

## Critical success factors for smart-professional disruptor in university

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### ABSTRACT

Current and emerging technologies have changed a lot. Consequently, every year, Gartner Technology has made many new changes in accordance with global developments. For example, in terms of artificial intelligence (AI), mixed reality (MR), extended reality (XR), collaboration platforms, online learning, distributed cloud, internet of behaviors (IoB), and cybersecurity. Due to changes in technology, disruptors have to constantly learn new technology in order to be up to date in the transfer of knowledge to learners. Therefore, in this research, critical success factors (CSFs) have been studied, which help them become highly skilled professionals by developing their own skills with technology to be a successful disruptor at university. The study found the CSFs, which were derived from the synthesis of international research papers. Disruptors' success consists of 12 internal and 10 external success factors. Smart-professional disruptors in universities were assessed using a focus group method with eight experts. Focus group results found that there were seven important internal factors for smart-professional disruptors in universities and seven minor internal factors. Including all internal factors, smart-professional disruptors have 14 factors; external factors are the most important ones for smart-professional disruptors in universities. In total, smart-professional disruptors have a total of 11 external factors.

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## 1. INTRODUCTION

Nowadays, the advancement of technology affects all aspects of life including work, business operations, farmers, agencies, educational institutions and organizations. They must develop in order to remain in-step with high performing digital organizations [1]. As well as this rapid change, all people have to accept and apply new technology that was always disrupt. Therefore, educational organizations such as universities, colleges and schools have to use and apply new learning and rapidly evolving technology, which is challenging for disruptors and educational institutions [2]. lifelong learning for today's digital citizens absolutely necessary to have digital literacy, digital competency and digital intelligence [3]. Active emotional learning is a behavioral learning process that is a fundamental life skill because education is required to link

academic knowledge with specific skills [4]. Also, coronavirus disease 2019 (COVID-19) spreads rapidly all over the world, it was effect changing the daily life and the education is also affected [5]. From the previous problems, technology has been developed all the time to accommodate things. Therefore, disruptor will have to adapt and development of new skills to gain additional knowledge. To provide the ability to keep up with the changing world of technology.

In this research, the researcher focuses on the synthesis of knowledge in building the internal success factors of disruptors. External success factors of them. Technology related to disruptive technology in university at present. The research then builds an architecture framework in the university as a guideline to promote educational personnel to have the potential to transform technology by pointing out what factors encourage government personnel. Study and develop yourself until you become a smart-professional disruptor in a university. Analysis of the relationships between the analyzed variables was then performed.

## 2. LITEARATURE REVIEW

### 2.1. Critical success factors in education

Critical success factors in an educational institution have many contexts, including supporting factors. A broad spectrum of factors is needed to make education more effective and sustainable [6], including quality perception, tool support awareness, ease of use, perception of users, expectations and user satisfaction [7]. It is necessary to collect and prioritize a list of critical success factors (CSFs) to allocate the most appropriate resources for a sustainable quality education [8]. Convenience and collaboration are needed for the highest quality of education [9]; all of these are the determinants of the successful factors of a university education.

As previously mentioned, research has been conducted on the successful factors of university education. Yudiawan *et al.* [10] identified the following factors characteristics, internal motivation, instructor characteristics, quality of institutions and services, infrastructure and system quality, quality of courses and information, online learning environment. Alqahtani and Rajkhan [11] researched the CSFs of e-learning during the COVID-19 pandemic by interviewing 69 executives in the field of e-learning management in educational institutions. The results of the study found that although educational institutions have much institutional technology, in their work-related work, individuals played a large role in promoting the educational process during the COVID-19 pandemic.

