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Curriculum: A Brief Focus on Construction Management

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Abstract: Curriculum is an important part of formal education and training, albeit for general learning programmes. Although it is usually considered during the design phase for any programme, its interconnected nature between curriculum and other elements was arguably being misunderstood. This was apparent especially for greenhorn individuals/organisations that were newly involved in any programme development. Thus, this paper reviews the underlying concept and elements of the curriculum and further focuses on construction management programme development as a point of interest. Past selected manuscripts were taken based on two keywords, i.e. curriculum and construction management. In a nutshell, the development process for any programme needs to have clear and concise targeted goals. This was followed by the expected learning outcomes for a particular curriculum. Nevertheless, synergetic supports from essential stakeholders from the beginning of programme development are inevitable to ensure its effectiveness.

Keywords: Curriculum, Construction Management, Malaysia

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1. Introduction

The Cambridge Advanced Learner's Dictionary (Third Edition) exemplified that curricular or curriculum is "a group of subjects studied in a school, college, etc." [1]. The initial meaning seems clear and widely used by most the researchers associate the "curriculum" term directly with subjects being taught in the university. Though, according to the professionals related to that specific area, the curriculum is more than just a group of subjects. Therefore, a culmination of views from [2-8] will be discussed in order to conceptualize the particular meaning as a whole. Finally, a brief focus on construction management program is presented – pertaining to the subject in hand.

2. What Is Curriculum?

"Curriculum" is originated from a Latin word which means "a running/race/course/lap around the track". According to Egan, those meanings posed unmistakable questions such as "how long does it takes?" and "what are the obstacles?" [2]. Further, those questions unveiled another perspective in relation to modern/intelligent curriculum connotation which are quite similar; "how long does it take to complete the course?" and "what is the contents of the course?". Additionally, [2] discussed deeply in his paper on the evolution of curriculum which is above the context of this writing before summarizing a conclusion that curriculum is "the study of any and all educational phenomena that produce knowledge which may have educational value" [2]. Thus, it is realized that a curriculum is not just an educational tool which only associated with subjects in a particular course, but it is more than that.

Furthermore, quite a same deliberation was postulated by other researchers including [3,4,6]. They stressed that curriculum consists of several important elements and those elements need to be united together in order to have a holistic curriculum perspective. Originated from pedagogical model improvement, Universidad de Medellín states that curriculum is represented as "the selection, systematization, record, and projection of culture" [3]. Culture in their sense is the transformation of knowledge through educational program to enhance the society, where knowledge is described as fixed but the educational program (i.e. curriculum) is flexible in order to cater for different circumstances. Moreover, because of the wideness of curriculum scope, [3] tabulated a table consists of several important levels which being implemented by the Universidad de Medellín [3] as shown in **Table 1.**

Table 1: Analysis table of curriculum components for Universidad de Medellín [3]

Classification(s)	Level(s)	Conformation(s)
Macro-curriculum	Universal	**Institutional Education Program (PEI)** • Foundation act • Slogan "Science and Freedom" • Purposes and principles • Pedagogical Model • Curricular structure **Guideline for each program** • Foundation Act • Mission, vision, and values • Purposes and principles • Pedagogical model • Curricular structure design • Glossary of curricular structure concept • Objective of the program • Relation of the program with PEI
Meso-curriculum	Particular	• Formation problems • Formation purpose • Curricular Organization Units (COU) • Plan of formation

Micro-curriculum	Singular	• Object of study • Problem related to the object of study • Concepts: basics, laws, principles, theories, schools, methods, techniques, processes, systems, etc. • Formation purposes • Methods • Methodology: didactic strategies • Evaluation • Bibliography

On the other hand, Waluyo described a curriculum as a human/animal organism that has a particular arrangement of anatomies which interrelated with each other [4]. He portrayed the important components of anatomy from the whole body of the curriculum as purpose, content/matter, process/delivery system, media/medium of delivery, and evaluation as shown in **Figure 1.** In addition, what is described by Waluyo seems to be a process needed to be done in order to have a holistic curriculum development, starting from the process of determining the purpose to embark on a curriculum venture and end up with an evaluation process in order to have a comprehensive cycle. Thus, **Table 2** explains on the important components of the curriculum individually according to Waluyo's point of view.

