INTEGRATING AGRICULTURAL EDUCATION AND MODERN LANGUAGE INSTRUCTION IN LIFE SCIENCES UNIVERSITIES

R. PAŞCALĂU[1], Laura ŞMULEAC[1], Speranţa MILANCOVIC[2], Laura STIEGELBAUER[2], Alina PĂDUREAN[3], G. BĂRBULEŢ[4]

[1] University of Life Sciences" King Mihai I" from Timisoara
[2] " Vasile Goldiş" Western University of Arad
[3] " Aurel Vlaicu" University from Arad
[4]"1 Decembrie 1918", University of Alba Iulia

Corresponding author: laurasmuleac@usvt.ro

Abstract. *Within the continually shifting scope of higher education, the confluence of agricultural education and modern language teaching arises as a significant subject meriting investigation. As the phenomenon of globalisation becomes more pronounced, universities that focus on life sciences find themselves required to prepare students with not just specialized knowledge but also with communication abilities that surpass linguistic constraints. This complex educational methodology promotes the amalgamation of varied agricultural techniques alongside intercultural dialogue, thereby cultivating a more comprehensive comprehension of agricultural challenges. The imperative for such an integrative model is highlighted by the escalating interconnectedness of global food systems and the demand for professionals who are adept in negotiating both scientific inquiries and language-related obstacles. In this regard, the following analysis seeks to clarify the interrelations between agricultural education and language teaching, championing for a curriculum that adequately addresses the requisites of the agricultural industry alongside the linguistic proficiencies essential in a world that is increasingly interconnected. The trajectory of agricultural education amidst the realm of life sciences has been marked by a transition towards the integration of interdisciplinary methodologies, which thereby reflect the multifaceted realities that characterize modern agriculture. Present-day curricula not solely underscore traditional disciplines such as agronomy and horticulture but also incorporate essential elements like sustainable methodologies, biotechnology, and environmental stewardship. This more expansive viewpoint seeks to furnish students with the necessary competencies to confront global food security dilemmas whilst advocating for environmentally sustainable practices that alleviate ecological repercussions. Moreover, the assimilation of technological advancements and data analysis techniques into agricultural educational frameworks has proven to be crucial, thereby allowing students to partake in precision agriculture and avant-garde resource management strategies that aim to enhance productivity.*

Keywords: modern languages, agriculture, education, instruction, life sciences

INTRODUCTION

An extensive comprehension regarding agricultural pedagogy is crucial to the evolving domain of life sciences, particularly as it converges with ecological and integrative learning frameworks. This academic area not solely transmits vital competencies pertinent to sustainable agricultural methodologies but also cultivates a systems-thinking orientation regarding intricate biological and environmental relationships. By promoting the evolution of value systems, agricultural education propels learners to interact with ecosystems in communicative and participatory manners, thereby fostering a more salubrious society, as delineated in the eco-holistic viewpoint Additionally, contemporary investigations underscore the significance of selection and growth rates within agricultural contexts, exemplified through examinations of the Australian red claw fish, whereby the advantages associated with judicious cultivation practices were elucidated via compensatory growth phenomena. As forthcoming cohorts of life scientists materialise, the amalgamation of agricultural syllabus with linguistic

instruction is poised to bolster their collaborative capabilities, thereby ensuring their preparedness to confront present-day predicaments in our interlinked milieu. In the recent past, notable alterations have been observed within the agricultural domain, propelled by technological progressions alongside an augmented emphasis on sustainability-oriented practices. These transformations can be epitomised by the escalating implementation of good management practices (GMPs), which are designed to alleviate nutrient losses directed towards water sources whilst concurrently enhancing overall productivity. For instance, an examination of dairy farming operations in New Zealand has revealed a persistent upsurge in the adoption of GMPs including but not limited to low-rate application of effluents and minimal tillage practices, thereby effectively diminishing the runoff of nitrogen and phosphorus (MACINTOSH, 2024). Furthermore, the incorporation of Internet of Things (IoT) technologies within the realm of precision agriculture has significantly accelerated the processes of data gathering and analysis, thereby enabling more astute decision-making aimed at optimising the utilisation of resources. Such innovations not only signify a purposeful transition towards sustainable methodologies but also bring to light the critical nature of interdisciplinary educational programmes in preparing forthcoming agricultural professionals with the requisite competencies to adeptly manoeuvre within a dynamic operational landscape.

