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ESCAPING THE TRADITIONAL: INTEGRATING AN AR ESCAPE GAME IN A VOCATIONAL EDUCATION NURSING COURSE

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Abstract

This article presents a case study of an AR-integrated escape game workshop on infectious disease control in a vocational education and training nursing course. 21 students participated in the workshop, and data was collected through two focus groups, observation notes, and semi-structured interviews conducted with the teacher and two pedagogical counsellors who created and facilitated the workshop. Using a theoretical framework of AR integration in educational contexts, results show that the workshop was successful in facilitating soft skills such as teamwork and collaboration, and demonstrated the importance of factors such as digital infrastructure, digital competency development, and the experiential nature of AR escape games for health students.

Keywords: augmented reality, escape game, vocational education and training, nursing education, digital competency

INOVACE VERSUS TRADICE: INTEGRACE ÚNIKOVÉ HRY S ROZŠÍŘENOU REALITOU DO ODBORNÉHO KURZU OŠETŘOVATELSTVÍ

Abstrakt

Tento článek představuje případovou studii využití workshopu formou únikové hry s integrovanou rozšířenou realitou (AR) v kurzu odborného vzdělávání v oblasti ošetřovatelství. Workshopu se zúčastnilo 21 studentů a data byla shromážděna za využití ohniskových skupin (dvě skupiny po třech studentech), pozorování a polostrukturovaných rozhovorů s učitelem a dvěma pedagogickými poradci, kteří workshop vytvořili a vedli. Pomocí teoretického rámce vyvinutého Buchnerem a Zumbachem (2020) výsledky ukazují, že workshop byl úspěšný při rozvíjení měkkých dovedností, jako je týmová práce a spolupráce, a poukázal na význam faktorů, jako je digitální infrastruktura, rozvoj digitálních kompetencí a zkušenostní charakter únikových her s rozšířenou realitou pro studenty zdravotnických oborů.

Klíčová slova: rozšířená realita, úniková hra, odborné vzdělávání a příprava, vzdělávání v ošetřovatelství, digitální kompetence

1. INTRODUCTION AND GOALS OF THE STUDY

The integration of interactive technology in learning situations, often identified as a lever in classrooms to foster learning (Beauchamp & Kennewell, 2010), has evolved significantly over recent decades. Interactive technologies, particularly in the context of vocational education and training (VET), can play an important role in bridging the gap between what is taught in class and the tasks students will have to perform in their future workplaces (Schwendimann *et al.*, 2015). At the forefront of these, immersive technologies such as augmented reality (AR) and virtual reality (VR) have emerged as transformative tools in VET (Chiang *et al.*, 2022; Liu *et al.*, 2023; Mubai *et al.*,

2021). These tools provide the opportunity to facilitate the acquisition of skills specific to various industrial sectors through their experiential learning nature (Zaman & Mozammel, 2017), which is closely aligned with the experiential-based learning ethos of VET (Toth, 2012). More importantly, these immersive technologies enable learners in high-risk fields to train safely, with the opportunity to make mistakes without serious consequences (Baudin & Maillard, 2021; Kamal *et al.*, 2022; Lutz, 2018). Furthermore, they can reduce the learning curve during workplace-based training and help to lower training costs (Juhana *et al.*, 2020), a crucial factor for VET given the demanding material and budgetary resources (Hoeckel, 2008).

