

High-Tech Based Disruptive Innovation Model (Case Study Di Stie El'fatah Manado)

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ABSTRACT: The main objective of this study is to analyze and describe a high-tech-based disruptive innovation model, focusing on network infrastructure availability and leadership strengthening. This was conducted through a qualitative descriptive approach, utilizing direct observation and in-depth interviews with five informants to address issues related to weak initiatives in implementing high-tech-based disruptive innovation models, with data analysis techniques using triangulation.

This research resulted in a high-tech-based disruptive innovation model as a form of transformation and innovation in information services, shifting from conventional to digital by integrating three areas of information services: Education to Citizen (EdtoC), Education to Entrepreneurship (EdtoE), and Education to Education (EdtoEd). The conclusions drawn indicate that a high-tech-based disruptive innovation model within the realms of Education to Citizen (EdtoC), Education to Entrepreneurship (EdtoE), and Education to Education (EdtoEd) enables educational institutions to explore new opportunities, test ideas, and face emerging competition on the global landscape through adequate network infrastructure availability, political will, and strong leadership. These factors help in addressing issues of coordination, communication, and synchronization to foster a more modern work culture.

The implications of this disruptive innovation model perspective provide an operational concept that integrates cyber technology for strategic decision-making processes, meeting the aspects of confirmability and transferability, ensuring that it can be applied in other settings.

KEYWORDS: Disruptive Innovation; Network Infrastructure; Leadership Strengthening

INTRODUCTION

Educational institutions are a crucial area for the application of disruptive innovation to enhance academic and non-academic services, making them more streamlined, fast, easy, efficient, accountable, and modern. Disruptive innovation, a term coined by Professor Clayton Christensen (Soffia Ranti, 2022) from Harvard Business School, details how disruptive innovation can provide a shock effect for an institution to improve management and maintain product quality. Disruptive Innovation is a tool that can be used by all higher education institutions to replace conventional service methods with high-tech innovations, offering a new level of efficiency beneficial to all stakeholders.

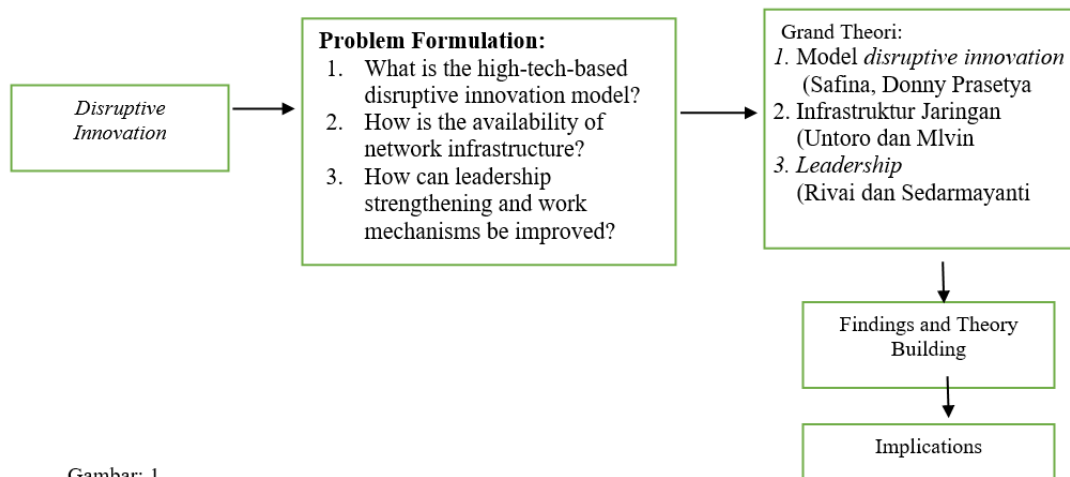
Recently, some higher education institutions, especially in the field of management, have raised concerns about declining interest among new students, particularly those graduating from high school. Generally, prospective students prefer top-tier universities or state universities as their primary choices. Institutions offering disruptive innovations, both academic and vocational, have emerged as superior players, gaining market dominance. The competition between academic and vocational institutions is fierce, and it is not surprising that some private institutions, especially smaller management colleges, are less attractive to prospective students. Many administrators resist adapting to developments, opting instead for rigidity and thus struggling to compete with highly innovative institutions that meet market demands with fresh ideas.

