rely so much on the community of practice and the affinity spaces on the internet where other people have given their ideas away. … If they're giving their ideas away, I need to be giving my ideas away.

Like James, Vana's unwavering commitment to promoting accessible language education is evident in his provision of community-based computer-assisted language learning (CALL) services, which include a range of Massive Open Online Courses (MOOCs). Notably, Vana does not charge any fees for these services, reflecting his steadfast belief in the transformative potential of CALL to facilitate language learning among diverse populations. When queried about his pricing policies, Vana says, "No. Not really! I'm not really. I'm a very open-source kind of person. I think I'll get paid in karma." One of the reasons he does not sell his services is the fact that he also learns a lot from the people in his social communities. He says, "So you get into the community, and you learn from people in your community that you interact with, and, believe it or not, it helps you get your next job because you stay on top."

Sometimes, certain products or their variations require a fee to use. Jane's online portfolio tool charges $2 per student per year for individual use, and is also available for sale to institutions such as schools, universities, school districts, and states. On the other hand, the mobile game/app can be downloaded for free but offers in-app purchases for users who want to progress faster within the game. Vana distributed his computer software in a form of shareware, where people could acquire the software for free, and if they liked it, they would pay for it and obtain a license. He says, "we produced a version of our software that let people know this was unlicensed shareware and when they paid for it they would receive a version that had no such notice." The licensed copy was available at three prices: $50 for a single-user copy, $80 for a site-licensed copy, and $110 for a site-licensed copy with some added features. Similarly, customers who wished to obtain Nuru's product in CD format were responsible for covering the costs related to production and shipping. Nuru says, "we ended up putting them on CDs because there were some schools that could not access it online. If someone requests them, they would have to pay the costs of producing those CDs but not the costs of the materials." These expenses amounted to approximately $400 for the 20 CDs included in the product.

Target Customers of CALL Academic Entrepreneurship

The intended customers of CALL products and services were both learners and educators, contingent upon their deployment in a classroom or non-classroom setting. For instance, in the early stages of his entrepreneurial pursuits, James envisioned classroom language instructors as his primary target audience. His rationale stemmed from the belief that these educators are most frequently confronted with technological impediments, such as lack of access or inadequate knowledge of technology usage. He aimed to provide low-cost CALL products and services to support classroom teachers in marginalized school districts, who may not have the resources to purchase expensive language technologies. Through CALL training and workshops, James believed that he could help teachers who lack the necessary knowledge and skills to integrate technology effectively into their classrooms, indirectly benefiting classroom learners by improving the quality of their language education. He says "[My target customers are] predominantly teachers and by extension, their students in low resource settings… not more research-focused teachers but teachers in the classroom because they're the ones who are involved with the students on a day-to-day basis." Similarly, Vana's training and community-based CALL services were directed toward practitioners who engage in CALL within classroom settings.

On the other hand, Nuru and Jane's key customers were individual language learners in institutional settings, although even teachers could use these products for diverse pedagogical needs. Nuru's products were tailored toward students enrolled in US-based higher education and K-12 institutions. Nuru believed that her product would be beneficial for individualized learning projects, catering to self-learners and those who lacked access to institutionalized learning. Nuru says, "my primary target was all the institutions of higher education that were teaching Swahili and Yoruba. But also, we had a hope that we could move this to the primary and high schools, [and] at the same time for the individuals who did not have an opportunity to be at institutions." Jane's products aimed at K-16 learners who, according to her, "are really looking at integrating goal setting and reflection as a part of their everyday teacher teaching and learning practice." Her mobile applications were developed to serve both commercial and educational markets, but their primary focus was on self-directed learners.

