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prowide

Online Proctoring Manager
Further education program for supporting digital transformation at Higher Education Institutions

Qualification profile
Online Proctoring Manager

Staatlich anerkannte, private Fachhochschule des Mittelstands (FHM)

proctorio

LIEPAJA UNIVERSITY

UNIVERSITÀ TELEMATICA INTERNAZIONALE UNINETTUNO

ANADOLU ÜNİVERSİTESİ

Document metadata

Project title	Online Proctoring Manager – Further education program for supporting digital transformation at Higher Education Institutions (PROWIDE)
Funding program	ERASMUS+, Key Action KA226 – Partnerships for digital Education Readiness (Higher Education)
Reference number	2020-1-DE01-KA226-HE-005765
Title of the document	Qualification profile Online Proctoring Manager
Activity/Intellectual Output	O1/A1: Development of a qualification profile Online Proctoring Manager
Dissemination level	Public
Date of release	January 31, 2022

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The creation of this publication has been partially funded by the ERASMUS+ grant program of the European Union under grant no. 2020-1-DE01-KA226-HE-005765. Neither the European Commission nor the project's national funding agency DAAD are responsible for the content or liable for any losses or damage resulting of the use of this publication.

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1.Introduction

The COVID-19 crisis has reopened a debate over equal opportunities, accessibility and flexibility when it comes to obtaining (online) academic education. While Higher Education Institutions (HEIs) seem to have managed to make a transition to digital learning and teaching, online assessment, in particular, Online Proctoring[1], is still in its infancy across the European Union, although this service might be a powerful tool for conducting professional testing without leaving home and therefore significantly contribute to increasing opportunities for all towards receiving an academic degree [1-8].

The reasons for a modest use of Online Proctoring are manifold: data protection issues, compatibility with educational law, inadequately qualified online proctors, lack of awareness among internal HEI stakeholders (including HEI managerial, teaching and administrative staff, and – last but not least – students). Even if a HEI takes a decision to introduce online proctoring services, they usually rely on support of proctoring companies who, indeed, have at their disposal needed technical expertise but are not in charge of implementing a holistic approach to online proctoring at HEIs. As a result, end-users of Online Proctoring services, such as students and teachers, are mostly discouraged and confused with their online proctoring experiences [9-24].

In this context, the PROWIDE project has been co-funded by the European Commission in the framework of the Erasmus+ programme. The project is coordinated by the Fachhochschule des Mittelstandes and involves five partners from Germany, Italy, Latvia and Turkey (four HEIs and SME Proctorio that is specialized in developing Online Proctoring solutions and services).

The goal of the PROWIDE project is to help HEIs make a transition to high-quality online education and, in particular, to remote exams by ensuring the best possible academic integrity. Based on our understanding, introducing Online Proctoring services requires consolidated efforts of HEI stakeholders at different levels (managers, teachers, educational and exam offices, IT) that

[1] Online Proctoring refers to the process of monitoring and supervising online exams or assessments to ensure academic integrity and prevent cheating. It is a method used by educational institutions, certification organizations, and employers to maintain the credibility and fairness of online assessments. Online Proctoring typically involves the use of technology and software tools that enable remote monitoring and surveillance of test-takers during their exams. These tools may include webcam monitoring, audio monitoring, screen sharing, and recording capabilities. They are designed to detect and deter cheating behaviours such as looking up answers, using unauthorized materials, or receiving assistance from others.

need to be coordinated by a specialist with an interdisciplinary qualification profile that embraces data protection issues, education law, technical aspects, communication with internal and external stakeholders, management skills. We associate this type of professionals with the job title, or profile Online Proctoring Manager and believe, qualifying and recruiting Online Proctoring Managers at HEIs is crucial when making transition to a high-quality online education based on equality, flexibility, and accessibility. Neither such type of professionals nor corresponding training solutions for their qualification are present yet.

Against this background, objectives of the PROWIDE project are:

- To boost capacities for HEIs towards implementing holistic Online Proctoring strategies;
- To raise awareness of HEIs stakeholders for Online Proctoring services;
- To promote new job opportunities related to the management of Online Proctoring services within different sectors by having a focus on HEIs.

To attain these goals, a further education program Online Proctoring Manager will be jointly developed by the PROWIDE partnership, including the creation of the qualification profile, the curriculum design, the development of digital learning contents, a teaching and assessment strategy, the preparation of the online learning environment, finally testing it in terms of online delivery. Program attendees will be qualified to Online Proctoring Managers and expected to be employed at their home HEIs in the corresponding position related to the implementation and integration of Online Proctoring strategies and procedures.