The phenomenon of using Artificial Intelligence (AI) technology has driven society to urge all educational institutions to implement more streamlined and innovative services to meet global challenges. The implementation of Disruptive Innovation (DI) not only serves higher education's interest in improving quality, culture, and performance but also meets society's pressing need for better access to academic and non-academic services. The benefits of Disruptive Innovation (DI) in educational institutions will enhance competitive advantage by preparing students with academic and professional skills to apply, develop, and enrich knowledge and technology in response to shifting global demands, ultimately enhancing national dignity, status, and civilization. According to Donny Prasetya et al. (2021), "future competition will not be based on output and price but rather on new technology formulas, commodities with new supply chain systems, new types of organizations, and new business models." Disruptive innovation can serve as a reference for organizational management in higher education institutions, which can bridge coordination with stakeholders, private organizations, and various other government elements.

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The disruptive innovation model is expected to create new innovations with a valid data foundation for developing university blueprints and master plans, supported by adequate infrastructure, both network infrastructure and data application systems that will serve as a reference or standard for an integrated educational management information system. The disruptive innovation model, which will be implemented in higher education through digital technology, is not only intended for administrative order and documentation purposes but also aims to develop superior, competitive human resources recognized globally. The disruptive innovation model in educational management holds significant strategic value because its specificity and existence enhance the quality of education to meet global demands. The scope of the disruptive innovation model, through the development of an educational interoperability system, is broad and complex, requiring standardized communication procedures and mechanisms to synergize all governance application systems available in each educational unit within the framework of an integrated educational management information system.

Based on the research focus and objectives, the researcher illustrates a conceptual framework as a pathway for conducting the research, as shown in Figure 1.



Gambar: 1

Framework of the Disruptive Innovation Model

Source: Research Data, 2024

The high-tech-based disruptive innovation model is a shock-powered innovation that can create new markets or replace old ones with fresh business ideas tailored to the fast-paced and dynamic needs of consumers. According to Safina Nurul Ramadhani et al. (2024), "In the midst of rapid technological development and digital transformation, modern businesses are facing increasingly complex challenges in maintaining their competitiveness. In response to these challenges, innovative strategies have become a crucial foundation for business success in navigating the ever-evolving market dynamics." This definition implies that disruptive innovation is an ongoing, continuous process and a key to sustaining business competitiveness in the ever-changing digital era. Businesses that are innovative, adaptive, and responsive to change will hold a strong competitive edge in facing challenges. Disruptive innovation has become a multidisciplinary field for transforming various forms of knowledge that are continuously explored and developed, though a fixed definition of disruptive innovation has yet to be agreed upon.

Safina Nurul's research, published in the *Economics and Business Management Journal* (EBMJ) in February 2024, shows that businesses able to adopt disruptive technologies have a significant advantage in facing digital-era competition. Technologies such as Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain technology have demonstrated their ability to fundamentally alter business paradigms. Businesses using AI can enhance operational efficiency, improve data analysis, and even create more personalized and relevant customer experiences. Likewise, the application of blockchain technology can increase transaction security and transparency within the supply chain.

According to Soffya Ranti, in her article at Airlangga Executive Education Centre on April 8, 2022, disruptive innovation involves creating new outputs that are accessible and reachable by the entire public in specific market segments. This explanation means that disruptive innovation goes beyond merely improving or enhancing output for a target group; it involves high-tech applications to make products easier to use and available for competitive markets.

According to Black and Porter (cited by Stefanus Yufra, 2021), disruptive innovation is a strategy for winning business competition, particularly in enhancing global competitiveness, as it represents an organization's ability to consistently win in a competitive environment. This ability to succeed is demonstrated by high productivity in creating valuable outputs. Stefanus Yufra et al. (2021) describe competitiveness as achieved by excelling in one of five ways: (1) doing something better than others, (2) doing something difficult to imitate, (3) doing something valuable to consumers, (4) doing something difficult to replace, and (5) providing benefits to the industry.