Maciel-Monteon *et al.* [12] researched the design and validation of tools to assess the implementation of key success factors to improve processes in higher education institutions. The tool was validated among Mexican institutions of higher education, which was survey collected 743 data. The data was analyzed using statistical product and service solutions (SPSS) analysis of moment structure (AMOS R) software program. The results showed that the presented tool was statistically accurate and could be used in educational institutions. This accords with the research of Naveed *et al.* [13] which examined CSFs for cloud-based e-learning. In this research, an analytical hierarchy process (AHP) process was used in conjunction with cluster group decision-making (GDM) and fuzzy analytical hierarchy process (FAHP) to study a wide range of factors from various dimensions of e-learning on the web. The results of the study showed that each factor helped instructors and learners. They were able to formulate educational policies, manage e-learning systems, and implement resource management to support the global change in knowledge acquisition and management. This corresponds with the study of Lu and Dzikria [14] on the CSFs of distance learning systems. It identified the CSFs of the online learning systems from a learner's perspective by examining the students' competences and needs. They concluded that instructors must have characteristics of online learning content and a focus on technology infrastructure. They found that system support and institutional support are factors that should be considered by all educational institutions around the world for the development of online learning systems.

### 2.2. Disruptive technology in university

Disruptive technology is an innovative technology or tool that is converted from being in its original form to new forms of daily life. Educational institutes are affected by the changes in technology all the time. As such, they need to improve the quality of teaching and learning to be as efficient as possible in the current era. Today, there are many technologies being used by educational institutions such as artificial intelligence (AI), virtual reality (VR), augmented reality (AR), mixed reality (MR), extended reality (XR), collaboration platforms, online learning, distributed cloud, internet of behaviors (IoB), cybersecurity mesh and hyperautomation. As a result, instructors need to adapt to have the knowledge and ability to adapt to changing technology. Many studies have been conducted on the application of these technologies in universities or educational institutions.

For example, Fahimirad [15] studied the application of AI in teaching and learning in educational contexts. They predicted the role of AI in the future of education in the world. In terms of the effective application of AI as a means of improving the quality of teaching and learning in today's world, the literature suggests that there are many challenges in applying AI technology to learners and systematically supporting teaching, learning and management for learners. This is consistent with research on the application of computer VR technology in college physical education teaching [16]. It is necessary to use three-dimensional (3D), including: i) Modeling technology; ii) Modeling technology; iii) Model drive technology; and iv) Visual tracking and viewpoint sensing technology for teaching physical education using VR technology to understand the basics for safety for physical education learning. This is consistent with Borisova *et al.* [17] who developed an AR textbook for bachelor and masters programs called “design, technology and management of the fashion industry”. It has been found that 3D models can be seen in detail, as well as the possibility of mastering the design and all structural properties of the image using the generated quick response (QR) code. The 3D modeling can be applied with other textbooks in fashion design and pattern making; it is easy to learn. This is in accord with Bec *et al.* [18], who researched VR and MR for second chance tourism in order to conserve tourist attractions, reduce the impact on local communities in various tourist areas by using VR and MR as the tour operator. Further, Kim *et al.* [19] worked on XR smart glasses in the development of a nursing skills program using smart glasses and self-assessing the functionality and feasibility of its implementation. Studies have shown that they are useful, convenient and interesting. It helps students to have better skills and to be able to perceive their professional practice more effectively.

There are also various automation technologies that allows birth to learn together. For example, Kohler and Hagen [20] researched a conceptual framework for a communication and collaboration platform within a European transnational logistics knowledge cluster of universities and companies. This has led to the creation of new knowledge and innovations in the logistics field. This applies to students, teachers and establishments who have good relations with each other. Jumadi *et al.* [21] researched the impact of collaborative model assisted by Google Classroom to improve students' creative thinking skills the results of the research showed that learning by project collaborative model assisted by Google Classroom model allows students and teachers to express their creative thinking. This is in accord with Sun *et al.* [22] who presented an online language learning system on a blockchain. This monitors the learning of the learners each day and assesses the behavior of the learners automatically. It also facilitates the task of monitoring the students' homework and the students' behavior assessment scores. The IoB examines the behavior and intelligence of the organization's personnel, as well as the interplay patterns, to achieve common objectives by creating behavioral software development [23]. In addition, research on disruptive technology in networking has been applied to various technologies in academia. For example, Yan *et al.* [24] created an retrieval and storage-based indexing framework (RSIF). It was designed to improve both end-user and service providers' concurrent access to cloud stored healthcare data. This reduces the time it takes to access and retrieve information simultaneously. Ros *et al.* [25] also researched the game design of cybersecurity based on constructivism learning theory. They created a game scene using a contractual style to present the main content of cybersecurity to students. Designing realistic games and developing games with distinctive influences are best practice in game design. Therefore, introducing games to educational courses will increase the participation of learners and consolidate their knowledge of cybersecurity.