MATERIAL AND METHODS

With keen research, both in philology and agriculture, we decided to use for this research article, the analysis method and also the comparative one. We analysed both the side related to modern languages instruction in life science universities and also the need in agriculture for professionals mastering foreign languages (TSVETKOVA ET ALL., 2021) and we went deeper into their education, noticing that only in the first and the last year of their study they make English classes, which means the second and the third year lacks of English knowledge, which more often takes the student back in the 4th year, to the level he had in the first year. We compared with other universities across the globe (ZHOU ET ALL., 2016) and noticed that specialist in agricultural fields have all the study years modern languages classes, even if they are rare, but they do not loose the contact with the foreign language at all for two intermediate years (PAȘCALĂU ET ALL., 2024). The incorporation of contemporary language education within the realm of agricultural studies acts as a significant means of improving communication competencies, which are undeniably crucial for promoting global cooperation and advancement in the life sciences. The shifting environment of higher education prompts a need for a re-evaluation of teaching strategies, notably within universities focusing on life sciences, where the confluence of agricultural education and contemporary language instruction becomes an essential tactic. Such a confluence caters to the intensifying globalisation of scientific inquiry and the escalating necessity for interdisciplinary skills amongst graduates. Faced with notable hurdles including precarious funding and dwindling prestige that hinder the recruitment of emerging scholars into scientific fields, educational establishments need to develop a curriculum that not only delivers technical knowledge but also promotes efficient communication across language divides. The present research seeks to clarify the relationship that exists between agricultural education and the instruction of modern languages at universities dedicated to the life sciences, with the intention of pinpointing key pedagogical measures that must be taken to bolster student abilities in this interdisciplinary field. In particular, it endeavours to tackle the urgent requirement for professionals who are knowledgeable in agriculture and adept in language proficiencies, thus contributing to the international agricultural trade matters as delineated in (YANG ZHOU ET AL., 2016). Additionally, the research aspires to create a thorough curriculum model that is somewhat

reminiscent of the European Graduate Placement Schemes' goals concerning the fostering of synergies between academic entities and the industry.

RESULTS AND DISCUSSIONS

In an increasingly globalised environment, contemporary language teaching arises as a pivotal element of higher education, especially within disciplines that are specialised, like agricultural science. The demand for proficient communication across various cultural and professional settings has accentuated the significance of language capabilities among graduates. In particular, the discipline of agriculture necessitates not merely technical knowledge but also the capability to interact effectively with international collaborators and stakeholders. Current research has shown that improvements in language proficiency can substantially enhance employability, as illustrated by studies regarding work-integrated learning. programmes, which underline the importance of merging generic skills, such as effective communication, with vocational competencies. Additionally, the context of agriculture in areas like Florida, where there is a notable deficiency in agricultural literacy, highlights the pressing need for educational approaches that amalgamate language education with agricultural studies. This integration can provide students with the essential competencies needed to traverse and impact the agricultural sector more significantly (PINKERTON ET AL., 2021). Therefore, the assimilation of modern language teaching within agricultural curricula not only augments the learning experience but also equips students to navigate the complexities they are likely to encounter in their professional journeys.

The interdependence engendered by globalization has, in a fundamental sense, reshaped the landscape of language acquisition, markedly within the domain of specialized fields such as agriculture. As collaboration on an international scale becomes ever more crucial within the realm of agricultural science, the pressing need for proficiency in multiple languages stands out prominently, permitting professionals to interact adeptly with a heterogeneous assemblage of global stakeholders. This pressing demand is emphasised by the position that agriculture is significantly contingent upon international trade, cooperation, and communication, thereby illuminating the necessity for bespoke language education that caters to distinct agricultural contexts (PAȘCALĂU ET ALL., 2024). Moreover, the intricate complexities inherent in agricultural practices globally necessitate a more profound engagement with a variety of linguistic resources, which, in effect, augments one's ability to access essential research and market intelligence. Ultimately, the capability to converse across cultural divides not only augments professional discourse but concurrently fortifies international collaborations, rendering the incorporation of contemporary language education into curricula for life sciences an essential element for nurturing well-rounded agricultural practitioners.

