Novice and Experienced Police Officer Simulation Experience – Guiding the Future

Dr Amanda Davies
Charles Sturt University
Goulburn, NSW, Australia
adavies@csu.edu.au

ABSTRACT

"Perfection is not attainable but if we chase perfection we can catch excellence"
(Lombardi, as cited in Carlson, 2004).

In the education and simulation design communities the deliberations continue which are centered on how much fidelity is enough or too much. This paper presents findings from a research project which explored the way in which fidelity influences the sense of immersion and presence and the subsequent perceived benefit to the transfer of learning to the field of application in police training for high-risk high-stakes decision-making. The unique feature of the study is the inclusion of two case studies, one of which utilizes low physical fidelity and high psychological fidelity with participants who are seasoned field based police operatives. The second simulation based learning exercise environment and scenario embraced high levels of physical and psychological fidelity with participants who have nil or limited operational experience in the real world of policing. The common criterion for the two simulation exercises is a pivotal catalyst which requires decision-making in providing a police response to a high risk incident. The findings suggest that a key design feature in the development and application of simulation-based learning environments and exercises is the level of prior real world experience the learner has with the simulated environment. This case study offers insight into the value learners place on the simulation characteristics in representing the real world environment and how this influences the application of knowledge and skills in their real world of policing the streets. Understanding the influence on field based application of simulated learning environments offers a valuable contribution to the instructional design endeavours for creating authentic situated learner experiences.

ABOUT THE AUTHOR

Dr Amanda Davies is Course Director at the School of Policing Studies, Charles Sturt University, Australia. Her work focusses on the education and training of police recruits with twelve years of experience with curriculum design and delivery of the Associate Degree in Policing Practice at the New South Wales Police Force Academy. Dr Davies research interests are centered on the use and evaluation of simulation technology in preparing police officers for operational practice.

Novice and Experienced Police Officer Simulation Experience – Guiding the Future

Dr Amanda Davies
School of Policing, Charles Sturt University
GOULBURN, NSW, AUSTRALIA
adavies@csu.edu.au

INTRODUCTION

As the world faces changing threats to domestic and international safety and security the ever present challenge for police educators to offer experiential learning which adequately prepares officers for the often volatile and complex reality of policing the streets maintains momentum. Following the lead from other professions, the military, medical and aviation for example, police educators are increasingly turning to the affordances of simulation technology to provide the platform for simulated reality based training. Policing in line with similar professions where practicing the application of knowledge and skills has the potential for loss of life and/or destruction of property looks to the simulation community to provide 'safe' learning environments. There is however, limited published literature which informs on the learning outcomes of training initiatives which are founded in simulation based learning exercises for developing decision-making skills for (a) policing high risk high stakes and (b) use-of-force situations. In parallel there is limited literature which offers insight into the instructional design factors in policing specific simulation environments which are requisite for aiding the transfer of learning in decision-making from the training arena to application in the real world. Globally, policing organisations are balancing the ever increasing training needs of their force with the fiscal restrictions present in the current economic climate. In 2004 Borodzicz heralded the future requirement for validation of the financial spend on simulation based training in commenting:

> … simulations can be both time-consuming and expensive to produce. In the author's research experience it is not uncommon for major county exercise among the emergency services to be budgeted in the millions rather than thousands of pounds…Of concern here is the extent to which such training proves to be of subsequent value. In an increasingly litigious and regulated society, the need for organizations to demonstrate ability is now almost as important as actual ability. How simulations are used and validated for training purposes is therefore likely to become an area of increasing significance.

The study presented in this paper resonates with the concerns raised by Borodzicz and offers an evidence based contribution to considerations of the level of physical and psychological fidelity required to realise positive learning transfer to the field of operational policing. This paper discusses the evaluation of two simulation based learning environments for application of decision-making skills by police officers in high risk high stakes situations. The two environments are constructed on differing levels of physical and psychological/functional fidelity characteristics. An important point of difference with the two case studies is the learner experience and exposure to the real world of policing, the novice police recruit and the experienced senior police officer. The paper provides an overview of the literature informing in this domain, presentation of the two case studies and discussion of the fidelity and the perceived benefit to transfer of learning as it relates to each case. A final discussion presents comparative simulation design characteristics of the two cases and their contribution to the simulation based learning community. The two case studies offer a contribution to educators and instructional designers developing policing context specific simulation environments and have the potential to resonate with the training initiatives in a wide range of professions.

