

The hunt for computerized accounting education in the GCC: a structured literature review

Mohammed Muneerali Thottoli
University of Nizwa, Nizwa, Oman

Abstract

Purpose – The objective of this paper is to review and analyze the existing literature on computerized accounting education (CAE) in educational institutions across the Gulf Cooperation Council (GCC) countries and to suggest a research agenda for the future.

Design/methodology/approach – The author employs a structured literature review (SLR) approach to analyze CAE research published in the GCC between 1981 and 2021.

Findings – The current study has focused mainly on education in the field of computerized accounting (CA); however, very few research studies have focused on CAE. The author recognized two key topics: the broad concept of CA and the identification of software programs used to teach CA courses.

Research limitations/implications – A future study might extend to address the gap in the knowledge of graduate students' theoretical concept in accounting with CA program across higher-educational institutions (HEIs) in the GCC.

Practical implications – The broad topic analyzed by the author leads to highlight the growing need for students' practical skills in CA, particularly in the GCC, and to give suggestions for future research. This study also provides a kind of advice to educational institutions to implement an appropriate CA program for CA courses.

Originality/value – Currently, there is a lack of SLR on CAE. Findings on the broad topic analyzed in the current study have been addressed by agreeing on a critical assessment of present research and future research goals.

Keywords Computerized accounting, Education, Structured literature review, GCC

Paper type Research-paper

1. Introduction

Computerized accounting education (CAE) comprises accounting software, teaching methods, teaching materials and overall course design to improve students' competency in computerized accounting (CA). However, the use of software programs to teach CAE is prioritized. Thottoli (2021b) and Özpeynirci *et al.* (2013) stated that the use of software programs to teach accounting lessons from theory to practice is critical to students' success. CA courses in educational institutions must be offered in response to the accounting job market demands of a country's existing businesses and to ensure their employability (Qasim and Kharbat, 2020). The Fourth Industrial Revolution era, the most recent trend of technological revolution led by artificial intelligence, has resulted in dramatic changes in accounting education (Lestari and Santoso, 2019). Proficiency in CA leads to more competence in the accounting job market. In a practical sense, CA practices have made it easier for students to interpret accounting data efficiently and effectively (Abbott and



Palatnik, 2018; Boulianne, 2014). As a result, CA will undoubtedly aid in the improvement of the education system in the Gulf Cooperation Council (GCC) countries. CAE in GCC universities and educational institutions is almost certain to produce professional accountants with modern knowledge and skills to meet current market demands (Thottoli, 2021a). Educational institutions can use a variety of software applications to deliver CA courses in the accounting curriculum (Peng, 2019).

Many universities have failed to select the best accounting software that is required to compete in today's job market. However, the use of adequate software to teach CA courses is still lagging (Al-Hattami, 2021). Some of the accounting software programs used by companies in the GCC are Tally ERP (enterprise resource planning) 9, Oracle, QuickBooks, Peachtree, Zoho, SAP ERP, Sage ERP, Microsoft Dynamics AX, Intacct, Exact max ERP and so on. Hence, educational institutions should consider the precise needs of the job market to introduce appropriate software to deliver the course, CA. The software used to learn CA might affect the confidence level of new graduates to applying for accounting jobs (Heang *et al.*, 2019). CA must be taught in universities or colleges in response to the country's existing business needs (Serçemeli *et al.*, 2018).

According to the literature, educational institutions in the GCC have faced numerous challenges by educational institutions in various matters relating to CA courses. For example, Thottoli (2021a) suggested that the Ministry of Higher Education (MoHE) should make sure that the curriculum for university graduating students contains adequate theoretical and practical training by versatile accounting software. Griffin and Coelho (2019) emphasized the relevance of technical skills in the accounting field for Arab graduate students and expressed that CA skills were important in their academic program. As a backdrop, the time has come for the GCC countries to enrich CAE by choosing the right accounting software program in the university syllabus. The researchers also believe that revising CAE programs by suggesting the right accounting software in the accounting curriculum will help the development and success of young graduates in their early carrier.