Although AR and VR share certain similarities, their hardware requirements differ significantly. VR requires specialised equipment, such as a headset or head-mounted display, which allows the user to be fully immersed, visually, aurally, and/or gesturally, in a virtual environment (Cattan, 2021; Milgram & Kishino, 1994; Tisseron, 2021). Gloves or handheld controllers are often needed to enable interaction within this environment. AR can also require headsets, such as smart glasses, but the user is not fully immersed in a virtual world as with VR (Garzón & Acevedo, 2019; Sirakaya & Sirakaya, 2020). Instead, AR overlays virtual elements onto the real world (Azuma, 1997), thereby enriching reality, whereas VR creates an entirely new world (Simeone *et al.*, 2023). Depending on the tools and software used, AR hardware requirements can be minimal. For instance, a simple smartphone or tablet may suffice to offer an interactive, virtual overlay onto the real world, making it less expensive and more flexible than VR. From this perspective, AR emerges as a more cost-effective and accessible alternative to other training technologies. Additionally, its integration into VET responds to calls for a stronger alignment with the growing digitalisation of contemporary workplaces (Kamsker & Slepcevic-Zach, 2021), which can have significant implications for digital competency development (Cattaneo *et al.*, 2022; Diao & Yang, 2021). As workplace environments become increasingly digitalised, VET students are required to develop the appropriate skills to navigate these environments effectively.

Thus, due to its economic accessibility and experiential affordances (Jantjies *et al.*, 2018; Snyder & Elinich, 2010), AR has generated growing interest in VET over the past two decades, demonstrating its compatibility with the objectives of this educational pathway by enhancing motivation (Bacca *et al.*, 2018), strengthening cognitive connections (Chan *et al.*, 2022;

Kwiatek *et al.*, 2019), and facilitating effective learning (Supriyanto *et al.*, 2023). Nevertheless, its inclusion and fit within certain programs raise questions about pedagogical and didactic approaches when including it in VET environments (Cattaneo *et al.*, 2022). Therefore, it is worthwhile considering pedagogical approaches that can solidify the hands-on experiential nature that many VET students seek. Moreover, unlike many other forms of education, the VET system in Québec, Canada, encompasses both youth and adult learners in their environment. This heterogeneity is reflected by a diversity of learners who may have been ushered into VET because they were considered unsuccessful of meeting the requirements of traditional, academic education (Landry & Mazalon, 1995), whereas other students might be mature, lifelong learners who want to take the opportunity to participate in formal training again (Cournoyer & Deschenaux, 2017; Onstenk & Duvekot, 2017). Given its heterogeneous classrooms, VET teachers are often required to adopt pedagogical strategies that offer engaging, practical scenarios while meeting the core program competencies. Thus, game-based learning appears to be an effective approach to support student engagement and facilitate the practical relationship with the theory taught in class (Fischer & Barabasch, 2020).

Game-based learning integrates real-world scenarios, helping students effectively apply technical skills (Xiang *et al.*, 2014), and often involves teamwork and problem-solving activities that enhance social interactions and team skills, commonly referred to as «soft skills» in many professions (Alzahrani, 2020). Moreover, immersive game-based learning approaches like escape games are reputed to provide students with meaningful activities mirroring authentic work settings in the classroom (Veldkamp *et al.*, 2020), particularly in the nursing field, where improvements in decision-making, critical thinking, problem-solving skills (Köse & Özcan, 2025), and learning motivation (Esmaeilzadeh & Aygün, 2025; Gómez-Urquiza *et al.*, 2019) have been observed. Given the above, this study seeks to explore the ways in which an AR-integrated escape game activity may respond to various demands and challenges (heterogeneity, competencies) in a VET nursing course.

Theoretical Framework

Our study builds on work related to AR integration in other educational sectors, particularly the work of Buchner and Zumbach (2020), which informs our theoretical grounding in educational environments with AR integration.

In their work, Buchner and Zumbach (2020) identify an instructional design approach when integrating AR, based on three fundamental dimensions:

1) The focus of the AR (i.e. the primary content and the augmentation of such).
2) The didactic/pedagogical approach used during integration.
3) The degree of enrichment offered by AR.

