

DEVELOPMENT OF COLLABORATION, RESEARCH AND MENTORING SKILLS OF PRE-SERVICE TEACHERS FACILITATING ICT LEARNING BY OLDER ADULTS

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The purpose of the article is to substantiate educational strategies of collaboration, research and mentoring skills development in pre-service teachers facilitating older adults' learning of ICT with the use of problem-based practice-oriented adult learning activities. The study involved students of Ukrainian and Polish universities who were in the first year of Master degree programme for pre-service teachers and older people enrolled in the non-formal educational programme "The third age university". In order to identify the data on the initial levels of the target skills development in pre-service teachers, we used narrative interviews, a self-assessment questionnaire, and observations. At the stage of target skills development, we used the problem-based learning method which required the pre-service teachers to research the older adults' needs in ICT learning, provide mentoring and promote collaboration in the learning process. At the stage of evidence verification, we employed observation of pre-service teachers' behaviour and a self-assessment questionnaire and compared the results with the initial data. Our findings showed an increased level of the development of all the three skills of pre-service teachers, which confirmed the appropriateness of the use of the chosen learning method based on the authentic problem that was relevant to the pre-service teachers since they understood that its solution was important for the involvement of older citizens in active life of community and society undergoing digital transformation.

Keywords: pre-service teachers, ICT, older people, problem-based learning, collaboration skills, research skills, mentoring skills.

Introduction

The historical transition of human civilisation to the Information Age is characterised by the possibility of rapid communication on a global scale, the processing of large volumes of information and the existence of information networks, which significantly change the conditions of human life in the modern society. However, in terms of the democratisation of the information society, the issue of mastering digital skills by all segments of the population is crucial, as citizens with insufficient levels of digital skills are at risk of being excluded from active social life.

According to the research, digital immigrants, people over the age of 55, who grew up in the time when mobile digital and internet technologies were lacking or developing at a slower pace, are at high risk. In contrast to digital aborigines born in the times of the rapid development and spread of digital technologies and the Internet, digital immigrants need to master digital skills in order to avoid social exclusion.

Supporting citizens in raising their digital literacy should be aimed at integrating them into the active life of modern societies undergoing digital transformation. This problem is directly related to the promotion of democratic values. One of the important areas of democratic social action is the fight against various types of discrimination, among which age discrimination holds a special place, as it can lead to the social exclusion of a large number of elderly people. The risks are increased for people of very old age and single people, and may rise even more because of various phobias, such as fear of losing their job or poor health. Age isolation can contribute to the development of mental illnesses, including depressions. The use of digital technologies to counteract the social exclusion of the older people should be realized through the creation of favorable conditions for digital literacy of older citizens.

It is obvious that digital skills are not innate but acquired. Therefore, the process of teaching is critical for efficient digital skills acquisition. As students at schools or universities get these skills during their learning, elderly people should learn themselves, which causes serious educational problems. We decided to

address the problem in our study and combined the development of collaboration, research and mentoring skills in students while they are teaching digital skills to elderly people.

The urgency of the development of these skills in pre-service teachers is explained by the necessity to organise a favourable learning environment. Mentorship implies encouragement and trust instead of formal instructions and strict control. Collaboration skills help teachers to engage and unite the learners and provide the efficiency of learning outcomes. However, both processes require strategic planning and goals setting, which necessitates the development of teachers' research skills so that they can find out the needs, possibilities and resources of students.

In view of this, **the purpose** of the article is to substantiate the educational strategies of collaboration, research and mentoring skills development of pre-service teachers facilitating older adults' learning of ICT with the use of problem-based practice-oriented adult learning activities.

Theoretical background

The "Concept of Adult Education in Ukraine" (Lukyanova, 2011) states that the current demographic situation in most countries of the world including Ukraine at the beginning of the 21st century is characterised by a significant increase in the proportion of older people. In this regard, it is necessary to develop a new philosophy of perceptions of an aging population and a strategy to ensure old age in the life cycle of each individual. The Digital Competence Manifesto was first presented at the All Digital General Assembly in May 2019 and approved at the All Digital Summit in Bologna on October 11, 2019 (All digital, 2019). The work of the digital competence centre network and relevant expert organisations in the Digital Competence Manifesto (2020) is driven by the need to have digital skills in all spheres of life: social or personal, professional or leisure, public or private. The primary purpose of developing digital competencies is to improve the quality of life. The Manifesto emphasises that, through digital skills, the elderly have an opportunity to participate and contribute positively to the community and society, to maintain contacts with family and friends, to participate in cultural and public activities, to be involved in all levels of planning and service delivery. These opportunities are an integral part of providing decent living for older adults and contributing to their social integration.