Based on the above perspectives, it can be concluded that the theoretical foundation of disruptive innovation still needs further development and meets the criteria for establishing a new discipline. This implies that disruptive innovation can be applied in

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various fields, including public administration, management, politics, social culture, and education, which is inevitable. Disruptive innovation does not mean changing how educational institutions interact with the community. Instead, it means that the community can still interact with educational institutions through phone calls, face-to-face meetings, or letters for suggestions or feedback. The high-tech-based disruptive innovation model only functions in the context of using digital information and communication technology, supported by adequate network infrastructure. Kodoatie (2005) explains infrastructure as a system that supports various activities in both social and economic aspects, serving as a foundation for policy-making and decision-making. The high-tech-based disruptive innovation model is an asset comprising physical and non-physical infrastructure, designed as a system to enhance public information services.

Untoro (2010) argues that several types of infrastructure are developed by businesses, communities, and governments: a) Hardware, including input devices, processors, output devices, backing storage, and peripherals; b) Software, as described by Pressman (2015), "software refers to program commands in a computer" that only functions when executed by the user. Software is a tool that organizes computer activities and all instructions directed to the computer system. Melvin (2018) emphasizes that software bridges user interactions with the computer using machine language. Software components include: (a) Operating system, which organizes all computer machine components, (b) Application programs written in specific programming languages for particular fields, (c) Utility or supporting programs that help the operating system, such as Google Chrome, Mozilla Firefox, Winamp, antivirus, etc., (d) Programming languages to operate computers to standards, such as JavaScript, PHP, Visual Basic, Pascal, and more (Pressman, 2015). Brainware consists of professionals in information system and data processing operations, including operators, programmers, and administrators.

Leadership, according to Marifield and Hamzah as quoted by Zakub (2015), is "the act of stimulating, mobilizing, directing, and coordinating a group of people involved in joint efforts." Nazarudin (2016) explains, "Leadership is part of the management function, holding a strategic position within the organizational system and work hierarchy." Slamet (cited in Moehersono, 2014) states that leadership is the ability to influence others to take actions toward specific goals. This is supported by Rivai (2015), who says leadership is the action of motivating and inspiring individuals in an organization to develop skills, take responsibility, make decisions, access resources and budgets, and receive recognition.

The higher a person's level of leadership, the less technical skills are needed, favoring managerial skills, although a leader should not disregard technical skills to avoid errors and mistakes in performing duties (Martoyo, 2015). Rivai (2015) emphasizes that leadership is "the process of influencing or setting an example for followers in achieving organizational goals." Essentially, leadership is a process of influencing others to do or not do something desired, interacting between followers and leaders to achieve set goals, guiding collective efforts, and motivating desired activities or behaviors to meet objectives (Sedarmayanti, 2016).

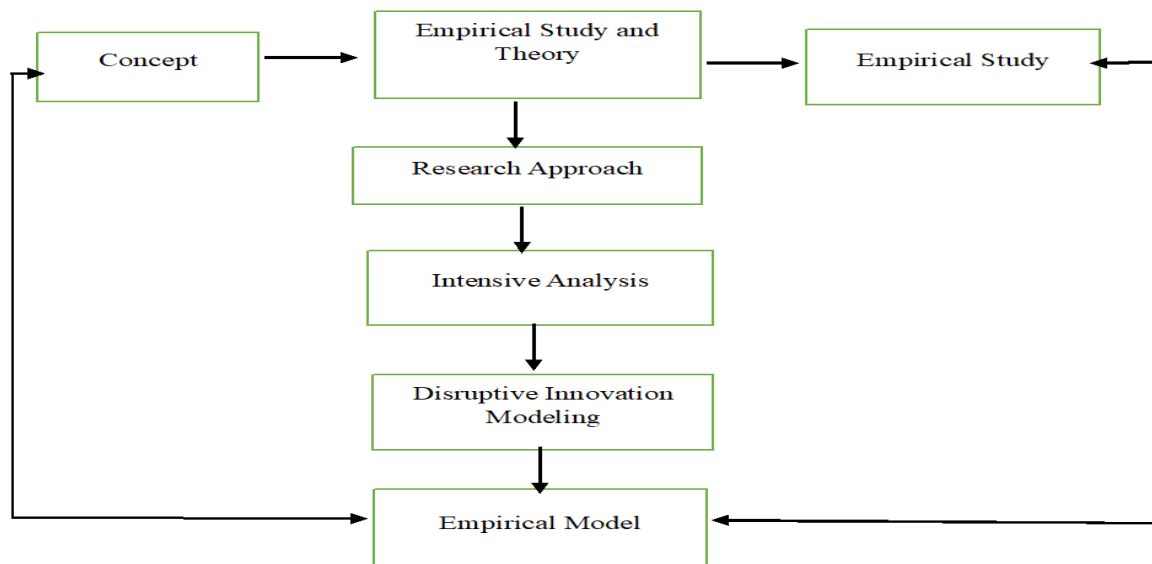
The above perspectives can be summarized to define leadership as the ability or art of influencing others to take action in alignment with a leader's vision within an organization to achieve common goals. This means that a leader must have the capability to influence their followers in various ways, such as using legitimate authority, setting examples, establishing goals, restructuring the organization, and communicating a shared objective to be accomplished.

