

**Justification of the Entrepreneurial Ability of Individuals with Special
Needs on the MSME Scale Based on the CDIO Framework
(Case at the Jakarta State Polytechnic)**

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Abstract

This study aims to explore the CDIO educational framework within the context of vocational education to prepare graduates with special needs for the workforce. The background underscores the significance of the disability issue in contemporary discourse, emphasizing the need for improved awareness and application of existing regulations. The research methodology employed a descriptive approach with data collected through literature review and expert interviews. Preliminary findings indicate that graduates engaged in the CDIO framework are expected to achieve proficiency levels ranging from 3 to 4, demonstrating potential in adequately preparing them to meet workforce standards. In conclusion, the CDIO framework shows promise as an effective approach to enhancing vocational education preparedness for individuals with special needs, highlighting the importance of inclusive and relevant education in addressing current job market challenges.

Keywords: CDIO, Disability, Law, Vocational.

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INTRODUCTION

Persons with disabilities have equal rights with others (Hendriks, 2007). Even so, discrimination is still often felt because they are considered not independent. In order to achieve independence, people with disabilities do work to meet the needs of life and improve social skills (Raudeliunaite & Gudžinskienė, 2017). The lack of availability of jobs for people with disabilities makes people with disabilities prefer to work in the business sector (Kitching, 2014). The existence of law no. 8 of 2006 makes people with disabilities guaranteed to be able to work in a company (Wicaksono, 2019). This is a challenge for people with disabilities because they must be able to adapt to the work environment. For those who are not used to it, meeting new people is certainly not an easy thing. Discrimination that has been felt by people with disabilities can certainly hinder the process of self-adjustment. Therefore, social workers also have an obligation to increase the capacity of their resources in overcoming the problems

faced and connecting the resources around them to help overcome problems. One way to overcome this problem is through a change in the learning paradigm for individuals with special needs, namely by continuing their education to the most optimal level possible.

In the world of higher education, education for citizens with special needs is also held, both at the academic and vocational education levels (Bottoms, 1992; Clarke & Winch, 2012). In vocational education, one of the organizers of Education for Citizens with Special Needs is the Jakarta State Polytechnic. In the world of education itself, in order to obtain quality graduates, it is necessary to prepare a good curriculum. In the learning process or lecture activities, it is necessary to have a concept of activity in its implementation, one of the basics of the learning process is project-based learning or what is commonly called Project Based Learning (PBL) (Anazifa & Djukri, 2017; Kokotsaki et al., 2016; Tamim & Grant, 2013). In this PBL, of course, it is also wrong to need a framework to support its implementation, one of the supporting frameworks for this PBL is to use the CDIO Framework (E. Crawley et al., 2007). CDIO is a framework for a project-based learning and education system to produce graduates who are modern professionals.

CDIO aims to educate students to be able to become graduates who understand and are able to practice in depth the field of knowledge they choose during college, and also of course equipped with a high sense of curiosity so that they are willing and able to continue to update their theoretical and practical knowledge through research and service activities. This ability is mainly to help equip our graduates to face the VUCA era using their skills, knowledge, and attitude added to the X-factor. CDIO is also designed based on the needs of the environment through a survey of the expectations of graduates' proficiency levels (Armstrong & Niewoehner, 2008; Bankel et al., 2003; E. F. Crawley et al., 2014). The environment referred to here is the industry that uses graduates, academics, active students, new graduates (1-5 years), and old graduates (>5 years). This information is needed to determine the extent to which graduates are expected to have proficiency against the frameworks described in the CDIO framework (E. Crawley et al., 2007). This research indirectly aims to identify as a university graduate who is an individual with special needs to know the extent of the quality that must be possessed if based on the CDIO framework, especially if this graduate is difficult to enter the world of work and try to enter the world of entrepreneurship.

RESEARCH METHODS

To get a deeper understanding of the problem, data collection is carried out with illustrations as shown in figure 2.

