Capturing competency: does the laboratory training approach impact the safety culture of a microbiology laboratory?

Hannah McGregor[1], Sarah Alexander[1], Arinola Adefila[2]

1 – Culture Collections, UKHSA, Colindale, London NW9 5HT 2 – Staffordshire University, College Road, University Quarter, Stoke-On-Trent ST4 2DE

INTRODUCTION

The National Collection of Type Cultures (NCTC) curates over 6,000 reference bacterial strains of medical and veterinary importance, preserved and supplied as freeze-dried ampoules. The freeze-drying process (Fig. one) requires a highly knowledgeable and skilled workforce; therefore, a suitable and sufficient training programme is essential to deliver and instil the skills, knowledge, and experience required to perform tasks safely and effectively[1], otherwise known as competency.

Laboratory training programmes are a requirement of the Health and Safety Executive (HSE), and testing laboratory ISO standards, which are often not prescriptive, allowing for individual interpretation and potential omission of safety-critical tasks.

Competency is a key part of building and maintaining a positive safety culture in an organisation. Along with individual and group values, perceptions and patterns of behaviour, it influences how an organisation approaches health and safety management [1].

Fig. 1 – Freeze-dried glass ampoules loading onto the freeze-drier

AIMS

- Critically evaluate the training process in NCTC, and its impact on the safety culture in the workplace.
- Demonstrate how adverse incident corrective actions are implemented.
- Implement improvements to the training and competency process.

METHODS

Reviewed competency assessment forms

- 120 forms
- 15 staff members training in the freeze-drying process

Extracted information

- Job role of trainee
- Training techniques used
- Questions asked
- Comments from trainer / trainee

Compared to local and national guidance on competency assessment

- ISO17025 / ISO9001
- HSE guidance
- Training manuals (organisation and departmental)

Reviewed incident logs and dissemination of corrective actions

- Standard Operating Procedures (SOPs)
- Meeting minutes
- Audit reports
- Training records

RESULTS

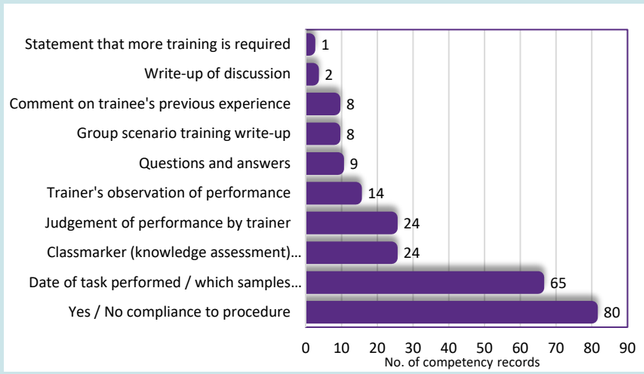

Fig. 2 – Nature of comments found in the 120 competency assessments reviewed.

- Figure two shows the nature of the comments on the competency assessment forms. Most commonly, the trainer confirmed "Yes" that the trainee complied to a series of set questions.
- The majority (34% 41/120) of records employ two training methods. The most common combination being competence assessment with observation, accounting for 30 (25%) records. Other methods include Q&A (53%), review of laboratory records (14%) and demonstration of correct decision making (4%).
- Risk awareness was primarily assessed through self-declaration of understanding (59%) and questioning (54%).
- All records were linked to written SOPs as required by the ISO and safety standards. No records used a sliding scale of competence or linked back to the trainees role roles as required by HSE competency guidance.

- Figure three shows the flow of how corrective actions are disseminated to the NCTC team
- 19 corrective actions were identified in incident logs.
- The relevant risk assessment in 13 incidents was updated to reflect the safety improvements made.
- Only seven of these actions filtered through to the training as captured on the competency records

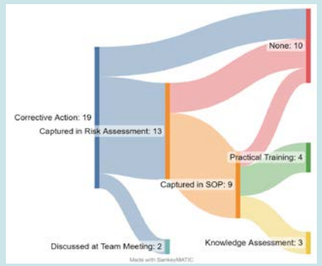

Fig. 3 – Sankey plot of how corrective actions were implemented

DISCUSSION

The laboratory has kept thorough competency records. The nature of comments on the forms were factual rather than descriptive. An important part of the training cycle is assessment and evaluation, so both parties can improve.

Recording feedback would highlight parts of procedures people struggle with and allow adaptation to meet the needs of the learners.

There is no differentiation between grades of staff. A supervisor would have more responsibility and would be expected to act in the event of a failure or non-conformance. This was not reflected in the information captured in the training records. Bloom's taxonomy of learning[2] could be used to set clear learning objectives for each grade of staff in the training statement for each SOP. This will give trainers a better understanding of what needs to be included and create consistency.

Training in NCTC is strongly aligned to the quality standards and guidance. Better incorporation of control measures identified in the risk assessment into the SOP will enable a clearer focus on training for safety.

Whilst the information is not always captured in the records, safety awareness may be conveyed through other methods such as informal conversations, previous experience or departmental meetings. Understanding what sources of information staff value, will enable better implementation and adherence to safety measures and improve the safety culture.

In conclusion, the competency process was not being used to its full potential as a tool for influencing safety culture.

In addition, it is recognised that formal training is not the only way staff receive health and safety information.

RECOMMENDATIONS

Based on the findings in this study, the following will be implemented in NCTC:-

Train the trainers – Staff will be empowered with training skills to enable thorough assessment and adaptation to the needs of the trainee.

Simple, comprehensive records – The competency form will be updated to enable the capturing of feedback and setting of SMART objectives, whilst still remaining user-friendly.

Reflection and feedback – Space for staff to reflect and provide feedback will be created in meetings, online, and in the training process.

Quality, Safety and Training management systems integrated – The three teams will work closely together to provide a uniform approach to training.

Evaluate Communities of Practice[3] as a model for influencing and assessing safety culture – Staff are also gaining knowledge through informal routes, further work to assess how this can be utilised will be undertaken.

ACKNOWLEDGEMENTS

Thank you to all NCTC staff for participating in this study. Dr Sarah Alexander, Head of Culture Collections, and Dr Arinola Adefila, University Supervisor, for support.

REFERENCES

Health and Safety Executive (2013) Managing for health and safety (HSG65). Available at Managing for health and safety (HSG65) (hse.gov.uk)

Bloom, B. S. (1956). Taxonomy of educational objectives. Vol. 1: Cognitive domain. New York: McKay, 20, 24.

Wenger, E. (1998). Communities of practice: Learning, meaning, and identity. Cambridge University Press.