



Doctoral School of Regional Sciences and Business Administration

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Cyber Farmers' informal learning

Doctoral dissertation summary

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1. Introduction

Background

The tendency to change profession alongside the change in lifestyle as part of the move from urban to rural areas attracted our attention. The migration from urban to rural is coined with the concept of counterurbanization in social sciences, which addresses the phenomenon at the social level. Some counterurbanizers become farmers. The growing number of social media groups with increasing membership related to restarting life in rural areas and the appearance of festivals organized by these newcomers all indicated that this is a rising phenomenon. We speculated whether these moves are mostly driven by the "rural-idyll" narrative, the pull of the countryside rather than push factors. Our interest in the phenomenon elevated due to personal involvement. One interesting ascertainment was the Do-It-Yourself (DIY) attitude of the newcomers. DIY for them is not a fashion, a trend, but rather a way to approach problem solving in everyday life, whether it is about gardening, making bread or building a house. We questioned if this attitude is in line with the DIY economy

concept or if it is driven by some other needs, values and convictions. Learning does not end in formal education, but continues through one's professional career either in formal or informal settings. Formal education is focused on teaching, informal learning as described by Cross (2007) is focused on knowing. The digital age brought changes to formal education, but more importantly unlocked the potential for informal learning. Today, we use the internet as a learning ecology to find new knowledge, solutions and share experiences. To understand informal learning in the digital age, it is fundamental to consider the impact of technology on the way we learn, think and search for information. Carr (2011) describes how the internet makes us shallows. When accessible knowledge is abundant, the quick, rapid evaluation of the accessible knowledge is indispensable. The ability to synthesize and recognize connections and patterns is a skill we all must develop and improve.

The notions of global, local, and glocal emerged. Not only the abundance of the information but the glocal aspect also impacts the validation of the accessible knowledge. We searched the internet for a couple of keywords in organic farming and YouTube for farming practices, and as a result we were faced with abundant contents. This indicated the supply, not the need. We questioned whether demand-supply model would describe the the phenomenon appropriately. The freely available content on the internet as a source of information engaged us in the exploration of the role of "free". Learners search for free content, content providers publish free learning content. Therefore, additionally to the study of the different learning content types, the role of the "passionate learning content practitioner" in provision was determinative. Therefore, we speculated on the question: how is the accessible learning content on the internet published by the passionate practitioners validated for its applicability needed there and then for the newcomers' tentative problem solving?

Literature review

To understand the phenomenon of moving to the countryside, we found valuable the thoughts of Handy (2015) on the DIY economy and S-curve. Handy described

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changes in one's personal life, business or society with shifts from one sigmoid curve (S-curve) to another.

The protagonist of our story is the newcomer to farming, who changes profession or lifestyle, in other words moves from one S-curve, to another. Therefore, uncovering the mindset patterns of becoming an organic farmer was the first step we had to reflect on. To understand decision making and reasoning as the foundations of our research we studied the works of Herbert A. Simon (1977), James G. March (1991), Daniel Kahneman (2013), Richard H. Thaler (2015), Dan Ariely (2008). These grounded us on concepts like: bounded rationality; the role of the expectations, incentives and desires; intuitive knowledge; planning fallacy; misbehaving; and stereotypes. To understand the DIY mindset, we started from the thoughts of Handy (2015) on DIY economy, followed by the IKEA effect (Norton, Mochon and Ariely, 2012). These concepts did not describe completely the newcomer's approach to problem solving. As a result, we considered as keywords "bootstrap age" and "bootstrap mindset" instead of DIY. The learner's identity affects the learning process and the learning content selection and validation. We considered Popper's (1992) tentative problem solving as the framework for our study of the learning process, which is a trial and error elimination process. To acquire a skill, one has to experiment, to make mistakes, to accept feedback and to try again. Experiential learning theory by Kolb and Fry (1974) is a model for this cyclical learning process. Our studies also incorporated Nicolescu's (2005) thoughts on transdisciplinary education and connectivism theory by (2006). Understanding informal learning Siemens required us to reflect on concepts like tacit- (Polányi, 1962) and meta-knowledge (Baracskai and Dörfler, 2017). The thoughts of Chris Anderson (2006, 2009) Marc Prensky (2009) and Nicolas Carr (2011, 2014) were the main sources which affected our exploratory research on digital era; which highlighted the significance of "free" and the role of the "passionate practitioners" in addition to "digital wisdom" and "shallows".