All relevant research finds that current disruptive technology such as AI, VR, AR, MR, XR, collaboration platforms, online learning, distributed cloud, IoB, cybersecurity mesh and hyperautomation affects daily work and life. Therefore, educational institutions have to accelerate the development of educational people to have potential and competence with changing technology. The next section discusses the factors that affect smart-professional disruptors, leading to smart-professional disruptors who are smart educators specializing in supporting the changing world of technology. Spotting gaps and developing the benefits of change what factors are required to support it.

### 3. RESEARCH METHOD

#### 3.1. Phase one

Analysis, synthesis of documents and international research related to critical success factors for smart-professional disruptor in university. Study documents and research related to internal-external success factors of disruptor, study disruptive technology in university published in the international research base system between 2017-2021 (total 38 subjects). Analysis of internal- external success factors of disruptor, disruptive technology in university these are shown in Tables 1 and 2, and diagram in Figure 1. The research tool was content analysis form, data analysis by content analysis technique.

### 3.2. Phase two

The information obtained from the synthesis stage was used to determine the characteristics of smart-professional disruptors in universities. It is including the internal-external success factors of disruptors and disruptive technology in universities. This is then evaluated in phase three.

### 3.3. Phase three

Evaluate the defining characteristics of smart-professional disruptors in universities, using a focus group of eight experts, divided into two groups. Group 1 was specialized in information technology. There were four people in group 2 from computer engineering specialists; four of them were chosen by specific selection, with more than five years of experience in both of these.

## 4. RESULTS

### 4.1. Phase one

Synthesis results internal – external success factors of disruptor from the 21 relevant research papers published in the international research base system between 2017-2021 are shown in Tables 1 and 2. Table 1 shows the synthesis of internal critical success factors of smart-professional disruptor. There are 12 factors of internal success: Age according generation, earnings, commitment, attitude, flexibility, motivation learning technology, knowledge learning technology, systematic learning, social interaction, thinking strategies, computer skills and time management.

Table 2 shows the synthesis of external critical success factors of smart-professional disruptor. There are 10 external success factors for teachers: information technology (IT) infrastructure, learning machine, help disk availability, training, environment, facilities, top management support, teaching style, internet system, and financial support. When data from Tables 1 and 2 are combined together, they can be written as a diagram as shown in Figure 1.

Table 1. Synthesis matrix of internal critical success factors of smart-professional disruptors

| Components                     | References   |
|--------------------------------|--|
| Age according generation       | [6], [8], [11], [14], [26]–[31]                              |
| Earnings                       | [6], [8], [11], [14], [26], [27], [29]–[32]                  |
| Commitment                     | [6], [8], [11]–[14], [28]–[31], [33], [34]                   |
| Attitude                       | [6], [8], [11]–[14], [28]–[31], [33], [34]                   |
| Flexibility                    | [6], [8], [11], [13], [14], [28]–[31], [33], [34]            |
| Motivation learning technology | [6], [8], [11]–[14], [26]–[31], [33]–[35]                    |
| Knowledge learning technology  | [6]–[8], [11]–[14], [26]–[30], [32]–[34], [36]               |
| Systematic learning            | [6], [8], [11], [12], [14], [26], [28]–[34], [36]            |
| Social interaction             | [6], [8], [9], [11], [12], [14], [26]–[30], [32], [34], [35] |
| Thinking strategies            | [6], [11], [12], [14], [26], [27]–[32], [34]–[36]            |
| Computer skills                | [6], [7], [11]–[14], [27]–[30], [32]–[34], [36]              |
| Time management                | [6], [11]–[14], [27]–[32]                                    |