Simulation Based Learning in Police Education and Training

There is limited published literature which focusses on research endeavours evaluating the levels and elements of fidelity requisite to enable the transfer of decision-making skills from the training environment to operational practice in policing. The research associated with judgmental use-of-force simulations for preparing novice police recruits for operational application is primarily centred on marksmanship and ammunition factors (see Baldwin, 2012; Irwin, 2012; Peck, 2012; Pinizzotto et al., 2004;Tracy, 2008;) and to a lesser extent assessment of

judgement/decision making (Davies, 2015; Bennell, Jones & Corey, 2007;). Appreciatively, issues associated with commercialism, intellectual property and security do not encourage wide spread publication of research endeavours in this field. Similarly, the evaluation of simulation based learning in preparing senior police officers for decision-making in high risk high stakes situations is an area of limited research based publications (see Alison et al., 2012; Crego, 2004; Jenvald & Morvin, 2004;). There is general acknowledgement that the early simulation work in the aviation, military and medical communities has enabled the development of wider profession specific simulation-based learning as exampled in the policing domain. As the education and training community increasingly scaffolds on the affordances of technology to replicate the real world whilst mitigating risks to trainers, learners and the public, research endeavours which contribute more widely to instructional design deliberations continues. There is a wealth of literature devoted to considerations of levels of fidelity for simulation environments and the associated conundrum of how much is enough or too much for engaging and immersing the learner. The categorisation of fidelity into physical (auditory, visual, tactile, spatial features) and psychological/functional (task and participant skills) continues to gain traction in the simulation community. This is helpful in explicating the instructional design elements and their individual influence in creating environments participants consider realistic and enable immersion and presence (Dede, 2009; Maran & Glavin, 2003; Hays & Singer, 1988). The study discussed in this paper seeks to inform on the impact of learner experience in the real world the simulation seeks to replicate and the implications for simulation fidelity characteristics.

Data Collection

A triangulation of data approach was employed in this study for the potential it provides to offer a rich and meaningful understanding of the participants experiences through comparing and cross checking between the qualitative and quantitative data. Three phases of data collection were implemented. Phase One comprised a pre-simulation survey, Phase Two comprised a post-simulation survey. The pre and post simulation surveys contained Likert scale and short answer questions. Phase Three comprised field based interviews with selected participants which were conducted approximately 3-4 months post-simulation. The rationale for this data collection approach is guided by the work of Denzin and Lincoln (2008) and Patton (2002) which suggests surveys enable uniformity of measurement and reliability whilst interviews are a conduit for capturing potentially explanatory descriptive data of the participants perspective on their learning experience. Table 1 presents the key focus of the three data collection methods.

Table 1. Data Collection Methods

Pre-Simulation Survey	Post-Simulation Survey	Field based interview
Prior experience relevant to the learning content; prior experience with simulation exercises; expectations of the simulation exercise; and perceived confidence and competence within the specific learning domain.	How they felt undertaking the exercise (confidence and competence); elements of realism in the simulation exercise; and perceived impact of the exercise on their learning.	Realism of simulation from field based perspective; and perceived transfer of learning from simulation to the field

Participant Selection

The participant selection for Case One and Two was predetermined by their identification/selection by the New South Wales Police Force (NSWPF) to participate in the respective simulation exercises. All participation in completing the pre and post simulation surveys was on a voluntary basis. Similarly, whilst selection of the interviews was founded on capturing representation of the participant cohort by age, gender and field based location actual interview participation was on a voluntary basis. Table 2 presents the potential number of participants for each case study and the realised participation numbers.