Problem areas

We narrowed the original problem space to five problem areas, or we could say five pillars. These five areas on one hand represent our journey to understand the newcomers' tentative problem solving in the overcoming of their lack of knowledge. On the other hand, these standalone problem areas cover some of the most thought-provoking topics we came across. During our research process, there were no major changes to the original content map for our problem space. The revisions were rather due to the narrowing of it, and the purification of the concepts, notions and frameworks.

"Newcomer to farming" is a notion used in common language; the "new peasant" we encountered in literature. Nevertheless, we conceptualized the "Organic Cyber Farmer" in our research. "Organic Cyber Farmers" are counterurbanizers, who chose organic farming as their new S-curve, adopting environmentally friendly farming practices. They venture out of their original profession and leverage digital technology in many ways, one being knowledge refreshing and learning. We arrived at the following assumption (thesis): newcomers to organic farming do not know what they should know. The antithesis of this assumption was that they are aware that the required, needed knowledge is available. From these a synthesis could be deduced, which was our research problem: searching for knowledge is a skill that can be learned.

The first problem area we identified was the decisionmaking process to become a newcomer to organic farming. We aimed to find mindset patterns for those who change profession and/or lifestyle and move to rural areas. In the second problem area we observed the contemporary learning environment. Through the exploration of the third problem area, we aimed to understand the learning process via visualized presentation. The fourth problem area addressed the validation of relevant learning content from the world wide web. In the fifth problem area we studied the validation process of the applicable knowledge by Cyber Farmers. The resulting conceptual model for this problem area presents the mindset patterns of experience miners in the digital age. To explore this thoughtprovoking problem space, we needed to step out from the disciplinary boundaries and adopt a transdisciplinary approach.

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2. Approach and methodology

The demarcated problem space for our research determined our approach. The five problem areas, similarly to every real problem, resist attempts to resort to mono-disciplinary frameworks. We therefore adopted a transdisciplinary approach, which is our doctoral schools' basic principle. One approach is to consider transdisciplinarity as interventionist, as required to address the relation between science and society, used to cope with complex problems (Jahn, Bergmann and Keil, 2012). In the works of Gibbons et al. (2010), transdisciplinary knowledge production is characterized by constant flow between fundamental and applied, theoretical and Max-Neef highlights practical. (2005)that transdisciplinarity is a manner of seeing the world more holistically. However, we chose to adopt Nicolescu's (2014) transdisciplinary methodology in our approach. methodological Along the guidelines of transdisciplinarity, we distinguished between the different levels of reality. We observed the Organic Cyber Farmer's reality on a personal level. To study the phenomenon on a social level could be the problem space of a separate, future research.

The data collections and analysis in our works were qualitative-quantitative processes. For the first problem area, to understand the mindset patterns that lead to selecting organic farming as a new S-Curve, the data collection was performed through a survey, due to nonavailability of a validated questionnaire. The responses from the survey were analyzed with factor analysis and a Knowledge Based System (KBS). The data collection process for Knowledge Based Systems' is called knowledge acquisition. Rule-based reasoning (RBR) and Case-based reasoning (CBR) are the most widely known and applied functionalities of Knowledge Based Systems. In our studies we used the Doctus Knowledge-Based System (Baracskai, Velencei and Dörfler, 2007), developed based on Simon's (1977) conception of bounded rationality. Knowledge representation of the decision maker's knowledge in Doctus KBS is based on symbolic artificial intelligence (AI). Reductive reasoning, the third way of reasoning delivered by Doctus KBS always follows CBR. Reductive reasoning generates a

new rule-based knowledgebase based on the most informative attributes identified during CBR. In the exploration of the problem areas we used all three functionalities of Doctus KBS: rule-based reasoning, casebased reasoning and reductive reasoning.

3. Papers included and contribution

In our studies we searched for explanations for the identified five problem areas, resulting in five solutions. Starting from a distinct problem definition for the problem space, different results could be achieved.