We have adapted these dimensions slightly for our project by proposing the following:

- **The Focus of AR Augmentation and the Technological Aspects (disciplinary content, digital infrastructure, etc.):**
  According to Buchner and Zumbach (2020), this dimension refers to the augmentation of subject content via technology. They distinguish between primary content extended by AR (e.g., an electrician seeing wire capacity through AR glasses during installation) and content directly provided via augmentation (e.g., step-by-step installation instructions via AR). The way this information is presented and interacted with can significantly affect the theory-practice dynamic, particularly the way in which information complements, rather than supplements, content. To apply this framework more precisely to our project, we also include the material and infrastructural necessities related to AR use (e.g., Wi-Fi connection, student access to devices, user guides or manuals provided by AR developers) as they are equally pertinent to AR integration in educational contexts (Lee, 2012).
- **Didactic / Pedagogical Aspects:**
  The didactic/pedagogical aspects relate to how the subject content is taught and deployed through AR (Buchner & Zumbach, 2020), and how AR contributes to achieving learning objectives. Pedagogical approaches (teaching methods) and didactic considerations (discipline-specific content) are central to aligning theory with practice (Gauthier & Desbiens, 1997). Since the pedagogical approach of this study centres around game-based learning, and more specifically an escape-game approach, we are particularly interested in how overlap between didactics and game mechanics can emerge throughout the workshop when AR is integrated.
- **Enrichment Provided by AR**
  The third aspect identified by Buchner and Zumbach (2020) relates to the level of enrichment brought by AR. AR can offer optional learning experiences not necessarily linked to course content or course objectives,

which can allow students to pursue additional learning out of personal interest or to go beyond basic objectives. An effective example of this would relate to the opportunity to develop digital competencies when integrating AR technology. Thus, the opportunities for students to negotiate and interact with factors for digital competency development are of particular interest to us here. Moreover, given the value of soft skills development, such as collaboration and teamwork in VET (Tripathy, 2020), which often emerges through game-based learning (Alzahrani, 2020), we seek to explore these factors and how they emerge in a game-based learning approach that integrates AR.

- **Objectives:**
  Thus, three research objectives emerge, which help address the research question regarding AR integration through game-based learning in VET:
  - Document the AR role in regard to the technological material aspects (disciplinary content, digital infrastructure, etc.) when integrated into a VET course.
  - Identify didactic and pedagogical choices and gamification elements during the integration of a gamified approach.
  - Describe examples of soft skills and digital competency enrichment provided during AR integration in a game-based learning context.

2. METHODOLOGY

This study implemented an exploratory case study research design (Yin, 2011), which took place during an AR-supported escape-game workshop conceived for upper secondary-level VET students in a nursing course at a vocational training institution in Québec, Canada. The entire workshop lasted approximately 90 minutes. Data was collected via semi-structured interviews before and after the workshop with the teacher who taught the nursing course and the two pedagogical counsellors who conceived of, and hosted, the escape-game workshop activity for the course. Focus groups were conducted with two groups of three students each, and observational notes were taken during the workshop.

Qualitative methods were selected to document the rich practices from the workshop, and a thematic analysis was conducted using a structured qualitative content analysis (Mayring, 2015). The deductive themes were based on the theoretical framework inspired by Buchner and Zumbach

(2020), and the inductive categories emerged when screening the transcripts and observation notes. NVivo software was used to code the data. The study passed the Ethics Review Board of the researcher's university and the school board in which the study was conducted.

The escape game scenario was the following: the students were faced with a serious infection threat that spread throughout the training centre. They had one hour to complete the escape game by using their knowledge of infection prevention, the immune system, and pathogenic microorganisms to solve various puzzles and prevent the spread. Following the workshop, a 30-minute debrief was conducted.

The AR escape game scenario and digital overlay were created using Adobe Aero by one of the pedagogical counsellors. QR codes were accessible at each station throughout the laboratory classroom and scanned by the students' smartphones, through which a clue or puzzle would appear. In teams, students would solve the clues/puzzles. At the end, students were to inject the special serum into the critical, infectious patient (a doll).

3. RESULTS AND DISCUSSION

Technological and Material

Through our analysis of the data, we had regrouped several categories under the theoretical theme 'Technological and Material' derived from Buchner and Zumbach's (2020) design model. Here we detail the four prominent categories: Ease of Use, Accessibility, and Digital Infrastructure.

