

FOSTERING YOUNG AGRONOMISTS' COMPETENCIES THROUGH EXPERIENTIAL LEARNING: A PILOT RESEARCH IN THE AGRICULTURAL UNIVERSITY OF ATHENS, GREECE

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Abstract

In the 21st century agronomy students need to take the responsibility of their career planning. Upon graduation, they are called to combine knowledge, skills, and values, in order to support as change agents, farmers' decision making aiming at sustainable agriculture and rural development. To reinforce such a role it is deemed necessary to cultivate student agency, namely, a sense of responsible and active participation in society. Students need to be able to set achievable goals, collaborate successfully in order to solve problems, and act in-line with a professional ethos supporting the wellness of the community and the sustainability of earth. Hence, the need of competence-based education in our century is usually taken as granted. Higher education should adopt educational methods and tools that would support students' competence development. Experiential learning, represented by Kolb's Experiential Learning Cycle (KELC), is an essential part of such an approach and includes four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. In this paper, we explore the effectiveness of experiential learning aiming at the acquisition and/or development of competencies on the part of Agricultural University of Athens (AUA) students. To attain such an objective, we carried out a pilot with 69 AUA students, in spring of 2021. Students were divided into three groups (A, B, and C). Each group, attended a 3-hour meeting, using different approaches (A=traditional lecturing, B=experiential learning based on KELC and C=investigative case-based learning). Furthermore, students were offered a participatory class regarding rural advisors' profile and planet sustainability. Due to the COVID-19 pandemic, online tools were adopted. Students participated in pre- and post-survey based on a questionnaire. Focus groups and observation methods were also utilized to further explore and validate quantitative data. In this paper we report the design and the quantitative and qualitative findings, particularly focused on the experiential learning approach.

Keywords: *Higher education, experiential learning, competencies, agronomy students, future advisors.*

1. Introduction

In agricultural education and agricultural extension, experiential learning (EL) constitutes an essential and fundamental component of the learning procedure (Roberts, 2006). Due to the nature of the studies at the Agricultural University of Athens (AUA), students parallel to traditional lecturing, experience laboratory work, fieldwork, field trips, and internships. These learning environments support the acquisition and development of scientific knowledge and technical skills that are necessary for academic and professional progress. Nevertheless, we need to consider the acquisition and development of social competencies necessary to support students' role as future agents of change.

2. Theoretical background

Kolb (1984) in his Experiential Learning Theory (ELT) affirms that “Learning is the process whereby knowledge is created through the transformation of experience.” Kolb’s Experiential Learning Cycle (KELC) provides a clear view on the above statement. ELC consists of four stages: Concrete Experience (CE), Abstract Conceptualization (AC), Reflective Observation (RO), and Active Experimentation (AE) and invites the learner to a circle of experiencing, reflecting, thinking, and acting (Kolb & Kolb, 2005). This learning procedure helps students retain information (Knapp & Benton, 2006), develop meta-cognitive skills and competencies, and achieve personal and moral development. In order to offer such experiences, ELC requires holistic participation, through thinking, feeling, perceiving, and behaving, on the part of students. A good grade in exams does not always mean solid knowledge; on the other hand, when the content of the learning is relevant or could be linked or refer to students’ goals, personal experiences, and life interests, supported by constant coaching in the direction of creating meaning around the experience, then the acquisition and stability of knowledge and competencies is enhanced.

One necessary pre-condition is the educator’s presence and willfulness to develop a learning environment that will engage students in a process towards goal-orientated, meaningful, relevant, and measurable experiences (Baker, Robinson, & Kolb, 2012; Kolb & Kolb, 2005). To achieve students’ participation and motivation, the educator should support the four phases of the ELC in different ways, playing the role of the facilitator (experiencing to reflecting), subject expert (reflecting to thinking), evaluator or standard-setter (thinking to acting), and coach (action to experience) (Knapp & Benton, 2006; Baker et al, 2012). When ELC in agricultural studies is successfully implemented by the educator, students are invited to communicate efficiently and to collaborate successfully in order to solve real-life problems, to participate in settings and/or accomplishing goals that involve the collective wellness and the sustainability of the environment, to take initiatives, and to reflect and act in-line with ethos and responsibility for themselves, for others, and for the earth. These qualities describe student agency that could lead to professional agency. The Organisation for Economic Co-operation and Development (OECD, 2019) refers to student agency as: “the belief that students have the will and the ability to positively influence their own lives and the world around them as well as the capacity to set a goal, reflect and act responsibly to effect change. Student agency relates to the development of an identity and a sense of belonging.”