The envisaged impact of the project is:

- Reinforced capacities of HEIs across EU towards providing reliable Online Proctoring services and high-quality online education in general,
- Increased opportunities for formal and non-formal learning;
- Enhanced cooperation between HEIs and Online Proctoring providers to contribute to achieving the best possible academic integrity.

Aim of the TASK 1 of the project

The PROWIDE project aims at elaborating one Intellectual Output, which is quite complex, covers different levels of expertise, and includes the design, development, test and integration activities. To produce the output, eight tasks have been identified to be headed by appointed lead partner. Lead partner will be in charge of the overall coordination of each task, participation of all other partners is required to ensure the transnational dimension of the output.

The first task relates to the development of a qualification profile Online Proctoring Manager that has to reflect needs of HEI sector linked to the implementation of a holistic approach to Online Proctoring services. These needs will be detected across different partner countries, by interacting with experts and stakeholders in the field. UNINETTUNO, being the task leader, is in charge of analysing the obtained results and identifying dimensions that will form the basis of the qualification profile. The analysis is expected to include, among others, the description of profile competences, job tasks that are associated with the profile, and profile accomplishments. The Online Proctoring Manager qualification profile will serve as basis for the curriculum development to be performed under Task 2 of the project.

2. Methodology for the elaboration of the qualification profile

As a research method for identifying the relevant dimensions of the qualification profile of an Online Proctoring Manager, expert interviews were chosen in partner countries (Germany, Italy, Latvia, and Turkey). Each PROWIDE partner identified internal and/or external university stakeholders with relevant experience in the field of (digital) examinations, online teaching, and IT support. Their insights regarding the requirements for an Online Proctoring Manager were gathered through individual and/or group interviews.

The expert interviews were conducted using a standardized questionnaire. This ensured the comparability of results and the derivation of desired dimensions of the qualification profile that were valid for all participating countries. The questionnaire was developed in English under the coordination of UNINETTUNO and translated into respective national languages. The questionnaire was divided into four sections as follows:

- introductory questions,
- organization of digital examinations,
- experiences with online proctoring,
- competences of an Online Proctoring Manager.

The questionnaire is attached to this document as an annex.

The interviews were conducted by project partners in respective national languages. In total, 32 individuals participated in the interviews. The interview results were documented in written form in English by each partner and provided to the coordinating partner UNINETTUNO. UNINETTUNO was responsible for analyzing and summarizing the results, as well as developing a draft of the qualification profile. The draft was analyzed, supplemented, and finalized by all partners with the coordination of UNINETTUNO

3. Analysis of the collected data

3.1 Preliminary questions

The preliminary questions aimed to collect a few statistical data about the interviewed experts.

As shown in the Fig. 1, there was a prevalence of participants from Turkey, with nearly equal participation from Germany and Italy and reduced participation from Latvia to be explained through a lack of awareness of digital assessment at Latvian HEIs.

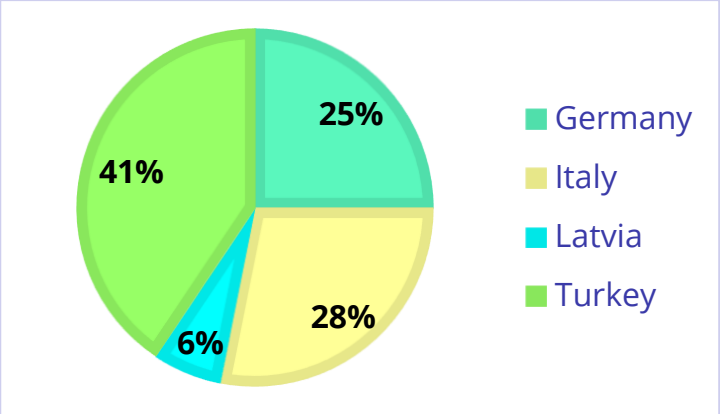

Fig. 1: Country of the experts (n = 32)

In terms of role, as shown in Fig. 2 there was a fairly uniform participation, with a slight prevalence of professors. This uniformity ensured that the analysis was able to capture the views of experts belonging to different roles within the HEIs.