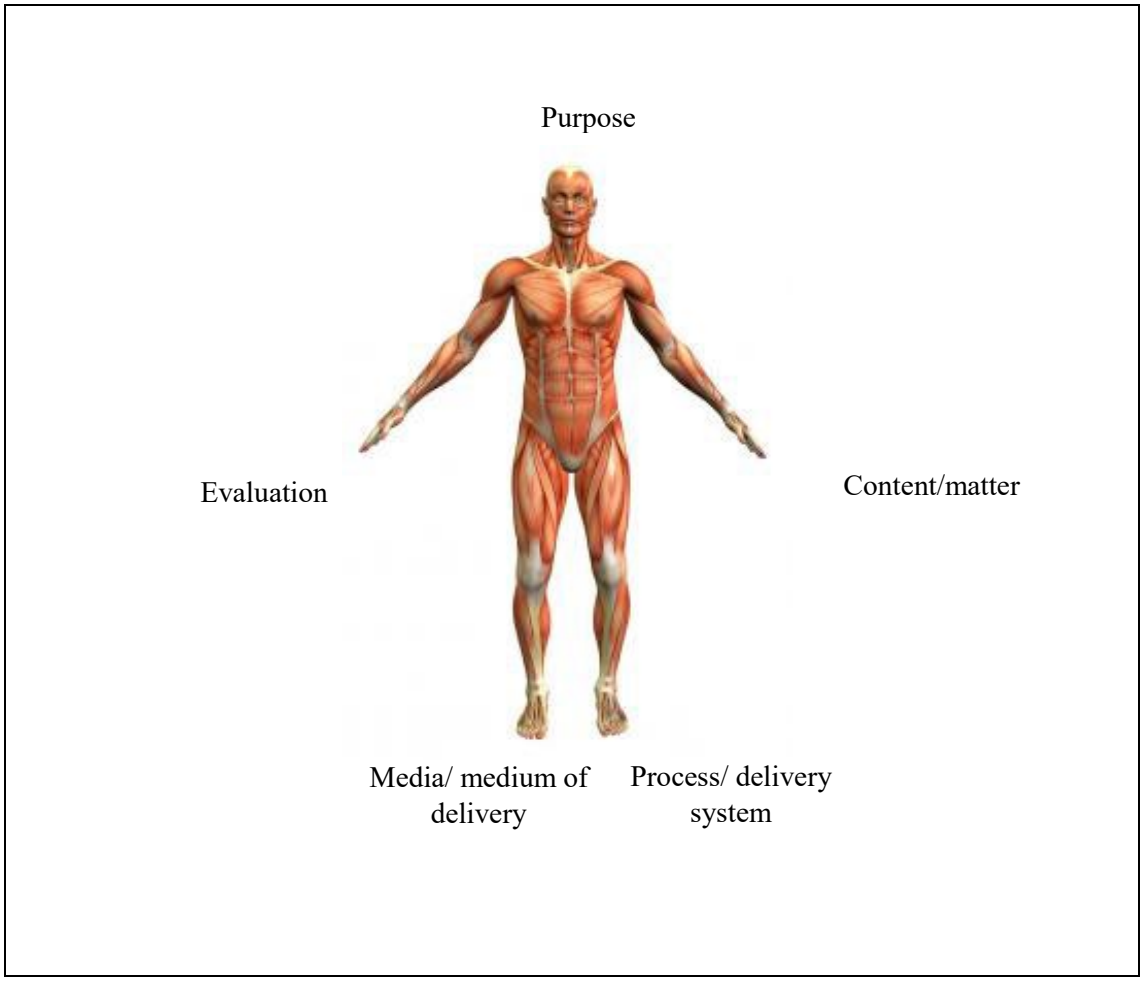

Figure 1: Important components of curriculum as portrayed by [4]

Table 2: Explanations on the important components of the curriculum by [4]