The experience of the European Union countries in providing older Europeans with new life opportunities through the acquisition of new knowledge and skills is noteworthy. In particular, the 2002 International Plan of Action on Ageing (Madrid International Agenda, 2002) emphasises that "Elderly people should be fully involved in the development process and reap its benefits. No person should be deprived of the opportunity to enjoy the benefits of development. The consequences of population ageing for the socio-economic development of society, combined with the socio-economic changes that are taking place in all countries, require urgent steps to be taken to establish continuous activities in the field of social integration of older people and to enhance their rights and opportunities" (p. 24).

The urgent task of modern pedagogical science is to study the specifics of teaching older people to use digital technologies in order to support their active life in the information society. In this context it is important to mention Jarvis's (2004) fundamental monograph "Adult Education and Lifelong Learning" as also works by Dhrakshayani (2016) and Formosa (2007; 2009; 2014).

In the field of national pedagogical science, it is necessary to distinguish the research by Chagrak and Ugrinyuk (2018) who highlighted the European experience of education of people of the third age as a way of adapting to the demographic ageing of society. Demyanenko and Chagrak (2017) suggested a learning programme for the Institute of Education of Third Age People. The study by Bykov and Leshchenko (2016) was devoted to the ways of development of digital humanistic pedagogy which focuses on digital education of people of all ages.

Considering the experience of foreign and national scientists in this area, we emphasise the importance and lack of national research on the impact of digital technologies on the lives of older people, their way of thinking and adapting to the digital society. Therefore, one of the main tasks of digital humanistic pedagogy is to assist the elderly in mastering digital media and developing their digital skills – the ability of a person to perform specific activities and use digital technologies, namely: the ability to use, access, filter, evaluate, create, programme and exchange digital content; the ability to communicate, solve problems on the Internet, protect information, personal data, and use digital devices.

The development of democratic processes in Ukraine involves the effective inclusion of older people in the digital society. A purposeful approach to the development of digital skills of digital immigrants is an important means of ensuring their active lives. The term "digital divide", or the so-called "digital inequality" (Fishchuk et al., 2018) is understood as inequality in access of citizens to the possibilities of computer, telecommunication, digital technologies in various spheres of life.

The results of the study conducted by Formosa (2012), a researcher at the European Centre for Gerontology at the University of Malta, who considered different aspects of teaching the elderly at the University of the Third Age, show that the educational activities of the elderly give them the opportunity to adapt to life more quickly in the face of rapid changes in all aspects of social development and considers education as one of the main ways of social integration of people of this age group.

Mentoring and collaboration skills play a significant role in teaching older people. However, pre-service teachers often lack these skills (Maria-Monica & Alina, 2011) which are essential for a mentor whose primary role is not only sharing knowledge, but also giving advice, challenging and supporting adult learners (Clark, Harden & Johnson, 2000).

Vumilia and Semali (2016) claim that mentoring not only contributes to job satisfaction and helps new teachers adapt to their jobs but also have a positive effect on student's academic achievement and engagement. As argued by Hall et al (2008) mentoring is complex and mutually beneficial for mentors and mentees as well. Among benefits for pre-service teachers they mention self-reflection on practice with constructive feedback, professional development, use of learner-centered approach.

Therefore, our research is devoted to the development of collaboration, research and mentoring skills in pre-service teachers facilitating older adults' learning of ICT with the use of problem-based practice-oriented adult learning activities.

Research Methodology

We designed our study in accordance with Designing Research Methodology to trace and explain the connections of influencing factors between existing and desired situation that raised the urgency of educational research on the formation of collaboration, research and mentoring skills in pre-service teachers.

