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Development of a Scenario-Based Training Tool for Crime Scene Examination Response to a Complex and Major Incident

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ABSTRACT

Following the use of knowledge elicitation techniques with Scene Examiners, and in collaboration with the Forensic Services Scottish Multimedia Unit, a scenario-based training tool was devised to simulate four separate but related scenes of crime. Exemplar responses to this complex and major incident were generated by experienced Scene Examiners across three National regional areas. This is an example of the type of training tool that could be generated as part of a wider expertise-based training environment for Scene Examination services.

KEYWORDS

Learning and Training; Crime scene examination; Scenario-based training; Judgment and decision making.

INTRODUCTION

The aims of this research were to develop a simulation scenario training tool as a means of accessing and documenting knowledge in Scene Examination, particularly with regards to Professional Judgment and Decision Making (PJDM), and to ascertain how knowledge accessed via simulation scenarios could be packaged to facilitate on-going professional learning.

This research investigating PJDM expertise in Scene Examination (SE) attempted to 'make thinking visible' by accessing and capturing the thought processes of experienced SEs. This involved the use of Applied Cognitive Task Analysis (ACTA, Militello & Hutton, 1998) to elicit knowledge, understand the cognitive demands on PJDM in Scene Examination, and to identify the key cognitive elements required to perform proficiently.

The data generated via ACTA offered a unique window on the thought processes and PJDM of Scene Examiners, and transformed covert thinking into detailed observable information about actions taken, situation assessment, and the use of critical cues. This information was then used to create a scenario-based tranining tool for scene examination response to a complex and major incident. Synthesised responses to a complex simulation scenario formed 'exemplar responses' from experienced Scene Examiners in three National regions for use as part of a training tool.

These phases of work were designed to establish cognitive authenticity (the emulation of the features an expert would perceive in the performance environment that support perception and decision making; Ross & Pierce, 2000) within the Scene Examination profession and therefore contribute to sustainability for the future in terms of retaining expert knowledge and training PJDM expertise within the Scene Examination workforce.

METHOD

Participants

Following institutional ethical approval and informed consent, 6 Scene Examiners were recruited (2 male and 4 female). This exceeded the recommendation of 3 – 5 participants by Militello and Hutton (1998). Participants were recruited across three regional areas (2 from each area). All participants were deemed competent and monitored by their National Govering Body. Participants had worked in the field for an average of 18 years (range 6-32 yrs). Participants interviewed were either experienced Scene Examiners (3) or Scene Examination Supervisors (3) and were selected by the National Governing Body senior management on the basis of their experience and expertise (e.g., Militello & Hutton, 1998). In addition to their Scene Examination role, participants also had experience in a range of other roles including: fingerprint officer/expert, footwear and tool impression comparison, ballistic examiner, photography assistant, and medical photographer.

Materials

This project involved the use of Applied Cognitive Task Analysis (ACTA, Militello & Hutton, 1998) to understand the cognitive task demands on PJDM of SEs, and to identify the key cognitive elements required to perform proficiently. This meta-method comprises of three techniques (task diagram, knowledge audit, and simulation interview) which complement each other, but which also tap into different elements of cognitive skill (McAndrew & Gore, 2013). For the purposes of developing a scenario-based training tool the third stage of ACTA (Simulation Interview) was utilised. This method offers a unique window on the thought processes and PJDM expertise of Scene Examiners, and transforms covert thinking into detailed observable information about actions taken, situation assessment, and the use of critical cues. Previous findings have indicated high levels of validity and reliability with modal statistics occurring in the range of 90% to 95% (Militello & Hutton, 1998).

Scenario Design

A simulated scenario of a complex and major incident was developed with support from the Forensic Services Scottish Multimedia Unit. This simulation incorporated four separate but related scenes of crime (first deposition site, deceased's home address, second deposition site, and suspect's home address) and included location maps, photographic stills, and panoramas for each of the scenes of crime. Each scene included briefing notes and the simulation developed over time to incorporate the four separate but related scenes of crime. This approach to scenario design could be adopted by other forensic services governing bodies, especially as the process of scene examination inherently involves video and photographic capture, providing a uniquely advantageous position from which to re-create crime scenes using high and low fidelity techniques, and therefore to offer cognitively authentic training experiences.