RESEARCH METHODOLOGY

This research is qualitative with a descriptive approach, aimed at analyzing and describing data, facts, conditions, and trends, followed by modeling Disruptive Innovation to enhance global competitiveness. High-tech-based disruptive innovation modeling, in essence, is not merely a contextual social reality but factual, so intensive qualitative interpretations will provide confidence and a comprehensive, integrative picture. The goal of this research is to develop a high-tech-based Disruptive Innovation model to encourage universities to be dynamic and flexible in achieving the status of a good university. The research location is STIE El'Fatah Manado, chosen by the author to provide input on the concept of high-tech-based Disruptive Innovation modeling through fostering a delivery spirit to create the best, unique, and business-appropriate innovations. The data used in this research is descriptive data obtained from in-depth interviews with informants at STIE El'Fatah Manado, including the Chairperson, Deputy Chairperson of Academics, Deputy Chairperson of General Administration, Deputy Chairperson of Student Affairs and Collaboration, and the Head of the Study Program.

The data analysis technique uses triangulation, with the research steps as follows: The author conducted direct observations on the availability of network infrastructure in each unit/department, checked the availability of supporting infrastructure such as dedicated operator rooms, and assessed bandwidth capacity. Interviews were conducted with informants who truly know, understand, and have expertise in disruptive innovation. The data obtained through preliminary studies were examined empirically based on supporting theories, carefully recorded and categorized based on domains or existing categories for rechecking. Then, the author checked the availability of management organizations to ensure sustainable leadership strengthening and conducted intensive analyses to discover novelty in the disruptive innovation modeling, aiming to produce an empirical model with principles of novelty and transferability.

Conceptually, the research steps are arranged systematically and purposefully, as presented in Figure 2.



Gambar: 2 Research Methodology Approach

Source: Research Data,2024

RESULTS AND DISCUSSION

The development of information and communication technology in various higher education institutions has demonstrated to society that the use of applications such as Education to Citizen (EdtoC), Education to Entrepreneurship (EdtoE), and Education to Education (EdtoEd) plays a vital role in simplifying, enhancing accuracy, and improving responsiveness in the implementation of the Tri Dharma of Higher Education. The application of the disruptive innovation model in educational institutions is urgently needed, given the community's demands for high-quality higher education management, which requires the implementation of high-tech-based organizational management information systems for faster, more concise, and transparent services. The Chairperson of STIE El'Fatah Manado added that this perspective will soon be realized in the implementation of good governance towards becoming a good university. The implementation of a good university through the adoption of new technologies at STIE El'Fatah Manado is expected to be done consistently and sustainably. It should not happen that when leadership changes, policies also change, disrupting sustainable program activities outlined in the Master Development Plan (RIP). It is essential to formulate this accurately, starting from commitment, budget support, infrastructure availability, and expert personnel to ensure that this model becomes a clear framework for improving the quality of information services.

The implementation of the disruptive innovation model will mark a new milestone for all educational institutions to create shock value and uniqueness in developing academic and non-academic information services, leading to new performance that differentiates and characterizes each higher education institution. The public is curious about unique and attractive services because educational institutions can no longer maintain an 'ego-centric' attitude, as if everyone needs these institutions. Times have changed; society is now viewed as customers who must be treated well. If educational institutions continue to uphold conventional methods in providing academic and non-academic services, they should not be surprised if they are left behind by society. Therefore, the application of the disruptive innovation model is an urgent policy that must be outlined in the institution's blueprint and master plan. The implementation of the disruptive innovation model is an important and strategic policy that must be formulated by higher education leaders in collaboration with the academic senate, as it will involve all available resources. Moreover, this policy formulation is long-term and must be sustainable. Higher education leaders need to design appropriately in line with the development of smart technology through careful planning. This policy must be implemented in concrete work programs by designing an adequate budgeting system to provide all institutional and network infrastructure while utilizing all available resources with clear procedures and mechanisms. Most importantly, a proper oversight system must be established.