As an integral component of their triumphs, each of the four CALL entrepreneurs recounts instances where their products were offered to customers who were unanticipated at the conception of the entrepreneurial idea. For example, Nuru had received orders from European

countries, a development that had taken her by surprise. Similarly, during the interview, it was noted that Jane's online portfolio product boasted a user base of approximately 60,000, which spanned not only across the United States but also globally. In addition, Jane's product gained popularity among educators who utilized it to cater to a diverse range of pedagogical needs. James and Vana alike, initially thought they could only reach practicing classroom instructors in the US, but their services attracted stakeholders elsewhere. For James, this led to getting opportunities to work on international projects like travelling to South America to train teachers. According to James, he was thrilled to realize that his entrepreneurial initiatives attracted people and authorities he had never expected and that teachers elsewhere faced similar technology challenges. He says, "I think it's really important to think about how a teacher in Tanzania and a teacher in Peru might have the exact same problems in their classroom, but they just don't communicate."

CALL Academic Entrepreneurial Goals

The products created by the academic entrepreneurs in this study exquisitely exemplify their aspirations to tackle a multitude of challenges encountered by both teachers and learners. Specifically, the CALL products aimed toward learners proffered solutions to a myriad of impediments encountered by the learners during the learning process, while the products targeted at teachers imparted invaluable CALL knowledge, skills, creative expertise, and tools for their pedagogical needs. In the following paragraphs, specific learner-based and teacher-based CALL issues are further described.

Learner-Based CALL Issues

The following are some of the learner-based problems the CALL products were trying to address:

Facilitating Independent Learning. Institution-based learning may not cater to the unique learning requirements, preferences, and pace of individual students, who may aspire to complete an intensive curriculum in a shorter timeframe. However, the absence of curriculum-based web-based courses presented an obstacle to their learning objectives. For instance, even though Swahili is the backbone of the field of African Language pedagogy, it still lacked a digital inventory that would cater to the needs of 21st-century learners. At the time, there was no any Internet-based African language program that was openly accessible. Nuru noted that the absence of web-based courses for Swahili and other less-commonly taught languages (LCTLs) in higher learning institutions resulted in a constrained "hour-to-hour" system that did not align with the schedules of language students in higher education who have demanding academic commitments. She says, "we were teaching the language on schedule, and when we had the quarter system it was 50 minutes a day. So, I wanted to change the learning of the language based on a number of hours into lifelong learning." In addition, language learners were limited to conventional learning environments, such as school buildings, laboratories, and home study desks. To achieve this, she envisioned a learning experience where students could conveniently access learning materials on-the-go, whether in their cars or other suitable locations. As a solution to such a challenge, Nuru and Jane developed learner-based CALL products that offer personalized learning options to students: flexibility to access learning resources at their convenience, anytime and anywhere.

Facilitating Self-education. There are individuals who embark on self-educational projects for various reasons including financial constraints from traditional learning and demanding schedules that limit their ability to commit to regular classroom-based learning. These individuals often rely on online resources and computer applications to pursue their language learning objectives. Recognizing this need, CALL academic entrepreneurs designed products

specifically tailored to this demographic. Jane, for instance, created an app for learning Spanish that targeted people with this kind of need. Jane says, "the app, really, is about learners – self-directed learners. It doesn't have to be with students in language classes but even people just wanting to learn a language."

Communicative Competence. According to Jane, the majority of learning resources available for both classroom and individualized learning tend to overemphasize lexical and grammar acquisition. On the contrary, the primary emphasis of the applications and tools she develops is on the development of comprehensive communicative competency, encompassing aspects such as pragmatics and culture. Similarly, Nuru's products aim to provide learners with multimedia resources that facilitate the acquisition of authentic language materials. According to her, learners get "to hear the local people speaking the language and keeping pace with them", in contrast to just learning by memorizing textbooks. According to Nuru, teachers sometimes resort to an 'artificial' way of speaking to facilitate student comprehension, which fails to expose them to authentic language, and consequently hinders the development of productive and receptive language skills that align with their individual learning styles.

Facilitating Learner Self-reflection. Jane and her team developed a portfolio app for students to store their learning materials in one place for reflection purposes. She noted that the absence of standard-based tools to facilitate learner goal-setting and reflection prompted them to create a mobile app, which would be easily accessible to learners. She says, "so the problem really was about and facilitating reflection. There wasn't really a tool to help instructors facilitate learner reflection and learner goal setting across the board. So, the online portfolio is designed to do that."

