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ORIGINAL RESEARCH PROJECTS

ORYGINALNE ARTYKUŁY BADAWCZE

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Research on Development Needs in the Context of Innovative Methods of Providing Soft Skills and Professional Training through Virtual Reality to Persons with Disabilities – The Case of Poland

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Abstract

This paper presents the results of quantitative research concerning people with various disabilities interested in participating in innovative methods of soft skills and professional train-

ing (improving professional competencies and preparing for entry into the labour market) through Virtual Reality. The research on the training needs of the target group was conducted within the project enabling people with disabilities to improve their professional competencies through the realisation of works in virtual space, carried out between July 2021 and October 2022. In this quantitative research, there were 255 participants from all over Poland (including 205 with mobility disabilities), who evaluated the proposal of the competency tests, soft skills and professional training developed as a part of the project. The opinions, expectations and needs of potential participants formed the basis for the substantive and practical development of training materials. This paper contributes to the research field in that the practical implications of the research analyses can constitute guidelines for training institutions and IT companies for developing educational services and products for people with disabilities.

Keywords: Virtual Reality, disability, labour market, professional training, soft skills training.

Introduction

The World Health Organisation reports that people with disabilities comprise almost 16% of the global population (WHO, 2023). In 2020, only 28.5% of the disabled in Poland were employed (RPO, 2020). Studies show that the employment rate among citizens with disability in the European Union is 50% (EPRS, 2020), while the relative figure for the United States is only 35% (Bonaccio et al., 2020). People with disabilities often remain underemployed, though they would like to work (Lindsay et al., 2018). Many studies highlight the importance of employment for people with disabilities. First, it is an opportunity to reduce isolation and poverty (Vornholt et al., 2017). The lack of employment opportunities for disabled people excludes them from engaging in social life. Further, Zhu et al. (2018) mentioned that thriving at work, defined as an opportunity for an individual to experience vitality and learning at the workplace and is related to personal growth, is especially important for people with disabilities. Employment plays an important role in the self-efficacy and self-worth of the disabled (Zhu et al., 2018; Bonaccio et al., 2020). The main goal of this project is to enable the introduction of modern tools for improving the level of preparation and aptitude of persons with a disability, in turn improving their competencies by orienting them towards new professions through VR instruments (Bal, 2012).

The COVID-19 pandemic has caused and accelerated the natural process of transfer of many professions to the virtual space. Today, such solutions are still imperfect and unavailable to people with disabilities. Experts in project implementation claim that the development of IT tools through VR technology not only improves this process but also enables a realistic assessment of one's skills and shortcomings, which people who seek a job in a specific profession need to address (Dubovi et al., 2017). The tools so developed can be used for cyclical research on the degree of preparation for a specific e-profession, and, through a series of trainings including soft skills exercises, for improving the professional employability of people with disabilities (Alhalabi, 2016; An et al., 2018).

The premise of the project was the development of training scenarios dedicated to using VR technologies, which prepare people with disabilities for taking up e-professions, projected by labour market observers as prospective and in demand. The professions' scenarios were enriched with training in the field of soft skills, such as leadership skills, management skills, elements of auto-presentation, public speaking, negotiating techniques and communication skills (Dobrowolska & Deja, 2020; Dobrowolska & Knop, 2020; Arciénaga et al., 2021; Dobrowolska & Ślazyk-Sobol, 2021).

A prototype of the system for imparting training in the field of soft skills, defining the professional aptitude of people with disabilities, was created as a part of the project. For this purpose, specific scenarios of eight (selected) professions were prepared, which will partly be made available free to people with disabilities where possible, on the platforms of NGOs supporting the disabled. The COVID-19 pandemic has accelerated the process of transfer of many professions to the virtual space. Today, such solutions are still imperfect and unavailable to people with disabilities. The development of suitable IT tools through VR technology improves this process and enables a realistic assessment of one's skills and shortcomings, required by people seeking a job in a specific profession. The solutions presented in this paper will enable the use of the prototypes in two ways: to conduct the tests cyclically (at each stage of school education, for adults too), and to guide future employees towards a specific professional path. In turn, the soft skills package in each of the chosen professions constitutes an additional value that fosters the development of the prospective employee's interdisciplinarity. Due to the pandemic and

the continuous development of Internet services, the need for e-professions is growing and will continue to do so with every passing year. Adopting appropriate solutions will enable disabled people to achieve professional development.