Participants

The study involved 20 students of Vasyl Stefanyk Precarpathian National University, Ukraine; 24 students of Poltava V.G. Krolenko Pedagogical University, Ukraine; 25 students of Jan Kochanowski university, Poland. All students were in the first year of Master degree programme for pre-service teachers and were enrolled in the special elective course focused on adult education. Our choice was substantiated by the level of students' readiness to perform mentoring activities and their wish to participate in collaborative societal research projects. The students' participation was voluntary and they were informed about the research procedure and conditions of participation. Students acted as mentors for elderly people (n 54) who were also the participants of the research and were enrolled in the non-formal educational programme "The third age university".

Research procedure

The methodology involved five stages:

- research clarification – goals setting, theoretical background selection, hypothesis formulation;
- descriptive study I – description of current situation, analysis of factors of influence. At this stage, we used narrative interviews, a self-assessment questionnaire (see Table 1), and observations to evaluate the levels of formation of collaborative, mentoring and research skills of pre-service teachers before the experimental learning;
- target skills development – with the use of problem-based practice-oriented adult learning activities. In order to teach students collaborative, research and mentoring skills and apply knowledge in practice at the same time we used the task based learning method aimed at research and evaluation of digital skills level of elderly people with the follow-up mentoring of them in the process of further development of these skills;
- prescriptive study – hypothesis verification and testing of initial ideas. At this stage, we used the same self-assessment questionnaire as was used before the experimental learning and the method of observation;
- The duration of our research was 12 weeks. The students had classes in methodology of research, practical lessons and tutorials.

Data collection tools

According to Designing Research Methodology framework of our research we chose data collection tools for every stage. At the first stage we applied a comparative-pedagogical analysis of international and national research in order to determine the content of basic theoretical concepts. In order to identify the data on current situation we used narrative interviews, a self-assessment questionnaire, and observations which identified the initial levels of the skills development. At the stage of target skills development we used activities which required solving real-world problems of teaching digital skills to older adults. At the stage of

evidence verification we employed observation of students' behaviour and a self-assessment questionnaire and compared the results with the initial data. The self-assessment questionnaire which was used to evaluate the levels of formation of collaboration, research and mentoring skills of pre-service teachers before and after the experimental study was created by the pre-service teachers themselves. The questionnaire included questions for self-assessment of the levels of formation of three skills: collaboration, mentoring and research (See Table 1). As a background for our questionnaire we took Collaborative Leadership Self-Assessment developed at University of Washington (Collaborative Leadership, 2011) which is presented in Appendix 1.

Research ethics

The data collection has been performed according to general standards of research ethics as recommended by the Academy of Pedagogical Science and was approved by the Research Board of the Pedagogical departments of the universities which participated in the research. Before the experiment started, participants were informed about the nature of experiment, the confidentiality of the observation data, their right to familiarise with the experiment results and were asked for their permission to publish the results of the experiment. Students could stop the participation at any time without any academic consequences. It was emphasised that results did not deal with individual abilities assessment and data would not influence the academic performance. The participation in the programme "Third age university" was also voluntary.

Results and discussion

The answers to the questionnaire at the pre-experiment stage showed low and middle levels of the development of collaboration, mentoring and research skills of pre-service teachers. 43% of respondents chose "sometimes", 31% - "often" and 27% - "seldom" to self-assess their collaboration skills; 36% chose "sometimes", 22% - "seldom", 34% - "often" to self-assess their mentoring skills; 32% chose "sometimes" and 29% - "seldom" to self-assess their research skills. Mentoring skills were developed better than the other two skills because the pre-service teachers had obtained some practical training and experience of teaching while studying the Bachelor degree programme. Collaborative skills were developed at approximately the same though slightly lower level because the students previously performed some collaborative projects. However, they mentioned experiencing difficulties with group roles distribution and team members' motivation in case of disagreement in a team. The results of the experiment showed that 93% of students had difficulty communicating with the elderly, particularly, emotional annoyance when explaining the same information to them more than once. For 7% of the students, the digital phobias of older adults seemed strange and incomprehensible. The least developed skills were research skills, which can be explained by insufficient attention to the research work during the study for the Bachelor degree.