Teacher-based CALL issues

The CALL products designed for teachers, in contrast, were geared towards ameliorating the technological and pedagogical obstacles that language educators encounter in their daily instructional practices. The following were the specific aims of the CALL products whose target customers were teachers.

Teachers' Technological Challenges and Attitude. In the realm of tech-based language teaching, teachers encounter several technological challenges. James and Vana intend to address this issue with their training-based entrepreneurial services. Their objectives are to equip classroom teachers with the necessary CALL knowledge and foster their innovative and creative skills in CALL. James perceives teachers' attitudes toward technology as, in itself, an entrepreneurial opportunity. He claims that, despite the pervasive use of technology among today's language learners, many instructors remain ignorant of how to integrate technology into their pedagogy. They treat technology as they would traditional classroom tools, such as books and chalkboards. The prevalent belief among many teachers is that a simple online search using a web browser constitutes technology-based instruction. James says:

> So, in-class students sit down, they open their books, and they do the activity. You take these students to the computer lab, they sit down and open a web page, and they do an activity. I think that's kind of silly, and it limits what we can really do with technology. It shouldn't be a tool. Technology should be a space that provides infrastructure for you to create and do things right. And so my hidden goal with a lot of this stuff is to get teachers using technology differently and seeing what's possible. And that's what I think is really missing now.

Community-based Problem-solving. Members of the CALL community of practice

encounter comparable challenges. To address these, CALL academic entrepreneurs developed services that promote a community-based approach to tackling obstacles by exchanging effective teaching tactics and CALL strategies among members. Vana's community-based services, in particular, were created based on this connectivist view of learning/teaching. He says, "It involves people learning from one another in an uncontrolled environment." Vana adopts Clay Shirky's concept of cognitive surplus to suggest that CALL practitioners possess a surplus of mental capacity that, if left unexplored, could be lost to activities that may not be advantageous to the field. Vana further argues that online social networks present an opportunity for these individuals to converge and establish collaborative communities, thereby channeling their cognitive surplus towards pursuits that can have positive impacts on others within the field. He says, "they can actually take that extra time and energy to develop their passions and not only to connect with others but also to improve things in the world."

Bridging the Technology Gap. The present study reveals that the majority of entrepreneurial endeavors in the field of CALL aim to mitigate the ubiquitous issue of technology disparity. CALL academic entrepreneurs demonstrate a passion to narrow the gap between language learners in underprivileged regions and those in more affluent areas by providing free access to a suite of technological resources such as mobile language games, web-based language courses, CALL tools, and CALL training. The participants' rigorous effort reflects a laudable commitment to promoting equitable access to language learning opportunities, regardless of one's socioeconomic status. As an example, James grew up in a low-income school district with limited access to technology, and he always envied students from wealthier areas who had more resources. Consequently, his passion has been to create affordable tools and capacity building through CALL training, which helps to bridge the technology gap between underprivileged and affluent regions. All of his entrepreneurial activities are geared towards achieving this goal. He says,

> I was one of those kids that went to a bad school. There was no money at my school. The school across town had money, and their education was better, flied out. And I think all that carried out like resentment of 'we shouldn't have that sort of things going on.' So, a lot of stuff I am making are like, 'I wanna see a lot of things innovated as cheaply as possible, for the best benefits as possible'. Working with [and for the] people that wouldn't normally think technology could go there. And we can. We can make technology cheap and affordable, whether it is in a mountain village in Vietnam, or somewhere in Mississippi, in the United States. We can do it.

Creating CALL Materials for Special Purpose. The provision of Language for Special Purpose (LSP) courses that meet the distinct requirements of diverse institutional contexts poses a challenge to educators who must source appropriate materials aligned with their curricula. To address this challenge, Vana and a colleague undertook the development of customized CALL software at his university in the Middle East. This innovative solution was subsequently installed on 20 standalone workstations located within the university's self-access resource center, under Vana's directorial supervision. This laudable effort attests to a steadfast commitment to improving language education by harnessing bespoke technological solutions that cater to the specific needs of learners and teachers.