In the pursuit of efficacious methodologies to amalgamate agricultural education with the instruction of modern languages, it is of utmost importance to recognise the intricate and multifarious characteristics inherent in both domains. The utilisation of technological advancements is of critical significance; for example, the assimilation of precision farming technologies via bilingual platforms can markedly augment comprehension amongst learners hailing from varied linguistic heritages (ALKA, 2024). Furthermore, opportunities for experiential learning that engage students in multilingual agricultural endeavours (ȘMULEAC ET ALL., 2023) may serve to bolster practical involvement whilst simultaneously reinforcing linguistic competencies. The establishment of collaborative alliances between departments of agriculture and language faculties might yield curricula that encapsulate international agricultural regulations and methodologies, thus equipping students for employment in an

increasingly globalised market (RASHID, 2024). Moreover, the incorporation of cultural dimensions pertaining to agriculture could enhance language acquisition, facilitated by students' learning of specialised terminology in contextually relevant scenarios. The successful enactment of these strategies necessitates continuous evaluation and modification to ensure that they adequately address the shifting requirements of students, ultimately contributing to a more all-encompassing educational environment within life sciences institutions.

The formulation and structuring of curricula within life sciences educational institutions necessitates an exhaustive methodology that amalgamates specific disciplinary acumen with the exigencies of contemporary occupational landscapes. Through the integration of agricultural pedagogy into the curricular framework, educational establishments have the potential to bolster the employability of students, as substantiated by research insinuating the critical nature of incorporating universal workplace requisites and generic competencies in work-integrated learning (WIL) programmes (NGUYEN ET AL., 2022). Considering the pronounced economic relevance of the agricultural sector in locales such as Florida, it is of utmost importance to tackle deficiencies in agricultural literacy via meticulously designed educational initiatives. Empirical evidence indicates that learners display a notably inadequate comprehension of agricultural principles, notwithstanding the sector's fiscal significance, thereby underscoring the urgency for avant-garde pedagogical methods that actively engage students. Consequently, a meticulously crafted curriculum serves not merely to nurture vital agricultural insights but also to enhance linguistic competencies that are imperative for effective discourse within an increasingly globalised marketplace, thus accommodating both the educational aims and professional ambitions of the student body, including and merging theory with practical agricultural activities in the field (ŞMULEAC ET ALL., 2022).

In the not-so-distant past, the adoption of collaborative teaching frameworks in the realm of higher education has attracted substantial interest, especially within interdisciplinary domains such as agricultural education and contemporary language studies. These frameworks engender a setting wherein educators jointly formulate curricula that not solely adhere to disciplinary benchmarks but also augment students' educational experiences employing an array of pedagogical methodologies. By harnessing the specialised knowledge of instructors from diverse backgrounds, collaborative teaching encourages a comprehensive grasp of subject matter, enabling students to establish links between abstract notions and their practical implementations (GEORGIEVA ET ALL., 2021). For example, the incorporation of language education into agricultural curricula may foster linguistic competence whilst concurrently tackling worldwide agricultural issues, thus equipping students for a multifaceted and interconnected labour market. Additionally, such collaborative structures promote professional growth among educators, motivating them to exchange effective methodologies and investigate inventive teaching techniques that respond to a variety of learning preferences (BALSCHWEID, 1998). In conclusion, the effective integration of these frameworks could yield improved academic results and nurture a culture of collective knowledge within academic institutions.

The amalgamation of technology within the realms of both language and agricultural education engenders a rather interactive and immersive milieu for learning, which in turn cultivates indispensable skills amongst learners (MEHAR ET AL., 2018). By utilising various digital platforms, educators are able to facilitate conversations and collaborations in real-time with individuals from a multitude of linguistic and cultural backgrounds, thus enhancing the learners' proficiency across the domains of language and agricultural methodologies. Moreover, the utilisation of technology-oriented tools, such as simulations conducted in virtual environments and extensive online repositories, proffers an abundance of resources which allow students to delve into intricate agricultural concepts whilst concurrently refining their

linguistic abilities. For example, the employment of mobile applications tailored for the management of greenery provides learners with the opportunity to engage in practical contexts, effectively bridging the chasm between theoretical understanding and practical enactment as outlined in (PARRA-LÓPEZ, 2024). Furthermore, the versatility inherent in technology allows for instructional methodologies to be customised so as to cater to diverse learning predilections, thereby fostering both inclusivity and engagement within the educational framework. Ultimately, the judicious application of technological resources augments the educational landscape, assuring that graduates are adequately prepared to tackle the exigencies of both the language and agricultural sectors.