Application of VR solutions in innovative education

The application of virtual reality in education displaces traditional schooling methods, consisting of studying books and instructions. Research shows that the best methods of study are based on multi-sensory communication, simultaneously engaging sight, hearing, touch, smell and taste. Moreover, VR enables the disabled to overcome communication barriers related to both movement and speech organs.

Research reveals the advantages of using VR in education (Casale, 2018), the first of them being immersion in the learning process and mitigation of distracting external impulses. In the case of virtual goggles, the user cuts himself/herself off from the outside world and focuses on the actions in VR. Such immersion aids greater involvement. Calling VR creations experiences also emphasises their sensationalised nature, which is stronger here than in other media. Another positive aspect of the use of VR in the educational process is the possibility of ongoing analysis and correction of the users' behaviours through an adequately developed scenario. In VR, the whole process of learning is very transparent. VR applications enable not only tracking where the user is looking and how they are gesturing but also voice analysis (speaking rate, timbre) and even catching unnecessary interruptions and repetitions. Thanks to these solutions, the user can receive responses from the programme much faster.

The potential result of the project is a publicly accessible, interactive solution that represents a nationwide innovation. Its functionality enables the following, *inter alia*:

- professional education in various industries and support in choosing or changing the profession for people with disabilities (congenital or acquired),
- help in overcoming the barrier of learned helplessness,

- orienting people with disabilities on the effective use of their skills and aptitude,
- building awareness of an innovative approach to education in the domain of the disabled,
- nurturing tolerant behaviour and mutual respect and passing on good values.

The solution enables the virtual experience of work in various industries. The simulations included in the scenarios are adapted to people with different disabilities.

The user can choose from the key professions identified during the research as transferable to VR (the list will grow along with the operation of the platform).

A single e-profession scenario includes, *inter alia*,

- educational material on the nature of a given profession,
- test examining aptitude and matching the candidate's interests with the work in a given profession,
- soft skills training, crucial in a given profession.

Currently, as a part of the research, the values of VR in education and training are being discovered (in narrow industries, e.g. pilot training, VR has been used for over 40 years). In many cases, the training content in VR provided the users with much higher test results, as proven by numerous scientific publications. One of the important aspects of the project is the issue of content personalisation. Content of the VR, quizzes and other forms of verification of the users' skills are generated automatically or are parameterised, based on an analysis of the user's results. The concept of resolving the research problem is based on machine learning methods and neural network architecture capable of clustering unsupervised information and realising association and heteroassociation. As a part of the planned research, various neural architectures will be developed and evaluated: the classic ones, recursive, LSTM, as well as Encoder-Decoder and convolutional ones. Thereafter, the hierarchical variants of the above will be considered. Thanks to controllers, it is possible to include natural gestures in the interaction between the movement of avatars, due to inverse kinematics. It is assumed that the users will be involved in gamification-like processes.

Choosing e-professions appropriate for people with disabilities

In the modern labour market, people with mental disabilities are directed to simple, uncomplicated jobs not requiring any significant aptitude. People with different levels of disability, e.g. mobility disability with full mental capacity, seeking jobs enabling the realisation of their best potential, come across various barriers and adversities, which makes their "normal" functioning much harder. Specialisation and the development of e-professions, preceded by training and diagnostics through VR solutions, enable the disabled to choose their professional career according to their abilities and interests. Just a few years ago, a person working online from home was perceived to be moonlighting (making money on the side), not actually earning an income. Today, the work performed in the virtual world is adequately rewarded, with demand for it still growing.