Ease of Use (7 references)

Many of the participants' responses related to the ways in which there was an initial 'learning curve' that, for the students specifically, they were quickly able to appropriate the technology. For instance, one student claimed: "For me, at the beginning, it was like difficult, but after, it got easy." (Student 2, FG1) Indeed, this technological learning curve was compared to the integration of other technologies and software that they use at their institution and in comparison to these, the AR interactivity was quite easy: "We have a learning curve like anything else that we have, learning OneNote or any working platform we have to use for school; this is very easy compared to other technological applications." (Student 3, FG 1)

Also, for the teacher, this learning curve was attributed to the generational reality of current students' experience with smartphones: "The way we have this generation of students that we have, even downloading the app didn't seem to be a problem." (Teacher, Pre-Interview) Moreover, as one of the pedagogical counsellors (PC) stated, the fact that AR can be experienced via smartphones is a necessity in its ability to reduce technological barriers and students' anxiety: "Not only is it necessary, it's also very beneficial because as a student, they're already very familiar with their device. So that device familiarity really helps break down any technical barriers. It can also probably help reduce stress or anxiety." (CP 2) Indeed, as Widiaty *et al.* (2021) observe, most students are already proficient with mobile operating systems (iOS, Android), which facilitates the integration of AR in VET contexts. Thus, introducing technologies that students are already familiar with has its advantages; however, they also raise digital competency concerns, which will be addressed below.

Accessibility (6 references)

Students' ease of use is inherently tied to accessibility issues. For instance, the more certain technologies are accessible to them, the easier it is to appropriate them in a variety of contexts, and indeed, this was a category that emerged in the data. However, accessibility to specific technologies can alter the experience. As an example, the technology used during the workshop was more effective with Apple phones than with Android phones, specifically Google Android devices. This was a prevalent issue that was mentioned by both PCs (5 references) and one student. Another student experienced difficulties with their phone, which required the student to collaborate with others.

Nevertheless, as the PC who developed the project states, in an ideal situation, a tablet would be used: "Ideally, you need an Apple device for it to work well, and ideally a tablet because you can see it better. That's really a problem because, you know, on a cell phone, the screen is small, and you can't see the scene." (PC1) However, it is not always the case that tablets are accessible in certain vocational centres, relating once again to the budgetary realities of these levels of education (Hoeckel, 2008), which further positions this technology in its economic and experiential accessibility (Jantjies *et al.*, 2018; Snyder & Elinich, 2010). Furthermore, the interactive nature of this application

facilitated disciplinary content manipulation and was thus more accessible and immersive than a textbook, as confirmed by one of the students: "It's quicker to use information and interact with the information than in a textbook, etc." (Student 1, FG 2)

Digital Infrastructure (5 references)

The digital infrastructure of public education contexts can be a constraint to integrating new technologies (Derder *et al.*, 2024; Richter *et al.*, 2025). Thus, concerns regarding the digital infrastructure when integrating AR technology into the classroom are important to consider, and aspects of this emerged in the study. One of the main examples relates to the vocational centre's Wi-Fi network. As the teacher of the study mentioned: "If we have them on our Wi-Fi, it might not work as well, especially since we're moving around and stuff like that." (Teacher Post-Interview) The effect of this concern is that students may be required to use their own data to properly use technology (this will be discussed below in relation to digital competency).

Furthermore, the use of smartphones versus tablet technology also affects the visibility of the virtual overlay and the success of the AR content focus. Given that tablets were not available at the vocational centre, it meant that the teacher had to ensure that all students had a smartphone, and if not, that students would share their personal phones with others during the activity. As the PC who conceived of the activity claims: "As for tablets, not all training centres have them, and the internet connection isn't great in training centres, which is really a problem." (PC) This relates to research conducted in VET using AR mobile technology by Cubillo *et al.* (2015), who note that the availability of an effective digital infrastructure is essential for the integration of AR in VET environments. Similarly, Wang and colleagues (2016) note that although AR has strong educational potential for VET, its effectiveness remains dependent on the availability of high-performance technical infrastructure.