The list of challenges and perceptions presented above leads researchers to investigate the present situation of CAE in the educational institutions of GCC countries; thus, the objective of this paper is to review and analyze the existing literature on CAE in educational institutions across the GCC countries and to suggest a research agenda for the future. Therefore, the following research questions will be addressed in this study:

- RQ1. What are the broad concepts of CA in educational institutions across the GCC?
- RQ2. How well have educational institutions identified the various software programs used to teach CA courses in the GCC?

The rest of the sections are arranged as the research method, descriptive analysis, CAE: literature development and focus and directions for future research: discussion and conclusions.

2. Research method

As previously stated, the current study's strategy is based on a structured literature review (SLR) approach, which is considered crucial and thorough and concentrates on the concept (Webster and Watson, 2002) because it provides a summary of what has already been studied by previous researchers. As a result, it must be done in a comprehensive and precise way (Levy and Ellis, 2006). To give a clear direction for summarizing and evaluating the key findings of appropriate studies on a topic, the data were acquired and gathered using a defined and replicable methodology. The final execution of a literature review is agile, and our research approach is straightforward. The methodology employed in this research is centered on the following steps:

- (1) Planning as well as a selecting appropriate review.
- (2) Research classification based on study objectives, data extraction and evaluation as well as completing review and
- (3) Reporting including dissemination, by both descriptive and an extensive (thematic) assessment of the current study field.

40 The first step is to plan as well as select appropriate reviews.

To begin with the selection of appropriate reviews, the researcher did a thorough search of databases for relevant literature, which proved to be a difficult effort. It was difficult to come up with a set of quality criteria for article selection (Armitage and Keeble-Allen, 2008; Santis *et al.*, 2018). Google Scholar database is a search engine that focuses on scientific information and the finding of citations for peer-reviewed and academic articles, making it a formidable competitor to other citation indexes (Torres-Salinas *et al.*, 2009). The beginning of the Google Books search engine has given enormous and valuable support and enriched and varied content of Google Scholar (Jacsó, 2008). Furthermore, Google Scholar is used for information extraction for index analysis (Cabezas-Clavijo and Delgado-López-Cózar, 2013). Sadat-Moosavi *et al.* (2012) reported that the availability of web articles by examining online resources on information science peer-reviewed articles be found in ISI (International Scientific Indexing)-ranked journals accessible in the Emerald database. Thus, the current study has selected the following databases to select appropriate reviews:

- (1) Google Scholar and
- (2) Emerald.

To begin, it is necessary to establish whether there is no other comprehensive literature review related to CAE in the GCC countries.

The second step endures with research classification based on study objectives, evaluation and data extraction, as well as completing a review. Typing keywords through specified datasets was used to classify past studies. The literature has been classified after considering existing areas on CAE in educational institutions across the GCC countries. The research classification has been done based on typing keywords to search using databases.

Step two (conducting the review) involves the selection of research studies based on specific keywords and databases to be used. Additionally, this step entails defining criteria for inclusion or exclusion of studies with clear regulations. The included study review papers were systematically evaluated to include any papers that might be of interest followed by completing a review.

As a result, the search was based on the following keywords, using the aforementioned six descriptions of CAE in the GCC as a starting point: (CAE in GCC or Kuwait, Bahrain, Oman, Saudi Arabia, Qatar and the United Arab Emirates) or (computerized accounting in GCC or Kuwait, Bahrain, Oman, Saudi Arabia, Qatar and the United Arab Emirates) or (accounting education in GCC or Kuwait, Bahrain, Oman, Saudi Arabia, Qatar and the United Arab Emirates) or (the concept of computerized accounting in GCC or Kuwait, Bahrain, Oman, Saudi Arabia, Qatar and the United Arab Emirates) and (identification of software program used to teach CA course in GCC or Kuwait, Bahrain, Oman, Saudi Arabia, Qatar and the United Arab Emirates). The study was limited to journal papers (with peer reviews) authored in English and covered from January 1981 to July 2021. The study excluded working papers, editorial notes, exposure drafts, review articles, official releases, reports and publications written in a language other than English that is not considered. We also exclude duplications of papers that appeared in different databases. Having accomplished this initial phase, a

residual number of 146 (133 out of the Google scholar database and 13 from Emerald Publishing Ltd) papers were gathered, as [Tables 1 and 2](#) show.