Table 2. Data collection Case One and Two

Case	Max. potential case study participants	No of completed pre-simulation surveys	Completed post-simulation surveys	No of completed field based post simulation interviews
One	33	29	21	13
Two	372	351	372	15

Data Analysis

Data collected during the three phases of each case study (pre-simulation, post-simulation and field based) was analysed separately. Quantitative (Likert scaled) survey data was analysed using descriptive statistics in order to obtain a broad picture of the experience of all participants across each of the cases. An open coding process (Strauss and Corbin, 1988) was applied to the qualitative data in order to identify core themes. Triangulation across the data sets was used to strengthen the reliability and validity of findings from the study.

CASE ONE

Case One comprised 29 senior police officers from the NSWPF participating in a Minerva Incident Command and Control simulated public order incident. The pivotal learning outcome for the exercise is the application of decision-making skills. The Hydra/Minerva simulation environment designed by Professor Jonathan Crego (1996) enables officers to apply and develop their knowledge and skills in an environment which replicates the real world which would not be practical in reality. The following description offered by NSWPF Simulated Operations Unit provides an overview of the Minerva environment:

> … designed as a real-time command simulation system allowing a simulated incident or emergency to unfold uninterrupted and in fast-time from the point of first approach to the point at which effective incident management has been established, typically 3 hours. …Minerva is a team-based simulation system allowing for interaction and problem-solving between members of a command team, each of whom has different roles and responsibilities at a real incident (2011).

The specific installation of a Minerva suite comprises:

- a plenary/lecture room which acts as both a briefing and debriefing room; three or four syndicate rooms containing a computer; video screen; telephone (each of which is networked to the control room);conference table and whiteboards; the rooms are outfitted with the equipment the participants would need in a real life event; a fixed command support/control room from which each syndicate room is monitored via closed-circuit television and boundary microphones; the technology network enables the feed of information to the participants e.g. intelligence briefings; police radio traffic; newscasts; telephone calls; and
- officials control the exercise and feed of information to the trainees; and a control room houses the subject matter experts, program training staff, and replicated police radio communications.

Figure 1 presents a graphic depiction of a Minerva Simulation suite and the indication of communication flows. Figure 2 depicts the NSWPF Simulated Operations Unit Minerva suite. It is this suite in which the case one participants engaged in a simulation exercise requiring a policing response to a burgeoning public order incident – rioting in two neighbouring suburbs of a large city. Of note is that whilst this environment does accommodate presenting video footage (of media releases or from the simulated site) in Case One this environment and simulated exercise did not give the participants a 'visual' of the scene to which they are to respond – there is no physically looking out of a building/ car window or film footage.

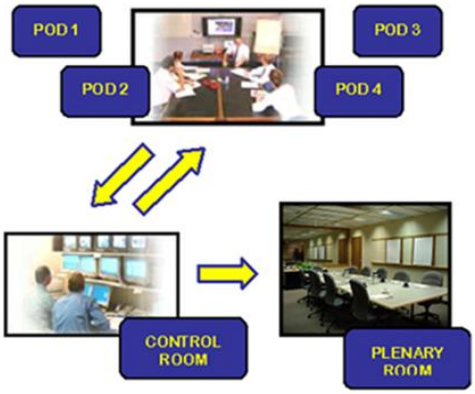

Figure 1. Hydra/Minerva Layout

Figure 2. NSWPF Hydra/Minerva control room

Three dimensions which contribute to understanding the physical and psychological/functional factors required in simulation based learning environments to support the transfer of learning to application in the real world are realism and presence and immersion. The simulation participants' view on these dimensions aids in deliberations of the level of fidelity required to meet learning outcome expectations and informs on instructional design specifications. Further, identifying the influence of the simulation experience on future application in the real world contributes to validating the realism, presence and immersion aspects participants identify as valuable.

Case One Results - Realism

It is important to the latter discussion and comparison of Case One and Two to be cognisant that the Case One participants who responded to the pre-simulation survey had an average length of service as a NSW Police Force officer of 26.5 years. Their view therefore as to the authenticity and realism of the simulation exercise and environment is premised on holding a mental library of what the 'landscape' of policing incidents 'looks and feels like'. Post Simulation Survey Question 2: *I considered the scenario depicted in the simulation was reflective of real world situations* received 21 responses with a rate of 100% agreement with the statement. The level of agreement ranged from 19% Agree, 43% Strongly Agree and 38% Very Strongly Agree.

