SPEAKING SKILLS TRAINING: A USE CASE IN VOCATIONAL EDUCATION AND TRAINING AND ADULT LEARNING ENVIRONMENTS

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*T*his paper describes a speech analysis technology that computes personality traits of a speaker. The technology analyses primary speech features via sound engineering and complex personality features (concretely, the "Big 5") via an AI model trained on a variety of native and non-native speakers of English. The results are communicated to the users/learners so that they can understand how they are being perceived as speakers and therefore improve their speaking skills. To this end, an online course explains speaking features, interpreting personality computing results, and exercises on breathing, etc., to improve one's speaking performance. We describe the process of deployment of this course to learners of VET or other professional education and training at institutions in 8 countries and online globally, including the presentation of the course and the related technology, the identification of participants, and the implementation of a pre-survey on attitudes related to speaking and a feedback survey post-course. We report an analysis of the results of the surveys as well as of the achievements of the learners who took the course. Results suggest that the learners present an improved understanding of how they are being perceived as speakers, as well as a high satisfaction rate and engagement with the course. Additionally, in the short duration of the trial, a slight improvement in speaking skills is arguably already detectable. However, actual improvement in speaking skills is a long-term effort, and generalised claims cannot be made, in contrast with the improvement in understanding how one is perceived by others as a speaker, which is evident by the results presented in this work.

Keywords: speaking skills; personality computing; Vocational Education and Training.

INTRODUCTION

The labour market is rapidly transforming, with new skills and jobs being in high demand, while 44% of the workforce faces the need to upskill or reskill by 2027 (World Economic Forum 2023). To prepare the labour markets for the

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transformation and the challenges in the post-COVID-19 era, one of the goals is to strengthen and modernize vocational education and adult learning, as part of the priority of supporting the upskilling of the workforce (OECD 2022). This entails the development of new tools and adapted curricula to support the training of learners in the context of Vocational Education and Training (henceforth: VET) and adult education.

In this article we focus on speaking skills training, which addresses horizontal yet indispensable competencies for the successful professional integration of VET and adult trainees. Effective communication is key to personal and professional success. Workplace communication in the VET and adult education domains refers to skills and competencies required to communicate effectively in a professional environment. This could include interacting effectively with colleagues in decision-making and goal setting, delivering presentations, participating in team meetings, clearly delivering thoughts and ideas during problem-solving, and opportunities for career advancement. Our focus is on speaking skills, since voice is one of the main modalities one uses to communicate. In this respect, speaking skills are viewed as a core part of communication skills, as one's voice is primarily used to convey information verbally and in a way that a listener can understand. Pursuing training and improvement of speaking skills is expected to assist people in becoming better communicators, being more effective in what they say, and eventually becoming more fluent and more confident speakers.

The value of communication and speaking skills becomes more relevant in the era of digital skills: the digital economy requires − in addition to digital skills − complementary skills, including communication competencies, which are indispensable for the readiness and adaptation of workers in changing environments (European Commission 2023). This is in line with the European Skills Agenda (European Commission 2020), which stresses the increasing need for transversal (i.e., communication, collaboration, and problem-solving) skills and their high demand in the labour market.

This applies also to the VET sector, i.e., on top of knowledge and technical skills, workers are expected to be equipped with communication skills that will assist them in succeeding in the workplace. It has been stressed that VET can play a major role in addressing current and future workforce shortages because it displays a close connection to the world of work, and this makes it possible to offer the right mix of technical and soft skills (Cedefop 2023).

The contribution of our work to this special issue is to present a training solution targeting the development of knowledge and skills related to speaking and communication that are necessary for assisting the successful integration of young adults in the labour market.

An innovative approach to speaking skills training

The challenges that the communication skills training must address relate to providing competencies that are relevant to industry standards and equipping VET and adult learners with strong communication skills that meet employer expectations. Next, we present the development of an AI-based training solution, enabling learners with the flexibility to train remotely, at their own convenience, to receive personalised feedback evaluating their speaking performance, and to keep practicing to improve their speaking skills.

AI technology in and for the workplace has been sought after in recent years, as it is convenient and provides fast results. In this article, we describe the deployment of Interveu (Interveu 2024), a solution for skills assessment and self-development potential. Interveu is an AI-powered speech analysis technology delivered through an online course, designed for adults who aim to receive communication and speaking skills training to upskill their professional competencies. The technology analyses the voice and gives insights on a) speaking skills such as voice stability, volume, clarity, and pace, and b) derived perceived personality skills such as the "Big 5" (openness, conscientiousness, extroversion, agreeableness, neuroticism) (Costa and McCrae 2008). The online course explains concepts of speaking skills and personality traits and offers tips and exercises to practice with the Interveu technology.

The coupling of AI technologies and speaking skills development has been largely explored in the context of second language learning, and particularly English as a foreign language (EFL), because of the importance of spoken communication. Recent advances in AI-based applications, mainly chatbots, together with more traditional technologies of speech recognition and natural language processing, have been applied to EFL instruction and evaluation, with the aim of assisting EFL learners in their speaking practice, speeding up the EFL learning process, and enhancing the EFL learners' learning outcomes, confidence, engagement, and motivation (Du and Daniel 2024).