Later, only relevant papers were selected for the study after a thorough quality assessment. Inappropriate papers were excluded, and relevant and appropriate review papers were only considered for the current study.

In the last step, three, the authors were able to decide to conduct dissemination, by both descriptive and an extensive (thematic) assessment of the current study field. Year of publication, country and journal names are described in the study. A structured review was followed to examine each selected paper thoroughly. This process facilitates researchers to find room for answering those defined research questions in the current study. The study will discuss descriptive analysis in the next part.

All articles related to the study from the database of Google Scholar and Emerald Publishing Ltd were further analyzed, and some of the articles, which were not relevant to the study, were eliminated. [Table 3](#) shows the details.

In terms of the publication year, [Figure 1](#) shows that there were a limited number of papers published from 1981 to 2021.

3. Descriptive analysis

Basic descriptive analysis facilitates the development of insights that aid in answering SLR questions. A descriptive assessment extracts complete and comprehensive information from the selected studies using a simplified set of categories. The specific categories such as paper title, name of the journal, year of publication and country of study, have been shown in [Table 4](#).

3.1 CAE: literature development and focus

This section aims to answer the research questions of this study to examine the papers selected to know how CAE literature is developing and focusing on the issues raised in the previous studies. We hope that by doing so, we will be able to highlight the main topics reported in the literature. From a theoretical perspective, it is worth noting that several papers have primarily dealt with CAE (its concept, adoption and identification of software program used) by educational institutions to teach CA courses in the GCC. [Yafooz et al. \(2021\)](#) suggested information technology (IT) builds a collaborative intelligent computer study

Sl No.	Search criteria	Google Scholar							Total
		GCC	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	
1	Computerized accounting education in	0	0	0	0	0	0	0	0
2	Computerized accounting in	0	0	0	0	0	0	0	0
3	Accounting education in	14	14	17	0	1	35	5	72
4	Concept of computerized accounting in	0	0	0	0	0	0	0	0
5	Software program used to teach CA courses	0	0	0	0	0	0	0	0
	Total								72

Table 1.
Databases (Google Scholar)

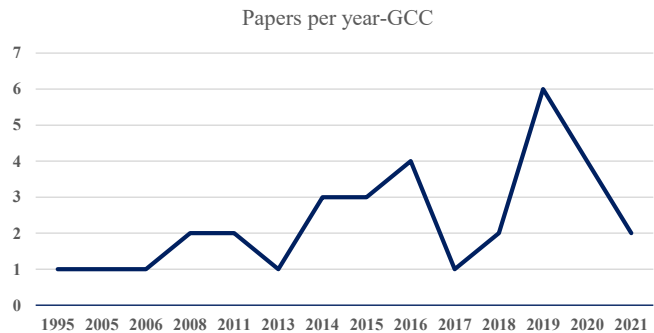
Table 2.
Databases (Emerald
Publishing Ltd)

Sl No.	Search criteria	Emerald Publishing Ltd							Total
		GCC	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	
1	Computerized accounting education in	1	0	0	1	0	3	1	6
2	Computerized accounting in	0	0	0	0	0	0	0	0
3	Accounting education in	1	0	0	0	0	1	0	2
4	Concept of computerized accounting in	0	0	0	0	0	0	0	0
5	Software program used to teach CA courses	0	0	0	0	0	0	0	0
	Total								8

Table 3.
Relevant articles

Details	Total
Selected papers	144
Eliminated papers	–96
Relevant papers	48

Figure 1.
Papers per year (GCC)



graduates and labor market framework to minimize the gap between the labor market and graduates' competency. [Maali and Al-Attar \(2020\)](#) assessed whether existing university accounting curricula meet job market demand, as well as the abilities and competencies that firms require from accounting graduates.

