ADAPTIVE PROBABILISTIC VIDEO TRAINING FOR POLICE STUDENTS

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ABSTRACT

Emergency medical services (EMS) are vital, and continuous training is crucial for first responders to deal with high-pressure situations effectively. Traditional training methods have limitations, and an innovative approach to enhancing EMS education is the use of probabilistic interactive video training. This method utilises interactive web-based platforms to offer immersive learning experiences through standard web browsers on computers and mobile devices (Herault et al., 2018a; Herault et al., 2018b). It creates dynamic and personalised learning scenarios that adapt to individual trainees' progress and performance, employing non-Markovian Process principles. Trainees can interact with realistic emergency scenarios, improving their decision-making skills and preparedness for real-life emergencies based on probabilistic models. The approach is accessible and adaptable and enhances training with personalised feedback. A study at Linnaeus University, Sweden, involving more than 200 police and ambulance students each semester, demonstrates its effectiveness in enhancing critical thinking, decision-making skills, and emergency preparedness through the use of varied footage, including 360-degree and drone videos. The goal is to augment traditional EMS training tools with this novel approach and evaluate its impact.

The creation of the training scenarios was guided by the principles of Participatory Design, which shares similarities with the concept of co-design. Participatory Design advocates that the design process, whether it be for social or technological systems, should be democratic and inclusive of users. The rationale behind this is that users, having firsthand experience with the systems, should contribute to their design. Engaging an expert in Emergency Medical Services (EMS) training from the project's outset ensured continuity and expertise throughout the development process. Each specialist featured in the training videos actively participated in crafting their respective scenarios, ensuring their insights influenced the final product. The use of interactive storyboarding techniques facilitated a streamlined filming process by encouraging collaboration among all team members. This preparation was essential as missing critical content could delay the project up to a year due to the infrequency of similar activities (i.e. a fully simulated car accident).

Throughout the filming, editing, and creation of the probabilistic interactive scenarios, close collaboration with the EMS expert was maintained. This extended to

conducting multiple pilot tests aimed at identifying and rectifying any inaccuracies or bugs. Continuous dialogue between the filming crew and EMS personnel ensured the video content was comprehensive and demonstrated the key elements effectively. While aesthetic adjustments such as colour correction and sound enhancement were solely the editor's responsibility, the editing process was a collaborative effort between the editor and the course's primary instructor. Incorporating the training scenarios into the Learning Management System (LMS) weeks before the start of each course allowed the teaching team to familiarize themselves with the content and conduct necessary tests before granting students access. The training tool was used in two distinct manners: collaborative viewing sessions facilitated by an instructor and individual viewing by students at their convenience. This dual approach enabled the collection of direct feedback, which was instrumental in refining the tool.

The tool demonstrated robust performance, accommodating up to 224 concurrent users each semester starting from 2022, with no significant access issues except for a minor glitch related to the university's LMS in its mobile application, which was promptly addressed by providing an alternative access link. One student mentioned an issue with a long loading time from a WiFi connection and another with a poor mobile data connection. They expressed the need for an offline version. The tool's primary objective—to prepare students effectively for their examinations—was successfully achieved. Informal feedback and, notably, 25 semi-structured interviews conducted with police students in June 2024 offered valuable insights. These students, participating in a predominantly online distance learning program with occasional intensive on-site sessions, provided a unique perspective on the tool's efficacy.

Feedback from both students and faculty has been overwhelmingly positive. Students particularly appreciated the opportunity to view the content multiple times, enhancing their preparedness for examinations. This preference for visual learning over traditional text-based materials was echoed across the board. Faculty members noted the tool's impact on student engagement and enthusiasm, which was supported by data indicating an average of 2.23 views per student over the last three semesters. The success of the tool has led to its integration into the curriculum for the foreseeable future, reflecting its perceived usefulness. All students mentioned wanting this tool in other courses in their education. To further validate these perceptions, upcoming studies will employ a crossover design, coupled with a questionnaire framed around the Technology Acceptance Model (TAM), to objectively assess the tool's impact on examination outcomes. More interviews will be performed each semester to validate the collected data. partnership

Keywords: Adaptive Learning, Probabilistic Training Tool, Police Education, Participatory Design

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