The impact of AI-mediated speaking activities on learners' speaking fluency, coherence, lexicon, grammar, pronunciation, and willingness to communicate was studied by Fathi, Rahimi and Derakhshan (2024). The results of this study showed that the AI-mediated speaking activities were more effective than traditional methods in improving both the learners' speaking skills and their willingness to communicate. Qiao and Zhao (2023) investigated the effectiveness of AI-based instruction in improving speaking skills and speaking self-regulation in a natural setting: the learners group, which received AI-based instruction, exhibited significantly greater improvement in EFL speaking skills compared to the group which received traditional instruction. Besides the linguistic output gains, the former group also reported higher levels of self-regulation. Similar promising results were reported by He, Mavrikis and Cukurova (2024) who explored voice communication with AI agents enabled by large language models with the goal to enhance EFL

learners' oral proficiency. The effect of automated speech evaluation systems for EFL learners on their speaking practice outcomes was investigated by Zou et al. (2023); significant improvements in the speaking skills were noted, while learners reported on their own perception of improvement using the feedback provided by the AI speaking evaluation program.

The Interveu solution described here deploys AI from another perspective, that of technology able to infer personality traits from voice, by exploiting speech signal processing and machine learning models. The solution focuses on the acoustic aspects of speaking, namely on how the speech is delivered, rather than the content of the speech itself. However, the design choices of its implementation aim to maximise some horizontal benefits already attested by the literature and the aforementioned applications and solutions, including the engagement and the motivation of learners, and their self-regulated learning. Specifically, Interveu learners engage in self-paced learning, going through the training offered in their own time and place, and getting a personalised learning journey. Using the online training material and practice platform, learners can go beyond the conventional restrictions of face-to-face training that can be less personalised or evoke nervousness and reluctance to speak in front of others. Finally, Interveu learners are expected to get involved in individual speaking activities and receive personalised feedback.

We consider the users of the Interveu solution as learners of professional skills (presentation skills, communication skills, etc.) whom we seek to empower. In this respect, we use AI/ML technology as a driver for an augmented intelligence application (IEEE Digital Reality 2024), and not as a standalone decision-making information system. Our solution assesses personality traits and speaking skills from speech, while addressing two perspectives: the first one is about the robustness and fairness of the technology itself, and the second is about user expectations of objectivity.

Concerning the first perspective, we opt for analysing the speech modality (voice) as the paralanguage, namely the acoustic properties of the speech signal, is highly informative and literature related to personality perception provides evidence that judgments made from speech have the highest correlation with a person's own judgments compared to other modalities (Ekman *et al.* 1980; Vinciarelli and Mohammadi 2014). The running version of our solution has been trained on the First Impressions dataset (Ponce-López *et al.* 2016) and results are promising, with a prediction accuracy of over 90% for each of the big five personality traits. While our solution is based on a dataset that includes speech from native and non-native users of English, we acknowledge that personality traits and their perception are dependent on the cultural context. As a means to tackle this challenge, the measurements of speaking attributes and personality traits take into consideration a voice sample that each user gives before using the voice analysis tool, and this sample serves as a benchmark for the specific user, with the aim to offer as personalised feedback as

possible. A further measure that we intend to look into is to expand the training dataset, so that it becomes more representative in terms of cultural and language contexts.

It should be stressed that our self-development learning design explains to the learner that our solution provides measurements about how the users' specific personality traits are perceived, which should be distinguished from a prediction of their actual personality or any judgement about the learner as a person. Research findings have stressed the connection of personality traits to some of the workplace competences, e.g. leadership (Judge *et al.* 2002). Thus, speaking skills development can play a major role in building up leadership qualities, which are among the top 10 core skills required by companies worldwide, are increasing in importance, and upskilling workers on leadership is among the companies' skill strategies (World Economic Forum 2023). In addition, effective speaking skills can manifest clear communication and persuasion capabilities, skills that are becoming more important within organisations, as they facilitate the smooth collaboration of co-workers (Cedefop 2022c).

The second perspective addresses the expectations of the users of the solution. Contemporary AI adoption in the recruitment industry is almost entirely focused on selection and recruitment by human resources departments, and not on personal development; and corporate trainings are usually procured by external vendors and presented in the form of content delivery, more often than not without any practice opportunity. Our target users are individuals in need to improve their job candidate and employee communication skills. Our solution analyses a user's speech and generates measurable feedback and actionable speaking improvement recommendations, giving users the opportunity to practice and develop their communication skills, thus being a highly valuable tool, because of the learning and self-development potential.

Specifically for the workplace and/or preparation to enter the workplace scenaria, treating users as learners and their tasks as professional development is our proposed lens of focus. With a learning solution users are empowered to learn about skills. To achieve this, the "Iron Triangle of Education", i.e. the learners, content, and instructors should be considered main components and stakeholders of the designed applications (Kapros and Koutsombogera 2018).

A training use case in VET and adult learning

This article focuses on a speaking skills training use case that took place in the framework of the Erasmus+ project *PREDICT: Jobs of the future, with AI 4 VET Inclusion* (PREDICT 2024). The project aims to develop methodologies, digital tools and training for learners and trainers in vocational education and similar training environments. PREDICT intends to create a set of strategies to address the learners' needs and the organisations' requirements in the context of digital and technological skills for future jobs, including a deeper understanding of how advanced

technologies work. In this respect, the project addresses tailored solutions in which VET participants can find helpful tools, resources, and materials that boost their digital competencies and life skills. In the context of providing training experiences, one of the objectives of the project is to train VET learners on communication skills, using innovative digital tools. The related activity, which is described in detail in the following sections, is about the deployment of the Interveu technology and the related online course to VET learners.