Table 2. Synthesis matrix of external critical success factors of smart-professional disruptors

| Components             | References  |
|------------------------|---|
| IT infrastructure      | [6], [8], [9], [11]–[14], [27], [28], [30], [32]–[34], [37]               |
| Learning machine       | [6], [7], [11]–[14], [28]–[35], [37], [38]                                |
| Help disk availability | [6], [7], [11]–[14], [28]–[30], [32]–[34], [37], [38]                     |
| Training               | [7], [11], [13], [14], [26], [28]–[30], [32]–[35], [37]                   |
| Environment            | [6]–[8], [11], [13], [14], [27]–[32], [34], [37]                          |
| Facilities             | [6]–[8], [11], [13], [14], [27]–[32], [34], [37]                          |
| Top management support | [6], [8], [9], [11], [12], [14], [27], [28], [30], [32], [33], [35], [37] |
| Teaching style         | [6], [7], [11], [13], [14], [26], [28]–[35], [37]                         |
| Internet system        | [6], [7], [11], [13], [14], [26]–[30], [33], [34], [37], [38]             |
| Financial support      | [6], [7], [9], [11]–[14], [26]–[30], [32], [35], [37], [38]               |

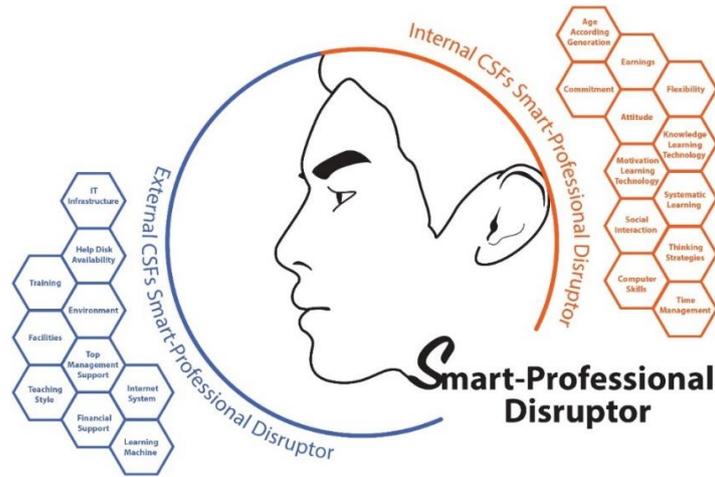


Figure 1. Internal and external critical success factors of smart-professional disruptors

**4.2. Phase two**

Define the characteristic of smart-professional disruptor in university was from the previous synthesis of the document. It contains the components of internal-external success factors of disruptor and technologies related to disruptive technology in university. This is then evaluated in phase three.

**4.3. Phase three**

A focus group results of characteristics for smart-professional disruptor in university by the following experts. The internal factors of the two expert groups of smart-professional disruptors accorded with the important factors of commitment, attitude, motivation, time management and social interaction. Other internal factors of the smart-professional disruptors are the secondary factors; however, there were differences of opinions between the experts in group 1 and the experts in group 2; namely, the experts in group 1 thought that the internal factor of communication skills should be added. Communication is an extremely important factor that will help promote a smart-professional disruptor. The second group of experts thought that leadership should be added to the internal factors; this is a very important factor to help promote the smart-professional disruptor. So, it can be concluded that there are seven main factors for smart-professional disruptors in universities: leadership, attitude, commitment, motivation, communication, time management and social interaction; the second most important internal factors are knowledge learning technology, systematic learning, thinking strategies, computer skills, flexibility, earnings and age. In total, there are 14 internal factors for smart-professional disruptors, as shown in Figure 2.