In developed countries, citizens more often shop, book their vacation and consult their diet, all online. Lifestyle changes create greater and more diverse possibilities in the labour market, for the disabled too.

The following are a few popular e-professions for which the VR scenarios are prepared, along with the elements of training including necessary soft skills the nature of the profession calls for (Bell & Fogle, 2004; Manpower, 2010; Brasil et al., 2011; An et al., 2018; Bracq et al., 2019; Bourhim & Cherkaoui, 2020; Cabada et al., 2020):

- E-salesman

Reasoning: Global trade is moving online increasingly (Tech Trends, 2017). The kinetic enterprise of the Deloitte company reports that on average, Polish people spend 4.4 hours online (on computers) and 1.3 hours on mobile devices. In 2016, the number of active social members in Poland totalled approximately 14 million. This trend translates into spending hard-earned money in online shops. Global analysis shows that 56 cents out of every dollar is spent on e-commerce. Concurrently, as reported by a consultancy company, many companies still struggle with an effective response to the changes expected by the clients, specifically in adapting sales to the digital world. This makes online selling one of the most popular e-professions.

- Online tourism advisor

Reasoning: A tourism advisor can work in a chosen place in Poland or anywhere in the world, both for the travel agency and the travel service. It is a 100 percent online job. The advisor needs to suggest travel destinations and offers suited to the budget.

- E-nutritionist

Reasoning: Polish people are intent on losing weight *en masse* and increasingly consult specialists for this. The ARC Rynek i Opinia (*Market and Opinion*) research shows that 59 percent of people meet the nutritionist personally while 29 percent opt for an online consultation. In addition, a section of the people admitted using both online and in-person consultations. These numbers will continue to grow, because of the increasing number of Polish people struggling with obesity.

- Social media expert

Reasoning: The phenomenal growth of social media has created numerous job opportunities for social media experts. Such experts are tasked with creating a proper brand image on Facebook, Instagram or Twitter. Besides this, they create a relationship with clients, combining the elements of PR, marketing and advertisement. Simultaneously, it is important to maintain authenticity, because internet users quickly notice a company's inconsistent image actions. Very often, it is a job for young people, who have the pulse of social media.

- Web positioner

Reasoning: Positioning in Google search results is one of the most important tasks in companies and organisations. Therefore, they hire Search Engine Optimisation (SEM) and Search Engine Marketing (SEM) experts, whose task is to create the most visible website. Computer graphics design has been one of the most popular e-professions for years, often chosen by freelancers, and such designers are one of the highest-paid professional groups. As their work requires a creative approach, they often work during unusual hours and remotely.

- Media worker

Reasoning: This is a person working in media, creating a quiz, a gallery, etc. and writing short notes for the website. Sometimes, media workers are connected with a single editorial office and sometimes with several of them. The demand for media workers is linked to the changes taking place in the media. Jobs in the editorial offices rarely provide a full-time position and are mostly task-oriented.

- E-PR specialist

Reasoning: During the current times when traditional conferences are replaced by online ones, meetings with e-mail exchanges, and contacts with the client in a virtual space, the demand for PR specialists is growing. It is they, along with the web designers, e-marketing experts and web programmers, who ensure the virtual well-being of companies.

The following are proposals for different e-professions to be completed after the project:

- Graphic designer

Reasoning: This is a popular and well-paid profession, which allows for independence, with work coming to the place where it is performed.

Study on developmental needs in the context of innovative methods of training through VR for the disabled

Based on this research and surveys, letters received and general industry knowledge confirming the market demand, it was decided to implement the project and start solving the research problem, which, based on a literature database review of over 100 scientific publications, is part of the progressive globalisation and internationalisation of didactic processes.