The rollout of the course and the Interveu platform for speaking skills training was offered to VET learners for three months, during the duration of the project, and related learning analytics were monitored. Next, we describe the steps involved in this activity, including a pre-survey conducted before the implementation of the course and a feedback survey implemented after it. We also discuss the learning contents of the course offered to VET students and the related digital platform used by the students to train their speaking skills, including a description of the learning design necessary to apply for the course on authentic VET environments.

METHOD AND MATERIALS

Participants recruitment and onboarding

The prospective learners for the online course were identified by the PREDICT consortium partners, and specifically from their network of learners and professionals coming from the VET sector, Higher Education institutions and other adult training activities from all over Europe. A large number of learners (>250) was then invited to take part in the activity, which consisted of 4 steps: a) informative and onboarding sessions; b) pre-survey; c) rollout of the online course; and d) feedback survey. More details about the final number of participants and the countries they come from can be found in section *Pre-survey participation and outcome* below.

Three online onboarding sessions, each lasting 1 hour, took place to accommodate all learners. In each of the sessions, the motivation behind speaking skills training, an overview of the online course modules, and the Interveu AI platform were presented. Instructions were additionally given with respect to the timeline and the tasks that the students will go through, i.e. Task 1: respond to the pre-survey; Task 2: enrol in the course and complete its modules; Task 3: respond to the feedback survey about the course. The onboarding sessions took place in March 2024 and were well attended by a high number of learners.

Pre-survey design and rollout

A survey was launched to collect responses from the prospective learners described above, with the aim to understand their status with respect to their

performance regarding speaking skills, and potential issues and impact this has on their personal lives and careers. The survey also aimed at collecting information about the effort and frequency that the learners are engaged in public speaking and presenting. The survey also looked into their habits of using online learning courses. Most importantly, it attempted to identify the respondents' learning needs and expectations with respect to developing their speaking skills.

A thorough research was performed with respect to the survey design configuration, related to format options, accessibility features and appropriate extent. The primary concern was to improve the user experience, while at the same time minimising the drop-out rate. We opted for a platform that would allow us to collect, organise and analyse learners' responses (Qwary 2023), and which offers survey design options with good user experience and usability, accessibility design principles, and a clear GDPR policy which protects respondents, including their right to delete personal data, and restrict or object to the processing of personal data.

Different answer formats were selected (close- and open-ended questions) keeping in mind the quality of responses we intended to receive. Considering the high drop-out rate that surveys often have, the set questions were designed in a way that it would take 5−7 minutes for a respondent to complete. *Table no. 1* lists the set of questions included in the user survey, accompanied by the type of reply they require.

Table no. 1

Pre-survey questions and the type of reply required

1. First, we'd like to get to know you a bit. Could you tell us about your role at your company or institution? (free text)	**7. What are you currently doing to solve speaking/presentation skills problems?** Either for you, or for your team. (free text)
2. Perfect! In which of these activities do you spend the most time speaking? A. Meetings B. Presentations C. Job interviews	**8. How much are you, or your company, paying for courses?** Online courses or face-to-face ones. On free online courses, have you ever paid to get a certificate or to keep access to the learning material? (free text)
3. How much time do you spend on preparing for a presentation/meeting/job interview? (numerical likert scale)	**9. Now we will ask you about your experience with online courses. How many online courses have you taken to date?** A. 1 to 5 B. 5 to 20 C. 20+ D. I have never taken an online course E. Other
4. How do you feel about your speaking/presenting skills at the moment? (emoji scale)	**10. If you have taken online classes, which platforms were they on?**

	E.g., Coursera, Udemy, EdX, Futurelearn, etc. If you have used several, feel free to mention the ones you used more often. (free text)
5. Tell us about the last time you faced a situation related to speaking skills. Some prompts/ideas: You can talk about the last time you personally found it stressful to present something, or about a team communication situation. (free text)	**11. Do you prefer online or face-to-face courses?** Select all that apply A. Online (live) B. Online (at my own pace) C. Face-to-face (semester type) D. Face-to-face (2-days seminar/workshop) E. Other
6. How much has having this speaking situation cost you in time, money, or happiness? Feel free to use as reference the situation you mentioned in your previous answer. (free text)	**12. What are your expectations from a speaking skills course in terms of adding value to your situation?** How would you expect a course to help you improve your speaking skills in job interviews, presentations, meetings, negotiations, etc.? (free text)

Online course on "Mastering your speaking skills"

After the first phase of the pre-survey was completed, the learners were invited to join the online course. The online course offered to VET learners consists of an online course and the Interveu platform for measuring speaking performance.

Specifically, the online course includes 8 modules developed in an online learning management system (LMS). The modules dedicated to speaking skills include learning and training materials. In addition, the course provides introductory guidelines to the learners explaining what the course is about and its lifecycle, as well as a demonstration video guiding the users through the course and preparing learners for their learning objectives, while at the same time showing the innovative aspects of the course and the added value to the users. The Interveu platform is an engine that provides measurements on speaking attributes such as the pace, the volume, the pitch, the pauses and the trembling of the voice, and assesses the speakers' Big 5 personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism) as perceived from their voice. The platform is connected to the online course via online links provided for each of the speaking skills.