The issue related to the advancement of teaching CA and the improvements in teaching CA courses were examined by [Jiuzhi *et al.* \(2010\)](#). Companies need to use CA information systems to improve their economic or financial performance [Uzrail and Bardai \(2019\)](#). [Ernest \(2015\)](#) has offered extensive information on the notion of auditing and its significance in a CA system. Further, they investigated the auditing process in a CA environment after providing a brief explanation of the terms auditing, computer and CA system. Accounting graduates are increasingly expected to have practical knowledge, such as proficiency in using CA

No.	Paper title	Name of the journal	Year	Country	Citation
1	A citational analysis of the accounting education literature, 1956–1990	<i>Accounting Historians Journal</i>	1995	GCC	11
2	Distance higher education experiences of Arab Gulf students in the United States: a cultural perspective	<i>International Review of Research in Open and Distributed Learning</i>	2005	GCC	156
3	Exploring perceived threats of CAIS in developing countries: the case of Saudi Arabia	<i>Managerial Auditing Journal</i>	2006	GCC	26
4	Tax software versus paper return: the effect of a computerized decision aid on cognitive effort and student learning	<i>Advances in Accounting Education</i>	2008	GCC	6
5	Development of enforcement mechanisms following adoption of international accounting standards in the Gulf co-operation council member states	<i>Journal of International Business Strategy</i>	2008	GCC	22
6	Integrating international financial reporting standards into the accounting curriculum: strategies, benefits and challenges	<i>Academy of Educational Leadership Journal</i>	2011	GCC	18
7	Value chain for strategic management accounting in higher education	<i>International Journal of Business and Management</i>	2011	GCC	47
8	Use of E-learning tools to solve group work problems in higher education: a case study of gulf country	<i>Advances in Computer Science: An International Journal</i>	2013	GCC	37
9	Compliance with international education standards in Saudi Arabia: policy and educational implications	<i>Journal of Business Studies Quarterly</i>	2014	GCC	29
10	A study of the emergence of the Kuwaiti association of accountants and auditors	<i>Accounting History</i>	2014	GCC	11
11	Bridging the gap between the perceptions of accounting students and accounting practitioners: evidence from Ahlia University of Bahrain	<i>Jordan Journal of Business Administration</i>	2014	GCC	11
12	Impact of enrollment timing on performance: the case of students studying the first course in accounting	<i>Journal of Accounting</i>	2015	GCC	0
13	The current status of accounting education and knowledge and skills required for Qatari market	<i>The Arab Journal of Accounting</i>	2015	GCC	0
14	The influence of prerequisite grades on students' performance: Further evidence from Kuwait	<i>The Journal of Developing Areas</i>	2015	GCC	9

(continued)

Table 4.
Articles (GCC)

No.	Paper title	Name of the journal	Year	Country	Citation
15	ERP and organizational change: a case study examining the implementation of accounting modules	<i>International Journal of Organizational Analysis</i>	2016	GCC	21
16	Extent to which university complies with IES 2 in the development of education plans and curricula-case of Saudi Arabian University	<i>Journal of Business Studies Quarterly</i>	2016	GCC	1
17	Factors influencing students' choice of accounting as a major: further evidence from Kuwait	<i>Global Review of Accounting and Finance</i>	2016	GCC	14
18	Accounting students' perceptions of effective faculty attributes	<i>Journal of International Education in Business</i>	2016	GCC	23
19	International financial reporting standards (IFRS): the benefits, obstacles, and opportunities for implementation in Saudi Arabia	<i>International Journal of Social Science and Business</i>	2017	GCC	17
20	The effect of students' performance in introductory accounting on college duration: evidence from Kuwait	<i>Journal of Global Responsibility</i>	2018	GCC	1
21	Students' level of awareness of accreditation process: a case of University College of Bahrain	<i>International Journal of Pedagogical Innovations</i>	2018	GCC	0
22	Convenience of accounting education for the requirements of Saudi labour market: an empirical study	<i>Management Science Letters</i>	2019	GCC	2
23	Preparedness to teach international financial reporting standards (IFRS) in Ethiopia: a study on selected universities	<i>International Journal of Commerce and Finance</i>	2019	GCC	1
24	Determinants of accounting students' competency: Kuwait University	<i>International Journal of Business Administration</i>	2019	GCC	0
25	Factors affecting the integration of the SAP-financial accounting module into an accounting curriculum: evidence from a gulf-based university	<i>International Journal of Smart Technology and Learning</i>	2019	GCC	0
26	Do entrepreneurial skills affect entrepreneurship attitudes in accounting education?	<i>Higher Education, Skills and Work-Based Learning</i>	2019	GCC	16
27	Educational governance and challenges to universities in the Arabian Gulf region	<i>Educational Philosophy and Theory</i>	2019	GCC	15
28	Knowledge and use of accounting software: evidence from Oman	<i>Journal of Industry-University Collaboration</i>	2020	GCC	9
29	Generic skills in accounting education in Saudi Arabia: students' perceptions	<i>Asian Review of Accounting</i>	2020	GCC	2