The application of the high-tech-based disruptive innovation model is an institutional policy that must involve the foundation, management, and stakeholders. All parties must sit together to clearly formulate the objectives and targets, as well as the budget allocation outlined in the Activity Budget Plan (RKA) for the sustainability of this policy implementation. Institutions must provide adequate network infrastructure and expert personnel to design, operate, maintain, receive feedback from the community, and make an impact toward achieving a superior and competitive university. According to Christensen (Saffya Ranti, 2022), disruptive innovation can be categorized into two types: low-end disruption and new market disruption. Low-End Disruption refers to a company's action of using a simple business model by offering lower-priced products while maintaining good performance, thereby having the potential to capture a wider market segment or acquire competitors' customers. This tends to create opportunities for disruptive innovation to perform adequately in the low-end market and gradually become superior in the

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future. New Market Disruption is the company's ability to create a new segment in an existing market with a low-cost version. In this concept, companies will tend to look for ways to attract new consumers in the same market.

A model is a representation or formalization in a specific language (widely agreed upon) of a real system, as explained by Jogiyanto (2017), "A system is a collection of several parts or elements that are interconnected and organized based on their functions into a single unit. This means that a system is a collection of related procedures that connect to perform a task together within an organization to achieve specific goals. Information systems can be divided into three main components: hardware, software, and brainware. These three components will work together and are interrelated within a single internet network to generate the database and information needed by consumers. The network infrastructure consists of hardware, software, and brainware. Collaboration with the private sector should be established through the provision of competent experts in the field of information technology, ensuring that data updates can always be carried out. The existing experts must be capable of developing various software that can be used with a reliable data security system. Network infrastructure is a vital tool needed to build a compatible information and communication system. We will also prepare data center infrastructure, data networks, security measures, and database backups, along with adequate maintenance costs. This will be carried out by all experts from the parties collaborating with STIE El'Fatah Manado.

The high-tech-based Disruptive Innovation model will bring benefits and positive implications for consumers as users of higher education information services, allowing them to obtain fast, concise, easy, transparent, and accountable information services. The implementation of the disruptive innovation model across all institutions must establish standard benchmarks that will serve as references for service users, including ethics and privacy rights protection, service ethics, public information, feasibility of data-based archiving systems, authentication, regulations, and other standards. This will be a primary concern for program policy managers to prioritize information system security, namely privacy, accuracy, accessibility, and property.

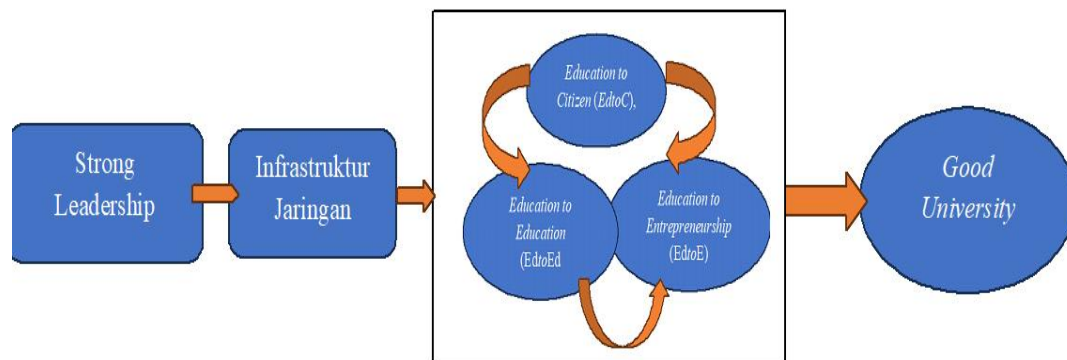
This process must continue to be carried out gradually within a sustainable system across three domains: Education to Citizen (EdtoC), Education to Entrepreneurship (EdtoE), and Education to Education (EdtoEd). The availability of adequate network infrastructure for the implementation of the disruptive innovation model in higher education institutions is an urgent and essential action in providing high-tech-based information systems services, such as data networks, data centers, supporting infrastructure (servers, power supplies, hosting scanners, UPS, etc.), disaster recovery (database backup), network maintenance, availability of spare parts, security (data/information and physical), collaboration with ICT service providers, equipment (software and hardware), and regulations. Another indicator of the successful implementation of the high-tech-based disruptive innovation model is the strengthening of leadership within the organization. The dimension of leadership is closely related to strategic decision-making. Leadership functions need to be enhanced with broad authority to formulate strategic policies without waiting for directions from the foundation, clearly regulated in joint decisions. Leaders must have a clear and directed vision and mission regarding the development of the high-tech-based disruptive innovation model, which will be articulated in the blueprint, master plan, and technical guidelines, ensuring optimal management support.