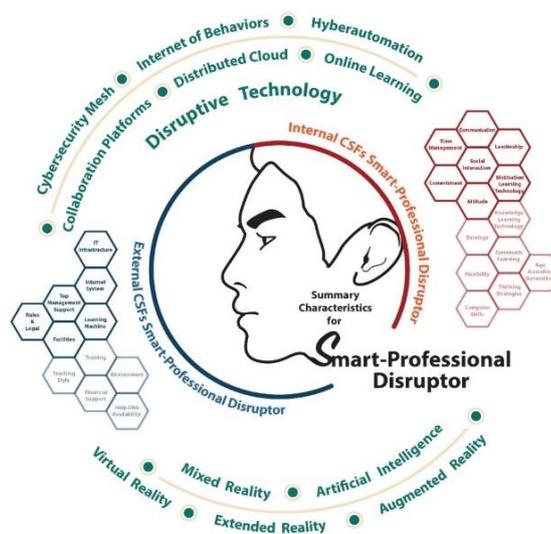


Figure 2. Summary characteristics for smart-professional disruptor in university by experts

On the external factors, both groups of experts shared the same opinion on the importance of top management support, IT infrastructure, facilities, learning machine and internet systems. Other external factors affecting smart-professional disruptors are the secondary factors; however, there were differences of opinions between the experts in group 1 and the experts in group 2; namely, the experts in group 2 thought that there should be additional external factors in the rules and laws that enable disruptors to extend the work or the copyright, innovation, as well as the rules. So, it can be concluded that there are six main external factors for smart-professional disruptors in universities: Top management support, IT infrastructure, facilities, learning machine, internet system, and rules and laws. The second most important external factors are environment, help disk availability, training, teaching style and financial support. In total smart-professional disruptors have a total of 11 external factors, as shown in Figure 2.

## 5. DISCUSSION

From the research of CSFs for smart-professional disruptors in universities, it can be concluded that there are 14 internal factors. There are seven main factors: leadership, attitude, commitment, motivation, communication, time management, and social interaction. There are also seven internal factors, namely: knowledge learning technology, systematic learning, thinking strategies, computer skills, flexibility, earnings, and age [29]. The multidimensional model in the study of success factors influencing continuity and success in e-learning is in accordance with the research of Lu and Dzikria [14] on CSFs of online learning systems, as well as Naveed *et al.* [13], who assessed the key success factors in the use of multi-criteria decision-making e-learning systems. Alhabeeb and Rowley [30] also researched the CSFs of academic staff and students' learning. According to the study, it was found that various researches identify the success factors within the elements as well. There are 11 external factors. There are six main factors that are essential to support those who will become smart-professional disruptors: top management support, IT infrastructure, facilities, learning machine, internet system, and rules and laws. There are also five external factors: environment, help disk availability, training, teaching style and financial support. This is in accord with Lu and Dzikria [14], which studied the CSFs in research and Rujira *et al.* [1] to a high-performance digital organization, such as Helmy *et al.* [9] the CSFs for education and government cooperation. It is also consistent with the research of MacIel-Monteon *et al.* [12] who conducted research into factors of success in higher education institutions. According to their study, the outward factors of success were identified as well as the elements.

## 6. CONCLUSION

The study found that each research gave the CSFs affecting the success of internal and external factors of their own research in various fields such as education, teaching and learning. In this research, the factors affecting the success of being a smart-professional disruptor completeness of all factors affecting being smart-professional disruptor in university can be used to develop the direction of an organization or university, which will result in personnel being smart-professional disruptor. Future research should bring various factors to develop the direction of the organization. It could bring the estimation to enhance the personnel in university for individuals and create joining forces in the further development of the country.

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