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Immersive Learning in Professional Education: Stakeholder Perspectives on Integrating XR/VR into Police Education

J. Pearson, L. Pinchen

University of Sunderland (United Kingdom)

Abstract

This paper uses exploratory focus groups to examine stakeholders' perceptions of how immersive technologies, such as Extended Reality (XR) and Virtual Reality (VR), can be integrated into police education to better prepare students for complex policing practice. Five focus groups were conducted with 29 stakeholders from Higher Education (HE) institutions, policing, and partner organisations across the UK. The paper presents stakeholders' perceptions of the pedagogical potential of immersive technologies, identifies policing scenarios most suited to immersive simulation, and examines the institutional and technological challenges associated with XR/VR implementation. Findings highlight both strong perceived pedagogical value and significant implementation constraints, particularly around organisational readiness, ethics, and infrastructure.

Keywords: Extended Reality (XR), Virtual Reality (VR), Immersive Learning, Experiential Learning, Police Education, Design-Based Research.

1. INTRODUCTION

Professional policing is characterised by the need for officers to make rapid, context-sensitive decisions that are not only operationally effective but also legally informed and ethically defensible. These decisions often take place in highly dynamic, uncertain, and high-pressure environments, where incomplete information, competing priorities, and public scrutiny intersect [1]. Preparing students for such complexity presents an ongoing challenge for UK police education programmes, which must balance the development of theoretical knowledge with the cultivation of practical decision-making capabilities [2]. Traditional pedagogical approaches within police education, including lectures, case-based learning, and role-play simulations, continue to play a central role in supporting foundational knowledge and critical reflection [3,4]. However, these approaches can be limited in their ability to fully replicate the cognitive demands and situational pressures of real-world policing [5]. They often struggle to recreate the immediacy and ambiguity associated with operational environments, potentially limiting opportunities for students to develop situational awareness and adaptive decision-making skills in realistic contexts [6].

Recent advances in immersive learning technologies, particularly Virtual Reality (VR) and Extended Reality (XR), offer new possibilities for addressing these limitations [7]. XR/VR technologies provide learners with opportunities to safely experience immersive, life-like training scenarios that would otherwise be difficult to recreate within traditional learning environments [8]. By enabling users to engage with interactive, computer-generated environments, immersive technologies can support experiential learning in ways that more closely mirror real-world conditions [9]. Within professional education, these technologies have increasingly been explored for their potential to facilitate active learning, enhance engagement, and provide safe spaces for repeated practice and reflection [10,11]. In the context of police education, XR/VR environments may offer a means of simulating complex operational scenarios while allowing learners to experiment with decision-making processes without real-world consequences [12].

Despite growing interest in immersive technologies, there remains a need to better understand their pedagogical value and practical implications within police education programmes [13,14]. Questions persist regarding how such technologies can be effectively integrated into curricula, which learning outcomes they are best suited to support, and the challenges institutions may face in implementing them at scale [5]. Addressing these questions requires engagement with a range of stakeholders, including educators and practitioners, whose perspectives can inform both the design and application of immersive learning environments.

This paper draws on exploratory stakeholder focus groups conducted as part of a UK Arts and Humanities Research Council (AHRC) funded project under the Curiosity Award framework. The study identifies three overarching themes: (1) the pedagogical opportunities afforded by immersive experiential learning, (2) the practical and institutional challenges of integrating XR/VR within educational contexts, and (3) the design requirements necessary to ensure authenticity, ethical realism, and alignment with professional learning outcomes. These findings contribute to ongoing debates about the role of immersive technologies in professional education and inform future development of XR/VR learning approaches within policing curricula.

2 METHODOLOGY

This study adopted a qualitative exploratory design in the initial phase of a broader research project examining the integration of XR/VR technologies within police education. The exploratory phase aimed to capture stakeholders' perspectives to inform early-stage design considerations [15]. Data was collected through five stakeholder focus groups involving participants, including policing academics based at UK Higher Education (HE) institutions, police training practitioners, and policy makers and support partners (n=29). These groups were selected to provide a broad range of perspectives relating to the pedagogical, operational, and strategic considerations associated with immersive learning.