Summary of Major Findings and Discussion

The literature shows the relationship between opportunities, goals, and products is of vital significance in entrepreneurial studies (Ardichvili, Cardozo, & Ray, 2003; Manion, 2002;

McKenzie, Ugbah, & Smothers, 2007). The goal of entrepreneurship is to provide solutions for an existing problem or need in the community (Manion, 2002), and the products created in the process have to provide that solution. The literature shows that some of the CALL challenges include limited availability of resources, anti-social behaviors which may cause learners to study languages in isolation, dissimilar learning styles, underutilization of resources, and ineffective deployment of CALL resources (Beatty, 2013; Levy, 1997; Levy & Stockwell, 2013). CALL academic entrepreneurs who participated in this study created different products to provide solutions to some of the CALL problems and needs aforementioned. The solutions provided by these CALL products included providing tools and platforms for independent learning and self-teaching, providing CALL tools for functional-based language learning, and providing solutions for CALL classroom challenges.

The present study highlights that the CALL products developed by academic entrepreneurs are highly contextual in nature. Additionally, all the CALL academic entrepreneurs created products tailored to the languages they teach or the languages within their respective CALL sub-fields. For example, Nuru designed CALL products specifically for Swahili, which is not only her native language but also the language she teaches at her university. Similarly, Jane developed a mobile game for learning Spanish, which aligns with her language-teaching interests. This reflects clearly Levy and Stockwell's (2013) emphasis that each CALL designer's work exhibits a clear point of departure that reflects their unique perspectives influenced by various factors such as language learning approach, teaching philosophy, CALL knowledge and skills, personal interests, and academic background. This phenomenon is also observable in prior research, indicating that each academic discipline presents specific challenges (opportunities), and possessing sufficient knowledge and experience in particular disciplines is essential for recognizing and seizing opportunities in those fields (Ardichvili, Cardozo, & Ray, 2003; Baron, 2006).

Furthermore, the contextual nature of these products emphasizes the significance of accounting for individual differences and distinct perspectives when examining the ultimate objectives of CALL academic entrepreneurship. Variables such as demographics, personal experiences, psychological traits, and interests, in addition to their professional expertise in the field of language learning and teaching, are crucial in comprehending entrepreneurial goals. James's background influences the type of CALL tools that he makes. Coming from a poor, low-tech school district, his main passion was to create cost-effective tools to bridge the technology gap between affluent and marginalized areas. He also wanted to help teachers to acquire CALL knowledge and skills and be creative with whatever little technology they have. Seemingly, James's motive corresponds to what Beatty (2013) asserted. Beatty stated, "the cost of technology can be a barrier both to getting involved in CALL and maintaining the latest technology. Materials created only a few years ago on one version of an operating system may not function properly or at all on the latest version" (p. 78). The fact that technology is in constant change provides the most exciting entrepreneurial opportunity in CALL academic entrepreneurism (Lubua & Kessler, 2022). While CALL training is constantly needed to address the frustrations of ever-changing technology, handmade, context-sensitive, and cost-effective CALL tools should be created to bridge the technology gap between high-tech areas and low-tech areas.

The present study highlights the importance of CALL academic entrepreneurs in responding to the needs of language instructors and learners. The study shows that these entrepreneurs had a broader vision of their customers. By creating various CALL tools such as simulations, mobile and web-based games and apps, and web-based courses, they provided solutions to the challenges faced by language instructors and learners in different contexts. The