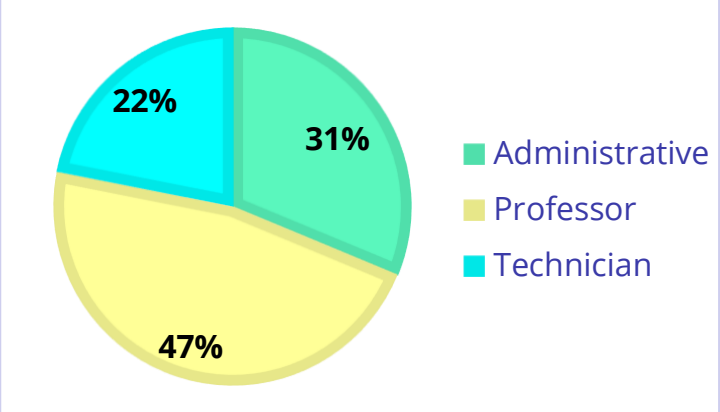

Fig. 2: Role in the HEI (n = 32)

Even in terms of the size of the HEIs to which the experts referred, as shown in Fig. 3, there was a quite varied distribution. There were a substantial number of small, medium and large universities. This was positive because it avoided polarizing the analysis on a specific type of university.

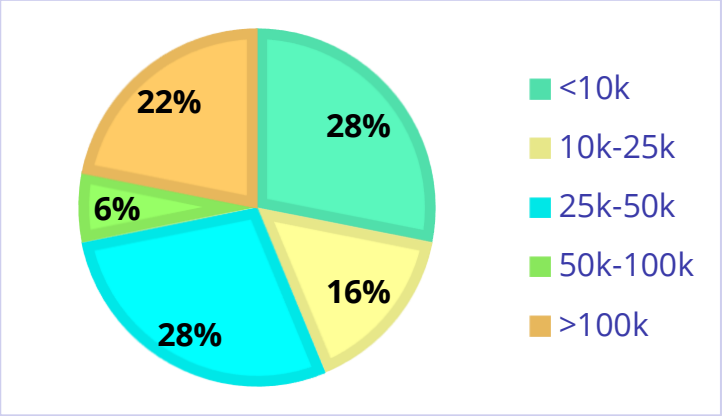

Fig. 3: Number of students in HEIs (n = 32)

Finally, all the experts interviewed belonged to HEIs which issued any form of qualification, up to the PhD.

3.2 Exams organization

Overview of the proctoring strategies

The HEIs have adopted several procedures and software to manage tests and exams online during the Covid-19 lockdown and in general to assess students' learning remotely.
HEIs have offered different modalities and software tools to their teachers mainly based on:

- Specific/custom teaching methods and tools adopted in the HEI (in some cases, also before the pandemic emergency);
- The number of students per exams;
- The specific needs and requirements of the exams (such as written tests, open answer tests, multiple choice quizzes, etc.) due to possible differences in the courses (such as for STEM, humanities, etc.)

Generally, HEIs adopted two different strategies:

- For small classes, only a human control of the students carrying the exam has generally been adopted, through typical video conference tools (Zoom, Teams, etc.).
- For larger classes (often with a threshold of 100 students) different kinds of online proctored solutions have been adopted, mainly Respondus Lockdown browser, Proctorio and Exam.net. These Online Proctoring tools have often been integrated in learning management systems such as Moodle or Blackboard.

From the interviewed experts, as shown in Fig. 4, it was found that 62.5% of HEIs organized only human-controlled exams, while 37.5% adopted both human controlled and online proctored exam solutions.

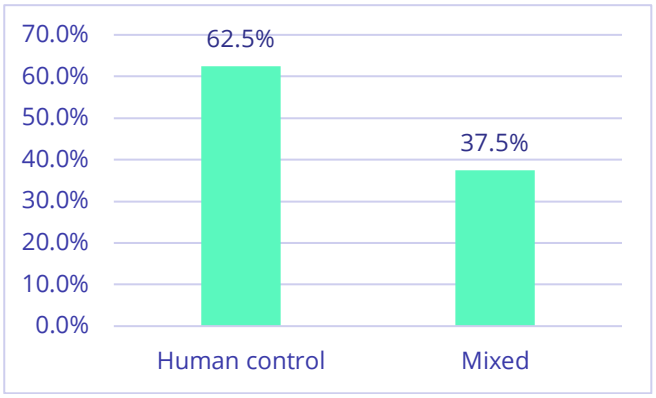

Fig. 4: Online exams' modality (n = 32)

The management of the online proctoring system

In general, all HEIs that have adopted a system for conducting online tests and exams with a proctoring system have provided guidelines and webinars to teachers. In some cases, hotlines were also established, focused on two main aspects:

- the management of technical aspects, including informatics details on application, communication and didactic requirements of the adopted software;
- the management of legal aspects (e.g. identification of the student, respect of the privacy, personal data management, etc.).

It was interesting to analyze different staff involved in Online Proctoring management. As shown in the graph on the right, the cases where technicians were mainly involved or the only ones involved, totally represented the 88%, while only in the 12% the administrative staff was mainly involved (Fig. 5). This allowed to suppose that an Online Proctoring

Manager has more likely to be found in the technical staff more than in the administrative one.