The learning design of the online course is based on the "Understanding by Design" (UbD) framework of G. Wiggins and J. McTighe (1998). This framework suggests a design process that is particularly useful for professional education and skill development, even though it is not limited to this use. The framework consists of three steps: a. identify results; b. determine acceptable evidence; and c. plan learning experiences and instruction.

The connection between skills development and UbD lies in the centrality and priority that is given to the identified results instead of planning the learning

experience and instruction/content first. UbD was applied in our course and platform as follows:

1. Identify results: Improving the learner's speaking skills is the objective of the course. The learner should be imprinted with an *enduring understanding* that speaking skills are important in how we are perceived as speakers and that – thankfully − they can be improved. It is *important to do* exercises related to practising skills and *worth being familiar with* principles behind voice attributes such as pace, pitch, volume, stability, etc.

2 Determine acceptable evidence: The multiple sources that are designed for evidence collection as an assessment strategy include a) informal checks for understanding throughout the course, b) a performance task per speaking skill at the Interveu platform/tool, and c) feedback from the learner for the course and the task, integrated as course evaluation. That is, the performance assessment is the summative part while the feedback is formative, the informal checks being mixed.

3. Plan learning experiences and instruction: The content followed the previous steps of the framework, in that it was planned to provide a) explanations about the importance of speaking skills and their role in our various speaking-related performance tasks (presentations, meetings, interviews, etc), b) exercises concerning speaking skills (breathing, relaxation, etc), and c) definitions and video examples of good and bad speaking practices (too fast, too slow, high pitched, etc).

Learning objectives that were identified as a result of the UbD framework applied to the general course objective are as follows: learners manage their speaking pace; they modulate their voice for a perfect pitch; they handle pauses in their speech; they balance the volume and stability of their voice; and they understand how they may be perceived by their audience from the attributes of their voice.

The learning process is the following: the learners start learning content about the principles of a voice attribute; then, they check their understanding through informal quizzes; they continue to learn exercises about how to perform well a speaking skill with their voice; they are assessed using the performance task at the Interveu tool; when they improve, they move to the next skill; and, finally, when they have finished the content and the performance tasks they give feedback as their final overall assessment.

The course is implemented on the Coassemble (2024) LMS and its structure follows the order of the learning objectives in general. However, additional elements were required: an introductory module, an end-of-course and "what's next" module, and within each module introductory and "what's next" screens at the beginning and the end, respectively.

Concerning the Interveu tool of recording the learner's voice and giving feedback on their speaking skills, the decision was made to present self-improvement in speaking skills by having an initial "calibration" activity to read a Wikipedia text, and then comparing the results of each practice task with Interveu to the ones obtained at the calibration. Pedagogically speaking, this is the same pre-test and post-

test as in other learning contexts, and the use of a tool to do the assessment does not affect the learning design. The tool is implemented on an Amazon Web Services server and a link is included in the course LMS that allows the learners to visit the tool.

For the content of the course, the learning materials were chosen based on criteria such as their openness (open educational resources − OER), being peer-reviewed and of high academic calibre, and appropriateness. Specifically for some example videos, comedic material was chosen on the basis of a comedian exaggerating a voice feature, thus having great explanatory power − and being entertaining and engaging content simultaneously. Concerning the text describing the voice skills in speaking and communication, we consulted various sources.

Ethics and privacy protection were considered throughout all processes, and not as an afterthought or a separate layer "on top of" other actions. In addition, the trial is part of a project (see Acknowledgements section below) that has submitted an Ethics proposal which has been approved as a condition of its successful acceptance for funding. A privacy-by-design GDPR-compliant approach is used throughout, and, the platform selection, the technologies used, the design choices, all reflect our ethical values of accessibility, transparency, and privacy protection. The learning management system is compatible with GDPR, and accessibility features such as the ability to hide menus and enlarge fonts were enabled in it. In terms of technology privacy protection provisions, Interveu does not store private information of the learners, nor are their audio files, i.e. audio files discarded after a few seconds of processing time. Finally, considering anti-bias measures, the technology was trained on a balanced dataset in terms of gender, age and ethnicity aspects.

Post-survey: learners' feedback about the online course

Feedback was provided within the course environment, i.e. a dedicated space for course learners to provide their comments in the course, without having to switch environments and login to external survey tools. Learners provided their responses regarding the overall impression of the course, its effectiveness and their level of satisfaction with it.

This course module, called "Course Feedback", includes 4 questions addressed to the learners, according to best practice concerning constructive feedback (Walsh, Neelen and Kapros 2017). Each question is accompanied by an explanation text:

− Q1: What went well? [What did you like about the course?]

− Q2: What could be improved? [Which aspects of the course should we focus on improving next?]

− Q3: What did you learn? [Has the course helped you with your speaking skills? Has it helped with actual speaking already, or has it helped with understanding your skills so that you can improve in the future? Or not at all?]

− Q4: Would you recommend it? [Would you recommend the course to the Learning Department of a company?]

Learners have the possibility to write free text and/or to upload files as part of their answer. Replies are collected in the platform and may be exported in a report for further analysis. In the Results section below we present a summary of the responses collected for each of the 4 questions.

RESULTS

Pre-survey participation and outcome

The survey was completed by 114 respondents (female: 59.4%), who used their laptop or mobile phone to access it. The average time that they took to complete the survey was about 4 minutes. Out of the 114 respondents, the majority of them are students (77.2%) or interns (4.4%), while there are also participants coming from the HR domain (3.5%, e.g. recruiter, job counsellor, HR manager) and other employees (14.9%, e.g. administrative staff, sales and marketing, secretaries, nurses). The respondents of the survey come from Greece (42.2%), Portugal (37.3%), Romania (7.8%), Cyprus (4.9%), Latvia (2.9%), Ireland (2%), Spain (2%) and Slovakia (1%).

