Does digital curriculum mapping improve curriculum alignment?

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Abstract. Curriculum alignment is a trending issue in the world of both general and vocational education because it is closely related to the goals of the curricula and educational institutions. One of the educational innovations in developing a curriculum is curriculum mapping. It can be used to measure curriculum alignment. Optimizing technology utilization creates a digital curriculum mapping that can be used to describe curriculum design, and ensure effective learning. This article aimed to explore the implementation of curriculum mapping and examine the technology used in developing digital curriculum mapping in an effort to improve curriculum alignment. The method used was effective literature review. The results showed that curriculum mapping was implemented in various disciplines, which includes technology, health, information libraries, accounting business, natural sciences, teacher education, computer science, social education, and agriculture. Technology that could be used in digital curriculum mapping development is diverse. It is adjusted to the needs of the institution, for instance web-based license forms, online mapping tools, electronic curriculum management systems, and software. Digital curriculum mapping affected students work readniness and was found to be good if implemented in vocational education.

1. Introduction

Vocational curriculum alignment intended to satisfy labor market needs is still a challenge for most developing countries [1]. Vocational education is regarded as very effective in preparing human resources to meet the needs of the labor market [2]. According to Indonesia Central Statistics Bureau (BPS), unemployment of vocational high schools' graduates is very high (8.92%) compared to unemployment of general high school graduates (BPS, 2018). This showed that the 2016 Presidential decree concerned with the revitalization of vocational schools in order to prepare graduates who are productive in industry and world of business is still to bear intended fruits [3]. Strengthening and effecting curriculum alignment amongst government, schools, industry and society could provide a solution that can overcome vocational unemployment [4].

Curriculum alignment is the best practice in the development and implementation of the curriculum[5] because it requires a strong relationship between goals with assessment, objectives with instructional activities, and assessment with instructional activities [6]. One of the procedures used to determine curriculum alignment is curriculum mapping [7]. Curriculum mapping is highlighted in current curriculum innovations as a counterweight in facing global competition [8]. Curriculum mapping is used to develop, review, improve and perfect an integrated curriculum [9], including curriculum alignment [10][11][5].

Most curriculum mapping come in the form of graphic illustrations consisting of tables or matrices (Schweitzer, 2017). In addition, software usage is at the disposal many higher education when it comes to the independent development of curriculum mapping [8]. Optimizing the use of technology in developing curriculum mapping is aimed to transform the curriculum into a more efficient procedure, that is when gathering operational data and / or making it more transparent to stakeholders. Curriculum mapping is considered capable of helping teachers, students, or parents, as well as other relevant stakeholders to obtain a more comprehensive understanding of the written curriculum, its implementation, and its outcomes. This article explored the implementation of curriculum mapping and examined the technology that could be used in developing a digital curriculum mapping in an effort to improve curriculum alignment.

2. Method

The method that was used is the effective literature review [12] with a systematic data approach consisting of three stages namely, literature collection and filtering, processing and output. The first stage was concerned with the related key issues and the literature collection process. The key words used are curriculum, curriculum alignment, curriculum mapping, and digital curriculum mapping. The main search engines used are Science Direct, Elsivier, Springer, Taylor & Francis as well as Google Scholar. The second stage consisted of know the literature, comprehend the literature, apply, analyze, synthesize, and evaluate. Following literature review was the provision of an overview of the argumentation theory and provision of logical writing arguments.

3. Results and Discussions

3.1. Curriculum Alignment

Curriculum alignment is invaluable for the realization of learning goals [11], because it connects goals with assessment, objectives with instructional activities, assessment with instructional activities [6]. Vocational schools, like any other school should have an excellently aligned curriculum where all subjects are taught as per the needs of the industry so that they can answer the demands of the local or global economy [4]. Curriculum alignment is also the goal of curriculum development meant to ensure that the curriculum structure and related components are aligned with the objectives of the institution and should reflect set standards [5].

The traditional method used to evaluate curriculum alignment involves a thorough review of related documents. Curriculum mapping is used to describe the achievement of learning objectives and it is also used to ensure curriculum alignment that is from planning, implementation, and evaluation of outcomes of ongoing learning. The results of the literature search showed that one of the objectives of developing curriculum mapping is to enhance curriculum alignment [13][11] [14][10] [15].

3.2. Curriculum Mapping

Many benefits are gained from the implementation of curriculum mapping in learning, for instance identification of unachieved learning goals and/ or overlaps [16], systematic evaluation of learning components [17], monitoring educational quality, development of goal-oriented curriculum, data sharing, and review of curriculum alignment [18]. In addition, curriculum mapping is also used to document, align, visualize and assess curricular data, such as learning outcomes, assessment materials, instructional techniques, and students' pre-and post-test scores [19].

The disciplines that have so far implemented curriculum mapping include technology [20][21][22][23] [24], health [14][25][26], library and information [7][17][27], accounting business, natural science [28] [29], teacher education [30], computer science [31], social work education [15], and agriculture [32].

3.3. Digital Curriculum Mapping

Digital curriculum mapping can describe curriculum design so that it can be used to guide students towards further study, ensure effective learning in each learning context, and can show clear or focused learning routes meant to ensure work readiness [8]. Digital forms that can be used for curriculum mapping, includes web-based forms [18] [10], online mapping tool [11][19], electronic curriculum management system [9], and software [1][7][13][17][21][27]. The content of digital curriculum mapping varies and the purpose of developing digital curriculum mapping should be tailored to the needs of each institution.

4. Conclusion

Curriculum mapping can be used in curriculum alignment so as to ensure work readiness by the students. Curriculum mapping had been implemented in various scientific disciplines namely technology, health, information libraries, accounting business, natural sciences, teacher education, computer science, social education, and agriculture. Technology utilization in digital curriculum mapping development varies and should be tailored to the needs of specific institution, for example, web-based license forms, online mapping tools, electronic curriculum management systems, and special software. This research contributes information for further research related to the development of digital curriculum mapping in vocational education.

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