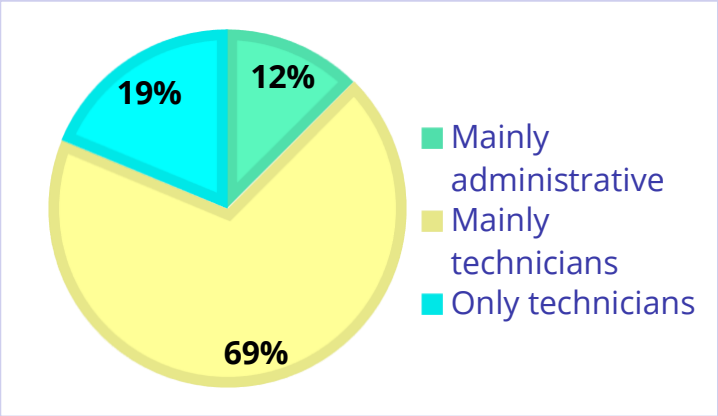

Fig. 5: Involved staff (n = 32)

The survey participants mainly focused on technical aspects rather than on the administrative ones. In fact, the need to solve the numerous problems of internet connectivity, software compatibility, etc. asked for an efficient technical support more than improving management or administrative procedures.

Additionally, there was a concern about cheating that was higher in online exams. At the moment, Online Proctoring did not seem to provide a trusted guarantee against cheating. Anyway, that seemed to be related to the modest uptake of Online Proctoring tools and distrust of the new. It was therefore possible to imagine that this sentiment would disappear as users became more familiar with Online Proctoring.

Although the management of privacy aspects appeared of minor interest for the survey participants, it could be a relevant issue on the scale of HEIs in order to prevent abuses and litigations [12, 18].

A statistical summary of the e-assessment related problems, coming from the interviews, is shown in Fig. 6.

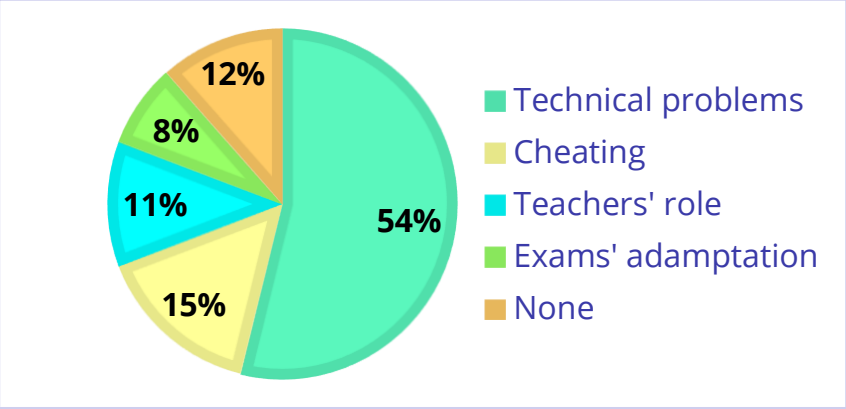

Fig. 6: Problems with online exams (n = 32)

3.3 Online proctoring

General difficulties of the proctoring system and in using the software

The main problems of an automatic proctoring system for online exams, highlighted in the survey, have been:

- the stability and the bandwidth of the internet connection available for the students;
- the need in providing technical support simultaneously to a large number of students;
- the difficulty in managing a high number of simultaneous connections to the server for online proctoring. It was reported that exam sessions had to be cancelled due to these difficulties;
- the variety of different settings and configurations of the students' PC as well as their compatibility with the software cannot be solved only at the installation stage. It requires check and support also just before executing the exam, which can cause significant problems and slow down the procedure;
- for not updated or not new hardware/software devices, the slowing down in executing a proctoring software creates further problems of difficult solution.

The survey showed that the adoption of the online proctoring procedures have had a huge impact both on students (afraid by automatic control and video recordings), teachers (in managing the software and the procedure) and on technicians (in supporting students and teachers). On the other side, the impact on administrative staff seems to have been lower, if any.

Difficulties for teachers

Managing new software to execute well assessed and standardized procedures such as those of the exams was not always an easy task, especially for older professors that had to learn something new, with some reluctance. They also had to change their way of conducting exams and learn how to deal with the integration, for example, of Respondus and Blackboard. However, the impact of these changes on professors varied based on their technical skills. Some participants reported that several training webinars have been useful to manage the problem.