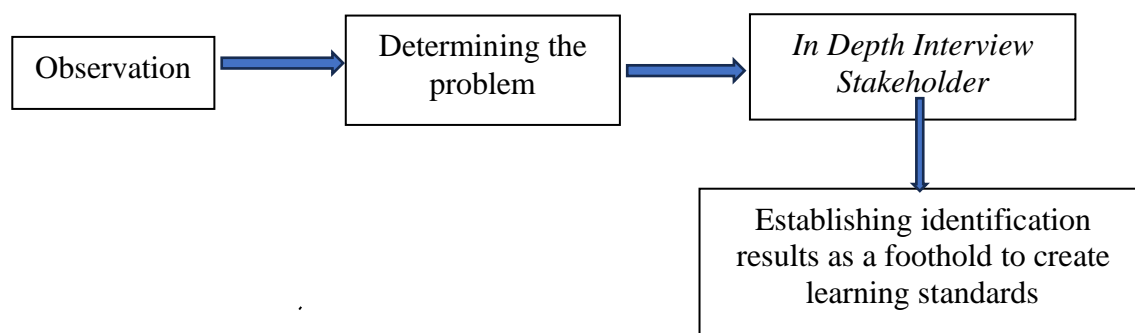


Figure 1. Data Collection Diagram

1. **Observation**
Observations were made by observing regulations, the framework of the CDIO learning model, and also the conditions of the workforce with special needs that can be absorbed by the labor market. Observation was carried out for approximately 1 month from the beginning of the observation activity
2. **Determining the Problem**
From the results of observations, questions arise that identify problems that can be used as material for interviews with stakeholders
3. **In-Depth Interview Stakeholder**
After the team can determine the problem, the next step is to discuss it with the parties involved. These parties come from several representatives of MSME entrepreneurs, academics who apply the CDIO framework as their educational framework, and also practitioners of Special Needs Citizen educators. This interview uses guidelines derived from the adaptation of problems containing points from Law No. 8 of 2016, as well as CDIO frameworks in the form of Standards, Syllabus, and Assessments. This interview takes approximately from March to August 2023, because it adjusts to the time that the respondents have, which of course, varies due to their respective busyness.
4. **Establishing identification results**
After the discussion, several inputs were finally obtained in the form of what standards must be met by workers with special needs if referring to the CDIO Syllabus with the CDIO assessment standards. After that, the standards obtained are given justification in accordance with the existing syllabus. The results of this justification can then be a reference for educators of prospective workers with special needs to the extent to which the graduate standards should be produced to meet the standards needed in the industry.

RESULT AND DISCUSSION

Along with the times, increasing the role of people with disabilities in the economy and national development is very important to pay attention to. As part of Indonesian citizens, it is appropriate for people with disabilities to get special accommodations as an effort to protect them from vulnerability to various acts of discrimination and potential human rights violations. Persons with disabilities have the same position, rights and obligations as non-disabled people by law (Ortoleva, 2010; Pinilla-Roncancio & Rodríguez Caicedo, 2022). To realize this, the Government is increasingly intensifying in accommodating problems related to people with disabilities. This effort is also supported by the ratification of the Convention on the Rights of Persons with Disabilities which is explicitly stated in Law Number 4 of 1997 concerning Persons with Disabilities.

Over time, this law was then changed to Law Number 12 of 2011 and finally changed again to Law Number 8 of 2016 concerning Persons with Disabilities. In particular, this law provides a strong legal foundation in the struggle for equal rights for persons with disabilities (Bulo, 2020). From the results of interviews conducted with several parties who are industry

players, entrepreneurial implementers, and also teaching staff who have students with special needs, it was found that the majority of industry players still do not understand that regulations on disabled workers are already listed in the Law. However, the scope of enforcement is still on a local scale, so if this survey is applied on a wide scale, it is likely to give different results. The rights listed in the law range from the right to get a job, get decent work accommodation, and many other things listed including in the fourth part of articles 45, 46, 47, 48, and many other articles. What should receive more attention is the fourth part of article 53 which regulates the number of workers that must be in state agencies and private agencies. Then also in article 54 which regulates incentives for companies that employ workers with disabilities.

Although it has been guaranteed in the law, it does need extra effort to place workers with disabilities in the world of work. As one of the solutions, it is an option to provide provisions for students with disabilities to be able to be entrepreneurs with all their advantages and disadvantages. This quality then becomes a reference for the success or failure of an individual in his journey to become a successful entrepreneur. One of the main suppliers of labor is at the university level, one of which is vocational education. One of the most recent learning frameworks is to use the CDIO learning framework (E. Crawley et al., 2007). This framework aims to produce graduates or professional and modern personnel. CDIO aims to enable students to master scientific knowledge in depth, be at the forefront of creating and operating new products, processes or systems, and understand the importance and strategic impact of research and technology development for society. The CDIO framework approach was initially compiled through standards in the field of engineering, which consisted of:

1. *Conceive*: Generate innovative ideas to suit the needs of graduate users.
2. *Design*: Translating those ideas into prototypes
3. *Implement*: develop and test prototypes that have been created
4. *Operate*: operate, control, and maintain educational projects that have been prepared and carried out.

Although the CDIO framework was originally created for the field of engineering, over time the CDIO framework can also be used as a reference for the social sciences. CDIO has a syllabus as shown in table 1 which is a reference for the graduate needs survey and also an assessment of its lecture activities (Todolí-Signes, 2017). This syllabus then becomes the basis for assessing the extent to which the quality of graduates is needed as a workforce. Assessment standards or assessment of lecture activities are measured using the CDIO assessment scale (E. Crawley et al., 2007). The scale in the CDIO framework is similar to the likert scale at first glance, which is in the range of one to five, with the following details:

1. Number 1 (Less): graduates have experienced or been exposed to
2. Number 2 (Enough): Graduates are able to participate or contribute
3. Number 3 (Good): Graduates are able to understand and explain
4. Number 4 (Very Good): Graduates are able to practice or implement
5. Number 5 (Perfect): Graduates are able to innovate