In the paper "Mindset patterns of newcomers to organic farming"(Varga and Baracskai, 2020c) for the first problem area, we aimed to understand the newcomers' mindset in selecting organic farming through changing lifestyle or profession in Hungary. We had to accept the inexistence of strict records in any form of those who change lifestyle and profession to become newcomers to farming. Our tentative solution to understand the career shift, was a push-pull model. Our personal experience with changing professions was a good source of inspiration in the construction of a survey for our study. The survey

comprised of five sections to describe the following areas: the stage of the decision making, initial state, push reasons, final state and pull reasons. Our data collection was performed in early 2019. As a result of the data analysis with factor analysis and CBR, we presented the mindset patterns with "if-then" logical rules among the identified attributes. We found that the three different groups ("already organic farmer", "in-process", "thinking about it"), being in different stages of the decision-making process, have different aspirations. For those who are "already organic farmers", the responses were collected post-decision, and thus affected by the tendency of flaws in memories. For those who are only "thinking about it", the responses were recorded for a future decision that may or may not happen. We argued that the scattered mindset patterns for this group almost classified them as dreamers. In the conference paper "Global vs. local knowledge in DIY economy" (Varga, 2017), we developed a learning process model in the Do-It-Yourself economy by assuming the co-existence of several learning models. We defined the learning process in today's digital era consisting of three steps: validating the consistency of the accessible knowledge through search engines, validating the relevance of the consistent knowledge and validating the applicability of the relevant knowledge. The learning process model developed in this paper served as the foundation for the studies in the subsequent problem areas. The conference paper with the title "Cyber DIY: Learner expectation patterns in new knowledge selection and validation" (Varga and Baracskai, 2018), concerns the learner expectations in new knowledge selection and validation. We assumed that the Organic Cyber Farmers have DIY and bootstrap mindset. Our resulting conceptual model was a representation of the mindset patterns in the through visualized presentation. learning process Although limited in scope, one interesting result was that if scientist and practitioner levels of reality are not distant, then visualization of knowledge enables spread of ideas and practices without language barriers.

"Cyber Farmer informal learning through YouTube" (Varga and Baracskai, 2020b) concerns the learning content selection from the world wide web. YouTube as a video sharing platform is used by DIYers in their quest for knowledge. In this study we investigated the patterns of the relevant learning contents from YouTube to perform "Artes Mechanicae" operation in farming. In this study we did not observe the motivation of the learning content providers; however, this would be a thought-provoking area for further exploration.

Lastly, in the working paper "A New Learning Process: The knowledge increase of Cyber Farmers in the digital age" (Varga and Baracskai, 2020a) we presented our conceptual model of the informal learning process for Organic Cyber Farmers. We aimed to understand the validation of the applicability of the relevant knowledge from the internet. We assumed that this validation could be achieved through experience mining. The foundations of our conceptual model were borne out by the findings in previous problem areas. Our model is not a synthesis of several different learning theories, rather an integrated representation of the learner with a bootstrap mindset, the learning process model for the digital age, learning content patterns and the passionate practitioner as the learning content provider.

4. Discussion and conclusion

Following Popper's (1992) tentative problem solving process from the original problem, which raised our interest while trying to solve it, we were faced with new, more captivating problems. The results of the five problem areas should not be viewed as each forming a fifth of our conclusions, but they should rather be deemed as results which determined the next problem areas' frameworks.

At the beginning of our exploration we conceptualized the "Organic Cyber Farmer". Throughout our journey to explore the Organic Cyber Farmers' reality we had a transdisciplinary approach, based on concepts and frameworks from several disciplines. We are among the first ones to address this problem space with this approach. Modeling the mindset patterns, human behavior with knowledge-based systems provided unique insight into the reasoning of the Organic Cyber Farmers in the following areas: decision-making to select organic farming as a new profession, learner's expectation patterns in new knowledge selection, patterns in relevant learning content validation and mindset patterns of experience miners. We conceptualized "experience mining" as the process of "mining" other's experiences from the internet. The uniqueness of our conceptual model for the Organic Cyber Farmer's informal learning comes from the integration of the learner's aspirations, learning process model, learning content patterns and learning content provider characteristics through logical "if-then" rules.

We argued that knowledge increase on operations for Organic Cyber Farmers can be achieved through informal learning, leveraging the accessible knowledge on the internet.

Our findings and results have limitations, detailed in the respective papers. As an example, for the first problem area, one limitation was the difficulty of estimating the size of the population of newcomers to organic farming. Another limitation was the geographical constraint; in our studies we observed the newcomer population in Hungary, with a focus on those who started organic farming. These limitations should be considered not only as the limitation for the given problem area, but also as the limitation of our whole study. Therefore, our results should be handled inside these boundaries. Regardless of the limitations of our findings, we argue that the presented models could serve as a foundation for re-thinking the transdisciplinary co-production of knowledge in organic farming among researchers, policy makers and practitioners in the digital age.

Finally, we recognize the currency of the S-curve concept in our lives and in society. As Handy (2015) puts it in order to see a better society, the start has to be in our own lives. The Second Curve is our chance to demonstrate that we learnt from the past to create a better future.

Author's publications on the topic

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