The survey participants reported that the adoption of online automatic proctoring procedures would require additional effort and time from the involved teachers for the exams. One of the difficulties experienced by the teachers was the need to adapt their exams to the new modality, for example, creating quizzes or understanding how to interpret alert videos. In fact, the new procedure requires that the exam texts must be prepared in a proper way and properly uploaded in the proctoring systems (well) in advance. The procedure has to be repeated for each exam and/or session. In addition, the proctoring software usually generates many false positive alerts, so the professor has to spend time to watch all the tagged videos, eventually without finding any real cheating situation.

Furthermore, the interviewees reported that sometime they needed to shorter the duration of the exam sessions at the expense of assessment quality.

In order to manage the cases when for one or another reason the procedure of online proctoring of exam failed, teachers needed to arrange several sessions of face-to-face exam. Anyway, this remedy strategy was a quite time-consuming solution. There is the common feeling that online proctored exams are not equivalent to in presence exams. Therefore, some respondents reported that there is always the need to arrange supplementary sessions of in presence exams. This means additional effort for teachers but also for students.

Some teachers complained that even with proctoring software it is not possible to fully check the desk headphones and if the student can use multiple devices (such as a double mobile phone). Even though, as with manned supervision, no automatic online proctoring system can ensure a

complete efficiency and one hundred percent of reliability. In addition, also an “in presence” written exam is not completely trustfulness.

A bit pessimistic but probably also (at least partially) realistic comment was that “In the end the online proctoring bothers honest people (sometimes it doesn't work, slow down the pc, create problems) but it doesn't work completely”.

From this point of view, the face-to-face oral exam procedure could provide the needed interactivity between teacher and student in order to assess its level of preparation. However, even though the oral exam seems to be preferable, this procedure is very time consuming and cannot be applied to assess large number of students remotely. This is also due to the absence of trustful shared supports (e.g. paper or blackboards) needed for carrying out some exams requiring writing formulas, plots, etc.

Psychological impact on students

In general, the use of online proctoring software was perceived as invasive by students. All the survey participants reported a diffused hostility of the students towards the online automatic proctoring procedure. The reactions ranged between an initial fear up to anxiety during initialization procedures (due to the common and frequent technical issues) [11]. Some participants reported that, after the initial anxiety for the control system, the students’ hostility gradually decreases. However, from their point of view, some students would have always found a way to bypass the proctoring control, as no system can completely prevent cheating or copying.

In general, proctoring services increased the level of stress in students, since they felt that problems of connections and wrong movements might trigger software’s alerts, leading to an uncomfortable situation. Some participants reported that a useful strategy in order to mitigate the psychological impact on students has been to clarify that possible technical or connections problems would have been managed differently from cases of cheating and would have not had impact on the possibility to fruitful give the exam.

Several participants highlighted that the good students had good performances even with the new method, but that the heavy procedure has had a big impact on the honest students, and provided an inappropriate advantage for the dishonest ones.

Technical support/assistance to teachers and students

In general, teaching staff was mostly in charge of managing the proctoring software. Instead, the technical staff had to set-up the new technical procedures and train teachers in the proper use of the software. Moreover, the technical staff had to provide daily and continuous support to teachers in case of inconveniences during online exams. This is a mandatory requirement in order to guarantee a robust and reliable system.

For both teachers and technicians, a common issue was the limited time available to learn, manage, and carry out the completely new procedure of conducting online exams to ensure a sufficiently reliable and robust system.

Additionally, a specific reported issue was the difficulty in interpreting alert videos and how adjusting/tuning the parameters of the proctoring software, such as the different alert thresholds connected to different events, in order - for instance - to define how much the head movement weights on the risk of cheating.

Some participants have highlighted that a centralized approach to the adoption and management of the online proctoring software would have reduced the impact of the various sub-departments involved in managing just the use of the system. The impact would have been manly restricted in managing the details of compatibility, ICT and server resources.

Although this opinion seems reliable regarding the choice of the software and the general settings (tests on various products, reassurances to students, implementations, training), the needs of the different departments, courses, laboratories and disciplines in large HEIs could be so various and different that this aspect was not so well clarified on the basis of the provided answers.

Legal problems, personal data and privacy management

Generally, HEIs provided guidelines on managing personal information and privacy according with GDPR [25-26]. However, legal aspects included the need to manage conflicts reported by participants in the survey, where students contested some procedures or specific cases/difficulties during online exams.

This issue highlighted that a manager expert in online proctoring procedure should be particularly well skilled on legal aspects in order to provide reliable

answers, clear procedure and common guideline to teachers and administrative staff.