Table 4.

(continued)

Table 4.

No.	Paper title	Name of the journal	Year	Country	Citation
30	Accounting curricula in universities and market needs: the Jordanian case	<i>SAGE Open</i>	2020	GCC	7
31	Students' perceptions regarding classroom attendance and its impact on their academic performance: evidence from a developing country	<i>Education + Training</i>	2020	GCC	0
32	COVID-19 and digitizing accounting education: empirical evidence from GCC	<i>PSU Research Review</i>	2021	GCC	1
33	Machine learning based collaborative intelligent closing gap between graduates and labour market framework	<i>2021 International Conference on Artificial Intelligence and Smart Systems (ICAIS)</i>	2021	GCC	0

software programs. To recognize the effect of CA on learning, the students' rationales for and perceptions of learning CA in two accounting disciplines trialed at the university level were investigated by [Yaftian et al. \(2017\)](#). [Serçemeli et al. \(2018\)](#) have investigated undergraduate experiences in a setting where a CA course module was proposed using a flipped-classroom approach. Accounting professional revolution in the internet + accounting environment, as well as the composition of technology competencies of accounting professional applied talent, was studied by [Cao \(2019\)](#).

Students who used paper for entering data reported more complex cognitive effort than students who used software. The manual data entry requires students to complete task processes by gaining a greater understanding of the topic. Although the software can improve speed and accuracy, professionals should be aware of this problem as a learning tool ([Sheely Heath, 2008](#)). One should be aware of the advantages of using a CA system, which leads to the adoption of a technology-enabled accounting system ([Nyang'au et al., 2015](#)). It was discovered that academic contributions were made not only in the auditing field but also in IT ([Jaber and Wadi, 2018](#)). Teachers and software developers are constantly concerned with computer system response time and information exchange for improved educational performance ([Kim et al., 2015](#)). The value of acquiring generic abilities in accounting education and that of the Saudi accounting education system might do more to provide students with the opportunity to build generic skills that will help them thrive in their future employment ([Al Mallak et al., 2020](#)). [Senan \(2019\)](#) found that stakeholders agreed that the university curriculum was capable of satisfying the special requirements of the Saudi Arabian labor market. However, there are few suggestions for improving accounting program implementation and increasing graduates' employability through comprehensive CAE.

The following sections will go over some of the other issues raised in the study in greater depth to answer other research questions of this study.