The proposed solution is addressed to people with disabilities, especially with mobility impairments, congenital or acquired, and indirectly, those who help them choose or change their professional path. The most frequently encountered disability, according to the Central Statistical Office of Poland, relates to mobility impairments and diseases, affecting 59% of people legally or biologically disabled. Concurrently, almost half the disabled, according to

the statistical definition, declared having cardiovascular disease (47%). Two other frequently occurring disease groups are neurological diseases, which affect approximately 38% of people legally or biologically disabled, and sight impairments, affecting 35% of this group. One in five people with disabilities has a hearing impairment or disease (19%), while one in ten has a mental health condition (11%). Mental disability accounts only for 5% of all conditions. Notably, the above percentages indicate a large range of comorbidities in different groups of the same people. These statistics prove that the solution proposed in this project will constitute a real value for a broad section of the disabled populace.

Development of technology that enables improvement of the soft skills in the fields of communication, self-presentation and negotiation requires the creation of a technology capable of analysing the human-machine and human-human communication process (Campbell et al., 2017). To enable an automated analysis of communication skills and negotiation, a Virtual Interlocutor (VI) will be developed. Creating the VI requires developing an innovative solution based on algorithms from the field of artificial intelligence and machine learning in terms of, among others, Natural Language Processing, to analyse the language and expressions of participants in the communication process. The VI algorithms will analyse the statements, both oral and written, to generate personalised answers adequate to the situation, in a simulation of the conversation.

While starting the training on the platform, the user can choose the statement and the technology is able to "adopt" beforehand one of the scenarios related to a specific profession (e-salesman, online tourism advisor, social media expert, web placement specialist, computer graphics designer, media worker and E-PR specialist). During the project, the mechanism of easy editing and adding new scenarios has been created. While playing the scenario, the user can first get to know the educational path that leads to acquiring the skills necessary for a given job.

The core part of the scenario involves the user assuming the role of a representative of a chosen profession and presenting an interactive day in the life of a professional, during which the user faces more or less typical situations occurring in a given job. By playing the scenario, the user acquires an awareness of the requirements and practice, similar to the reality of working in the

profession. This limits cognitive errors while making decisions on changing or choosing the professional path based on own ideas or on the perception of a given profession in literature or media, not necessarily in line with reality. Moreover, the image of a given profession generally does not include important experiences related to performing a given job, which may be different for each person. It is hence important to individually experience certain situations related to performing a given job, long before making a significant decision on education in a particular field.

A single session, that is playing one scenario, can take several hours, depending on the user's commitment to the world of virtual reality, their interactions with characters of the scenario and tasks related to a given profession.

Method

Procedure and method

The main goal of this study was to measure the expectations and needs of potential users of the soft skills and professional training within the project, considering the relevance of developed solutions and the lack of available guidance in the literature for those designing such solutions for the disabled.

Accordingly, the survey research was developed with 22 questions concerning the evaluation of the preferences, the importance of the chosen e-professions and the usefulness of the developed soft and professional skills. In most of the questions, respondents estimated on Likert scales selected aspects related to the training activity proposal. The exact wording of each question analysed in this paper is furnished in the Results section (in notes below the Tables).

The survey contained questions also about the socio-demographic features of respondents (i.e. gender, form of disability – mental, intellectual, etc., level of education, total job seniority, and seniority in the current job position).

The following research questions were posed:

1. What is the interest in the e-professions? Which ones are of the greatest interest to people with disabilities?

2. Which e-professions included in the research are considered the most useful by the potential trainees?
3. Are there any significant statistical differences between women and men concerning assessing the interest and usefulness of the selected e-professions?
4. What are the key skills among the chosen soft skills and professional training?
5. Which of the evaluated skills is considered the most important by the participants?