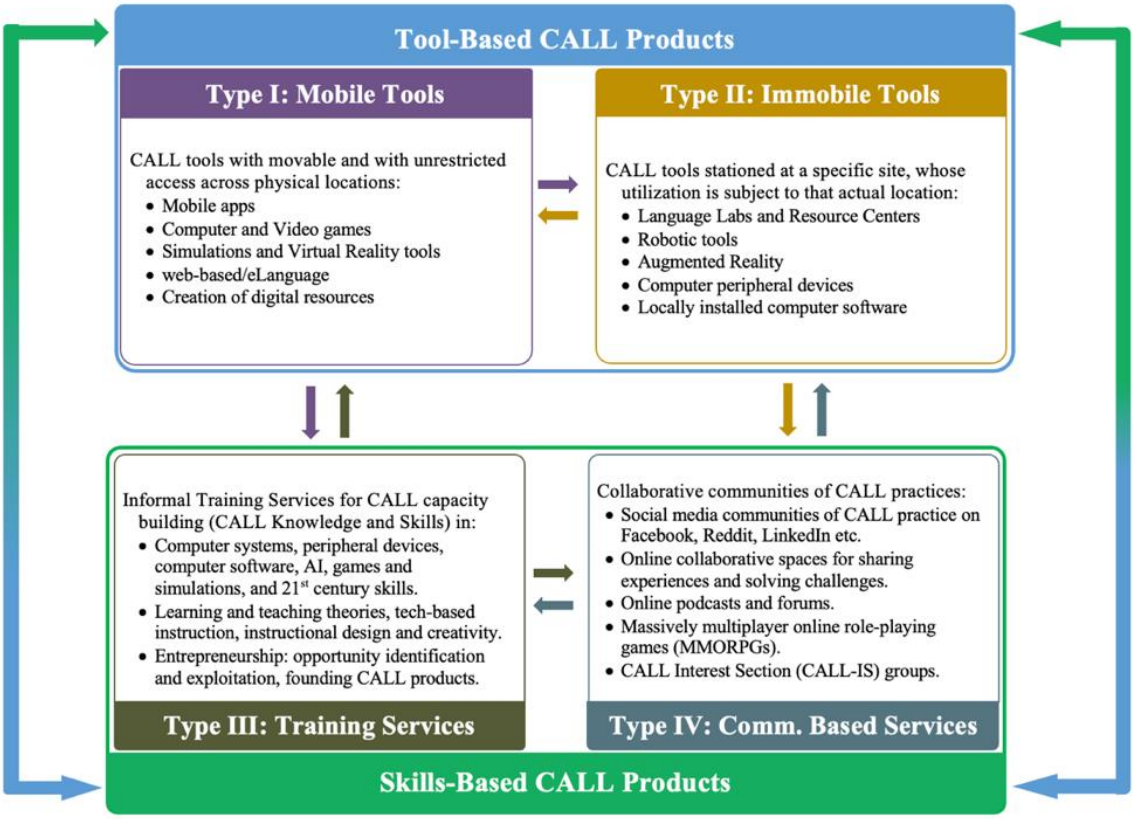
availability of these CALL tools also made language learning more accessible and convenient to a wider audience, including those who may not have access to traditional language classrooms. Furthermore, the provision of online learning and communities of CALL practices created opportunities for collaboration and knowledge sharing among language instructors and learners. Overall, the study highlights the potential of CALL academic entrepreneurship in improving language education and creating more diverse and accessible language learning opportunities.

Notwithstanding, based on the preceding arguments, it can be observed that all the CALL academic entrepreneurs in the present study are classroom teachers who get to deal with many pedagogical challenges, frustrations, and inadequacies. While they may make their products with the knowledge that they are not the only ones who face those challenges, it is apparent that they make products that will be beneficial to themselves (creators), their students, and their institutions first. By creating products that are primarily aligned with their own interests and preferences, they position themselves as their own primary and predominant customer base. This finding challenges the traditional notion that entrepreneurs create products primarily to meet market demand (Ardichvili, Cardozo, & Ray, 2003; Manion, 2002), suggesting that this perspective may not be universally applicable across academic entrepreneurial contexts. It also suggests that market demand is not the only factor driving entrepreneurship and that entrepreneurs may have other goals and motivations that guide their decision-making.

That shares some similarities with what Venkataraman (1997) called a pursuit of "selfish ends" (p. 133), although Venkataraman primarily associates his concept of selfish ends with wealth creation alone. Similarly, Beatty (2013) emphasized that teachers can determine the appropriate CALL tools if they have a clear understanding of their learners' needs. He advocated for starting the process by brainstorming with the learners to identify their needs, which would enable educators to make informed decisions about the type of CALL software that should be integrated into the classroom. Although Beatty's discussion centered around the selection of appropriate CALL tools for classroom instruction, his argument is equally important in CALL academic entrepreneurship. This is because CALL academic entrepreneurs determine the CALL products to develop by engaging in a brainstorming process to identify the needs of both themselves (as instructors) and their learners. However, it's important to note that this perspective may not apply in all cases and that market demand is still a crucial factor in many entrepreneurial contexts. The relationship between personal interests and market demand can be complex and dynamic, and successful entrepreneurs are often able to find a balance between the two.