When asked about the speaking activity where they spend more time (Question 2), the majority of learners picked presentations (62.73%), followed by meetings (25.45%) and, lastly, job interviews (11.82%, cf. *Figure 1*).

In response to the question about the time of preparation for a presentation (Question 3), meeting, or job interview, 28% of respondents replied that they need to prepare days in advance. On the contrary, 38% responded that about a couple of hours are sufficient for them. The majority of responses (44%) fall in the middle of the scale, indicating that most respondents do require some time to prepare, which may vary from several hours to 1 day.

And, regarding their satisfaction with their current skill performance (Question 4), most respondents rate it as neutral (38.39%) or good/very good (33.04%), while a 28.57% of them are not satisfied with their speaking skills (cf. *Figure 2*).

When asked to describe a challenging situation related to speaking skills that they remember most, (Question 5), the majority of the respondents (28.6%) note that they are challenged when giving presentations at the university or at conferences, and during oral exams. Some respondents (12.5%) have issues when addressing people in a language other than their native language. Another 12.5% stressed the negative feelings and cognitive states they experience when they are involved in speaking, including anxiety and nervousness, confusion, embarrassment, sleep problems, voice trembling, hands and legs shaking, forgetting their words. Some respondents focused on specific situations that make them nervous, including when speaking about topics for which they are not prepared (5.4%), when talking to large audiences (3.6%), when talking to strangers (4.5%), when being interrupted (3.6%),

or for technical reasons, e.g. their presentation software stopped working (1%). A 5.4% face challenges in the workplace, i.e. during job interviews or while giving job presentations. Finally, only a 7.1% responded that they don't have any issue, or enjoy speaking in public, while a 14.3% did not provide a response.
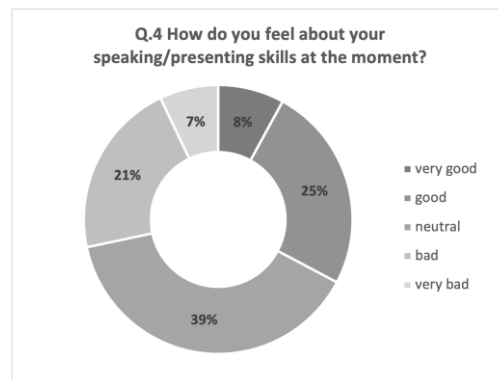
Figure 1

Q2: Most respondents use their speaking skills in presentations, then in meetings, and lastly in interviews

Figure 2

Q4: Respondents rate their satisfaction with their current speaking skills mostly as neutral or good

In response to Question 6, the cost that speaking situations have in their lives, a significant percentage of participants (41.3%) reported costs in happiness, explaining that, besides investing effort and dedication, they experience negative states of mood swings, stress, uncertainty, embarrassment, pressure, nervousness, tiredness, disappointment, hopelessness, confusion. Some of the respondents highlighted that they are still thinking about some of their talks, and some missed good grades in their exams because of their performance. Several respondents (17.4%) also mentioned that preparation for speaking and presentations take up a lot of time in their lives. Only 5% reported that they feel great about speaking in public and giving presentations, as they are enthusiastic about sharing knowledge and interacting with other people. Another 14% mentioned that this costs them nothing, or too little, without further elaboration, while the remaining percentage either did not respond or did not know.

In relation to the question about the actions that they take to address their speaking and presentation skills problems (Question 7), the majority of the participants responded that they are actually doing something about it, namely: a) practice and preparation (33%) − participants stressed that they try to prepare their presentations and talks well in advance, write down and go through their notes, to rehearse in front of the mirror or with friends, and to get involved more often in speaking occasions; b) formal and informal training (31%) − participants responded that they aim to learn more by taking courses or private lessons, participating in

seminars and talks, listening to podcasts, reading more articles and learning new things related to their specialties; c) An 11% of the respondents are trying to be more self-aware and mind their wellness, by e.g., taking breaths, focusing their eyesight, finding ways to feel more concentrated, but also calmer and not getting emotional when speaking in public. The remaining 15% responded that they did nothing about it, and 10% did not respond at all.

When asked about the amount of money respondents spend for online courses (Question 8), we notice a trend towards free courses (52.7%), while a 2.7% express a willingness to pay for online courses, especially if they get a certificate, and a 14.5% has already completed online courses with a cost ranging from 100 to over 1 000 euro. 1.8% responded that they don't wish to invest in online courses, and the remaining percentage either did not know or did not respond to this question.

In relation to the respondents' experience and preference of online courses (Question 9), most of them has shown to have followed online courses from time to time, and a 25.23% has no experience of those (cf. *Figure 3*). Respondents use mostly the major online learning platforms and providers, such as Coursera, Udemy, EdX, Linked Learning, Khan Academy etc., but also courses and webinars on YouTube, Webex, Zoom, and Microsoft Teams (Question 10).

Also, when asked about the modality of courses they prefer (Question 11), either face-to-face, or online, the most popular replied given are asynchronous online courses (35.50%) and semester type face to face courses (21.89%) (cf. *Figure 4*).