Identifying the factors the participants considered contributed to the realism of the simulated environment and exercise drew on the data collected from post-simulation survey Question 10: *Please comment on the sense of realism you experienced with the simulation exercise* and Field based interview Questions 1: *Please describe your experience in the simulation exercise: what actually happened? What was it like for you?* and 2: *Did you feel at the time that the simulation exercise created an atmosphere reflective of real time? You might like to comment on the extent to which you felt immersed in and focused on the exercise.*

The responses have been collated and presented in Table 3 under common characteristic categories and the comments further analysed to categorise as psychological/functional (F) or physical (P) fidelity. Appreciatively there are characteristics which align with both functional and physical. 'Pressure' for example, refers to the pressure experienced to 'get the job done' which is both felt physically and is a characteristic of the task identifying therefore as both functional and physical. Analysing this data into fidelity categories is helpful to the later presentation of the data collected in relation to sense of immersion and presence experienced by the participants. The basis for determining the fidelity category is indicated by the highlighted words in Column 3 of Table 3.

Table 3 Elements contributing to realism of the ICC simulation exercise

Element	Fidelity P and or F	Example Comments
Pressure/ Stressful	P F	"I felt under pressure, was very realistic in the sense of calls coming in just like they do in the real world" (P8); "The simulation was as realistic as possible, it presented pressures and decision-making skills that I would feel in real life situations " (P.3) "Hectic and stressful at times, you lose the thought process that it is just a simulation exercise" (P.21)
Timing	P	"time just disappeared [during the exercise] because it was a continuing exercise and felt real" (P.23); "The real time based incident gives you a sense of realism" (P.21)
Incident details	P	"Yes I do think it is reflective of real time, what creates that is the way the information comes through and the way the teams are set up and the way information comes and goes the constant interruptions" (P.15); "as soon as we started the radio started blaring as we started working on the map, time logs, listening making decisions it felt like we were there" (P.16)
	F & P	"The situation, roles performed, pressure experienced were all realistic and provided real-time experience" (P.12) "The simulation exercise is as close to the real situation as you could get, it is run in real time and encompassed conflicts and situations which you would possibly face" (P.14);
Reflective of reality	P F	" like people being injured, arranging for assistance, getting more staff and I have been involved in this for operations the simulation had all of these components…when I was trying to get a bus, I couldn't get a bus" (P.8); "just like in the field, we were trying to

Element	Fidelity P and or F	Example Comments
		find units …a highway patrol we couldn't find, we were waiting for Intel to come in and resources to arrive" (P.24)
Noise	P	"the noise, the participation of everyone else and that is just like a real situation" (P.1)

To further develop an understanding of the key characteristics of the simulation which the participants identified attributed to the sense of realism is aided through consideration of the characteristics which supported the participants' sense of immersion and presence in the simulation.

Case One Results - Immersion and Presence

In this study data in relation to immersion and presence was collected through (a) Post-simulation Question 3: "*I consider I was continuously engaged/immersed in the simulation based exercises";* and (b) Field based interview Question 2: *Did you feel at the time that the simulation exercise created an atmosphere reflective of real time? You might like to comment on the extent to which you felt immersed in and focused on the exercise*. Of note is the response to (a) was identical to that recorded for the level of agreement as to the realism reflected in the simulation i.e. 21 responses with a rate of 100% agreement with the statement. The level of agreement ranged from 19% Agree, 43% Strongly Agree and 38% Very Strongly Agree. The responses to (b) and presented in Table 4 indicate a commonality of characteristics with those presented in Table 3 – factors influencing realism.

Table 4. Immersion and Presence in the ICC simulation exercise

Contributing element	Fidelity P and or F	Example Comments
Timing	P	"Very immersed and focused, time just disappeared … felt real, very engaging" (P.23); "I think you had to be immersed, you did not know what was coming next, you couldn't just have a coffee, and you had to be ready for anything that could happen"
Physical resources	P F	"Felt like we were there, realistic, as soon as we started the radio started blaring, we started working on the maps, making decisions, it felt like we were there"
	F	"For me personally easy to immerse myself in it and get wrapped up in it ... if you really go with a mind set to play then it is not far removed from what happens" (P.13);
	P	"it certainly was not a holiday and the thought of people watching you from outside that I found off putting, but then I forgot about it because of the phone ringing" (P.8)
	P F	"the sim is very close to realistic because they can adjust it, the time spans, the resources, another incident can be created at the same time, it makes it very real and you do get immersed" (P.25)

Of note is the detractors to the sense of realism were identified as: not being able to look out of the window and see if the resources ordered in the incident had arrived (P.1); and Participant 16 suggested that the simulation exercise seemed to have too many Inspector ranked staff.