Simulation Interview

The third ACTA technique, the Simulation Interview, presented the participants with each challenging scenario in which participants were told "*As you experience this simulation, imagine you are the scene examiner in the incident. Afterwards, I am going to ask you a series of questions about how you would approach this situation.*" (ACTA Job Aid Card, ARA Inc, 2005). This simulation of a complex and serious incident allowed for an in depth exploration of the *major events* that would occur in addition to *actions*, *situation assessment*, *critical cues*, and *potential errors* that a less experienced scene examiner may make.

RESULTS

SEs responses to the simulation scenario (including major events, actions, situation assessment, critical cues, and potential errors someone less experienced may make) were synthesised to form exemplar responses from experienced scene examiners across three National regions. These findings highlighted potentially important regional differences in the effectiveness of the approach to the examination of a scene by SEs and provide an exemplar of the type of training tool that could be generated as part of a wider expertise-based training environment (Alison et al., 2013).

Simulation Interview Overview

A simulation interview overview table was compiled to consolidate and synthesize the data from the six Scene Examiners. Further simulation interview tables were compiled to represent responses from SE's in each of the three regions. These tables contained information on the major events that would occur, in addition to actions, situation assessment, critical cues, and potential errors someone less experienced may make. Overall, the major events that would occur were collated for each scene (first deposition site, deceased's home address, second deposition site, and supsect's home address) revealing between 18 and 20 major events, across regions. These findings highlighted potentially important regional differences in the effectiveness of the approach to the examination of a scene by SEs.

Due to the restricted nature of this data, it is not possible to provide illustrative examples of extracts from the Simulation Interview; however, these findings offer insight to the cognitive demands on professional judgment and decision making expertise in Scene Examination, and offer exemplar responses to a cognitively authentic simulation scenario for use as a training tool.

DISCUSSION

Simulation Scenarios: A Future Training Method

Scene Examiner responses to the simulation scenario (including major events, actions, situation assessment, critical cues and potential errors someone less experienced may make) were synthesised to form exemplar responses from experienced SEs in three National regions. The products of the ACTA simulation interview method were then utilised to develop a scenario-based training tool for crime scene examination response to a complex and major incident.

This simulation tool highlighted potentially important regional differences in the effectiveness of the approach to the examination of a scene by SEs. Going forward, it will provide the National Governing Body with a tool to access and collate the knowledge of the SE workforce, track development and changes in practice over time, and can be used as a training tool as part of a wider expertise-based training environment.

An Expertise-Based Approach to Scene Examination PJDM Training and Practice

Simulation interviews provide an opportunity for the understanding and development of declarative knowledge and reasoning in scene examination. Further, scenario-based tranining can facilitate expert learning by enabling professionals to form more complete metal models of practice as they move through the four cognitive steps of judgment, elaboration, flexibility, and decision making (Collins et al., 2015). This window of opportunity to make thinking 'visible' to supervisors, peers, and supervisees can provide a 'cognitive apprenticeship' model (Collins, Brown & Holum, 1991) for elaborating on the underpinning rationale for decisions, what other options were considered and rejected, and for explicitly exploring the choices made.

This focus on the development of professional judgment and decision making expertise would help to develop the thinking structures, adaptabiltiy, and critical analysis necessary to allow scene examiners to function with high levels of proficiency in their complex and dynamic envoronment. As Smith and colleagues so eloquently state: "academic research generally and our society particularly have largely neglected the fact that sound judgment and

decision making are the crux of many professions. By understanding and communicating what professional decision makers do and how they do it well, we make valuable contributions both to our field and to the professional community at large" (p.4). Thus, the development of a scenario-based training tool for crime scene examination response to a complex and major incident enables the understanding and communication of PJDM witihn Scene Examination, and to wider criminal justice partners.

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