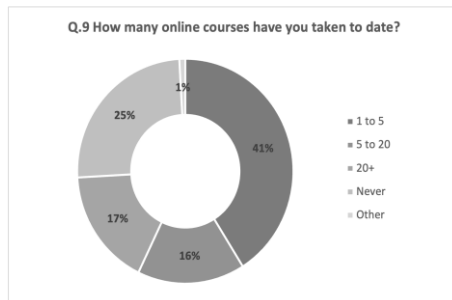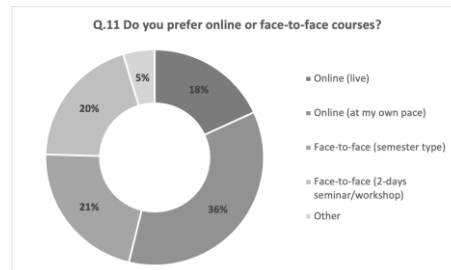| *Figure 3*	*Figure 4*
Q9: Most respondents have some experience with online courses	Q11: Online asynchronous learning or semester type face-to-face courses were the preferred modalities for the respondents

Q.9 How many online courses have you taken to date?

1% 25% 41% 17% 16%

■ 1 to 5
■ 5 to 20
■ 20+
■ Never
■ Other

Q.11 Do you prefer online or face-to-face courses?

5% 18% 20% 21% 36%

■ Online (live)
■ Online (at my own pace)
■ Face-to-face (semester type)
■ Face-to-face (2-days seminar/workshop)
■ Other

The final question (Question 12) is not about the past experience and habits of the respondents, but is rather a projective question, i.e. about the expectations from a speaking skills course. The purpose of this question was to understand how respondents define the value of a solution like Interveu. Responses to this question varied from tangible effects to impressions and feelings:

a. Providing advice: learners expect to learn techniques for overcoming their difficulties and better connect with their audience, as well as examples and tips about speaking skills improvement.

b. Assistance in confidence and stress management: learners expect to be able to gain confidence and feel more secure, to overcome their nervousness and handle their anxiety.

c. Specific areas of improvement: learners mention specific skills that they need to improve, such as stuttering, excessive voice loudness; but also specific activities where speaking is involved, including job interviews, presentations, and negotiations with colleagues.

d. Overall improvement of communication skills: learners expect that a course on speaking skills will help them express themselves more clearly, precisely, fluently and comfortably and eventually improve their general outlook;

Course rollout and learners' feedback

After the learners completed all the course modules, including the course feedback, they were all entitled to receive their certificates of completion. The learning management system where the course is built provides us with interesting metrics related to the activity of the learners and their interaction with the course materials. The average time that the learners spent on the course was 2 hours and 6 minutes, while the time spent for each of the modules may vary across learners. Learners who engaged with the course provided their feedback consisting of interesting insights that we are going to explore in the next section.

Analysis of feedback responses

Feedback Question 1: "What went well?"

Replies to this question were a mix of information about the learners' impressions of the user interface, the course structure, the quality of the materials and the overall ease of use. Examples of learners' statements are provided below:

Regarding comments related to their overall experience, learners assessed the course as a great, enriching and fun experience, offering valuable insights and practical techniques. Others have stressed the ease of use of the course, in that it's simple, easy to understand and follow, very well structured with excellent module flow, and very interactive.

When discussing the content quality, i.e., the learning materials, example videos and exercises about each skill, learners appreciated the video demonstration of examples, the detailed and structured information about each skill, the quizzes, pointers to additional learning materials, and the use of the recording and assessment tool.

Regarding the efficacy of the course, learners assess it as a complete course, including key concepts, examples, practice, explanation of performance; and that it is helpful, clear to understand and grasp the specifics of speaking skills, interesting and practical.

Finally, a lot of the learners stress the learning value of the course, in terms of: familiarising themselves with communication styles, best practices and acquiring knowledge about how to communicate more effectively; getting assistance and guidance about how to achieve their goal of speaking well, or better; and acquiring confidence to speak in front of a public.

Feedback Question 2: "What could be improved?"

It is worth noting that several participants responded that they found the course complete and that they could not think of anything that could be improved. The remaining learners' responses to this question were about specific issues noticed but also broader aspects of experience and indications for improvement.

Regarding the content and learning materials, learners comment that they would like to find more video examples, more practice tools and more difficult quiz questions. Others would like to have more prompts to use when practising speaking skills. Finally, a couple of learners encountered some technical issues, which were eventually resolved.

Feedback Question 3: "What did you learn?"

Replies to this question were mainly organised around 3 topics: (a) the knowledge acquired about what speaking skills are, specific information and features of each of the skills, and their importance in communication, e.g. *I learned how to present myself at an interview and a public talk;* (b) the awareness learners achieved through their performance, i.e. by understanding aspects they need to improve, or in any case consider, when speaking and presenting, e.g. *I learned about speaking more calmly, with sufficient pauses and voice stability*; and (c) its overall value, as perceived by learners, e.g. *I now know that the preparation to speak to an open public is not about only reading aloud the text and breathing*.

Feedback Question 4: "Would you recommend it?"