Instructional: Pedagogical and Didactic Aspects

The second theme derived from Buchner and Zumbach's framework relates to the instructional dimension. This was categorised by the two major categories present in the data: Pedagogical and Didactic aspects.

Pedagogical Aspects (10 references)

The pedagogical implications of the activity were a key factor in its success and implementation. As the PC who conceived of the activity claimed, pedagogy should never take a back seat to technology: "It's not just an activity for the sake of doing an activity. It had to truly serve a purpose. Pedagogy comes first; that's always the priority. And then digital technology comes in to support the pedagogy." (PC 1) Thus, the pedagogical and course objectives were at the forefront of the workshop's creation. This was remarked upon by the students in the focus group who felt that the pedagogical approach of the escape-game itself allowed them to tie theory to practice: "We're starting to shift more towards lab toys right now with 'still kits' and gloving and everything like that but before, it was just theory, so now we're getting first exposure to the labs, which is actually very fun, like she said, this is a nice bridge to our knowledge." (Student 2, FG2) Moreover, the effect of providing this content through an AR application, versus printing multiple sheets and modifying them each time such an activity occurs, points toward the efficiency of AR technology: "But if I calculate the design time, once you've understood it - it's really basic, it's just drag and drop. It takes much less time than doing it physically." (PC 1) This, however, goes against studies in which escape games were created in nursing education courses, with results pointing towards the barriers of cost and time to educators implementing them (Reinkemeyer *et al.*, 2022). Nevertheless, given the technological affordance of AR for this workshop, it seems that these barriers were negligible.

An escape-game activity is in and of itself a pedagogical approach, but the choices of group formation, modelling, and accompaniment demonstrate the importance and crucial pedagogical aspects of this design. In this way, even the pedagogical posture of the teacher evolved while the escape game was implemented. For instance, as emerged during the observation notes, the teacher did not position herself in the traditional posture. Rather, she took on the role of providing guidance and support - giving hints, accompanying those who had trouble (Observation Notes). This posture closely resembles that of a 'game master', one who guides and facilitates (Molin, 2017), undermining the traditional hierarchical teacher-student relationship.

Didactic Aspects (7 references)

One of the most interesting elements that emerged from the study was the way in which participants experienced the didactic aspects, which dovetailed effectively with game mechanics. Game mechanics refers to the overall systems, rules and actions that determine the way a game works and must be played (Adams & Dormans, 2012). Thus, in an escape game that is tailored to be played in a nursing course, mechanics such as a time limit add pressure and stress, which also generate necessary collaboration. This, coupled with the health-specific content knowledge, made the learning experience rich and authentic. The teacher articulated this well when she claimed: "It brings the students' experience in a way that is under pressure, which is another good factor, especially for this type of program, but also for the workforce; they're working under pressure, they're working against the clock." (Teacher, Pre-interview) This was echoed by one of the students in a focus group who stated: "The fact that there was the stress, and the time, it made it so that it was a good thing and a bad thing. It was a good thing to help us think quicker and more focused." (Student 3, FG 1)

This feeling of pressure was heightened by how the teacher and pedagogical counsellor implicated the school staff. For instance, students in the class were not told what the actual activity was. When they entered the classroom and class began, the secretary of the centre announced over the PA system that there was an infectious outbreak. Then, an alarm sounded, and the pedagogical counsellor explained to them the escape-game scenario. Observation notes revealed that the students all appeared excited, motivated, and engaged. The level of immersion into this game facilitated the activity and mirrored the emergency of an actual outbreak at a health institution, a crucial element to the success of the escape game approach in nursing (Gómez-Urquiza *et al.*, 2019).

Enrichment Provided: Soft Skills and Digital Competency Development

The third thematic concept used to group the data collected was Enrichment Provided by the AR integration. This concept was strongly present throughout the study, especially evident in the categories such as Teamwork and Collaboration, Engagement and Motivation, and Digital Competency.