Participants

Two hundred and fifty-five respondents participated in the survey (186 women and 69 men; nobody declared being a non-binary person; all of them were residents of Poland), where most of them declared mobility impairment (n = 205; 80%; for mental and intellectual disabilities respectively n = 26; 10% and n = 24; 9%). Most of the respondents held a basic vocational education level (n = 159; 62%), while a smaller number declared middle school education (n = 42; 16%), general high school education (n = 36; 14%), or higher education (n = 18; 7%). The average seniority was 10.74 years (SD = 5,03; range 2–30 years), whereas seniority in the current position was 2.32 years (SD = 1.82; range 0–9 years).

Results

The results of the analyses conducted are presented below. All the qualitative and quantitative research is available on the website: www.pro-lab.edu.pl.

Interest in professions and degree of their perceived usefulness

The first group of questions was related to the degree of interest and evaluated the usefulness of chosen professions. The frequencies of responses (for the questions concerning interests) and the average responses from the respondents (for the questions concerning usefulness), together with other descriptive statistics, are presented in Tables 1 and 2.

Table 1. Distribution of responses to the questions related to the interest in chosen professions (response scale: YES – NO).

	YES		NO	
	n	%	*n*	%
E-salesman	225	88	30	12
On-line tourism advisor	223	87	32	13
E-nutritionist	223	87	32	13
Graphic designer	223	87	32	13
Web positioner	222	87	33	13
E-PR specialist	223	87	32	13
Social media expert	223	87	32	13
Media Worker	223	87	32	13

Note. Question: "Which of the professions are you interested in?"

Source: Authors' research.

Table 2. Average responses to the questions related to the usefulness of chosen professions (response scale: 1 – 5).

	M	*SD*	Min.	Max.
E-salesman	4.12	0.32	4.0	5.0
On-line tourism advisor	4.13	0.33	4.0	5.0
E-nutritionist	4.13	0.33	4.0	5.0
Graphic designer	4.13	0.33	4.0	5.0
Web positioner	4.13	0.34	4.0	5.0
E-PR specialist	4.13	0.33	4.0	5.0
Social media expert	4.13	0.33	4.0	5.0
Media Worker	4.13	0.33	4.0	5.0

Note. Question: "Please estimate how much the above-mentioned professions are needed on the market today (considering the specificity of people with disabilities), using a scale from 1–5 (1 = not at all, 5 = very important) based on your impressions and opinions after the e-courses".

Source: Authors' research.

The respondents declared low interest (30–32%) in the proposed professions. At the same time, they indicated the high usefulness (average over 4,0) of the chosen professions.

Interest and evaluation of usefulness did not depend on the sex of the respondents – the *t* Student test analysis indicated the absence of statistically significant differences between men and women (Table 3). Interest and evaluation of the usefulness of the professions were also not related to education and seniority, as the Pearson's *r* correlation coefficients for the selected variables were statistically insignificant (Table 4).

Table 3. Differences between men and women in evaluation of their own interest and usefulness of chosen professions – *t* Student test results for independent groups.

		t	*df*	*p*	Cohen's *d*
Interest	E-salesman	0.92	253	0.356	0.13
	On-line tourism advisor	-0.57	253	0.570	-0.08
	E-nutritionist	-0.57	253	0.570	-0.08
	Social media expert	-0.15	253	0.885	-0.02
	Web positioner	0.39	253	0.698	0.06
	Graphic designer	0.28	253	0.780	0.04
	Media Worker	-0.57	253	0.570	-0.08
	E-PR specialist	0.28	253	0.780	0.04
Usefulness	E-salesman	0.92	253	0.356	0.13
	On-line tourism advisor	-0.57	253	0.570	-0.08
	E-nutritionist	-0.57	253	0.570	-0.08
	Social media expert	-0.15	253	0.885	-0.02
	Web positioner	0.39	253	0.698	0.6
	Graphic designer	0.28	253	0.780	0.04
	Media Worker	-0.57	253	0.570	-0.08
	E-PR specialist	0.28	253	0.780	0.04

Note. Question: same as in Table 2.

Source: Authors' research.

Table 4. Relationships between demographic variables and evaluation of interest and usefulness of chosen professions – Pearson's *r* correlation coefficients.