The majority of the respondents (96%) were very satisfied with the course and would recommend it to others. The justification for their positive assessment is, first, attributed to the course's helpfulness. Learners believe that the course is helpful in improving the understanding related to speaking skills and, in turn, improving communication per se. Second, the learners think that this type of course is essential for the workplace, from the perspective of the employee, i.e. in terms of upskilling their communication competence, but also from the perspective of the organization: learners stress the importance for an organization to have skilled employees

communication-wise, and to invest in their personal development, as this will lead to improved performance, productivity, and overall effectiveness in the employees' roles. Finally, learners advocate the use of the course because of its user-friendliness and its overall value in contributing to effective speaking and self-expression.

DISCUSSION

Discussion of pre-survey results

The survey provided more insights about our target groups and allowed us to better understand the PREDICT learners and their needs concerning the speaking skills they use in practice in their training and professional environments. While learners estimated their current speaking skills as neutral to good, they recognised that there is always room for improvement and that they would avail from a course on speaking skills.

We did attest that the responses of the survey participants validate the design options of the course and the platform. Core aspects and offerings of Interveu such as learning, practising, personalised feedback, online learning are needs acknowledged in the respondents' comments. The negative feelings expressed with respect to the attitude before and during a speaking occasion, as well as the emotional and time loss experienced by the respondents point towards the user expectation of a solution able to turn this negative experience into a positive, effective experience with actionable insights.

The survey responses overall provide supporting evidence for the deployment of training solutions such as Interveu, that is designed and implemented in a way that aligns with current and future trends in VET (Cedefop 2020) and adult education, and contributes to their realization. The first related trend is about the multi-model, multi-channel and immersive delivery of programs in VET and adult education. Investing in experiential learning programs that leverage technology is expected to have a positive impact on the learners. A hybrid approach integrating the strengths of the online and offline learning modes is becoming the best practice, leveraging the advancements of technology and the shift to a more remote working setup.

The majority of respondents face speaking and presenting challenges in formal settings such as job meetings or university presentations that are crucial to their academic and professional success. This highlights the need of learning and training resources that supports the learners in addressing this challenge. This is in line with the trend of broadening the VET course content towards transversal skills, including communication skills, emphasising a growing awareness of transversal competences.

A large number of survey responses also shows that the activity of speaking to an audience evokes feelings of uneasiness, and the majority of respondents experience such activities in an unsettling rather than an enjoyable manner. Thus,

besides offering skills improvement opportunities, there emerges the need of a learning design that will eventually transform this unsettling experience into a fulfilling activity, offered in an engaging manner. Interveu attempts to address this by embracing a self-paced learning approach, which is among the top trends in VET education, as part of the increasing flexibility and individual learning pathways. The benefits of this approach lie in the training delivery at the speed and level of complexity that matches the individual learner, and is aligned with each learner's strengths and weaknesses. This is an additional asset for learners that show reluctance to speak in front of others: practicing in their own space and time is expected to minimize speaking anxiety which may manifest during face-to-face training within a classroom.

It is worth noting that a minority of participants did not answer the pre-survey question related to the impact of speaking activity in their life, nor the question about actions they take to address potential challenges while speaking publicly. It is highly likely that these responses indicate lack of awareness of speaking challenges, on the one hand, and of available opportunities for speaking skills development, on the other hand. The first aspect was already addressed during the curriculum development of the Interveu course, with course modules explaining the importance of speaking skills in the professional landscape, and the benefits of the training leading to skills improvement. The particular course content seemed to have a positive impact on the learners' awareness, as is evident by their responses to the third feedback question, where learners acknowledged a better knowledge and understanding of said skills and their importance in professional communication. Regarding the second aspect, the learners' high recommendation rate includes a positive assessment of the overall solution, as an instrument that assists them in taking action to improve their speaking skills. We expect that this positive assessment will contribute to increasing awareness about the existence of effective and intuitive AI-based solutions that address skills development.

Discussion of the feedback survey results:

This task of learner evaluation and feedback was proven an extremely important source of information. It enabled us to better understand the viewpoint of VET and HE learners about the course usability and value, as well as collect concrete comments about numerous aspects of the course and the Interveu tool. Most importantly, it helped us validate the appropriateness of learning design principles and options (as implemented in all aspects of the course) for the VET context.

The overview of the learners' feedback shows that there is a consistency among them with respect to aspects that they find positive, aspects of the value of the solution, but also aspects to be revisited and improved. It is worth noting that, apart from the inter-learner consistency, we notice that there is also consistency with the feedback obtained from other groups of learners during previous deployments of the Interveu speaking skills training platform. In addition, the positive

recommendation rate (96%) that the PREDICT learners provided is similar to satisfaction rates achieved during past deployments of Interveu and is an additional argument in favour of the value, usefulness and appropriateness of this training tool for the VET community.

CONCLUSIONS

The goal of the described task was to incorporate innovative methods in vocational education and training that integrate technological components and that are essential to ensure a broader and more practical experience. We deem that such solutions and tools should be adapted to the needs of the learners, with the aim to improve skills that are important for their career path.

We deployed the online course for communication and speaking skills improvement to VET audiences with the aim to upskill the communication competences of VET students using digital tools with AI components. At the same time, a second goal was to conduct pre- and post-surveys to better understand their profile and needs related to communication skills, as well as their overall satisfaction of the course offered.

The results received from the survey were quite thorough, and we envision that those will inform not only future versions of the specific course, but also the design and implementation of digital tools and learning materials appropriate to respond to the needs of the VET community. Regarding the feedback results, the majority of the participants highlighted their improvement in understanding how one is perceived by others as a speaker, which we consider a strong motivator for them to appreciate and pursue speaking skills training. Notwithstanding the content of the learners' comments, this task confirmed the value of evaluation and feedback to the acceptance, operation and validation aspects of both the course and the tool, and evaluation will continue being an integral part in future deployments of the course to various learner groups.