Focus group data was analysed using thematic analysis to identify patterns of recurring and shared perspectives both within and across the focus groups undertaken [16]. This approach identified three key themes relating to pedagogical opportunities, implementation challenges, and design requirements. The study is exploratory in nature and was designed to provide early indicative insights to inform future development work; therefore, the findings are not intended to be generalisable. Participants were recruited using purposive sampling, meaning the sample is likely to reflect the perspectives of individuals already interested in digital innovation and immersive technologies within police education. As the study is situated within a UK police education context and focuses on early-stage stakeholder perceptions, the findings reflect anticipated opportunities and considerations surrounding XR/VR integration rather than evidence from implemented practice. Nevertheless, the study provides valuable early empirical insights into the pedagogical potential, design considerations, and implementation challenges associated with immersive technologies in police education.

3 RESULTS

3.1 Pedagogical opportunities for immersive experiential learning

Participants identified a range of pedagogical opportunities associated with immersive XR/VR environments in police education. These are explored here, with particular focus on experiential learning, decision-making and situational awareness, and opportunities for safe practice and repetition.

3.1.1 Experiential learning and realism

Participants consistently highlighted the pedagogical value of immersive XR/VR environments in supporting experiential learning, particularly through the creation of realistic and contextually rich scenarios. [17] highlight the value of experiential learning in enabling learners to engage with realistic, scenario-based training that bridges the gap between theory and operational practice. However, others argue that for this learning to be effective, scenarios must be situated in 'cognitive realism', immersing learners in engaging and cognitively stimulating tasks [18]. Shared perceptions across educator participants highlighted the need for authentic, immersive practice focused on task-based activities. These included activities such as arrests, custody and search procedures and crime scene management. Opportunities for the inclusion of more complex and sensitive scenarios, embedded within the wider safeguarding context such as suspect, witness and victim interviewing, were also identified, with an emphasis on the creation of high-risk, repeatable scenarios: '*dealing with an angry man again and again and again'* (FG4). A key advantage of immersive scenarios is that they allow learners safe exposure to policing situations that may otherwise be difficult or unsafe to practise in the real world: '*every scenario… there's the risk… somebody's going to get hurt… so the risk is going to drop quite dramatically*' (FG2).

Participants agreed that such scenarios must be authentic to avoid learner disengagement and build confidence in the method. They noted that XR/VR should support rather than replace traditional approaches such as role play and real-world simulation, with both working in parallel where the immersive element adds value: '*you just can't replicate [this] through discussions within the classroom… it can only really properly be done in some sort of live scenario*' (FG1). Role play was also seen by some as particularly effective for complex, people-focused scenarios: '*role play... they learn best way through that… then deal with it and then putting it into practice'*(FG2), suggesting that technology should not be viewed as a replacement for skills-based training.

Participants further recognised the potential of immersive technologies to create experiential learning opportunities and deepen understanding: '*it just gives them a much deeper understanding'* (FG2). They highlighted the value of learner engagement and flexible approaches that support different learning needs while reinforcing classroom teaching and the application of skills in a controlled environment. Educators noted that immersive technology could help bridge the gap between stated intentions and actual behaviour, linking decision-making and critical thinking: '*it separates what you say you would do from what you actually do*' (FG1).

3.1.2 Decision-making and situational awareness

Beyond the blending of theory and practice, a key pedagogical opportunity identified was the development of operational decision-making and situational awareness within complex scenarios. Participants highlighted the value of XR/VR in supporting learners to experience multilayered situations in which decision-making is challenged: '*you just can't replicate [this] through discussions within the classroom… it can only really properly be done in some sort of live scenario*' (FG1). Scenarios identified by participants where XR/VR may be beneficial included those characterised by unpredictability, rapid judgement, and the need for effective communication. They included domestic abuse, officer safety, and conflict management scenarios: '*walk about the streets going to public order situation and deal with some aggression and violence in your face*' (FG2). Participants also acknowledged that, immersive technologies could be used to train officers for public order situations, road traffic collisions, and major incidents requiring multi-agency responses: '*there's no limits as to what you could include*' (FG5), suggesting a broad and adaptable scope for their use within police education and pedagogy.

