New Trends and Issues Proceedings on Humanities and Social Sciences

Volume 8, Issue 3 (2021) 21-29

www.prosoc.eu

Selected Paper of 13th World Conference on Educational Sciences (WCES-2021) 04-06 February 2021, University of Cadi Ayyad, Marrakech, Morocco

Review study: Competency-based approach implementation in educational system

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Suggested Citation:

Ghezir, S., Naimie, Z., Leng, C. H., Shagholi, R., & Abuzaid, R. A., (2021). Review study: Competency-based approach implementation in educational system. *New Trends and Issues Proceedings on Humanities and Social Sciences. 8*(3), 21–29. https://doi.org/10.18844/prosoc.v8i2.6156

Received from February 20, 2021; revised from March 13, 2021; accepted from August 25,2021.
Selection and peer review under responsibility of Assoc. Prof. Dr. Jesus Garcia Laborda, University of Alcala, Spain.

Abstract

The aim of this article is to review the experiences of educational systems of different countries on using a competency-based approach (CBA) in their secondary schools. The historical development of CBA and the roles of using this approach in teaching and learning are also reviewed. Consequently, 8,296 published scholarly papers, books, reports and documents between 1985 and 2017 were found in the English language. The 14 selected articles from 2012 to 2020 have been revised and categorised based on the year of publication, country, purpose, method of study, sample and findings. Results of this review paper indicated that CBA can be a great approach to improve the teaching and learning process if teachers could reduce the barriers of its implementation. Therefore, this study recommends helping teachers in this matter through training and providing all needed resources, and then examining the new situation by future studies.

Keywords: Competency-based, implementation, review, secondary, school.

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1. Introduction

Nowadays, the world is experiencing a rapid change in all areas of life; economic, industrial and social changes are influenced by the increasing development of the use of technology in the lives of individuals and institutions, which has created a fundamental role for schools by keeping pace with this development by graduating individuals with necessary skills. The competency-based approach (CBA) aligns with globalisation and innovations in communication and information science and technology. The new orientation in many countries aims at making the educational system respond to rapid changes in the institutional, economic and social environment (Alice, 2015). Therefore, in the last two decades, countries have started updating the content of education to equip their citizens with skills and knowledge that facilitate achieving continuous professional growth and enable them to cope with the challenges of this technological world, by adopting CBA to reform the educational system. However, the number of studies that discusses the implementation of CBA on basic education (primary, middle and secondary) is dramatically reduced in favour of higher education where CBA has a stronger research base (Lurie et al., 2019; Walters, 2016). Thus, this review seeks to summarise the articles that discuss the experiences of implementing the approach in secondary schools around the world from 2013 to 2020, and answering the following questions:

1. Do teachers have sufficient knowledge about CBA?
2. Can teachers implement CBA in secondary schools?
3. What are the barriers that reduce the implementation of CBA in secondary schools?

1.1. Definition of CBA

CBA is an approach which is attentive to the knowledge and skills that can be assessed and used, to keep education in equilibrium with the needs of the labour market (Butova, 2015), which means that CBA is interested in reorganising the educational system and making it focus on the necessary competencies and making sure that each learner will be able to master and show off at the end of his/her learning experiences (Guskey, 2005; Spady, 1994). CBA focuses on the objective and observable results of studying, which are candid and can be easily measured (Griffith & Lim, 2014; Guskey, 2005).

From other perspectives, CBA seeks to develop students' prospective abilities, with the primary focus on learning outcomes. CBA addresses what the learners are expected to learn (Levine & Patrick, 2019; Mosalanejad et al., 2013). Students should show that they are mastering academic competencies, regardless of the time or pace of teaching (Palmer & Bowman, 2016), and should keep the learning process at pace with the community and labour market needs (Butova, 2015).

1.2. History of CBA

CBA as an idea has its root in some old principles which appeared in the Middle Ages; these principles emphasised that the learner in apprenticeship should successfully learn the specific skills. After that, the idea of CBA entered the academic field by Tyler, Wheeler, Bloom and Mager with the theoretical presented between the 1940s and 1950s. After the 1970s–1990s, many states in the USA adopted CBA in their education system to provide learners with important life competencies (Evans et al., 2020). The purpose of adopting CBA in education systems was to reconfigure the patterns of teaching and learning in a way that allowed all students to attain the same performance standards, regardless of the time needed and differentiated supports for each student. After 1990, CBA benefited from the four pillars that have been stated by J. Delors (learn to know, learn to do, learn to live together and learn to be) or the global competencies which were considered as the face of modern education. In addition, some American states added the demonstration of competencies in the list of graduation requirements and removed the credit hour from the list (Evans et al., 2019).