Teamwork and Collaboration (17 references)

Soft Skills are frequently mentioned as an added value to game-based learning in school contexts (Reuter *et al.*, 2020; Tan *et al.*, 2023). Soft skills refer to the skills required in the workforce that do not necessarily relate to the specific skills for a required task or profession, and are particularly important in nursing (Widad & Abdellah, 2022). Often, soft skills relate to communication skills, critical thinking, and people's ability to collaborate or work well in teams (Cimatti, 2016). This, therefore, situates it in Buchner & Zumbach's third element of AR-integrated technology in education, Enrichment Provided by AR.

Unsurprisingly, teamwork and collaboration have a rich history in escape room approaches for nursing education (Morrell, 2020; Feng *et al.*, 2024), and indeed, the theme of Teamwork and Collaboration was a predominant theme present throughout the data collection. As one student said, having teammates support one another was a positive experience: "I guess having my teammate, like someone telling you that that's right, it's just like it doesn't doubt you as much, it's not like being thrown into a den." (Student 1, FG 2) These sentiments were echoed by the teacher who highlights the importance of 'having someone to lean on', which is a crucial factor when working in the health field: "It brings in the 'know-how' that working under pressure, working in teams, there's a way that it really makes them collaborate as a whole, and I think that's like a part of the beauty of it as well." (Teacher, Post-Interview) These aspects relate to one of the crucial soft skills of the nursing field, highlighting the essential collaboration skills needed in order to work with health practitioners in various roles and responsibilities (McInnes *et al.*, 2015), but also the nature of the nursing field in which they are required to collaborate with practitioners from various disciplines (Ponte *et al.*, 2010).

Moreover, the nature of the cooperative activity engendered a division of labour, with some students taking on different roles: "For me, we have a group with different personalities, and that was nice that there were a diversity of personalities and tasks for everyone, and I took initiative too once I found my place and was able to know my role." (Student 3, FG 2) Indeed, putting different personalities together can also instigate conflict, an element that the teacher articulated in the pre-interview, when recounting a discussion she had with a student: "This is reality, and let's use it in a learning curve and see. And I said, you know, do me a favour and find another lens instead

of the one you're looking through and let's talk about it after. OK, let's see how that goes." According to the teacher, afterwards, the experience allowed the student to foster some self-reflection and implement some self-regulation, leading to a positive experience for the student. For another student, participating in the activity allowed her to reflect upon her role while in a team, and leaving space for others to assert themselves: "I'm always thinking about this, because I am such a go-getter in life, and I know that she's freaking smart, but she won't say it out loud 'cause it was the language maybe barrier sometimes, and so I notice for myself I have to slow myself down and include her more, because otherwise, she would just be left behind." (Student 2, FG 2) Indeed, the collaborative nature of this activity facilitated effective reflexivity on students' roles within a group and the personal dynamics that often underpin working together.

Self-Reflexivity and Critical Thinking (8 references)

Moreover, the self-reflection that such an activity fosters opens up possibilities not only for students to reconsider their implications in team dynamics, but also in regards to problem solving and critical thinking, another crucial element to work in the health field: "It's like the puzzle, there was a puzzle there, right, that's like yes, you know you're writing on it, but you have to match the words, you have to be careful that you put one letter in one box that didn't belong 'cause then now, the other one could be a mistake, so right so it's like now, that we're doing, in practical if I compare it, like I have to be so careful and so gentle not to make a mistake, because then, I'm making more mistakes further on." (Student 1, FG1) This metacognitive awareness the student exhibits highlights a crucial affordance for these types of games and activities that facilitate key problem-solving skills (Coffman-Wolph *et al.*, 2018). Furthermore, as the teacher highlighted in the post-interview, because of the structure and sequencing of the game, prioritizing and taking opportunities to evaluate options (i.e. triaging) becomes a necessary condition to succeed in the health field: "It's like you know if you take an exam, you're stuck on a question, and you know, we tried to teach the students pass on, go to another, but this teaches them that without even realizing, yeah they're stuck, you'll see them oh, where we were too stuck on time, let's go run to that other station, we will come back to it." (Teacher, Post-Interview) This corroborates the research of Köse & Özcan (2025), who, through their

systematic review, identify the critical thinking and problem-solving benefits of escape games in nursing education.

