The Effectiveness of Entrepreneurship Building Development in Wates Campus, Yogyakarta State University

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Abstract. Various developments of facilities and infrastructure have been carried out by Yogyakarta State University including the development of Vocational Campus in Wates-Kulon Progo, one of them is the Entrepreneurship Building. The development of Entrepreneurship Building in Wates campus is divided into 3 stages, from 2019 until 2021. The purpose of this study was to determine the effectiveness of Entrepreneurship Building Development in Wates campus when viewed in terms of cost perspective and terms of time. The method used in this study is comparative analysis and the comparison results are tabulated and analysed descriptively. The results of the study show that the implementation of the construction for the Entrepreneurship Building in Wates campus when viewed in terms of cost perspective during 2019-2021 period is estimated total budget of IDR 43 billion, meanwhile, if the construction is carried out in one year of work to completion, it is estimated total budget of IDR 36 billion, the percentage of difference as much as 15.625%. The development of Entrepreneurship Building in Wates campus when viewed in terms of time perspective during 2019-2021 is estimated to require 330 work days, meanwhile, if the construction is carried out in one year of work to completion, it is estimated that it will require 270 work days, the percentage of difference as much as 18.182%. Based on the results of the study, the implementation of the entrepreneurship building with multi years construction project is inefficient because there is a gap in cost and time comparing to a single year, especially for the pre-construction and additional work items that appear each year of construction (multi years).

1. Introduction

Yogyakarta State University has a strong commitment to develop and strengthen vocational education as listed in one of the university's missions, i.e., "Organizing academic, professional, and vocational education in competitive, creative and innovative fields of non-education to produce pious, independent and intellectual human beings." [1]. Based on the Regulation of the Minister of Research, Technology and Higher Education Number 35 of 2017, YSU is considered as a state university that provides academic, vocational, and professional education in various scientific and/or technology clusters [2]. The concrete manifestation of this commitment is the development of the vocational campus in Wates and Gunungkidul districts according to the Strategic Plan of YSU in 2020-2025. [1] [3].
To realize the above mission, YSU has started the construction of an entrepreneurship building in Wates and it is expected to be completed in 2021. The concept of the building is combining workshop and entrepreneurship to exhibit and market students’ creative products. This entrepreneurship building has also been adjusted to the superior products of each study program of YSU. Also, the building is designed to provide a service area, such as a hotel on the 3rd and 4th floors to promote the products of the Culinary Technology Study Program in meeting the potential users.
In general, the design stages of the building are divided into 6 (six) including 1) preparatory work, 2) structural work, 3) architectural work, 4) electrical work, 5) mechanical work, and 6) landscape work. These work components contain different loads ranging from the smallest portion of 0.166% in the preparatory stage to the largest percentage of 31.711% in architectural work.

The regulation from the Minister of Public Works and Public Housing Number 28 of 2016 on the analysis guidelines of unit prices in the public works sector shows that the direct cost component consists of labor, materials, and tools, while the indirect costs include the general cost and profit with the maximum value of 15% if added. The construction process of the entrepreneurship building in Wates is done in several stages including the preparation and the structural work (foundation). In 2020 and 2021, it focuses on the preparatory work, structural work, architectural work, electrical work, mechanical work, and landscape work. These conditions stimulate three times of financing for the preparation, and two times for the landscape work component. It indicates an inefficiency on the multi years construction project. Reviewing the Regulation of the Minister of Public Works and Public Housing Number 28 of 2016 concerning Analysis Guidelines of Unit Prices for Public Works, every construction work must obtain a component of preparatory work for mobilizing tools and workers.

2. Methodology
The approach used in this study is a comparative analysis by comparing the total costs and the required time during the construction of the entrepreneurship building in the YSU Wates Campus, Kulon Progo through 3 stages (multi years) in 2019-2021 and one stage/single year. The comparisons referred to the applicable regulations, such as the Regulation of the Minister of Public Works and Public Housing Number 28/PRT/M of 2016 on Analysis Guidelines of Unit Prices for Public Works, the Regulation of the Minister of Public Works and Public Housing Number 22/PRT/M of 2018 on the Construction of State Buildings, the Decree of the Head of the Construction Services Development Center for the Public Works, Housing and Energy of Mineral Resources of Special Region of Yogyakarta Number 188/00175 concerning Unit Prices for Building Materials in 2020, and the Regulation Number 30 of 2019 in Kulon Progo Regency concerning the Standardization of Goods Prices and the Services for the Fiscal Year 2020. The comparison results were tabulated and analyzed descriptively.
3. Result and Discussion

The cost of the work packages that have been implemented in 2019 and 2020 for the construction of the entrepreneurship building in the YSU Wates Campus was IDR 5,280,000,000.00 and IDR 26,399,000,000.00. The value is different because in the first year (2019) the focus of work is on the structure for the foundation, while the second year (2020) is to complete the main structure on the 1st and 2nd floors. In the third year (2021), the focus is the completion of all building components for the 3rd and 4th floors. The construction of the entrepreneurship building in the YSU Wates Campus is done in multi years with three (3x) work components that must be allocated for the preparatory work. In the multi-year development approach, it is possible that the second-year maintenance period (2020) will be less than optimal because there is an overlap of work items in the third year (2021). The percentage of the work component for multi years in 2019-2021 presented in Table 1 and Table 2 for a single year.