No.	Components	Details
1	Purpose	• According to [9] there are three categories of teaching purposes which is suitable for individual behavior: 1. Cognitive domain (refer to intellectual capability, i.e. knowledge) 2. Affective domain (refer to feelings, emotions, and behavior, i.e. attitude) 3. Psychomotor domain (refer to manual and physical skills, i.e. skills).
2	Content/ matter	• To achieve the selected purposes, the development of the contents of study must be in place. • Usually, the particular content comes from a broad field of study where it will be discussed and divided into a number of appropriate topics. • Though, the content development should follow several requirements from appropriate parties and other educational needs.
3	Process/ delivery system	• There are several strategies in delivery system according to [10, 11]: 1. Reception Learning – Discovery Learning; in reception learning, all of the teaching materials will be delivered to student in a finish form, either verbal or written. Contrast to discovery learning strategies, students need to undertake a number of information gathered activities, make comparison, categorizing, analysis, integration, organizing the materials, and make a few conclusions. 2. Rote Learning – Meaningful Learning; in rote learning, students just need to memorize the teaching materials given. But it is the other way round for meaningful learning where students need to prioritize on the underlying meaning of the particular teaching materials. 3. Group Learning – Individual Learning; by implementing discovery type of learning, students may learn individually or through small batch of groups.
4	Media/ Medium of delivery	• Medium of delivery refers to teaching tools prepared by educators which are able to stimulate and boost the students' learning. • [12] developed a "Cone of Experience" as in **Figure 2**.

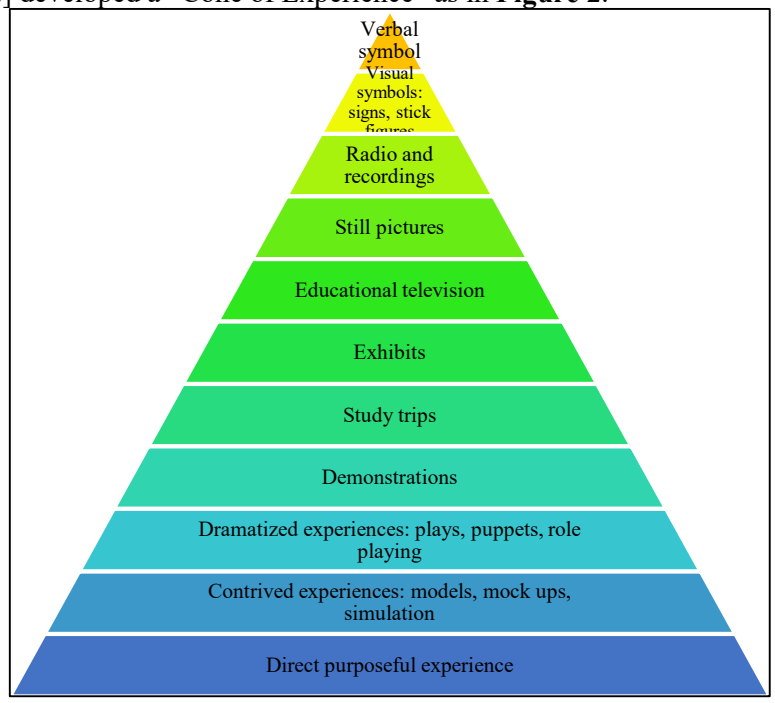

Figure 2: Dale's Cone of Experience [4]

- Whereas, [13] uttered five types of deliveries along with its specific tools which are not very different with Dale's **(Table 3).**

Table 3 - Medium of deliveries according to [13] in [4]

No.	Mediums	Tools
1	Written words	Books, projectors, posters, checklists.
2	Oral words	Educators itself, voice recording materials.
3	Picture and oral words	Slides with voice, audio video materials, lecture and poster.
4	Moving picture, words and other voices	Moving films, television, and demonstration.
5	Theoretical concepts through pictures	Moving films, models, and puppets.

5 Evaluation

- In order to measure the successfulness of the overall curriculum development process, an assessment need to be in place.
- Every teaching activity (including the purpose of teaching and the delivery systems) possess an output which is measurable.
- Thus, evaluation process is needed in order to improvise the existing curriculum.