Understanding whether the combined levels of physical and functional fidelity support the learning aims of the simulation is aided by exploring the influence of the participant' simulation experience as it transfers to application in the real world.

Case One - Field Based Perspective

Three sets of data informed on the influence of the ICC simulation exercise on participants' future application in operational policing. Data Set 1 - Post simulation survey Question 4: "*I was able to employ key decision-making skills* whilst providing further insight into the realism of the ICC simulation exercise also indicated the realization of

one of the goals for the exercise. The second goal is as an enabler for transfer of learning to the field of operation. A total of 21 responses were received for Question 4, here 19 participants indicating they agreed they were able to apply decision-making skills in the simulation. One participant indicated they were unsure and one indicated they did not have a role in the simulation exercise which allowed for application of decision making skills. Data Set 2 – Field based interview Question 7: *Can you tell me how your experience in the simulation exercises has influenced your decision-making in the field? Please could you give some examples* and Data Set 3 – Field based interview Question 8: *Are you aware of reflecting on the simulation experience and lessons learnt and applying that knowledge in decision-making in your policing practice?* suggested a direct correlation between the simulation experience and subsequent application in the field. Two key factors were revealed in the data. Firstly the thirteen ICC simulation participants interviewed were unanimous in confirming that the most valuable learning aspect they have transferred to their operational policing is the provision of a structure or model they can utilise for making decisions in routine and major incident policing situations. Participant 13 articulates this point in commenting:

> ... Yes you do use it [ICC decision-making model] on a daily basis just on a smaller scale… the ICC concept applies all the time just that you may do it with a team of 6 or 12 or you may do it with just you and someone else, so it expands, contracts, speeds up, slows down depends on the incident (P.3)

The second factor was the utilisation of the simulation experience as a reference point for decision-making in the field as the following comments indicate:

> ... for example one I did which was a high risk (Search Warrant) I made sure I had covered off on everything, some things in the simulation were not covered off properly and these you remember and transfer to the field (P.11);
> ... Referring back to an operation in January 2011 a two night operation …the simulation was a reminder of the clarity of the roles so one doesn't cross over roles (P.24); and
> ... I would refer to the simulation before I am involved in a similar situation (P.25).

Case One Summary

The findings from Case One should be considered indicative due to the small number of participants. However, the evidence from this study suggests that participants who have experience in the real world environment the simulation exercise seeks to replicate achieve benefits to aid the transfer of learning without the necessity of high levels of visual fidelity characteristics. The functional fidelity i.e. the task characteristics supported by information based fidelity characteristics supports realization of application of learning from the simulated environment to the real world of operation. The indicative findings should be considered in the context of the Case Two study.

CASE TWO

Case Two comprised a cohort of 372 NSWPF Academy police recruit students participating in a VirTra™ judgemental use-of-force (fire-arm) simulation. The environment consists of five screens and a 300-degree immersive training platform which relays from a library of realistic scenarios taken from after-action field reports. The audio system and transducers simulate sounds and movement and the environment has the capacity to employ a gas fired fire-arm safely which simulates return fire with an electric impulse (or vibration option). Figure 3 depicts the VirTra™ simulation environment (VirTra™, 2015). The Case Two VirTra™ utilised a replica Glock pistol and OC spray (oleoresin capsicum, a chemical compound that irritates the eyes to cause tears and pain) without using the electric impulse capability. The Case Two environment did not allow for the use of batons or physical restraint.
The participant officer or officers step onto a platform surrounded by the screens, onto which the high definition video is played. The video is operated by an instructor and the response from the actors in the video may be altered in response to the interaction with the participant.