![Flowchart](image_url)
Table 1. The Percentage of the Work Component for Multi Years in 2019-2021

| No | Components            | Percentage (%) | Information               |
|----|-----------------------|----------------|---------------------------|
|    |                       | 2019           | 2020          | 2021          |
| 1  | Preparation Work     | 1,256          | 0,243         | 0,325         | -             |
| 2  | Structural Work       | 98,744         | 27,971        | 18,647        | Fondation Work in 2019 |
| 3  | Architectural Work    | -              | 29,128        | 32,324        | -             |
| 4  | Electrical Work       | -              | 11,079        | 19,704        | -             |
| 5  | Mechanical Work       | -              | 25,677        | 21,568        | -             |
| 6  | Landscape Work        | -              | 5,904         | 7,432         | -             |
|    | Total Cost (IDR, in  | 5,280          | 26.399        | 11.321        |               |
|    | million)              |                |               |               |               |

Table 2 The Percentage of the Work Component for a Single Year

| No | Components            | Percentage (%) |
|----|-----------------------|----------------|
| 1  | Preparation Work     | 0,166          |
| 2  | Structural Work       | 28,243         |
| 3  | Architectural Work    | 31,711         |
| 4  | Electrical Work       | 8,696          |
| 5  | Mechanical Work       | 26,715         |
| 6  | Landscape Work        | 4,47           |
|    | Total Cost (IDR, in  | 36,061         |
|    | million)              |                |

Based on the Table above, it can be explained that the total construction with a single year basis is IDR 36,061,000,000.00. Meanwhile, the multi years in 2019-2021 spend IDR 43,000,000,000.00 because the preparatory work must be allocated each year in the multi-year project stage. Moreover, the additional work items (CCO) may appear every time so that it increases the workloads due to the poor cut of planning data within multi years project model [7][8]. Another weakness of multi-year construction project is that the user cannot directly test the function of the building related to the mechanical and the electrical work items when it is not 100% complete. The gap of the total cost between the multi-year construction project and the single year is approximately 15.625%.
Figure 5. a) The Difference in the Value for the Construction of the Entrepreneurship Building in Campus Wates, YSU; b) The Difference in the Time for the Construction of the Entrepreneurship Building in Campus Wates, YSU

Based on the picture above, it can be seen that the time difference for the construction of the entrepreneurship building in the Campus Wates, YSU with a single year is 330 calendar days comparing to 270 days of multi years in 2019-2021. It means that the time difference is approximately 18.182% due to the component of preparatory work in the multi year construction project. Besides, the field adjustment relatively takes a long period.

Reviewing the results above, it is clear that the concept of construction work for other buildings should be ideally done in a single year as long as YSU still has sufficient funds allocation. The advantages of a single year construction project are minimizing miss matches in the planning stage, saving costs and time, enabling complete test related to building functions, and optimizing the maintenance period by the contractor.

4. Conclusions

The results of the study show that the implementation of the construction for the entrepreneurship building in the Campus Wates, YSU in terms of costs during the 2019-2021 development period will spend a total budget of IDR 43 billion. In fact, if the construction is carried out in a single year construction project, it is estimated a total budget of IDR 36 billion. It shows the gap of 15.625% for the total budget. Moreover, the time difference for the construction of the entrepreneurship building in the Campus Wates, YSU with the single year is 330 calendar days comparing to 270 days of the multi years in 2019-2021 (18.182% of the time difference). Based on the results of the study, the implementation of the entrepreneurship building with multi years construction project is inefficient because there is a gap in cost and time comparing to a single year, especially for the pre-construction and additional work items that appear each year of construction (multi years).

5. References

[1] Minister of Research, Technology and Higher Education 2017 Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi Nomor 35 Tahun 2017 tentang Statuta Universitas Negeri Yogyakarta. Jakarta.

[2] Yogyakarta State University 2020 Detail Engineering Design of the Entrepreneurship Building in Campus Wates, YSU. Daerah Istimewa Yogyakarta.

[3] Yogyakarta State University 2020 The Focus of the Strategic Plan of YSU in 2020-2025. Daerah
Istimewa Yogyakarta.

[4] Minister of Public Works and Public Housing 2016 *Regulation of the Minister of Public Works and Public Housing Number 28/PRT/M of 2016 on Analysis Guidelines of Unit Prices for Public Works.* Jakarta.

[5] Minister of Public Works and Public Housing 2018 *Regulation of the Minister of Public Works and Public Housing Number 22/PRT/M of 2018 on the Construction of State Buildings.* Jakarta.

[6] Dinas Pekerjaan Umum, Perumahan dan Energi Sumber Daya Mineral DIY 2020 *Decree of the Head of the Construction Services Development Center for the Public Works, Housing and Energy of Mineral Resources of Special Region of Yogyakarta Number 188/00175 concerning Unit Prices for Building Materials in 2020.* Daerah Istimewa Yogyakarta.

[7] Regent of Kulon Progo 2019 *Regulation Number 30 of 2019 in Kulon Progo Regency concerning the Standardization of Goods Prices and the Services for the Fiscal Year 2020.* Daerah Istimewa Yogyakarta.

[8] G N I P Pratama, and H F Najihan 2020 The Effect of Beach Sands to Replacement of Fine Aggregate with Addition Filler of Ash Cane on the Asphalt Mixture on Marshall Characteristics. *In J. of Physics: Conference Series,* September Vol. 1625 (1), pp. 012032. IOP Publishing.