While we acknowledge that the cultural and policy context of each country may affect the responses of the learners, in terms of actual situations and the learners' perceptions, a limitation of this study is that it does not consider the country context in the analysis and interpretation of results, namely because the samples from each country involved were not balanced. In addition, in next iterations of the survey we plan to revise the question related to the impact of a stressful speaking situation on the learners (i.e. "the cost of a stressful speaking situation in terms of time, money, and happiness"): while currently it provides an assessment of their overall feelings, it is worth breaking it into distinct questions, enabling us to look into each individual item in depth (especially the aspect of anxiety), and to be able to carry out pre- and post-evaluations of those.

Keeping in mind the learner's reactions in the pre- and post-surveys, we believe that an area for further investigation and intervention is that of understanding

the VET and adult learners' mindset towards speaking skills training in a more profound and detailed way. A deeper understanding of both their perceptions and experiences would inform the design of solutions and awareness initiatives aiming to prompt learners to reflect on their actual situations and encourage them towards broader participation in skills development efforts. In addition, it would highlight the relevance of AI-based training for speaking skills improvement, especially to those who are unsure or not aware of the benefits involved.

Our pedagogically designed integration of speech training and self-assessment makes Interveu a highly valuable tool for a diverse array of workplace roles and applications, especially important to the modern workplace characterised by complex communication needs. Interveu seeks to empower its users by addressing them as learners of communication skills, offering professional development and not being a mere decision-making application (Koutsombogera and Kapros 2021). The pedagogical framework selected (understanding by design) is modular and allows the adaptation of the course to a variety of training scenarios, including VET and adult training. Our priorities in the design of our solution are to create trust and value to the user by pursuing fairness and explicability. Finally, by using principles of learning design we focus on skills development as a human-activity system, i.e. focus on the users as learners to improve skills, and thus help avoid their treatment as depersonalized job candidates.

The objective of our speaking skills training solution is primarily to effectively assist VET and adult learners so that they do not miss out on opportunities on account of their limited fluency; that is, to enhance the learners' ability to convey ideas with clarity and influence, build up their confidence and leadership skills, and eventually offer a lasting impact, both in terms of their personal development, and as added value to the organisations they work for. Through the display of effective communication skills, which are highly linked to teamwork, decision-making and leadership qualities, learners will have better opportunities to increase their employability, hireability and promotion prospects.

Finally, based on the positive feedback we received for the application of proper pedagogical design (such as UbD scaffolding) and on our positive experience in running a smooth trial using service design principles (such as user onboarding), we conclude that it is strongly recommended that AI technologies are properly introduced in an educational setting, including VET. Learners should not be expected to use generic commercial AI applications in a pedagogically appropriate way based on the popularity or the availability of said AI applications. The VET sector can greatly benefit from applications, AI-based or not, that are built for purpose and can thus offer sector-specific benefits in a truly innovative manner.

Acknowledgments

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*A*ceastă lucrare descrie o tehnologie de analiză a vorbirii care calculează trăsăturile de personalitate ale unui vorbitor. Tehnologia analizează caracteristicile primare ale vorbirii prin ingineria sunetului și caracteristici complexe ale personalității (mai exact, modelul „Big 5") printr-un model de inteligență artificială antrenat pe un eșantion variat de vorbitori nativi și non-nativi de limbă engleză. Rezultatele sunt comunicate utilizatorilor/cursanților astfel încât aceștia să poată înțelege cum sunt percepuți ca vorbitori și, prin urmare, să își poată îmbunătăți abilitățile de vorbire. În acest scop, un curs online explică caracteristicile vorbirii, modul de interpretare a rezultatelor privind personalitatea și include exerciții privind respirația și alte tehnici pentru îmbunătățirea performanței de vorbire. Lucrarea descrie procesul de implementare a acestui curs pentru cursanți din cadrul programelor de Educație și Formare Profesională (VET) sau din alte programe de educație și formare profesională, desfășurate în instituții din 8 țări și online la nivel global. Sunt prezentate, de asemenea, detaliile despre curs și tehnologia aferentă, identificarea participanților și aplicarea unui chestionar preliminar privind atitudinile legate de vorbire, precum și un chestionar de feedback la finalul cursului. Lucrarea include analiza rezultatelor acestor chestionare, precum și a progreselor obținute de

cursanţii care au participat la curs. Rezultatele sugerează că participanţii şi-au îmbunătăţit înţelegerea asupra modului în care sunt percepuţi ca vorbitori, iar rata de satisfacţie şi nivelul de implicare în cadrul cursului au fost ridicate. În plus, chiar şi pe durata scurtă a experimentului, poate fi observată o uşoară îmbunătăţire a abilităţilor de vorbire. Totuşi, îmbunătăţirea semnificativă a abilităţilor de vorbire necesită un efort pe termen lung, astfel încât nu pot fi formulate concluzii generalizate, spre deosebire de îmbunătăţirea înţelegerii asupra modului în care cursanţii sunt percepuţi de ceilalţi, aspect evident din rezultatele prezentate în această lucrare.

    Cuvinte cheie: *abilităţi de vorbire; calculul personalităţii; educaţie şi formare profesională.*