According to Butova's research, there are three major stages in the historical development of CBA, which are as follows:

1. The first stage dates back to the mid-1960s and early 1970s. In this period, educators started to use the term 'competency', defined it as a terminological one and explained its connection with other concepts, such as 'professional', 'competence' and 'education'. Later in 1975, D. Hymes introduced the concept of 'communication competency'.
2. The second stage (from the mid-1970s to the early 1990s) is distinguished using Chomsky's ideas which were adopted by psychological science. Then, the first preceptor of the CBA had been established in general in the field of foreign language learning (Burns, 2002, pp. 33–35). Besides, Raven (1984) in his book 'Competence in modern society – Its identification, development and release' proposed sundry determinations for key concepts and for the first time he stated the idea of interconnection (or inseparability) between social and professional competences.
3. The third stage is characterised by the universal development and active application, where CBA became a documentary acknowledgement, and UNESCO considered the implementation of CBA in educational systems as necessary objectives (Butova, 2015).

1.3. Roles of CBA implementation

Since CBA is a learner-centred method, the teacher's role changes from transferring information and knowledge to being a supervisor (Sturgis & Patrick, 2010). In this new orientation, teachers do not stop giving information, but they will do that in different ways that allow their students to be actively involved. Practically, teachers are required to prepare the material and the activities that can provide equal learning opportunities to their students (Paul, 2008) and enable each one to achieve learning goals. In other words, teachers should come to the class with specific and developed competencies and share it with the students at the beginning of the lesson and show them how they can master them (Griffith & Lim, 2014; Richards & Rogers, 2014). Besides that, teachers need to devote much time to plan different activities that allow students to master the specific skills which are necessary to construct the required competency and constantly assess students and give them direct, specific and personalised feedback (Richards & Rogers, 2014). In short, teachers need to help learners feel responsible for their learning.

Students also must change their role, develop strategies and be willing to take up challenges to make their learning more efficient (Marcellino, 2005); they need to diversify the sources of information and not just rely on what the teachers have given in the classrooms. They should be able to integrate, produce and extend knowledge. Therefore, they play an active role in the learning process and not receive the knowledge passively (Jones, 1994). Students must be autonomous in their learning to be able to construct and mobilise their resources to think critically, adapt, solve the problem or situation, be creative, confident, self-motivated and find ways to transfer their information from the classroom to their own lives. They also need to work on each competency and should not progress to the next one until they make sure that they have mastered the first one (Richards & Rogers, 2014; Sturgis et al., 2011).

2. Research methodology

Two English databases were used to review the available literature from 1985 to 2017: Education Resources Information Centre (ERIC) and Education Research Complete (EBSCOhost). The keywords searched included 'competency-based education', 'teacher's ability', 'competency in secondary school', 'educational competency', 'barriers on competency-based', 'mastery-based', 'proficiency-based', 'standards-based' and 'performance-based' to cover more related articles. A total of 8,296 articles, books, reports and documents were found; 6,613 in EBSCOhost and 1,247 in ERIC. However, some of the findings were repetitious and cited in both databases. For that, the reference manager software (Endnote version 7) was used to exclude books, reports and documents and prevent re-entry of any

retrieved articles. From the remaining 91 articles, 86 were excluded by the critical appraisal and its relevancy to the review questions. The last articles that were detected and used in responding to this reviews questions were 14 articles from 2012 to 2020 which considered the implementation of CBA in secondary schools.

2.1. Research findings

Table 1. Final retrieved articles in the review process

Authors and date	Country	Purpose	Research design and technique	Population and sample	Main findings
Evans et al. (2020)	USA	To examine factors that affect implementation and student outcomes.	A systematic literature of research from 2000 to 2019.	25 research studies	Almost the same facilitators and barriers were found in the reviewed studies.
Haynes et al. (2016)	USA	To examine the changes in learning capacities by using CBA	Quantitative study and survey	10 public schools, students (508), teachers (111) and administrators (16)	The implementation of CBA practices varied greatly across and within schools; it was not consistent with the settings deemed 'competency-based'.
Komba and Mwandaji (2015)	Tanzanian	To examine secondary school teachers' understanding of CBA and their abilities on planning the lessons.	Qualitative study. Interview, observation and review of documents	Teachers (186) from 13 secondary schools	The implementation of CBA was ineffective.
Pridane (2017)	Latvia	To evaluate and analyse which key competencies were defined by European Council in Home Economics and Technologies.	Mixed mode.	Secondary school students (25 girls)	The competencies of technology and digital and social, cultural awareness and creativity expression are more developed than Mathematical and natural science.
Makunja (2016)	Tanzania	To investigate the challenges facing teachers in implementing CBA in secondary schools	Qualitative research (case study). questionnaires and interview	Teachers (102), heads of schools (06) and academic masters (06)	There are many challenges which impeded teachers from applying CBA effectively.