Table 1. Quality Standards Based on Syllabus

No	CDIO Syllabus	Average Graduate Standards
	Disciplinary Knowledge and Reasoning	

1	1.1 Knowledge of Underlying Management and Sciences	3
2	1.2 Core Fundamental Management Knowledge	3,7
3	1.3 Advanced Fundamental Management Knowledge, Methods & Tools	3,3
4	1.4 Knowledge of Social Sciences & Humanities	3,5
Personal And Professional Skills and Attributes		
1	2.1 Analytic Reasoning and Problem Solving	4,3
2	2.2 Experimentation, Investigations, and Knowledge Discovery	3,3
3	2.3 System Thinking	3,7
4	2.4 Attitudes, Thought and Learning	3,3
5	2.5 Ethics, Equity and Other Responsibilities	3,7
Interpersonal Skills: Teamwork and Communication		
1	3.1 Teamwork and Collaboration	4, 3
2	3.2 Communications	4, 5
3	3.3 Communications in Foreign Languages	3
Conceiving, Designing, Implementing, And Operating Systems I n The Enterprise and Societal Context –The Innovation Process		
1	4.1 External, Societal, and Environmental Context	3, 3
2	4.2 Enterprise and Business Context	3
3	4.3 Conceiving, System Engineering and Management	3
4	4.4 Designing	3
5	4.5 Implementing	4
6	4.6 Operating	3,7

From the observation results, it was found that the average final score needed when the students graduated was 3.5. The results of this score mean that graduates as prospective entrepreneurs must be able to understand and explain what they are doing in entrepreneurship and must be able to practice these activities even though they are still with help or assistance from others. The result above the number 3 means that the graduates are not just working, they must also understand what they are doing. The maximum score in the assessment results is 4.5 which means that graduates must not only be able to practice and implement the understanding of the knowledge they have learned and what they will or are doing while entrepreneurship, but also must be able to start trying to innovate. This is in accordance with the fact that as an entrepreneur must be able to innovate so that it is especially in meeting the needs and demands of its consumers. The syllabus that got more than 4 points was in syllabus points 2.1, 3.1, 3.2, and 4.5. This means that graduates are expected to be able to communicate, cooperate, analyze conditions and find solutions if problems arise, implement the knowledge that has been gained during the lecture period (Todolí-Signes, 2017). Graduates must also be able to try to innovate in these categories.

In addition to those who get a score of more than 4, there are also those who get results close to the number 4, namely in syllabus 1.2, 1.3, 1.4, 2.2, 2.3, 2.4, 2.5 and 4.1. This syllabus contains ethics, behavior, thinking system, core scientific knowledge and also the ability to operate the activities needed in entrepreneurship (Todolí-Signes, 2017). This point close to the number 4 means that graduates in terms of ethics, behavior, thinking system, core scientific knowledge and also operational activities must be able to understand what is being done, and

have also begun to be able to apply and implement their knowledge. The main thing needed is that the graduates are able to understand it and also be able to explain what they are doing in entrepreneurship. Some of the results that are close to the number 4 are at 1.2, 2.3, 2.5, and 4.6. This entails management knowledge, systematics of thinking, ethics, and also operational activities. This means that graduates in entrepreneurship must be able to start trying harder to practice and implement in terms of management knowledge, systematics of thinking, ethics, and also the operation of entrepreneurial activities not only understanding and explaining it. The minimum point is at 3 which means that graduates are at least needed to be able to understand and explain (Todolí-Signes, 2017). The assessment syllabus that obtained these results is in 3.3, 4.2, 4.3, 4.4. This can be interpreted that graduates are expected to still be able to explain the basis of their knowledge after pursuing education. It also includes concepts, external environment abilities and foreign languages.

With all these results, it is hoped that education providers, especially for prospective entrepreneurs with special needs, will provide the best education to meet the standards needed to become at least an entrepreneur who is able to compete in the market. Being an entrepreneur will certainly have different calculation results when compared to being a workforce such as the results of research from (Todolí-Signes, 2017). An entrepreneur is more required to be able to innovate in his activities. The education providers, especially for students with special needs, starting from the new student admission process, the learning process, to the assessment and graduation must be done optimally in order to produce optimal graduates and meet standards.

CONCLUSION

It was found that the graduation standards with special needs from the Jakarta State Polytechnic that are needed to be eligible as beginner entrepreneurs are at points 3 and 4.5 with an average of 3.5. Jakarta State Polytechnic graduates who are individuals with special needs are expected not only to be able to understand, explain, implement, and practice the criteria on different syllabuses but also to be able to innovate in relation to entrepreneurial activities. The advice can be given because the results obtained from this study are that it can still be developed in the future. The specific classification of each variable, especially on the type of disability, scale, and the type of industry or business, is important. This specificity can certainly sharpen the results that will be obtained.

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