
Book Review

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Competency-Based Education in Aviation: Exploring Alternate Training Pathways

by: Suzanne K. Kearns, Timothy J. Mavin and Steven Hodge

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Over the last decade, competency-based education (CBE) became a central theme within aviation. From a global point of view, the notion of competence is defined as the ability to fully participate in complex social practice and requires skills, knowledge and attitude. In that sense, competency relates to any negotiated and agreed written statements that attempt to fully participate in social practice. Finally, CBE refers to the instruction design, training and assessment that reference such competencies.

These evolutions make a step forward from today's existing schemes, which are based on passing a certain amount of hours in a specified course. Being facilitated by the emergence of new training technologies, CBE focuses attention on the achievement of a certain level of competency independent on the amount of hours passed.

The current book provides an overview on how CBE entered in aviation and how it is currently managed. The analysis of both different aviation as well as CBE domains is organised in four main parts. Each of them contains several chapters, with an introduction and conclusion on its content. The approach to develop this book is based on interviews with domain experts across world-wide aviation organisations combined with elements from literature reviews in order to complete and frame the captured data.

The first main part of the book describes the content and definitions around CBE and how this approach found its way into aviation. Due to changes in the society, such as the need for cost reduction, or new technologies, the need to reconsider training for the different professions emerged and entered international groups involved in regulation. CBE offers numerous advantageous such as considering past learning experiences. However, some challenges remain to be solved, for example, how team-based competencies shall be integrated in a predominantly individualistic competency scheme.

More in detail, the second part describes the status of CBE for each of the major aviation professions, which are flight crews, air traffic controllers, cabin personnel, and maintenance engineers. The authors specify how the management of competences developed in the past and which is the current status of CBE. As the evolution of

competencies did not evolve the same across these groups, today some gaps between these groups may be noted, which poses questions regarding the future evolution of CBE (for example, few international standardisation for cabin crew).

The third part analyses best practices for implementing CBE as related to designing competencies, developing training, and assessing competencies. One of the challenges to cope with is the change of roles. New roles are needed for the development of competencies, whereas the roles of training designers evolve to ensure the link with competencies. Finally, also the assessment of training outputs needs to be reconsidered to ensure the demonstration of competencies being achieved.

The last part provides an outlook on the future of CBE in aviation. Even though new means such as wearable technologies and big data support the new approach towards competencies, it is not by itself the guarantee of a more effective training. Amongst the questions to be solved are the continuity between competence and expert performance, the writing and interpretation of competency texts by different stakeholders, and also how to respond to industrial requirements. As such, the book also concludes on the importance regarding the link between industry and research.

Overall, by creating a systematic link between the educational and the industrial domain, the book provides a very comprehensive analysis on the current situation of CBE in aviation. The characterisation of the evolution from the past to the future, from competency to instruction and assessment and across aviation professions is clearly complete, while at the same time evidence on open points is provided. As the global structure of the book is very logic and systematic, it is pleasure to read the book also outside an office environment.

Two points may however be raised as suggestions:

First, even though the presented topics are key for the understanding of CBE, for newcomers or HF specialists not already involved in the training, the content may not be as easy to grasp. Hence, for specific reader types, a dedicated introduction could be presented. On the other hand, the need for readers already involved in some of the CBE-related tasks may be to develop some topics more in detail. The authors addressed this need by providing references that may lead this type of readers further.

Secondly, the notion of competencies also provides a very helpful tool to support early design of new operations and systems. It allows reflecting on the feasibility of education for modified future working environments. As such, CBE shall not only be favoured within the education-centred areas of aviation, but also within system design-centred domains. Unfortunately, this link was not mentioned.

To conclude, the book is recommended for different types of readers that could be potentially impacted by CBE in aviation, or that wish to have a global view on what is CBE and how it can be used. But, even for readers active in other complex working domains the book may allow to draw comparisons and derive recommendations for their own respective domains.