Byrne et al. (2013a)	England	To explore the challenges that faced four schools with developing CBA.	Qualitative case study. Individual and focus-group interviews.	Four secondary schools in England, (school leaders, teachers and students)	The major challenges were planning CBA lessons, assessment in a real environment and finding time to plan the CBA lessons.
Byrne et al. (2013b)	England	To know how teachers are meeting the pedagogical challenges resulting from the implementation of CBA.	Qualitative study: observations, interviews and student surveys.	Four secondary schools in England	Teachers focused on content rather than competency; they did not develop their skills and did not give the students the autonomy to learn.
Jimenez et al., (2016)	Spain	To analyse teachers' opinions on the introduction of CBA. How they are involved in science teaching.	Mixed method	Science teachers (443)	After 10 years, CBA is not being implemented effectively in science education and experience should be accompanied by training.
Pesakovic et al., (2014)	Slovenia	To develop a suitable instrument to measure the quality of CBA evaluation in science and technology education.	Qualitative study; Experimental design (for 2 years)	First year: 38 students (6th grade), CG (20 students), EG (18 students). Second year: 35 students (6th grade), EG (17 students), CG (18 students).	CBA is an optimum approach to develop students' knowledge and skills. Good assessment improves the quality of science and technology skills.
Pantic and Wubbels (2012)	Serbia	To explore the changes that CBA made in teacher education curriculum	Qualitative study; interviews	School mentors and teachers: educators and teachers.	Teachers' education needs more attention.
Ryan and Cox (2017)	USA	To investigate the link between student-reported exposure to CBA and student outcomes.	Mixed method; develop a survey	Students in grades 9–12 (n = 599) at the two high schools in the northeast.	There is a need for measurement instruments that will allow researchers to investigate how this ambitious reform.

Crujeiras and Jimenez-Aleixandre (2013)	Spain	To address the challenges of implementing CBA for scientific competencies	Qualitative research; content analysis.	Analysis of the assessment criteria and diagnostic evaluation.	The scientific competencies are developed through practice and challenges, and the ability to apply knowledge and skills in new context.
Laius and Post (2016)	Estonia	To determine the effect of CBA on gymnasium students' scientific creativity skills and socio-scientific reasoning.	Mixed mode; visitation, complex interdisciplinary assessment test.	Students from 10th and 12th grade (1918) from 44 schools.	There is no significant affect yet from CBA on the students' learning outcomes and enhancement.
Yaman (2017)	Turkey	To reveal the teachers' perceptions on the subcomponents of the programme and to what extent its objectives have been achieved.	Qualitative; semi-structured interview method.	Primary and secondary schools' teachers (89)	The teachers stated that the scientific process and skills were sufficient for gaining basic science skills; they stated that they are not sufficient for gaining some of the causal and experimental skills.

In the following sections, the explanations of the responses of the study questions are given.

2.2. First question: teachers' knowledge about CBA

In most of the studies reviewed, there is a lack of focus on the level of teachers' understanding of the concept of CBA. The reason is likely the researchers' expectation that the implementers of the CBA are supposed to be aware of its definition and how to apply it. However, some studies noted that teachers did not have enough knowledge about the concept of CBA. It seems that teachers' enthusiasm for the implementation of CBA did not make a difference in the results, given that they did not have adequate training during pre-service (Haynes et al., 2016; Komba & Mwandaji, 2015; Makunja, 2016).

2.3. Second question: teachers' ability to implement CBA in secondary schools

The reviewed studies have shown that the teachers, during the implementation of CBA, are facing a lot of pressures to ensure their abilities meet the practical challenges. These studies also show that there is no significant difference between the degrees of CBA implementation between developed and poor countries. For example, the implementation of CBA in England varied greatly across and within schools; it was not consistent with the settings deemed 'competency-based' (Haynes et al., 2016) where the teachers focus on the subject content rather than competency; they did not develop their skills nor did they give students the autonomy to learn (Byrne et al., 2013b). In Spain, after 10 years,

CBA is not being implemented effectively in science education and experience should be accompanied by training (Jimenez et al., 2016). On the other side, the implementation of CBA in Tanzania was ineffective (Komba & Mwandaji, 2015) and the teachers are facing a lot of challenges that impeded the implementation of CBA effectively in the classroom (Makunja, 2016).

2.4. Third question: Barriers on the implementation of CBA

The studies' findings generally stated that the barrier preventing CBA integration in the classrooms is the teachers' attitudes and beliefs and lack of support and training for them to vary the methods and practices and to use modern technologies and materials efficiently (Chacko, 2014). Also, insufficient teaching and learning resources, the available textbooks and reference books and the lack of laboratories create a bad effect on learning through practice and experiments, so students just cram theories and principles. In addition, the researchers noted that the overcrowded classrooms prevent teachers from looking after students and helping them in their learning, especially students joining secondary education with low ability can pose an extra challenge to teachers because it is difficult to implement CBA particularly when most of the students have a low academic ability (Makunja, 2016; Tambwe, 2017).

3. Research conclusion

Nowadays, the quality of knowledge is more important than the quantity, and for this, it is critical to cultivate the skills and capacity of all individuals and further develop their competencies. In the CBA, education pursues to identify and build the unique intellectual, emotional and physical competencies of all learners, and supports them in achieving their possibility to lead a successful life. Misunderstanding the objectives of CBA by teachers is considered a barrier that reduces the CBA effectiveness on better education. Since the aim of implementing CBA is to make education attainable to everyone, it is essential to make it understandable to all participants in the education process. In addition, the resources and infrastructure for processes needed for the CBA are different from the ones traditionally required. CBA also needs teachers with capabilities to function as facilitators of the mastery of skills and assessors of attainment of skills. The obstacles can be overcome mainly through the observation of performance and change in teacher and student's beliefs.

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