On the other side, the survey participants perceived the management of privacy and personal data as not a significant issue because the same problems occurred in the classroom for in-person exams. Nevertheless, beyond the perception, gathering, storing, recording, and managing personal data - as well as defining the responsible actors and standardizing guidelines - were significant problems because the online procedure required the collection and temporary storage of sensitive data. What can be tolerated and accepted in the emergency of the pandemic period - beyond the strictly rules of the laws - could ask for further definition in “normal” daily activities also with students from different cultures and countries.

Other relevant legal aspects were those related to the management of alert cases provided by online proctoring software (such as how set up standard alert thresholds); managing cases of relevant/irrelevant cheating; and handling the evidences of cheating behavior in view of possible legal litigations.
Additionally, the limits and procedures for controlling the environment where the exam was carried out can rose legal issues.

Effectiveness and limitations in using the proctoring system

According to some survey participants, the proctoring software would act more like a deterrent rather than an efficient cheating finder. Some interviewees reported that the professors would not trust on online proctoring procedures and would prefer exam in presence (as soon as possible).

A few survey participants reported on a reduction in the percentage of students passing the exam. However, no statistical data or reliable analysis were available on this point. It would be hard to distinguish which other reasons (such as general difficulties with e-learning, poor management of online studies, difficulties with online exam, etc.) could have contributed to the claimed supposed reduction, in addition to or beyond the possible impact of difficulties due to online proctoring procedure of the exam. On the other side, some interviewees supported the thesis that no student has been rejected due to technical problems. However, it was not clear whether this result would be due to the “patience”/capability of the involved actors

(teachers, students, ICT staff) in managing the problems, or to the additional session of oral exams.

Some survey participants highlighted that all the online proctoring systems cannot completely prevent students from cheating and copying. On the internet, are available many videos, resources, groups and other tools that provided instructions explaining various techniques to bypass (at least partially) the online proctoring software monitoring (i.e. watch https://youtu.be/wK90iDT4_aw or https://www.youtube.com/watch?v=ODabmypRYL0). One participant estimated that, based on his experience, about 30% of exams could have been copied and suggested that the evaluation of whether this percentage was acceptable should be in the hands of the HEI, who "must decide whether it is acceptable or not".

At this point it must be noted that the success of the "cheating methods" - described in the videos - is depending on which proctoring settings were made by the respective institute. For all cases described, there are solutions that prevent or detect and mark the circumvention of a proctoring system.

4. Qualification profile Online Proctoring Manager

The qualification profile of an employee or applicant typically encompasses all the knowledge and skills acquired throughout a professional career through formal education, work experiences, certifications, and further educational measures. A qualification profile often forms a part of a job application and serves to inform employers about the formal qualifications and professional experiences a candidate brings to the position.

In the PROWIDE project, we have set the interim goal of defining and describing the qualification profile of an Online Proctoring Manager. First, a competence profile of a future Online Proctoring Manager was outlined that reflects relevant professional and transversal skills.

4.1 Professional competences

Professional competences generally refer to a person's ability to perform professional tasks based on existing subject knowledge and qualifications. Based on the interview results, the main professional competences of an Online Proctoring Manager can be summarized as follows:

- **General ICT competence**: proficiency in managing network security and connectivity**;**
- **Specific competences relating to Online Proctoring**: features of online proctoring software, troubleshooting, introduction of online proctoring solutions within organizations;
- **Legal competence:** sufficient knowledge about the framework of the European GDPR regulation as well as the national educational laws. This competence is crucial in order to have a responsible able of responding in a fast and effective way to the variety of questions that can daily rise in relation with the online proctoring;
- **Teaching experience**: helps understand didactical requirements to an exam at HEI;

It is evident that a potential Online Proctoring Manager should possess an interdisciplinary competency profile that combines technical, legal, and didactic aspects.

4.2 Transversal skills

Transversal skills usually go beyond domain-specific knowledge and hold high relevance across multiple professional fields. These competences are not strictly tied to a specific occupation, enabling an individual to effectively operate in various professional contexts and/or life situations.

Transversal skills of an Online Proctoring Manager were also identified in the expert interviews and were named as follows:

- **Interdisciplinary culture**: ability to understanding different needs from various disciplines in order to develop holistic solutions (in this case, for Online Proctoring);
- **Communication and problem-solving**: these skills were considered essential for an effective interaction with educators, students, and other relevant stakeholders, as well as for anticipating and resolving potential conflict situations that might occur when conducting an online proctored exam;
- **Ability to learn**: ability to acquire new knowledge and skills relating to Online Proctoring applications, and effectively integrate them into thinking and acting.

Transversal skills complete the competence profile of an Online Proctoring Manager, ensuring successful operation in the higher education context.