3.2 The broad concept of CA

A CA system is one that is made up of accounting software programs that are stored on a computer. Higher-educational institutions (HEIs) in the GCC, which have proliferated in the last decades, have been building themselves on the style, governance, programs and structure of Western universities ([Costandi et al., 2019](#)). One of the graduate attributes that have been identified by [Al Hinai et al. \(2020\)](#) is the HEIs' implementations of technology-

enabled labs such as computer-centered training, software programs and simulated learning environment. The accounting curriculum appears not to be broad enough to impart relevant technology-enabled accounting content to make students tech-savvy as competent accounting graduates (Nwosu and Amahi, 2019). Financial statements can be generated using CA systems based on information stored in a database (Amahalu *et al.*, 2017). Accounting software packages might come with a range of specified accounting features that might be possibly customized to any business operations (Ghasemi *et al.*, 2011). Accounting computerization is a type of accounting program, which will process accounting data, financial management and accounting management that is ultimately useful for financial forecasting and decision-making. CA substitutes the human brain to analyze and make a judgment on financial or accounting information. The main task of CA is to study accounting applications used in computers to better perform the role of accounting functions (Jiuzhi *et al.*, 2010). The books on CA techniques are virtue; all accounting entries should be properly recorded, classified and summarized daily for the requirement of users. Therefore, borders between chronological manual daybooks and ledgers no longer exist (Yang, 2011). According to the author's limited knowledge, there have been few studies on the concept of CA in the GCC. Weshah (2021) recommended that universities should employ faculty members who have practical experience to teach CA courses. Ahmed (2019) found that in the UAE, practitioners emphasized conventional accounting practices, while academics emphasized contemporary techniques. Spring (2015) recommended that more heterodox, innovative, critical and in-depth studies of the use of computerized technology in education are encouraged in the GCC region.

3.3 Identification of the software program used to teach CA courses

CAE uses sophisticated accounting software to deliver CA courses (Thottoli, 2021a). The CAE can be handled with standalone software, such as Xero, QuickBooks, Zoho, Wave and FreshBooks, or as a module in an ERP system, for instance, SAP, Sage, Oracle, Microsoft Dynamics, NetSuite and Infor (Maruschak, 2021). The impact of ERP accounting education on educational satisfaction, as well as the relationships between function, understanding, performance, value and ERP accounting education, was investigated by Lee, (2017). Da Costa *et al.* (2021) have examined the impact of digital videos, which were created using a technology tool, on the performance of accounting students. Various CA software programs and the advantages of CA systems were studied by Ernest (2015). Universities and colleges should constantly seek and restructure in order to encourage students' overall advancement and fulfill social needs as guidance and nurture students' creativeness, software development skill and data processing skill as the talent goal (Cao, 2019). Tax accounting software and taxation knowledge had the greatest impact on learning satisfaction. It was clear that graduates who put more effort to study their accounting subjects had higher levels of learning satisfaction (Lee, 2017). Haskasap (2021) has suggested that with the upcoming technological advances in the digital era, education will be delivered entirely through a computer-enabled system very soon. In the educational system, instructors should align professional accounting courses with business ERP applications, allowing students to learn and practice computerization courses. Students should properly investigate each ERP module, particularly the financial management module (Jiuzhi *et al.*, 2010). According to Saidi *et al.* (2019), various SAP modules should be considered for inclusion in other college curriculum in Gulf-based universities. Albassam *et al.* (2019) found that some areas of concern were discovered, including accounting graduates' lack of technical expertise, imprecise use of complex accounting systems and software and limited research abilities.

4. Directions for future research: discussion and conclusions

The current study has been performed through an SLR, providing insights into the methodological research bases and conceptualization of the broad concepts of CA in educational institutions across the GCC. According to the author's limited knowledge, there is a lack of related studies in the scope of the CA course in HEIs. The published papers chosen for this literature review study largely contributed to the knowledge enhancement on CAE. The majority of the study dealt with the adoption and use of CA in small and medium enterprises (e.g. [Habiba et al., 2019](#); [Abdulle et al., 2019](#)), but there are limited studies that contend with the broad scope of CAE in the GCC. The authors have then extended to retrieve related articles through Google Scholar and Emerald Publishing Ltd. Hence, the study was used to analyze 48 papers from different peer-reviewed journals published between 1981 and 2021.