		Education	**General seniority**	**Seniority on current position**
Demographic variables	Education	—		
	General seniority	0.20	—	
	Seniority on current position	-0.09	0.12*	—
Interest	E-salesman	-0.01	0.07	0.05
	On-line tourism advisor	-0.01	-0.03	-0.05
	E-nutritionist	-0.01	-0.05	-0.03
	Social media expert	-0.01	0.02	-0.00
	Web positioner	0.00	-0.01	0.01
	Graphic designer	0.02	0.05	0.01
	Media Worker	-0.03	-0.05	-0.02
	E-PR specialist	0.05	0.02	0.04
Usefulness	E-salesman	-0.01	0.07	0.05
	On-line tourism advisor	-0.01	-0.03	-0.05
	E-nutritionist	-0.01	-0.05	-0.03
	Social media expert	-0.01	0.02	-0.00
	Web positioner	0.00	-0.01	0.01
	Graphic designer	0.02	0.05	0.01
	Media Worker	-0.03	-0.05	-0.02
	E-PR specialist	0.05	0.02	0.04

Note. Question: same as in Tables 1 & 2.

* $p < 0.05$

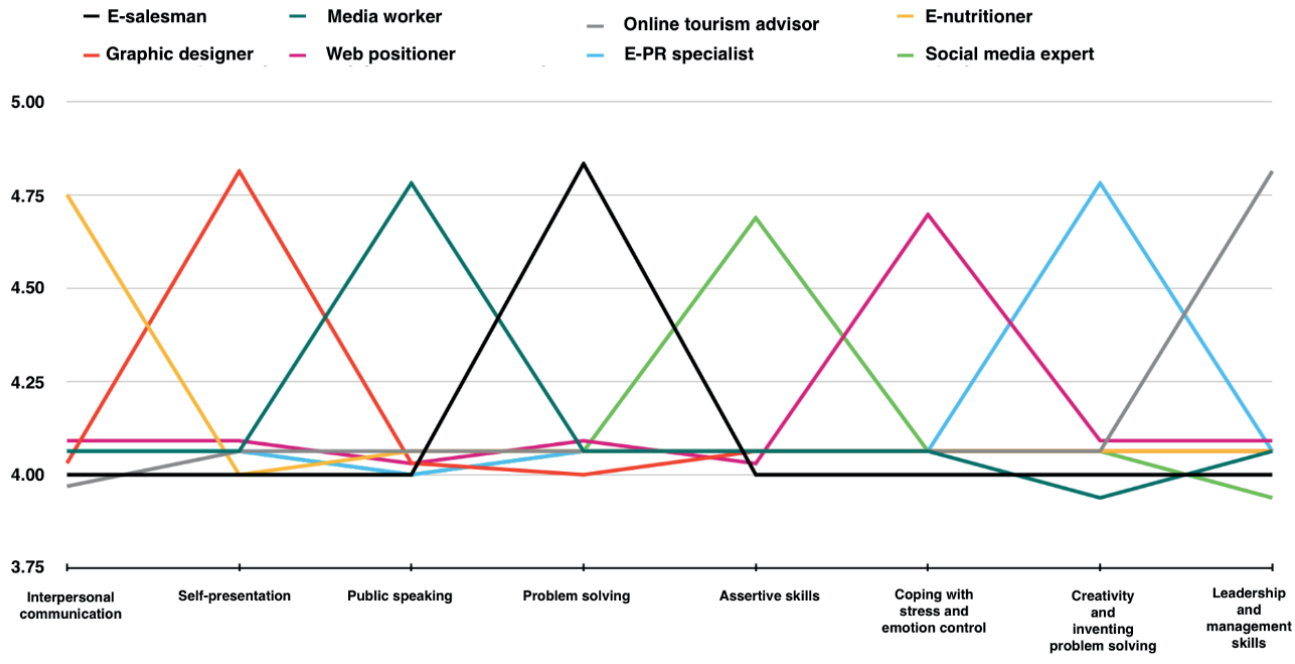
Source: Authors' research.