4.3 Qualification profile

Once relevant professional and transversal competences of an Online Proctoring Manager have been defined, they were combined into a relating qualification profile. The PROWIDE partnership has developed a project-specific catalog for this purpose, divided into three competence areas:

- Professional competences,
- Personal and social competences,
- Methodological competences.

A significant aspect of the created qualification profile is the linkage to a training course that will be developed in the next project phase allowing for obtaining a qualification “Online Proctoring Manager”. For this purpose, the competences from all three competence areas have been categorized into **core competences** (marked in **bold**) and *additional competences* (in *italic*) as shown in Table 1. The core competences reflect the essential requirements to an Online Proctoring Manager and can be acquired through the training

program mentioned above. The extended competences are equally vital for the position of an Online Proctoring Manager, but they are not covered by the Online Proctoring Manager training program. Therefore, our recommendation for future Online Proctoring Managers is to acquire these competences (if not already possessed) through alternative means.

Professional competences
- **Basic legal competence (higher education law, examination law, data protection law)** - **Basic competence in technology (ICT, campus management systems, learning management systems, online proctoring software)** - Knowledge about HEI organization (structure, processes, responsibilities) - Basic didactic competence (formulating learning goals, curriculum and course design, assessment strategies).

Personal and social competences
- **Adaptability** - **Assertiveness** - **Decision-making ability** - **Sense of responsibility** - **Communication skills** - **Ability to work in a team** - **Ability to deal with conflict** - **Critical faculties** - **Negotiation skills** - **Problem-solving ability**

Methodological competences
- **Project management skills** - **Change management skills**

The qualification profile encompasses, as previously mentioned, academic degrees, specific qualifications, and past professional experiences.

According to the opinions of the interviewed experts, an Online Proctoring Manager should ideally possess a degree in Computer Science, and have professional experience as IT project manager in a (higher) education institution.

Furthermore, an Online Proctoring Manager should have an in-depth understanding of internal university processes. This includes knowledge of university structure, understanding the roles and responsibilities, familiarity with study regulations, academic calendars, deadlines, and examination regulations. Ideally, an Online Proctoring Manager should be a university graduate, thereby bringing relevant insights into internal university processes from a student's perspective.

4.4. Job profile

The focus of a job profile typically revolves around the requirements and tasks of a specific job role, as well as the expectations associated with that role.

The tasks of an Online Proctoring Manager can be categorized into three main areas:

- **System management**: An Online Proctoring Manager is expected to adopt and strategically oversee the implementation of online proctoring at an educational institution by turning it into a permanent asset of the HEI. (S)he should identify, plan, execute, coordinate, and systematically evaluate an appropriate online examination process, including the selection of associated technologies. (S)he is responsible for developing guidelines for the implementation, monitoring, maintenance, and evaluation of online proctoring. This task also entails devising criteria for online proctoring applications, such as parameters to set sensitivity thresholds for alerts, and validating their accuracy. (S)he has to ensure that online proctoring aligns with

national or country-specific legislation, including privacy concerns. (S)he has to regularly update the institution's leadership about the status of online proctoring and to ensure transparent communication within the HEI concerning digital examination formats.

- **Resolution of critical situations**: An Online Proctoring Manager has to set-up and manage a service to solve the critical situations that might appear when conducting online proctored exams. This service can be carried out by an Online Proctoring Manager or by a wider structure, depending on the HEI size. The service should be operative to solve problems in real time, in order to avoid problems or delays in the exams' execution. An Online Proctoring Manager has to interact with all parties involved (including teaching staff, examination office, IT department and above all students) to solve critical issues that may have occurred during the exam, explaining what happened and identifying corrective solutions.

- **Training:** An Online Proctoring Manager hast to set-up a training plan and create training materials, to clearly explain online proctoring procedures to all the involved stakeholders (students, teaching staff, administrative, technicians). (S)he has to verify that the university staff is properly trained in order to properly introduce online proctoring.

Furthermore, an Online-Proctoring Manager should be capable of developing quality assurance processes for online proctoring while considering established internal university quality standards and procedures. This involves defining performance indicators, planning and executing monitoring measures, and ensuring a continuous improvement process. It is essential to portray online proctoring as a holistic, well-thought-out, and monitored process rather than single intervention.

Ensuring the availability of an Online Proctoring Manager beyond regular business hours and on weekends is prudent. Online proctoring is part of critical university infrastructure, and its smooth operation must be ensured at all times.

To elevate the significance of online proctoring within an educational institution, it is advisable to position the role of an Online Proctoring Manager at the strategic level of the rectorate. An Online Proctoring Manager will need to make decisions that will significantly impact university processes. Therefore, this role should encompass a high level of responsibility and decision-making authority.