CONCLUSIONS

The amalgamation of agricultural education alongside modern language teaching within universities that focus on life sciences is of considerable importance for developing a comprehensive educational journey that mirrors the intricacies of today's globalised environment. The necessity of prioritising both pedagogical practices and mastery of content is critical, as illustrated by the TPACK framework, which illustrates the interrelations that exist amongst technology, pedagogy, and content knowledge. Additionally, research findings concerning the utilisation of interactive whiteboard technology indicate that the employment of innovative instructional methodologies can markedly boost student performance across various learner populations. This bifocal approach not merely fosters linguistic skills but also provides students with the requisite agricultural literacy to adeptly navigate and tackle modern issues within the agricultural domain. Hence, a unified initiative aimed at the integration of these disciplines will not only enhance educational outcomes but also adequately equip graduates to engage proficiently in their chosen fields, thereby nurturing a workforce that is both informed and resilient, primed to confront forthcoming agricultural challenges.

The amalgamation of agricultural education with contemporary language instruction has produced noteworthy revelations regarding the educational framework's requisite for the improvement of communication and knowledge transference within universities specialising in life sciences. Essential discoveries elucidate that preparedness for the assimilation of technology, particularly as observed within the realm of precision farming, is pivotal to the establishment of an environment that is favourable for both learning and practical application Moreover, the varied applications of Artificial Intelligence underscore the necessity for interdisciplinary methodologies in education, as the engagement of students with AI technologies is posited to elevate their analytical and problem-solving abilities. Such findings imply that educational frameworks ought to elevate not merely the technical dimensions of agricultural education but also the linguistic proficiencies critical for international participation. This multifaceted approach is anticipated to foster a more versatile workforce capable of addressing present-day challenges within the agricultural sector, thereby bolstering the overall efficacy and pertinence of life sciences curricula.

The amalgamation of contemporary language instruction within universities focused on life sciences has considerable ramifications for the design of curricula as well as the employability of students. By promoting the mastery of multiple languages, institutions do not merely bolster students' capabilities in communication but also ready them for global challenges pertinent to agricultural research and practical applications. This strategy is in harmony with the escalating necessity for experts proficient in navigating various cultural environments and interacting with international stakeholders. Such competencies, in turn, serve to extend professional opportunities and career trajectories within an increasingly competitive job market. Moreover, with agricultural systems growing ever more intricate and interlinked,

the inherently interdisciplinary characteristics of modern education render it imperative that curricula simultaneously embed linguistic skills alongside scientific expertise. This duality can aid in fostering collaborative research ventures, encouraging inventive problem-solving approaches, and reinforcing collaborations with overseas institutions, thereby propelling the advancement of the life sciences domain whilst augmenting the educational experience bestowed upon students.

As the merger of agricultural education alongside modern language teaching advances, it is imperative for forthcoming investigations to centre around assessing the efficacy of novel pedagogical approaches that conjoin these fields. Highlighting the potential interchangeability of digital technologies may yield valuable insights into the augmentation of educational outcomes. For example, the utilisation of artificial intelligence and remote sensing does not merely enhance agricultural expertise but also introduces a chance to cultivate language abilities via technical lexicon acquisition and interaction in various language settings. Moreover, delving into the obstacles to the embracement of technology and language instruction within agricultural environments, as articulated in, can significantly guide the formulation of customised interventions that confront specific regional difficulties. This complex strategy is poised to reinforce agricultural entrepreneurial activities whilst simultaneously endowing students with vital skills requisite for sustainable development, consequently promoting a more cohesive educational structure that aligns with the current global requisites.

In reflecting upon the various benefits that arise from the amalgamation of agricultural education with the teaching of modern languages, one can discern that this combination not only augments academic programmes but also broadens the professional skill sets of learners. Such an integration leads to a well-rounded grasp of global agricultural methodologies through the prism of language, thus empowering students to interact with a wide spectrum of stakeholders in international spheres. Moreover, the ability to converse in an additional language enhances students' communicative abilities, facilitating more productive cooperation within interdisciplinary collectives, which is becoming increasingly essential in an economy characterised by global interconnectivity. Ultimately, these augmented skills prepare graduates to meet the requirements of contemporary employment landscapes while simultaneously nurturing a populace that is more educated and capable of tackling urgent challenges related to agriculture and environmental sustainability. Therefore, the convergence of these domains functions not merely as a novel educational approach but as an essential tactic for developing resilience and flexibility in the professional trajectories of students.

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