Student agency equips students with confidence, inspiration, and responsibility towards well-being, and that leads to actions toward global sustainability. Students probe, enhance and practice their agency during collaboration and communication with their peers and their educators. Furthermore, research shows that agronomy students feel more confident when they acquire and/or develop competencies and self-efficacy during their studies. The literature points to the need to provide future rural advisors with competencies like communication, collaboration, facilitation, reflection, analytical and inquiring thinking, collective and responsible acting, and ethos (Charatsari, Jönsson, Krystallidou, & Lymberopoulos, 2021). Therefore the interest and the need for research for the development of curricula and policies in Higher Education Institutions.

3. Methodology

3.1. Objective

The objective of this study is to explore the experiential learning approach impact, regarding AUA students’ opinion about the profile of the modern agronomist (MA)-agent-of-change with reference to knowledge, social competences, metacognitive skills, ethical values and professional ethics. It also investigates the impact of students’ learning experience following an ELT approach, in relation to the acquisition and/or development of the above mentioned profile components.

3.2. Participants

In March 2021 an invitation was sent to AUA students enrolled in two lessons, namely, “Agricultural Education” and “Management and protection of the rural environment.” Students were invited to participate in extra online classes that would use different learning methods, aiming to explore the acquisition of competencies necessary for their profile as MA. A total of 69 AUA students, 24 males and 45 females voluntarily participated and, afterwards, anonymously evaluated these classes. Students enrolled in “Agricultural Education” attended a 3-hour extra class on “Teaching techniques and tools”. Students enrolled in “Management and protection of the rural environment” attended a 3-hour extra class on “Organic Agriculture and Sustainability”. Students from each lesson were divided in three groups (A=27 students, B=21 students, and C=21 students). Each group followed a different approach:

A=traditional lecturing (TL), B=EL based on KELC and C=investigative case-based learning (ICBL). Following 57 students voluntarily attended an additional 3-hour participatory class, using the EL/ KELC approach, on the MA's-agent-of-change profile, communication and collaboration skills, and earth sustainability as a mixed group D (comprising students from A+B+C). In this study, we focus on groups B and D that experienced EL/ KELC.

3.3. Research strategy and instruments

The study methodology was designed between January and March 2021 and was applied on March and April 2021. Due to COVID-19 restrictions, online teaching using Microsoft Teams was adopted and online interactive tools such as Mural and Mentimeter were used. A 2-hour preparatory online meeting, helped group B (EL based on KELC) and group C (ICBL) students to get familiar with the online tools to be used them in the extra classes. It also gave them the opportunity to meet each other, as due to COVID-19 restrictions, some of them had never met before in person and through icebreakers and energizers to create a frame of collaboration necessary for the forthcoming class. Group A did not attend any preparatory meeting, as they were going to attend traditional lecturing.

Each student participated in total 6 hours, in 2 extra classes (3 hours each). In order to enhance the participation and the collaboration during the learning procedure (groups B, C and thus D; A students were also given a preparatory session in order to participate in D), tools such as role playing, brainstorming, mind maps, case studies, work in teams, debate etc. were used. For the evaluation of these extra-classes, a mixed research design was adopted using quantitative, qualitative and observation tools. Students, before and after the classes, filled an online quantitative questionnaire (google forms). The instrument consisted of a 5-point Likert scale, multiple choice, and open ended questions. Therefore, students' opinions regarding the agronomist's profile and the importance of knowledge, social competencies, metacognitive skills, ethical values, and professional experience and their respective learnings, during the extra classes were assembled.

For further assessment and validation of the quantitative data, online focus groups and observation were used. The focus groups were recorded with students' consent. Four focus groups were carried out (with regard to groups B and D). The abovementioned online tools provided the observation materials and the opportunity to delve into the rest of the materials collected. Qualitative data analysis followed the thematic content analysis approach (Gibbs, 2007).

4. Results

For the quantitative analysis Wilcoxon sign rank test, one sample Wilcoxon's rank test and Friedman's ANOVA were carried out using SPSS v27. Considering the impact of the EL in relation to the students' opinion about the profile of the MA and how important it is for the MA to have scientific knowledge, social competences, metacognitive skills, ethical values, professional ethics and professional experience a statistically significant positive change was observed only over 'ethical values and professional ethics' ($\chi^2=6.582$, $P=0.037$).

Considering the impact of the EL implementation in relation to students' "acquisition and/or development of knowledge" as well as "social" and "metacognitive skills" statistically significant positive differentiation was observed for all items with the exception of "ethical values and professional ethics" (Table 1 – Q6)

The same applies regarding the impact of the EL method and the opportunities given to students during the extra class, to apply social (collaboration, communication etc.) and metacognitive competencies (reflection, problem solving, critical thinking etc.) during the learning procedure, except for the items: "negotiate to resolve conflicts" and "test your limits in failure despite adversity". (Table 1 – Q9).