Necessity of Digital Competency (6 references)

As mentioned in the section about technological accessibility and infrastructure, digital tools might be accessible, but the ability to navigate those tools appropriately relies upon a developed digital competency. Indeed, students mentioned the ability to access and manipulate information in a timelier manner: "I was comfortable learning new things through technology, not only reading notes, so this activity allowed me to learn new things and for me, the technology was impressive and quick." (Student 1, FG2) This shift from old educational tools to new, is articulated in the importance of teachers to be competent in technology, evident in Competency 13 of the Teacher's Professional Competencies published by Québec's Ministry of Education (MEES 2019), which was the impetus to provide such activities for their students, according to the teacher: "I think it's bringing in like competency 13, we realize as teachers how we have to move forward in this, because it's just how it is." (Teacher, Post-Interview) This factor concerns 'changing with the times' as the teacher states; however, it also points towards how new technology can facilitate interactivity that go beyond sitting passively in front of a computer: "We have the capability to pop up an image and have this vision, and through the pictures in, and it's not sitting in front of computer which is really cool." Indeed, as technologies advance and become more interactive, their multimodal affordances, whether visual, audio, or gestural (Jewitt, 2013), provide opportunities for richer learning that relate to the digital reality of the contemporary workplace (Jia & Huang, 2023).

Further, integrating technology also implies issues related to data privacy and ethics. This is an explicit dimension of many digital competency frameworks (MEES, 2019; UNESCO, 2018; Vuorikari *et al.*, 2022). Issues surrounding data privacy are important, particularly as governments and school administrators are becoming more conscious of these concerns. Indeed, the PC who developed the game outlines the importance of having to run the project by the local IT representative to make sure it conforms to local data privacy law: "Well, I got the software approved by IT. That was clear. Then, once it's approved by my IT department, you know, when I go to a centre, I say, 'It's already been approved by IT'." (PC1) Having this approval legitimises privacy

concerns, which is essential, especially if youth or minors are using their own phones. Also, the teacher confirmed how data ethics are an issue when she mentioned how students' data could be used when they got bumped off the vocational centre's Wi-Fi network: "If we had complaints, maybe it would be more about data… our director said she would be open to having like tablets or something, some kind of replacement technology, but so far, it's been the students using their own cell phones." (Teacher, Post-Interview) Thus, as digital competency frameworks attempt to position students and teachers to become more conscious of data privacy or the threat of Big Data in education (Reidenberg & Schaub, 2018), there are still measures that need to be taken to ensure proper safety and security.

CONCLUSION

As demonstrated in this article, an escape game activity that integrates AR technology can facilitate soft skills development, interrogate the needs for digital competency, and open rich pedagogical and didactic affordances in a VET nursing course. In this way, it closely resembles the convergence culture (Jenkins, 2006) of contemporary media in how combining multiple modalities affects media consumers (Jewitt, 2013). Nevertheless, more research is needed to ensure meaningful learning has occurred when students engage in such activities, and a more detailed study validating students' retention of concepts after partaking in an AR escape game activity would be welcome. Yet, given the challenges of VET environments, particularly those in Québec, in which classrooms are marked by the heterogeneity of age (Cournoyer & Deschenaux, 2017), including some on lifelong learning trajectories trying to stay current with technological developments and remain employable (Onstenk & Duvekot, 2017) in the varied dynamics of current labour markets, activities such as these assure students can remain engaged, participate in authentic and experiential learning, and develop skills crucial to the contemporary workforce.

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