Key skills in chosen professions and training

The second group of questions was related to the usefulness of the skills in the chosen professions. The respondents were in groups of 30–32 people. The average responses from the participants are presented in Graph 1.

The respondents evaluated all the skills as important (all averages close to or above 4.0). Moreover, the analysis proved that concerning computer graphic design, the respondents indicated the highest importance of self-presentation skills, negotiation and conflict resolution skills in the e-salesman profession, public speaking in the media worker profession and coping with stress and controlling emotions in the web placement profession. Concerning online tourism advisors, the respondents indicated the significance of leadership, management skills, creativity and inventive problem-solving in the E-PR expert profession. Concerning the e-nutritionist, the respondents indicated that interpersonal communication was the most important skill, while for the social media expert, it was assertive skills.

Concerning training, the respondents mostly indicated that each of the proposed skills should be included (Table 5).



Graph 1. Average scores for key skills in selected professions – analysis of averages.

Note. Question: "Please indicate which of the following soft skills you consider most important in a given e-profession, based on the training you have completed (apart from those indicated) using the scale provided below (ranging from 1 = not important at all to 5 = very important)".

Source: Authors' research.

Table 5. The importance of chosen skills – percentage distribution.

Leadership and management skills				Assertive skills				Communication training				Self-presentation			
		n	%			*n*	%			*n*	%			*n*	%
building leadership authority - manager credibility factors	NO	27	11	the essence of assertiveness and distinguishing the types of behaviour	NO	17	7	paraphrasing	NO	35	14	self-presentation techniques and tools	NO	31	12
	YES	228	89		YES	238	93		YES	220	86		YES	224	88
styles of team management	NO	0	0	assertive refusal	NO	0	0	clarification	NO	15	6	making an effective impression on others	NO	11	4
	YES	255	100		YES	255	100		YES	240	94		YES	244	96
conducting management interviews	NO	14	5	expression and defence of opinions and rights	NO	17	7	types of questions	NO	15	6	building professional image	NO	11	4
	YES	241	95		YES	238	93		YES	240	94		YES	244	96
motivating employees	NO	27	11	accepting judgement - criticism and praise	NO	17	7	I-messages and you-messages	NO	10	4	coping with difficult self-presentation situations	NO	11	4
	YES	228	89		YES	238	93		YES	245	96		YES	244	96
evaluating employees	NO	0	0	expressing judgement - criticism and praise	NO	17	7	providing feedback	NO	20	8	art of on-line presentation	NO	20	8

Tabela 5. (continued).

Leadership and management skills				**Assertive skills**				**Communication training**				**Self-presentation**			
		n	%			*n*	%			*n*	%			*n*	%
	YES	255	100		YES	238	93		YES	235	92		YES	235	92
dismissal of employees	NO	30	12	expressing favours and expectations	NO	17	7	non-verbal communication	NO	10	4				
	YES	225	88		YES	238	93		YES	245	96				
Coping with stress and emotional control				**Creativity and inventive problem solving**				**Public speaking**				**Negotiations and conflict resolution**			
		n	%			n	%			n	%			n	%
the essence of psychological stress, „good" and „bad" stress	NO	19	7	the essence of creative thinking and inventive problem solving	NO	22	9	principles of effective public speaking	NO	17	7	negotiation styles	NO	30	12
	YES	236	93		YES	233	91		YES	238	93		YES	225	88
styles and strategies for dealing with stress	NO	0	0	creative problem solving techniques	NO	0	0	effective public speaking techniques	NO	0	0	chosen negotiation techniques and tools	NO	10	4
	YES	255	100		YES	255	100		YES	255	100		YES	245	96
emotional control and building psychological resilience	NO	19	7	resourcefulness in the context of dealing with non-standard situations	NO	17	7	dealing with stage fright and emotions during public speaking	NO	17	7	active listening during negotiations	NO	10	4