3. Curriculum Development and Construction Management

Previous study [4] added that a curriculum also needs to have a certain suitability or relevancy in two aspects; which is easy to understand by **Figure 3** . It is undeniable that before any curriculum development takes place, there are several important factors need to be complied. Cotgrave et. al. stressed on the involvement of different stakeholders including the Government, the industry leaders, and the academia as well; precede the whole process [5]. Those stakeholders are the prime information supplier in determining the current needs and demands, along with giving an overviews of general and required conditions to cater for societal change and development.

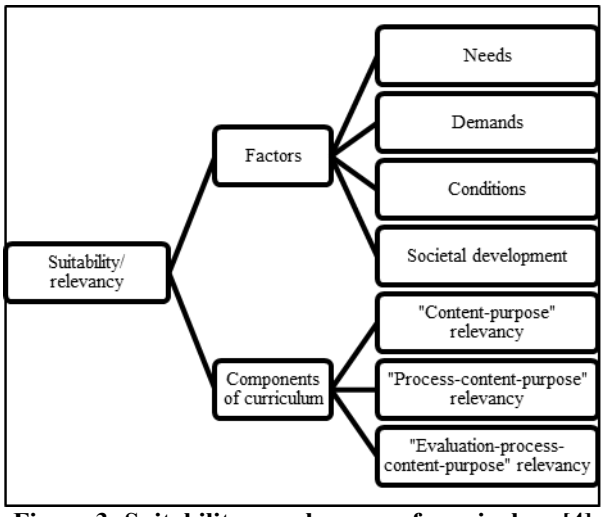

Figure 3: Suitability or relevancy of curriculum [4]

Additionally, [6] who studied on construction management curriculum also highlighted the works of [14] regarding the development of curriculum which is not very different with the previous important components of the curriculum. **Figure 4** explained on the process in four consecutive principles. Further, McDaniel developed an integrated curriculum model comprised of curriculum development, instructional design, and program evaluation as can be seen on **Figure 5.** Specifically, on the curriculum development phase, [6] implying the job competency identification process which became the basis of the subsequent phases.

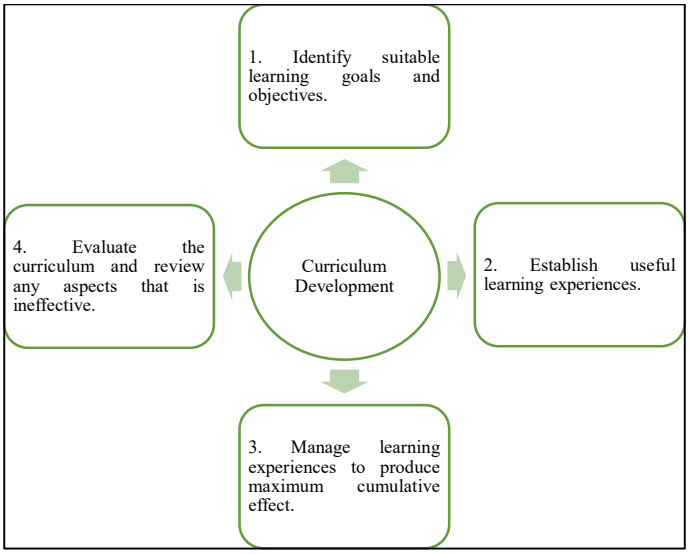

Figure 4: Tyler's fundamental principles in developing curriculum [6]