Operationally, every organization must prepare four main infrastructures: e-leadership, human resources, regulations, and applications. The implementation of the disruptive innovation model will have significant shock value if built within a comprehensive framework and subsequently articulated into a blueprint and organizational master plan. Along with the implementation of the high-tech-based disruptive innovation model, an important aspect that needs to be promoted is the strengthening of leadership with broad authority, adequate infrastructure availability, network infrastructure, consistent funding, brainware, and solid teamwork through structured work patterns and mechanisms within the context of the disruptive innovation model to enhance productivity and competitiveness. There is a need for flexibility to anticipate various organizational obstacles, characterized by the establishment of an organizational structure and working procedures (SOT) for the management team of academic and non-academic information services, which can accommodate new developments in the global landscape. Institutional support in the form of a technical implementation unit (UPT) specifically handling all stages of the implementation of the high-tech-based disruptive innovation model, as well as adjustments to the structure, main duties, and functions of the UPT, is an absolute requirement to facilitate coordination and smooth administration as a non-hierarchical entity appointed and established by the leadership through a decree. "To support the successful implementation of the high-tech-based disruptive innovation model, policies regulating the standardization of UPT institutional structures, including management units, main duties and functions, and authority, are necessary.

Access is crucial in the development of a high-tech-based disruptive innovation model, supported by a strong institutional infrastructure that includes communication, coordination, and synergy to enhance quality in an integrated manner through connectivity and data interoperability with PD Dikti. The Disruptive Innovation model in higher education is based on good, effective, and efficient operational management governance, which consists of three fundamental components: Input, Process, and Output. These components are used to select, input, and process data into the system to generate information tailored to the needs of various management levels, including top management, middle management, and lower management, in relationships characterized by building commitment, orientation-mindedness, and together consensus to realize shared value across three domains of information services: Education to Citizen (EdtoC), Education to Entrepreneurship (EdtoE), and Education to Education (EdtoEd). Based on intensive analysis of various findings and the theoretical framework used, the author has

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discovered a new concept as a formal finding, namely the high-tech-based disruptive innovation model in the realm of information services, which includes Education to Citizen (EdtoC), Education to Entrepreneurship (EdtoE), and Education to Education (EdtoEd) to realize shared value. The author illustrates these findings in a modeling format as follows:



Gambar :3 Disruptive Innovation Models
Source: Research Data,2024

The high-tech-based disruptive innovation model can be applied to support the Vision and Mission of higher education institutions, develop virtual learning processes, establish orderly administration, enhance transparent, effective, efficient, and accountable digital information services, increase benefits, and reduce issues related to information needs. Additionally, the high-tech-based disruptive innovation model can realize a quality academic and non-academic service system to produce intelligent, character-driven human resources capable of global competitiveness.

CONCLUSION AND SUGGESTIONS

The high-tech-based disruptive innovation model in the realms of Education to Citizen (EdtoC), Education to Entrepreneurship (EdtoE), and Education to Education (EdtoEd) holds significant strategic value due to its specific nature and its capacity to enhance educational quality to meet global demands. This model enables educational institutions to explore new opportunities, test ideas, and confront emerging competition in the global landscape through the availability of adequate network infrastructure, as well as strong political will and leadership to address various coordination, communication, and synchronization challenges, thereby transforming the work culture into a more modern one.

The distinctive characteristics of the disruptive innovation model encompass an operational concept that integrates cyber technology for decision-making processes and fulfills the aspects of confirmability and transferability, which refers to the value of applicability in other contexts.

Educational institutions must recognize that, in the face of increasingly fierce global challenges, everything must change—from striving to be the best to striving to provide the best for the world—through clear commitment to strengthening institutional capacity and budgeting in the implementation of the high-tech-based disruptive innovation model.

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