Tabela 5. (continued)

Leadership and management skills				Assertive skills				Communication training				Self-presentation			
		n	%			*n*	%			*n*	%			*n*	%
	YES	236	93		YES	238	93		YES	238	93		YES	245	96
the role of constructive beliefs in dealing with difficult situations	NO	19	7	methodology for developing creativity - courage to test novelties	NO	22	9	good practices in public speaking	NO	17	7	causes and sources of conflicts	NO	10	4
	YES	236	93		YES	233	91		YES	238	93		YES	245	96
												conflict resolution strategies	NO	20	8

Note. Question: "Please indicate whether the following soft skills should be included in a given e-profession training based on the training you have completed (apart from those indicated)?"

Source: Authors' research.

Discussion

As shown by the above results of the quantitative study, potential participants of the training through VR tools do not differ concerning the evaluation of key skills, expectations and needs (their sex, education and seniority do not impact them). Due to that, their training needs seem to be universal. The results reveal important elements like the postulates related to including all aspects of soft skills in the training programme for each e-profession.

The evaluation of the usefulness of the chosen e-professions is a significant aspect, although the relatively low interest of disabled people in selected professional courses seems surprising. Possibly, the respondents were not familiar enough with the specifics of the professions or have any experience concerning them. It is important feedback for the authors and contractors of the project when it comes to the promotion of the developed products and the education environment of people with disabilities. The proposed product, viz. professional and soft training, is innovative; it is also connected to the niche professions, which have just started gaining recognition in the Polish labour market. The specialists of the project are aware that implementation of the training programmes offered, and promotion of those specific e-professions will require time (Makransky et al., 2019). It is worth emphasising that the proposed soft training programme met with high approval from the respondents in terms of assessing the relevance and importance of specific training topics (Lu & Hindman, 2011). People with disabilities mostly evaluated the proposal as interesting and important from the level of soft skills development.

The analysis of the Polish market indicated the lack of products that could compete with the solution proposed by the Applicant. Though VR training platforms have already emerged worldwide, they are not inclusive of people with disabilities. Using these platforms enables browsing VR content (Moodle – USA, Engage – UK), and the more advanced ones enable gaining professional experience, although only in the static form because they do not use the controller (Docebo – Italy, MindBox VR – Slovakia).

The platforms most similar to the proposed one are Class VR and Teach VR. They are, however, dedicated to schools for conducting virtual lessons, but their functionality offers only viewing possibilities, without the interac-

tion that a developed VR controller in the platform can provide. The platform will become widely available in Poland at reasonable prices, unlike Class VR and iTeach VR, which are priced prohibitively. Moreover, it is assumed that it will be used not only by people with disabilities, often with limited budgets, but also by organisations supporting and employing such people. An analysis of 41 educational platforms available worldwide and in Poland clearly shows that the international solutions used, compared to the proposed one, focus on static content (Udemy, Corsea Coursera, Iversity, etc.), and only a few of them have started including VR content. However, those that do are at a nascent stage and have either no tools or little VR content and consider the needs of the disabled. In this regard, the proposal of the products concerning soft skills and professional training through VR was recognised as an interesting and innovative form of professional development (Smutny, 2019; 2022).

The results of the project constitute both the substantive model – in terms of creating scenarios of soft skills and professional training, and the technological one, in terms of building platforms and products, and VR solutions for people with disabilities.

In conclusion, this study highlights that VR training needs do not significantly vary across gender, education, or seniority, indicating a demand for universally designed programmes. It stresses the value of integrating soft skills into e-profession training programmes, especially for the underrepresented group of people with disabilities. The study underscores the innovative potential of the proposed VR training solutions in Poland, which are not only well-received by respondents but also address a notable gap in the market, setting a precedent for inclusive, practical and affordable educational platforms.

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