Figure 3 VirTra™ environment

It is important to the consideration of the following data to acknowledge that 100% of the Case Two participants had no prior experience in policing and 60% of the participants had no experience with firearms prior to commencing their NSWPF Academy studies. The response to post-simulation Question 2: *The VirTra™ simulation scenarios made me feel as if I were actually at the scene in real time* returned a total of 71.5% (*n=372)* participants agreeing with the statement. A total of 12.4% were undecided on this question and 16.1% did not agree. Interestingly whilst 16.1% did not confirm the realism of the simulation, the response to post-simulation Question 4: *The VirTra simulation scenarios provided an opportunity for me to apply my decision-making skills* revealed only 2.9% did not agree they were able to apply their decision making skills. The implication here is that it was possible for the simulation to engage the participant in applying their use-of-force decision-making skills even if they did not view the environment as completely realistic.

Case Two Results – Realism

It is the factors which the participants subsequently identify as producing the sense of reality that provides insight into the physical and functional fidelity factors which aid the realism of the simulation for novice learners. Two sets of data drawn from post-simulation Question 6(a): *Please identify the elements of the VirTra™ simulation which you consider assisted in providing a realistic scenario*; and field-based interview Question11: *When you now reflect on your experience in the VirTra™ simulation exercises, how realistic do you think they were? Please explain*. It is worthy to note here the participants were reflecting and responding from the perspective of three months real time policing experience. Column 1 of Table 5 identifies the categories of elements drawn from the data collated for Question 6(a) and 11. The category of fidelity, physical or functional, is included in column 1; examples of the text attributed to the categories is highlighted in columns 3 and 4.

Table 5 Elements of contributing to realism of VirTra™ Scenario (*n*=365)

Element	No. of responses	Examples of responses from post-simulation survey	Examples of comments from field-based interview
Sound effects P	226 (61.9%)	…the sound effects helped make the scenario more realistic(P.6452); the sound effects were real (P.6444)	…very realist …because that is exactly like the one I went to in the field all the same elements, the sounds, the dark at night, unknown what is around the corner (P.1); it is pretty realistic because it was really loud they were in your face and rushed … that is a bit like in the field (P.10)
Surround screens P	217 (59.5%)	…Surround screens – create the feeling as you were in real life situation (P.5903); the surround screens, made it feel real (P.6347)	
Language	127	...the language used was great, the	

Element	No. of responses	Examples of responses from post-simulation survey	Examples of comments from field-based interview
P	(34.8%)	male was very real in use of language which a man would actually say (P.5919)	
Timing P	163 (44.7%)	…the sound effects, language and timing were really good, what I would expect in the real world (P.5891)	…the scenario of the man with the screw driver was fantastic really good, shows how tiny jobs can escalate very quickly (P.6); on the screen it was real human beings and it was real threats and frantic and I felt the real sense of danger (P.4)
People P	20 (5.5%)	…actual people not targets (P.6338); the emotion of the people at the scene (P.6517); Scenarios are accurate – how people would act (P.6351)	…the aggression, the confrontation of the victim's emotion and their need for help, just like in the VirTra™ (P.12); the domestic, what made that realistic is the fact that [in the real situations] no one listens to you, the stress of the event, you can't get through to people and you do have to use your appointments (P.7)
Visual effects P	25 7%	…the warehouse scenario scene in my view resembled a warehouse and what we would encounter in the future (P.6021);	

Case Two Results - Immersion and Presence

Establishing an understanding of the sense of immersion and presence experienced by the VirTra™ participants offers further insight into the realism element experienced in the VirTra™ simulation. A total of 76.3% (*n=281)* of participants agreed they felt immersed and focused in the simulation. Forty-seven participants were undecided on this question and a total of 39 participants indicated they did not feel immersed and focused. It is valuable to consider the response of these 39 participants to post-simulation Question 7: *Please describe the emotional reactions you were aware of during the VirTra™ simulation scenarios (E.g. were you aware of being anxious, nervous, pressured, and self-conscious? Were you aware of your heart beating*? The 39 participants recorded the following response to Question 7: 4 provided no response, 2 felt unsure, 2 felt no emotional response, 1 felt frustrated with the technology and 30 recorded feeling an emotional response. A potential implication here is that irrespective of considering the simulation was not realistic there were simulation characteristics that created a level of realism to draw an emotional/physical reaction.