Consensus across the focus groups highlighted the significant potential for immersive learning to support the development of communication skills under pressure. Educators, in particular, further highlighted benefits for building confidence, engagement, and decision-making skills, especially for those new to policing roles. Immersive environments were seen as offering opportunities to practise communication under pressure, develop empathy through trauma-informed interactions, and engage in nuanced decision-making within ethically and emotionally challenging situations. Participants felt that scenarios should also include ethical dilemmas and competing priorities, such as enforcement of the law versus safeguarding, often to be found in '*suicide negotiator*' (FG4) and '*domestic abuse*' cases (FG5).

It was also noted that immersive technologies may allow learners to critically reflect on their decisions and performance within a safe and controlled environment, potentially leading to improved practice in real-life situations: '*they go in there, they apply it… then reflect on their actions*' (FG1). Participants emphasised the value of being able to revisit scenarios, reflect on actions taken, and refine responses without the risks associated with live operational contexts. Participants, particularly policy makers and support partners, further highlighted the two-way benefits of enabling learners to experience scenarios outside their usual geographical and social contexts. This was viewed not only as a means of enhancing operational understanding, but also to strengthen public legitimacy and trust in policing. Participants felt that helping learners better understand marginalised perspectives, including experiences of trauma, autism, and other protected characteristics, may contribute to more responsive and equitable police practice.

3.1.3 Safe practice and reflective learning

Participants also highlighted a significant advantage of being able to engage in repeated practice and structured reflective learning within a controlled and safe environment: 'I *think that would bring the risk assessment quite low to the activity that you undertake*' (FG2). Enabling learners to engage with the scenario multiple times to allow gradual refinement and development was viewed as particularly

valuable in a police education context, where opportunities to practice in real-life contexts are limited. This was framed as a means by which to expose learners to situations which are complex in nature, and which require critical thinking whilst under pressure: '*dial up the aggression and set the aggression to 10… dial it down and how they would respond*' (FG2). In highlighting safe exposure to challenging circumstances participants further identified the importance of reflection as a learning tool, particularly in the context of critical thinking and decision-making. There were, however, differences in views as to where reflective practice ought to occur. Policy makers and support partners advocated for continuous immersion, to allow for realistic decision-making: 'to actually live and breathe it in their most realistic situation' (FG4). Whereas police educators framed this as a staged learning process in which learners can iteratively reflect at decision points within an unfolding scenario: '*the before and after is just as important as the actual taking part in the immersive experience*' (FG5). This difference highlights an important tension between immersive, experience-led learning, and structured, staged reflection in the development of police decision-making skills. In summary, participants highlighted the pedagogical value of XR/VR in supporting experiential, scenario-based learning that bridges theory and practice in policing. They emphasised its potential to develop decision-making and communication under pressure through safe, repeatable exposure to complex situations. However, they viewed its value as dependent on complementing, rather than replacing, existing teaching methods. Overall, effectiveness was seen to lie in combining immersive experience with structured reflection.

3.2 Implementation challenges for XR/VR in police education

Implementation of XR/VR in police education is shaped by a range of interrelated challenges identified across the focus groups, including structural, pedagogical, cultural, and ethical factors. These include cost, scalability, procurement complexity, organisational resistance, and the need for appropriate ethical safeguards.

3.2.1 Structural and Logistical Constraints

The predominant challenge raised by participants was the potential cost of equipment purchase, licensing, ongoing support, and associated IT infrastructure, particularly given that UK police forces suffered heavily due to budget cuts during previous government administrations [19]: '*funding is an absolute nightmare when it comes to anything like this*' (FG4). Current indications are that future savings might again be requested from forces, leaving little, if any, spare funding for investment in IT equipment: '*education and training always seems to be… the thing that sort of falls to the back of the list when you're funding it*' (FG4). Participants also identified that the substantial investment already required for cybersecurity infrastructure, due to the risk of attacks targeting law enforcement agencies and the sensitivity of police-held information, may create further barriers to XR/VR implementation. Existing security systems and firewalls were seen as potentially causing compatibility issues with technologies, although some participants acknowledged that such issues might be mitigated through appropriate IT protections. However, a counterargument to these concerns is that, despite higher initial set-up costs, XR/VR training may become increasingly cost-effective as it is delivered across multiple cohorts [7].