5. Conclusions

Online proctoring has emerged as a popular solution for conducting secure and flexible exams in the digital age. However, the analysis of the subject, carried out both through expert interviews and literature review, has revealed several problems and challenges associated with online proctoring that warrant attention.

Firstly, the issue of privacy invasion and data security looms large over online proctoring. Many students and educators expressed concerns about the collection, storage, and potential misuse of personal data during the proctoring process. Striking a balance between ensuring exam integrity and respecting privacy rights is crucial.

Secondly, technical glitches and compatibility issues frequently disrupt the smooth functioning of online proctoring systems. From internet connectivity problems to software malfunctions, these issues can adversely affect the test-taking experience and compromise the validity of exams. Robust technical infrastructure and thorough testing protocols are essential to mitigate such challenges.

Thirdly, the resistance to change is observed both in teachers and students, as a natural and expected response when introducing new methodologies such as online proctoring. People often resist change due to fear of the unknown, concerns about job security, or a preference for familiar routines. It is crucial to anticipate and address this resistance by fostering open communication, providing training and support, and emphasizing the benefits of online proctoring.

In order to successfully introduce and manage an online proctoring process inside an academic institution, it is essential to specifically train a professional expert of the topic. The competence of an Online Proctoring Manager plays a pivotal role in addressing the aforementioned problems and effectively managing the entire online proctoring process. The study carried out in this document has brought out the main competences that the OPM should hold, thus allowing to design the first training course to certify OPMs. The PROWIDE OPM will possess a diverse set of skills, including a strong understanding of privacy regulations and data security measures, proficiency in technical troubleshooting, knowledge of bias mitigation techniques, and excellent communication and interpersonal abilities.

Furthermore, continuous research in the field of online proctoring should be pursued to improve the effectiveness and fairness of the process. Collaborative efforts among educators, technologists and students are essential in devising comprehensive solutions that preserve the integrity of assessments while upholding individual rights and ensuring a level playing field for all learners. Input from policy makers is essential from a legal perspective, to better define the OP's margins of operation and find the right balance between control and privacy protection. By doing so, we can harness the potential of online proctoring to modernize Europe’s Higher education area and create equitable education opportunities for all.

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Appendix 1. Interview questionnaire

PRELIMINARY QUESTIONS

1. What is your role in the HEI?
   a. Professor
   b. Administrative
   c. Technician
   d. Other (please specify)

2. What is the average number of enrolled students in your HEI?
   a. < 10.000
   b. 10.000-25.000
   c. 25.000-50.000
   d. 50.000-100.000
   e. >100.000
   f. I don't know

3. What is the highest level of degree issued by your HEI?
   a. Bachelor degree
   b. Master degree
   c. PhD
   d. Other (please specify)
   e. I don't know

EXAMS ORGANIZATION

4. Did your HEI organize online exams before the COVID-19 pandemic?
   If yes,
   a. Please explain the examination modality and the how did you verify the exam correctness (human control, software control, other…).
   b. Please explain if your HEI had any guideline for conducting exams online

5. Assuming that your HEI has organized online exams during the COVID-19 pandemic
   a. Please explain the examination modality and how did you verify the exam correctness (human control, software control, other…).
   b. Please explain if your University had any guideline for conducting exams online

c. Please explain if the administrative staff has been trained to manage online exams

6. According to your experience, what are the main critical aspects in the organization and execution of online exams?

7. Do you know about any legal framework in your country about online exams?

ONLINE PROCTORING

8. Have you ever used or seen an online proctoring software used in your HEI?

(if yes, continue to 9, if no go to 12)

9. Please describe the impact of Online Proctoring on administrative and technical staff (new technical requirement, new organization of the exams, new procedures, propensity/resistance to innovation, etc.)

10. Please describe the impact of Online Proctoring on professors (new procedures, trust/distrust of software, propensity/resistance to innovation, etc.)

11. Please describe the impact of Online Proctoring on students (new technical requirement, new organization of the exams, fear/anxiety/protest, cheating, etc.)

(after that, move to question 13)

12. If no. Why?
    a. Lack of information about Online Proctoring
    b. Lack of time to test Online Proctoring
    c. Lack of competences about the use of Online Proctoring
    d. National framework not allowing the use of Online Proctoring
    e. Other (please specify)

OPM COMPETENCES

Now, we want to define the profile of an Online Proctoring Manager, that is the staff inside the HEI in charge of the correct adoption of the Online Proctoring procedures.

13. Which background an Online Proctoring Manager should have?

14. What competences and skills an Online Proctoring Manager should have?

15. Which tasks an Online Proctoring Manager should carry out?

16. How the HEI internal quality assurance procedures should be related to the Online Proctoring Manager activity?