The field based interviews offered opportunity for participant reflection on the realism of the simulation from a basis of 3-4 months operational experience. Three participants articulated a direct connection between their field experience and the realism of the simulation environment (the remaining 12 participants interviewed had not yet been in a field position which required a judgemental use-of-force decision). The following examples of participant comments align with the key characteristics identified in Table 6 and the fidelity categorisation.

To provide a balanced view of the elements the participants considered aided the sense of realism is aided by presenting those elements participants considered detracted from the sense of realism in the VirTra™ scenarios. The data indicated a total of 54 mentions of detracting aspects from the realism experienced by the Case Two participants with the VirTra™ environment. The comments grouped into seven categorises and are presented as follows: Lack of realistic communication – the characters on the screen did not respond to communication appropriately (18 responses); a lack of interaction with the characters on the screen (10 responses); technical elements with the surround screens splitting images (5 responses); Distorted sense of distance in the surround screen area (7 participants); unclear audio (8 participants); the inability to use other tactical options e.g. physically restraint (3 participants); and unable to separate from knowing the screens are not real life (3 responses).

Table 6 Field based reflection on realism of VirTra™

Element	Example participant comments
Incident details F P	…Definitely, the domestic was realistic, at the time I didn't think it would be like that but having dealt with domestics like that in the field and having to use the capsicum spray. Like in the VirTra I thought he was coming straight for me but he went to his missus, which I have seen in the field but not with a knife (Participant 9);
Life size characters and behaviour F & P	…In the simulation there were humans, real threats and sense of danger, the same as the one I went to a couple of weeks ago me and another female officer. He [Person of Interest] had broken bail conditions, was intoxicated … and he approached with a knife just like in the simulation (Participant 1); and
Sound Timing Visual elements P	... [it was] very realistic, the sight, sound, timing, I am [policing] in a rough area so am constantly thinking and trying to be aware, at the end of the day there is always the likelihood of a gun or knife being involved in the incidents we attend (Participant 3).

Case Two - Field Based Perspective

An acknowledged goal of simulation based learning is to bridge the gap between the training environment and the real world of application. There is evidence from the field based interviews that high fidelity simulations such as VirTra™ contribute to building the decision making capacity of police recruits. An important contribution of the simulation environment is that for police recruits (and analogised for learners in other professions) with no prior library of experience or 'visual' of the landscape of the real world of their operational practice the simulation experience becomes a key reference point. The Case Two interview comments resonate with the perspective that the simulation experience is a pivotal reference:

> …"What I did in the real situation was made sure I was very aware of what was going on and all of the possibilities, just like in the simulation" (P.1); "[The simulation] made me realize I have to keep sharp and be aware of what is going on around me ... so in the field incident I stayed focused on what was going on around me" (P.13);
>
> … "In my field job I was going into the unexpected, just like the man on the mobile phone in the simulation, it made me continue to be aware of expecting the unexpected" (P.6); You might let one thing go but you have to keep thinking about everything else because you don't know what will happen next, I learnt this from the simulation"; "The simulation taught me to consider quickly, you don't want to shoot the wrong person" (P.3); "In the field it happens so quickly, just like the simulation" (P.1); "The simulation taught me how important it is to react in time, make the decision in time" (P.6)

Case Two Summary

The data from Case Two suggests that for the novice police recruits, high levels of physical elements in the simulation environment design are a key factor in contextualising the decision-making task and the subsequent application of learning to the real world of policing.

CONCLUSION

The data discussed from the Case One and Two studies offers insight into the fidelity characteristics which pertain specifically to novice or experienced learners in the field of endeavour from which the simulation exercise and environment is founded. The Case One participant data indicates as experienced operatives in the world of policing they do not need high levels of visual fidelity characteristics to achieve immersion, presence and application of learning. They are able to contextualise the environment from which the simulation is premised due to their library

of experience and view on the landscape of policing. In contrast the novice learners i.e. police recruits with no library of policing experience or view of the police landscape to which to refer to contextualise the simulation exercise and environment indicate in this study they require high levels of visual fidelity characteristics to support immersion, presence and application of learning.