The present study classifies CALL academic products into four distinct interconnected subcategories. Type I and II correspond to tool-based CALL products utilized for teaching and learning, with Type I being mobile and Type II being immobile. On the other hand, Type III and IV are service-based products, with Type III pertaining to CALL training services, and Type IV pertaining to community-based CALL services. The study's findings have resulted in the development of the CALL academic entrepreneurship products model, which is depicted in Figure 1.

Figure 1
CALL academic entrepreneurship products model



The model presented in Figure 1 depicts the two primary categories of CALL products and services - Tool-based and Service-based, along with their respective four subcategories. The arrows in the model show the reciprocal relationships between the categories and subcategories. The model presents a comprehensive framework for understanding the different types of CALL products and services available and their interrelationships, with a focus on academic and entrepreneurial perspectives. It shows that the entrepreneurial success of CALL products in one category/subcategory may depend on the availability of products in the other category/subcategories. For instance, the Type III CALL products, i.e., CALL Training Services, integrate informal CALL education (Karatay & Hegelheimer, 2021; Kessler, 2007; Hubbard & Levy, 2206; Lubua & Kessler, 2022), and the significance of CALL education depends on the abundance of mobile and immobile tools in the market. Thus, this model offers a precise visualization of the diverse categories of CALL products available, and it can be valuable for anyone interested in creating such products. Understanding the different types can aid CALL academic and commercial entrepreneurs in identifying market gaps and potential areas for innovation in CALL and in developing tools and services that meet the specific needs of their target customers.

According to the findings of the present study, the majority of CALL products developed by academic entrepreneurs were offered for free, with some exceptions. Jane's online portfolio and Vana's earlier software products were available for purchase, but not for profit. Rather, the funds generated were used to support other entrepreneurial activities in their centers. Nuru's product was distributed for free due to receiving a federal government grant but may have considered selling the product if she had to finance the project on her own or obtained

funding from a private grantor. James provides free workshops about his products and other CALL-based products, with a small honorarium to cover costs. This pricing approach showcases the intersection of market dynamics and educational initiatives in CALL product development, where financial considerations impact the availability of products to learners. The free nature of most academic CALL products is probably why these entrepreneurial endeavors have received little to no attention, given the strong emphasis on monetary values in entrepreneurial studies (De Silva, 2012; Siegel and Wright, 2015).

Conclusion

The present study investigated the products of academic entrepreneurs in CALL and found that these products are heavily contextual and reflect the entrepreneurs' personal experiences, interests, and professional expertise in language teaching and learning. CALL academic entrepreneurs appear to develop products that align with their individual interests and inclinations, positioning themselves as the primary and dominant customer base while acknowledging the potential market beyond their own needs. The findings of the study underscore the role of CALL academic entrepreneurs in addressing the needs of language instructors and learners, and their products can significantly enhance language education while creating more opportunities for cooperation and knowledge exchange among language instructors and learners. The study highlights the potential of CALL academic entrepreneurship in developing cost-effective tools for bridging the technology divide between high-tech and low-tech areas while emphasizing the need for continual CALL training to address the frustrations of ever-changing technology.

This study contributes important insights into the role of academic entrepreneurs in enhancing language education and devising solutions to the challenges encountered in CALL. It illuminates the remarkable role that is played by CALL's key stakeholders - educators and learners - as not just consumers but also creators of innovative CALL products. This finding underscores the evolution of CALL's mission beyond the exploration and evaluation of computer applications for language instruction, as it has been expounded by CALL literature. Instead, CALL now encompasses the development and commercialization of cutting-edge technological tools, as exemplified by the remarkable array of CALL entrepreneurs and their products featured in this study. The study emphasizes the need to incorporate entrepreneurial approaches into CALL research and practice to unlock the full potential of this field for the advancement of language education.

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Biodata

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