The ability of police forces to deliver XR/VR training was also perceived to be constrained by the range of delivery platforms available on the market, alongside challenges relating to ongoing maintenance, storage, and the rapid obsolescence of equipment. Participants noted that these issues are further compounded by complex police procurement processes, meaning that by the time IT equipment is purchased, it may already be outdated due to the pace of technological development and innovation, reflecting concerns that '*the policy and the vision [are] lagging behind*' (FG4). These issues were viewed by participants as a significant hurdle to the widespread future adoption of XR/VR by police training departments. Finally, scalability of the technology was highlighted as a potential issue by some of the focus groups, with the problems of delivering teaching to large cohorts of learners a particular concern. This was driven by the current ability to deliver instruction to large groups of students using traditional teaching methods, and a fear that this might not be possible to replicate with XR/VR learning: *'we exhausted scenarios quite quickly'* (FG2). Technical and logistical factors were thought to be issues that may constrain the future delivery of this style of teaching: '*you need something where you could go in on a weekly basis and it would be different*' (FG2). The time taken to set up and deliver XR/VR training was thought to be a further inhibiting factor with far longer required for each learner in terms of the time required to properly deliver content and debrief students.

3.2.2 Pedagogical Integration Challenges

The challenge of how to effectively incorporate XR/VR teaching into police curricula was identified by participants [14]. Instinctively, educator participants thought that XR/VR delivery could add value to their teaching, but were unsure of how to implement it, and how to negate the risk that '*the novelty of VR may be a distraction from learning*' [13, p.4]. Consequently, some policing agencies are unsure of how to proceed and how to ensure that XR/VR is not simply seen as a gimmick by learners. This issue was noted by Zechner et al, [20], who observed ongoing uncertainty within law enforcement agencies regarding how to begin implementing XR/VR training effectively. However, the primary risk is potentially not that the technology will not function, but that pedagogical misalignment results in the teaching approach not assisting students to achieve learning goals [21]. Participants were clear that any use of XR/VR should be curriculum-based and act as a learning tool rather than an entertaining novelty [22]. The tension between traditional police training, which tends to be procedurally based and repetitive, and the need to deliver education that is critical and reflective was acknowledged. It was felt by participants that the use of XR/VR might prove difficult when designing learning that encourages reflection, critical thinking, and ethical reasoning. Though a counterargument may be that this type of participative teaching is exactly what should be used to encourage those critical skills among students. It was felt that without careful learning design and clear learning objectives, XR/VR learning might default to simply being a vehicle for skills rehearsal without meeting more qualitative outcomes.

3.2.3 Cultural, Institutional, Ethical, and Safeguarding Constraints

Beyond integration challenges, participants felt that cultural resistance to the introduction of XR/VR teaching may be encountered within police agencies: '*the organisation would stipulate the way that learning has to take place*' (FG4). This suggests an element of institutional rigidity and resistance to change in pedagogical approaches. However, Halford et al, [7] suggest that learners themselves tend to view such technologies positively. Participants nevertheless felt that XR/VR may be perceived by some senior officers as a gimmick, which is problematic given that they typically make decisions related to expenditure and capital investment in training resources: '*you might get the usual apathy ...it's just a new-fangled thing*' (FG5). Those staff lacking digital confidence were also identified as a further group who may initially be resistant to the introduction of XR/VR content. It was felt that success in embedding XR/VR within organisations will depend on it being framed as a tool to enhance professional judgement among officers, rather than replace it.