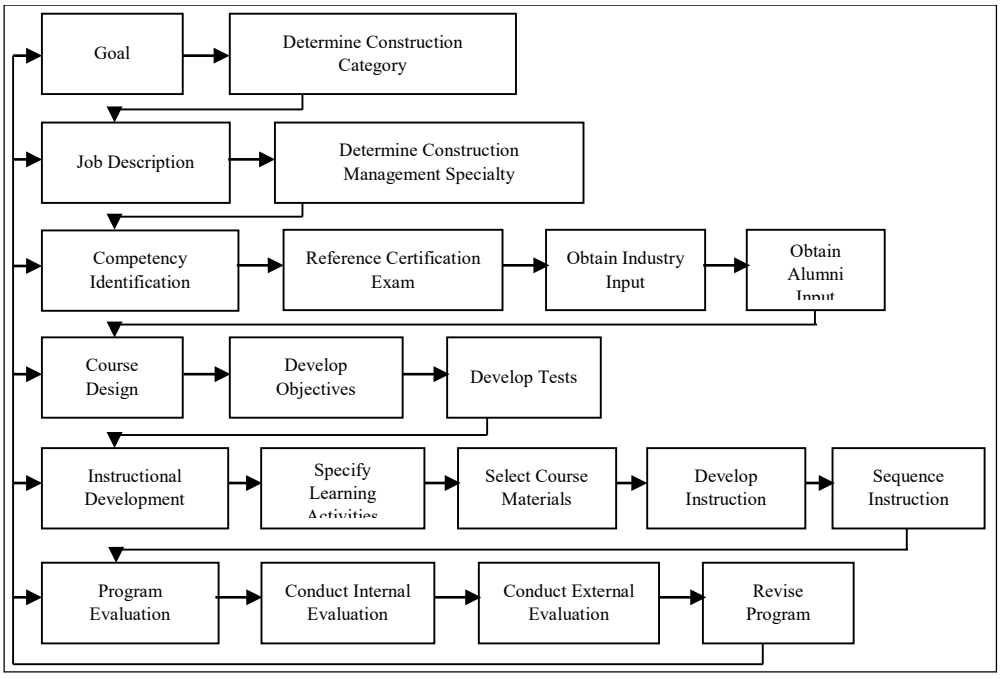

Figure 5: McDaniels's Construction Management Integrated Curriculum Model [6]

Consequently, based on the findings by [3,4,6] the underlying components or elements beneath the curriculum is fairly similar. Although [3] divided curriculum into several classifications (macro, meso, and micro), while [4] described curriculum as a human/animal organism, and [6] with his Integrated Curriculum Model; the critical components is still the same. In a nut shell, curriculum encompass goals/objectives, contents, delivery systems, and evaluations.

4. Lesson Learned

As the saying goes, the first step is always the hardest one. In curriculum design, quite a number of researchers uttered a quite similar concern on the goals or objectives construct. By referring to the works of Cotgrave et. al., McDaniel, Adcox Jr., and Hauck on the curriculum development for construction management, all of them agreed that the targeted goals or objectives must be concise [5][6][7][8]. Adcox Jr. stated four main reasons as follows [7]:

> *"**First,** without a clear understanding of the intended learner outcomes for a course, the selection of the teaching methodology, instructional materials, evaluation of learners, and course duration has no logical basis for implementation.*
>
> ***Second,** the learner needs to understand the purpose of the course, the final expectations of the course, the system used in evaluation (grades), so they will be able to organize their efforts for the course.*
>
> ***Third**, without clearly knowing what the learner's final expectations are, any test or examination developed by the instructor may be misleading and unfair.*
>
> *And **fourth,** the main reason relates to the instructor's ability to organize the course to impart their intended educational purpose." [7]*

Therefore, besides the initial focus on the Bloom's Taxonomy to determine a suitable purpose of curriculum, collectively all of the researchers mentioned above were acknowledged on the importance of determining the expected learning outcomes for a particular curriculum [5-8]. [15], [16], and as well as [17] also shared the same thought [5]. Moreover, according to Hauck, Colorado State University (CSU) were incorporate a comprehensive list of desired learning outcomes as a starting point during a curriculum reformation, and not from a list of course titles [8].

However, an achievable learning outcome will not just appear "out of the blue" without any support from various stakeholders (i.e. the government, the industry players, the academia, and so on) [5][6]. In fact, [6] stressed on the competency identifications where the input comes from the appropriate stakeholders (as can be seen on **Figure 5**) [6]. Hence, the identified competency will eventually act as guidance on the construction of comprehensive learning outcomes, where students were expected to be competent in their fields upon graduation.

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