In summary the data from Case One (experienced learners) indicated the key simulation characteristics were the task and the pressure to make decisions, real world timing within the simulated incident (for information, resources, unfolding of incident), replication of the environmental sounds and the premising of the exercise on a real world incident. The data from Case Two (novice learners) indicated the key simulation characteristics were: the replication of environmental sounds, language, real life sized characterization, the surround screens providing a real world 'landscape', timing within the simulated incident. Appreciatively, the broader indicative findings from the studies presented here may not be new knowledge. It is the explication of the individual instructional design characteristics which contribute to the novice and experienced learner experiencing the reality of decision making for high risk/high stakes situations which is of potential value to educators and instructional designers in the simulation community.

REFERENCES

Alison, L., Van den Heuvel, C., Waring, S.., Power, N., Long, A., O'Hara, T. and Crego, J. (2012). Immersive simulated learning environments for researching critical incidents: A knowledge synthesis of the literature and experiences of studying high-risk strategic decision making. *Journal of Cognitive Engineering and Decision Making.* Retrieved from: http://www.edm.sagepub.com

Baldwin, D. (2012). Edmond police train on use-of-force simulator. *NEWSOK*. Retrieved from http://newsok.com/edmond-police-train-on-use-of-force-simulator/article/3696070

Bennell, C., Jones, N. J., & Corey, S. (2007). Does use of force simulation training in Canadian police agencies incorporate principles of effective training? *Psychology, Public Policy and Law, 13*(1), 35–58.

Borodzicz, E.P. (2004). The missing ingredient is the value of flexibility. *Simulation & Gaming, 35(3), 414*-425. Doi: 10.1177/1046878104266221

Carlson, C. (2004). *Game of my life.* Sports Publishing, IL. p.149

Crego, J. (2004). Wisdon's way. *Police Review, 103*(5328), 24–25.

Crego, J. (1996). *Critical incident management engendering experience through simulation.* (Unpublished doctoral dissertation). Technology, Information, Management and Economics Institute, Graduate School, University of Salford, Manchester, England.

Davies, A. (2015). The hidden advantage in shoot/don't shoot simulation exercises for police recruit education. *Salus Journal,, 3 (1),* 16-30.

Dede, C. (2009). Immersive interfaces for engagement and learning. *Science Magazine, 323*(5910), 66–69. doi:10.1126/science.1167311

Denzin, N. K., & Lincoln, Y. S. (2008). *Collecting and interpreting qualitative materials* (3rd ed.). Los Angeles, CA: Sage.

Hays, R. T., & Singer, M. J. (1988). *Simulation fidelity in training system design*. New York, NY: Springer-Verlag.

Irwin, S. I. (2012, December). Budget cuts, fuel costs could spur military spending on virtual training. *National Defense: NDIA's Business and Technology Magazine*. Retrieved from http://www.nationaldefensemagazine.org

Jenvald, J., & Morin, M. (2004). Simulation-supported live training for emergency response in hazardous environments. *Simulation & Gaming, 35(3), 363-377.*

Maran, N. F., & Glavin, R. F. (2003). Low to high fidelity simulation: A continuum of medical education? *Medical Education, 37*(1), 22–28.

New South Wales Police Force. (2011). *Simulated Operations Unit: Hydra.* Unpublished manuscript, New South Wales Police Force, Sydney, Australia

Patton, M. J. (2002). *Qualitative research and evaluation methods* (3rd ed.). Thousand Oaks, CA: Sage.

Peck, M. (2012). Budget cuts force U.S. Army to use 'low overhead' alternatives. *Training and Simulation Journal,* June. Retrieved from http://www.defensenews.com/article/20120613

Pinizzotto, A. J., Kern, H. A., & Davis, E. F. (2004). One shot drops: Surviving the myth. *FBI Law Enforcement Bulletin, 73*(10), 14–21.

Tracy, S. (2008). Maxsell blank firing replicas. *Law and Order, 56*(3), 48–50.