While participants highlighted the potential for XR/VR to deliver training in specialist policing areas such as sexual offences, mental health, and victim management, they also acknowledged that immersive environments may present risks for learners. These were identified as including emotional harm or re-traumatisation, particularly for officers previously exposed to similar scenarios, a risk also noted in the work of others [20,5,10]. Participants additionally stated that it was important that '*properly considered and all the necessary checks are in place*' (FG4). Safeguards such as opt-out mechanisms and pre-brief/de-brief structures were seen as important for enabling facilitators to identify and respond to learner vulnerability. As such, it was suggested that robust ethical governance in XR/VR training should be considered a necessary precondition of implementation, ensuring learner wellbeing and responsible use of immersive technologies. Overall, participants identified structural, pedagogical, cultural, and ethical constraints that may limit the implementation of XR/VR in police education. Key concerns included cost, scalability, procurement complexity, and organisational resistance: 'p*eople are going to have their eyes on two things, the funding and the resource*' (FG4), alongside uncertainty about how to integrate immersive technologies effectively without undermining learning quality. Ethical safeguards were also seen as essential to protect learner wellbeing in potentially challenging scenarios. Overall, these factors suggest that implementation depends on alignment across institutional, pedagogical, and governance frameworks.

3.3 Authenticity, ethics, and learning design in XR/VR

Across the focus groups, participants consistently highlighted authenticity as a central requirement for effective XR/VR learning in policing, particularly in ensuring credibility with learners and relevance to operational practice. This theme is explored through the role of lived experience, structured interactivity, and considerations of inclusivity and learner diversity.

3.3.1 Authentic Experience and Context

Authenticity was consistently highlighted as an important consideration in police education, particularly given the need for credibility among an inherently sceptical student audience: '*you might get the usual apathy*' (FG5). Participants therefore suggested that XR/VR teaching should be realistic, with credible contextual content that closely reflects operational practice: '*real life as possible, but in a safe environment*' (FG4). Participants noted that teaching in these areas should be underpinned by ethical principles [5] and supported by recognised decision-making structures such as the police National Decision Model [23]. XR/VR training in these contexts was seen as having the potential to support officers in navigating the moral complexity and consequences of decision-making in a safe environment. Participants suggested that future XR/VR learning would need to balance policing requirements with learning outcomes while avoiding any risk or unintended harm to students. Overall, effective XR/VR design was seen as needing to go beyond a purely immersive experience, towards approaches grounded in realistic scenarios and clear pedagogical foundations.

Participants felt that, together with practitioners, community groups and victims, had an important part to play in the production of XR/VR content intended for police training. These partners will have lived experience of issues such as domestic or sexual abuse that will provide important context to content creators. This will in turn add authenticity to the finished material which will hopefully secure greater engagement from police practitioners: '*it hits home even stronger than any other form of training*' (FG4). A further benefit of community involvement in content creation could be where specific cultural considerations are a factor in the intended learning product. Cultural considerations might include issues related to local demographics or specific religious or ethnic groups, and their involvement was considered important by participants to inform and to add further authenticity. The use of real-life narratives in any future content creation was also considered relevant, with the investigation of missing persons and safeguarding flagged as potential areas of policing that might benefit from XR/VR content: '*you've got to have them involved and have their voice… or you're going to go nowhere*' (FG5). Therefore, it could be argued that authenticity in teaching is socially constructed and not achieved solely through technological advances.

3.3.2 Interactivity, Responsiveness, and Structured Learning in XR/VR

When creating content, participants stated that branching narratives within the XR/VR scenario would add realism, allowing students to fully explore authentic virtual policing scenarios: '*bringing the street into the classroom*' (FG1). The requirement for this 'decision-tree' feature of XR/VR content was viewed as an important factor for creators to consider, as elements such as time pressure and the consequences of decisions made are valuable teaching aids: '*you literally have four outcomes where the student will be immersed into the most real-life situation that possibly can*' (FG4). This, in turn, simulates cognitive complexity in XR/VR learning, rather than simply focusing on traditional police procedural-based learning. Participants also indicated that Artificial Intelligence (AI) might offer interesting opportunities for XR/VR content creators in the future, with AI-driven avatars potentially able to interact and respond dynamically to student actions. The ability to collaborate with colleagues was also seen as an important feature of XR/VR content, with team-based responses viewed as authentic and valuable in delivering learning at scale to larger groups of students.