One of the key factors provided was technology capabilities, which supplied unique factors perceived by faculty as influencing the success of technology integration in the existing curriculum ([Stec et al., 2020](#)). Accounting professionals believe that accounting graduates should focus on lifelong learning, particularly in terms of developing IT practical skills. Universities must therefore incorporate numerous accounting software and simulations appropriate to the Industry 4.0 environment into their CA programs ([Ghani and Muhammad, 2019](#)). [Wells \(2018\)](#) found that little attention has been given to prerequisites in the curriculum such as basic technical skills which are required for the changing role of accountants. The study has mainly focused on the broad concepts of CA in educational institutions across the GCC, the level of adoption of CAE in the educational institutions in the GCC and identifying various software programs used to teach CA courses in the GCC. To find out the answer to those research questions, the author has inspired to investigate the broad areas of CAE via an SLR.

Accordingly, the results of the questions are summarized in the following:

- (1) Offering CA courses by educational institutions should first match the CA syllabus with the commonly used accounting software by organizations and accounting service providers in the country.
- (2) Because organizations in a given country use variety of accounting ERP software programs, educational institutions should select at least two licensed versions of such software programs commonly used by organizations and accounting service providers in that country.
- (3) Educational institutions should determine the appropriate prerequisite course(s) to ensure students' basic conceptual knowledge in accounting.
- (4) The educational institutions should ensure that adequate skills in Microsoft Excel have been acquired by the students before selecting the course, CA.

The study's summary results are depicted in [Figure 2](#).

The synthesis of the study results showed potentially constructive opportunities for future research on CAE, a software program used to deliver the course CA in HEIs' transformation.

The findings of the study show that research on CAE in the GCC countries is still scant. We call on researchers to devote their time to investigating to understand CAE in HEIs in the GCC countries. This call may as well widen the growing importance of accounting scholars in countries like Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE.

Finally, through all reviews of literature, the findings are restricted to the choices made relating to the scope and limits of the data examined and the understanding of the results, which may possibly be subjective on a few occasions. We have selected to restrict our analysis and results (because of the lack of related studies in the GCC) to international peer-

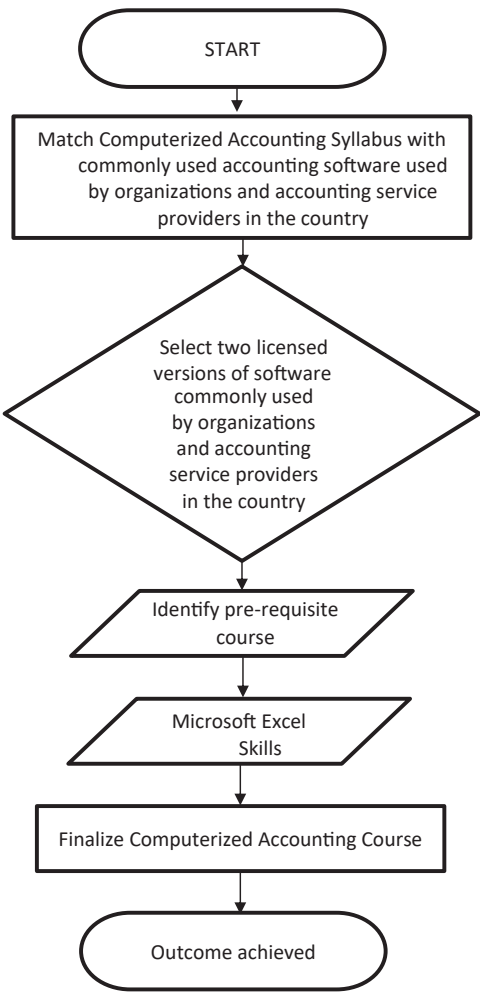


Figure 2.
Development flow of
computerized
accounting courses

reviewed journals listed in ABDC (Australian Business Deans Council) rankings in the study period between 1981 and 2021. Future research should enhance and update our research results by exploring beyond 2021. Even though the SLR methodology employed in the current study provides more reliable results than unstructured literature reviews, it may possibly be contended that researchers applying an SLR could interpret their findings differently.

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Corresponding author

Mohammed Muneerali Thottoli can be contacted at: muneerali@unizwa.edu.om

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