The idea of the engagement of elderly people in the experiment belonged to the pre-service teachers themselves, which was not unexpected since almost all of them had previous experience of teaching older adults. The results of the narrative interviews showed that 95% of the students were involved in teaching their relatives, acquaintances, older friends to use digital technologies. Students helped them learn the principles of work of smartphones. In particular, they assisted with the installation of mobile applications and advised on how to work with them (29% of cases). They taught to pay telephone bills through e-banking (35% of cases), use smartphones and the Internet (46% of cases). Students also helped older people learn to work on a computer (create an e-mail account and use it, work in Word, PowerPoint programmes, create an account in social networks, Skype, Viber and do the shopping online).

The self-assessment questionnaire which was filled out by the students at the end of the experimental learning showed an increased level of development of all the three skills. 23% of respondents chose "sometimes", 41% - "often", 12% - "always" and 7% - "seldom" to self-assess their collaborative skills; 18% chose "sometimes", 32% - "always", 54% - "often" to self-assess their mentoring skills; 28% chose "sometimes" and 36% - "often" to self-assess their research skills.

The observation of students' work on solving the task of teaching older people to use digital technologies also showed that they were continuously increasing their collaborative, mentoring and research skills in the process of the experiment which was particularly efficient in view of the authenticity of the problem and the perception by the students of the importance of their work for the enhancement of the quality of life of older people in the modern information society.

We believe that an important prerequisite for the preparation of "digital natives" for teaching older adults to use digital technologies is the development of the collaborative, mentoring and research skills in young people. This approach will help to reduce the gap that divides the two generations, "natives" and "immigrants" of the digital world, as both generations have their unique experience which can be shared by means of ICT. We would like to point out that regardless of the students' affiliation and their future

professional activity, the results of the study are approximately the same. Thus, we consider that our research can be beneficial for the development of the content of professional training and enhancement of students' soft skills.

The findings of our study are completely in line with positive results obtained by other researchers that focused on different aspects of problem-based learning approach to the development of collaborative, mentoring and research skills in pre-service teachers. We totally agree with Kahraman and Kuzu (2016) who argued that mentoring helped pre-service teachers share their knowledge and experience and had positive influence on their professional development. The results of our study also fully support the conclusions made by Drew and Mardis (2008) that problem-based learning approach helps students learn more effectively by constructing their own knowledge through experience and by responding to an authentic problem that they might face in their future classrooms. Our findings are also consistent with those obtained by Efendioglu (2015) who fixed substantial enhancement of students' achievement in the problem-based learning due to challenging, creative and affective learning environment which facilitated cognitive attainments of pre-service teachers.

Conclusions

In this investigation, the aim was to substantiate the educational strategies of collaboration, research and mentoring skills development of pre-service teachers who facilitated older adults' learning to use information technologies. We used the problem-based learning method which required the pre-service teachers to research the older adults' needs in ICT learning, provide mentoring and promote collaboration in the learning process. The results showed an increased level of the development of all the three skills in pre-service teachers, which confirmed the appropriateness of the use of the chosen learning method based on the authentic problem that was relevant to the pre-service teachers since they understood that its solution was important for the enhancement of the quality of life of the older citizens in the modern information society.

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Appendix 1. Self-assessment of the levels of formation of collaboration, mentoring and research skills of pre-service teachers

Statement	seldom	sometimes	often	almost always
1. I know tools to learn the needs of community				
2. I undertake an appropriate analysis of data				
3. I gather information before taking actions				
4. I clarify the problem before planning solutions				
5. I research the problem from different angles				
6. I create a framework for acting using system thinking				
7. I can build safe communication processes				
8. I can create trustful atmosphere for collaboration				
9. I encourage others to act together				
10. I take seriously my responsibility for coaching and mentoring others				
11. I define my role when serving as a mentor				
12. I can create opportunities for people to share their ideas and realise them				
13. I help people take advantage of opportunities to learn new skills				
14. I establish my expectations for the people I mentor				
15. I create a mutually agreed-upon coaching plan, including criteria for success				
16. I help people take advantage of opportunities to learn new skills				
17. I consistently listen to, respect, acknowledge, and support the efforts of others				
18. I can easily move between leader and follower, assuming either role as needed to accomplish the task				
19. I consistently participate in group problem solving with an open mind, sharing thoughts and ideas without inhibiting the contributions of others				
20. I freely share ideas, information, and resources				