Educator participants further stated that, before undertaking any XR/VR learning activity, students should attend a pre-briefing that details context and expectations, while also allowing facilitators the opportunity to outline arrangements to safeguard learners. Following immersion in the XR/VR scenario, participants felt that a structured de-brief was essential to fully maximise learning, requiring students to reflect upon their virtual experience. Participants suggested that the most effective learning would occur during this phase of the exercise and that the de-brief would also allow instructors the opportunity to make further links between theory and practice: '*the majority of the learning that happens will come in the debrief evaluation part of it*' (FG5). It was felt that XR/VR exercises without structured reflection risk being experiential only. This may prevent full delivery of learning objectives, where participants emphasised '*a lot of the learning is done after the debrief*' (FG5). This suggests that the pedagogical value of XR/VR may depend less on immersion alone and more on how effectively experiences are structured, facilitated, and reflected upon.

3.3.3 Inclusivity, Accessibility, and Learner Diversity

During the focus groups, participants highlighted that XR/VR learning should be accessible for all learners, with older police officers being identified as a group that has the potential to be disadvantaged

due to unfamiliarity with certain technologies. A further concern highlighted was the possibility that sensory overload while participating in certain immersive technologies might cause students to feel physically unwell due to issues such as motion sickness [5]. This point illustrates the importance of exercise pre-briefs so that facilitators can make students aware of potential risks of this nature: 'if it comes too much… what they need to do… to get that support' (FG5). Participants also suggested 'avoiding… unnecessary… graphical content or violence or too much sensory overload' (FG5). Participants highlighted that some learners might not enjoy or respond well to XR/VR learning and that some cognisance should be paid to the learning styles of students. In conclusion, participants emphasised that authenticity is central to effective XR/VR learning in policing, requiring realistic, ethically grounded scenarios that reflect operational practice and support credible decision-making under pressure. They highlighted that authenticity is likely to be strengthened through lived experience, community involvement, and structured design, including pre-briefing, immersion, and reflective debriefing. They also noted that accessibility and learner diversity must be considered to ensure safe and inclusive engagement. Overall, effective XR/VR design was seen to depend on combining realism, structure, and inclusivity rather than technology alone.

4 CONCLUSIONS

As a learning technology, XR/VR has moved from the realm of high-potential future innovation to a present-day learning tool that is increasingly being explored and used by police agencies and educational programmes to provide developmental and educational opportunities for learners and practitioners [20,24. Existing research suggests that immersive technologies may offer opportunities to enhance experiential learning, authenticity, learner engagement, and the connection between theory and professional practice. However, it also indicates that XR/VR is not always used to its full potential and can, at times, deliver underwhelming learner experiences that lack authenticity [18]. This may be due to factors including an overreliance on visual environments, limited technical familiarity among learners [9], and broader organisational constraints such as cost, operational pressures, and cultural resistance within police educational contexts.

Participants within this study identified a range of perceived pedagogical opportunities associated with XR/VR in police education, including support for experiential learning through immersive operational scenarios that develop decision-making, situational awareness, communication, and reflective practice within safe and controlled environments. Participants also highlighted the value of exposing learners to ethically and emotionally complex situations that are difficult to replicate in traditional classroom settings, alongside opportunities for repeated practice, structured reflection, and engagement with diverse perspectives and lived experiences. Collectively, these perceptions suggest that immersive technologies may support more authentic and professionally relevant police education. However, participants also identified significant challenges associated with wider implementation, including structural and logistical constraints, cultural and institutional resistance, and system complexity. Concerns were raised that piecemeal implementation could fragment standards across policing organisations, emphasising the need for greater national coordination and high-quality, curriculum-aligned content to avoid disengagement and limited learning impact. Participants further noted that content sharing between forces may be complicated by ownership, licensing, and intellectual property issues, with the College of Policing viewed as a potential coordinating body to support more consistent sector-wide implementation.

Overall, the findings suggest that the effectiveness of XR/VR in police education depends less on technology alone and more on its alignment with pedagogy, professional practice, and ethical governance. Effective design therefore requires authentic content, structured reflection, and clear learning objectives. XR/VR is most likely to succeed when it integrates realism, reflection, and direct relevance to professional policing practice.

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