Table 1. Students' evaluation on the impact of the EL class (One-sample Wilcoxon Signed Rank Test).

ITEMS	P
Q6. In your opinion, how much did the extra class influence you in acquiring:	
a. knowledge about teaching techniques and tools/ organic agriculture and Sustainability?	<0.001
b. social skills, i.e. effective communication, cooperation, teamwork, etc.:	<0.001
c. metacognitive skills, i.e. critical thinking, reflection, problem solving, etc.:	0.003
d. ethical values and professional ethics.	0.593
Q9. In the extra class did you have the opportunity to:	
a. Seek, organize and use information to solve problems	<0.001
b. Recognize and solve problems using concrete arguments	<0.001
c. Set goals and work methodically to achieve them	<0.001
d. Collaborate effectively as a team member	<0.001
e. Build and coordinate teams and networks	0.003
f. Communicate effectively your opinion and your ideas	<0.001
g. Act with confidence	<0.001
h. Develop empathy, understand, respect and appreciate other peoples' diversity, ideas and values	<0.001
i. Negotiate to solve conflicts and face crises	0.078
j. Take decisions taking into account the social and collective interest	0.002
k. Be flexible to changes	<0.001
l. Self-evaluate and reflect	0.008
m. Become aware of the consequences of your choices, sayings and actions	<0.001
n. Emphasize on the procedure and not just on the result	<0.001
o. Act under ethical rules and ethics	0.006
p. Collaborate using interdisciplinary thinking by combining scientific fields	0.002
q. Visualize the future of the wider agri-food sector companies	0.022
r. Test your limits at failure and continue to try despite harsh conditions	0.074
s. Use new technologies and adopt new methods and tools	<0.001
t. Take initiatives, make a plan and suggest innovative actions for further development	0.001
u. Define and describe terminology, formulas and procedures, about what you have learned in class	0.005
v. Explain what you have been taught using examples	<0.001
w. Use what you learn in real scenarios	0.011
x. Analyze, correlate and compare concepts in order to draw a conclusion	<0.001
y. Use the given information to design and compose something new by yourself	<0.001
z. Evaluate, review and assess an existing project	0.003

Qualitative analysis showed that students had a positive experience that triggered positive changes regarding students' opinions and their identification with the profile of MA. Students in the focus groups shared their impressions and opinions on-line, in a friendly and comfortable created environment comments like:

"while working systematically with my classmates I had to share my opinion and listen to others, so that we would able to reach a common result; being the time keeper I felt strongly the responsibility of my role to the accomplishment of the task; I realized that without ethics and respect we cannot work as a team" (Student 26);

"I took initiatives and I had to improvise and be creative in order to transform quickly my team's ideas into text to be presented in the plenary; I had the opportunity to learn about MA-agent-of-change profile. I realized that, additionally to my degree, I need to have and develop competences in order to build a MA's profile. The video we saw made me think about the MA's ethics and reflect on my commitments as a graduate" (Student 3);

"as a member of a team I had to be responsible for both my sayings and my actions (Student 24); coming from different Departments and having different personal experiences, in our team we exchanged our knowledge to solve the exercise and each one of us contributed in order to compose together the final presentation" (Student 24);

"I had to communicate with my peers in order to plan our study and read the proposed literature on time. We shared goals and we collaborated successfully ... and we achieved our goals on time" (Student 61);
"I reflected on my knowledge and competences through my classmates' feedback during my presentation" (Student 1);

"we had to give emphasis to the process ... not only to find the solution; we had to discuss, make decisions and follow steps" (Student 7);

"I had to respect my peers and act with empathy and responsibility in order to achieve my team's goals; I felt confident during the presentation and responsible that I am representing my team" (Student 48).

5. Discussion and conclusions

The purpose of this study was to investigate the impact that experiential learning approach might have on AUA students' opinion about the profile of the MA-agent-of-change, with reference to knowledge, social competences, metacognitive skills, ethical values and professional ethics. It also explored the impact of students' learning experience following the ELT approach, regarding the acquisition and/or development of the above mentioned profile components.

Both quantitative and qualitative analyses showed a positive multilayered experience on the part of students. The findings suggest that EL may influence the AUA students' profile development, as it provides an opportunity for communication between peers and teachers, reflection, feedback and collaboration with empathy and responsibility in order, using critical thinking to solve real problems. Our findings are in alignment with other researches (Meerts-Brandsma & Sibthorp, 2020; Knapp & Benton, 2006). Such an overall positive picture indicates that a move towards the adoption in HEIs curricula of experiential learning methods and participatory tools can support the transformation of the students towards the profile of the MA-agent-of-change.

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