EMI JOURNAL

Research Article

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Received 16 October 2024 | Revised 12 December 2024 | Accepted 16 December 2024

The Development Model of Factors Influencing the Desirable Graduate Attributes of Nakhon Ratchasima Rajabhat University Students

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Abstract

This research employed a mixed-methods approach to examine, construct, and empirically test a model elucidating the factors influencing the desirable graduate attributes of students at Nakhon Ratchasima Rajabhat University. The study was conducted in three phases. First, data were collected from a sample of 375 students. Next, a developmental model was synthesized based on evaluations provided by nine experts, with data collection occurring from August 1 to August 30, 2024. Finally, the model was implemented within the elementary education program, employing pre- and post-assessment tests to appraise graduate attributes across four dimensions: knowledge, skills, ethics, and personal characteristics. Data analysis was conducted using basic statistics and a t-test, with regression analysis also employed. Key predictors of desirable graduate attributes included self-management, attitudes toward learning, and learning styles, which together accounted for 81% of the variance in these attributes. Qualitative data were analyzed via content analysis. The recommendations confirm the suitability of the learning units' core components but emphasize the need for clearer, behavior-focused assessments with concise, targeted questions. The development model can be improved with thought-provoking questions, fair evaluations, and diverse activities. The experimental group showed significantly higher post-instruction scores, while the control group showed no significant changes. These findings provide valuable insights for enhancing graduate attributes to meet societal needs.

Keywords: The Development Model, Desirable Graduate Attributes, Students, Nakhon Ratchasima Rajabhat University

Introduction

The evolution of Thailand's educational landscape is paramount to producing high-caliber graduates capable of addressing the complex demands of both the labor market and society at large. Given the dynamic nature of national and international contexts, educational policies must serve as a robust foundation for these initiatives, particularly in fostering competencies that resonate with contemporary labor market needs (Vandeweyer, Espinoza, Reznikova, Lee, & Herabat, 2020). The Ministry of Education (2020) underscores the necessity for Thai graduates to cultivate a blend of knowledge, skills, and attributes that align with the evolving requirements of various sectors. This alignment necessitates a comprehensive restructuring of undergraduate and graduate curricula, ensuring that educational frameworks adapt to technological advancements and social transformations (Wijngaards-de Meij & Merx, 2018).

To adequately prepare graduates for the workforce, a concerted effort must be made to enhance critical skills such as communication, problem-solving, and collaboration. These competencies are essential for navigating the challenges of a rapidly changing work environment, especially in an era increasingly dominated by digital technologies (Office of the Higher Education Commission, 2018). Moreover, instilling moral values, ethical principles, and a sense of social responsibility is integral to fostering graduates who can fulfill their roles effectively in society. These attributes not only enhance individual performance but also contribute to the overall well-being of communities, reinforcing the importance of holistic education (Bisschoff & Massyn, 2023).

Despite ongoing efforts, several challenges continue to undermine the development of desirable graduate attributes, with research indicating that many graduates possess theoretical knowledge but lack the practical skills and personal characteristics essential for success in the workplace (Robson, 2023). In addition, deficits in digital literacy and effective communication have been found to significantly impede graduates' adaptability to professional environments (Kühn, 2017). Addressing these challenges requires a targeted enhancement of technological competencies, the promotion of emotional intelligence, and the cultivation of complex problem-solving abilities (Donald, Ashleigh, & Baruch, 2018). In response, institutions such as Nakhon Ratchasima Rajabhat University have been developing curricula aimed at equipping students with the necessary skills and values to thrive amidst rapid societal and technological changes (Nakhon Ratchasima Rajabhat University, 2022). However, despite these efforts, there remains a notable gap in research, particularly regarding how various factors influence the development of these graduate attributes. While existing literature emphasizes the overall importance of graduate attributes, it has overlooked an in-depth examination of the roles of key factors, such as

attitudes toward learning, learning styles, self-management, adaptability, and work readiness, in shaping graduate outcomes. Moreover, the impact of these factors on specific graduate attributes—such as knowledge, skills, ethics, and personal characteristics—remains inadequately explored. This study aims to address this gap by investigating the relationship between these independent factors and the desired graduate attributes, ultimately providing a framework for enhancing the development of well-rounded graduates who are prepared for success in the professional world.

Research objectives

1. To investigate the factors influencing the desired attributes of graduates at Nakhon Ratchasima Rajabhat University.

2. To develop a model for enhancing the factors that influence the desired attributes of graduates at Nakhon Ratchasima Rajabhat University.

3. To implement and evaluate a model for developing the factors that influence the desired attributes of graduates at Nakhon Ratchasima Rajabhat University.

Conceptual framework

Key content outlined in the Ministerial Regulation on Higher Education Qualification Standards B.E. 2565 (2022)

The Ministerial Regulation on Higher Education Qualification Standards B.E. 2565 (2022) aims to enhance the quality of education in Thailand by setting clear standards and emphasizing learning outcomes derived from formal education and real-world experience. The regulation applies to both public and private institutions, covering qualifications from degree to sub-degree levels, ensuring that learners acquire appropriate skills and knowledge according to their level of education. The learning outcomes must encompass four key areas: 1) Knowledge, which is developed through education and experience, tailored for careers in the digital era; 2) Skills, which is cultivated through practice and problem-solving, including digital proficiency and teamwork abilities; 3) Ethics, which reflects integrity and moral conduct in life and work; and 4) Personal attributes, which fosters self-confidence and social responsibility.

Factors influencing the desired attributes of graduates

The factors influencing the desired attributes of graduates have been examined from various perspectives. According to Sapian et al. (2022), self-discipline is more critical for academic success than intellectual intelligence. Lee (2024) highlights the importance of adaptability and a positive attitude

toward learning in achieving success in new business ventures. Furthermore, Cedere et al. (2020), Krouwel et al. (2020), and Barthakur (2022) emphasize the significance of self-management and learning styles in enhancing employability and learning outcomes. Mrazek et al. (2018) identify perseverance and self-regulation as essential for long-term success. Similarly, Wikansari and Wiyono (2023) stress the importance of emotional intelligence, psychological capital, and interpersonal skills in equipping graduates for the labor market.

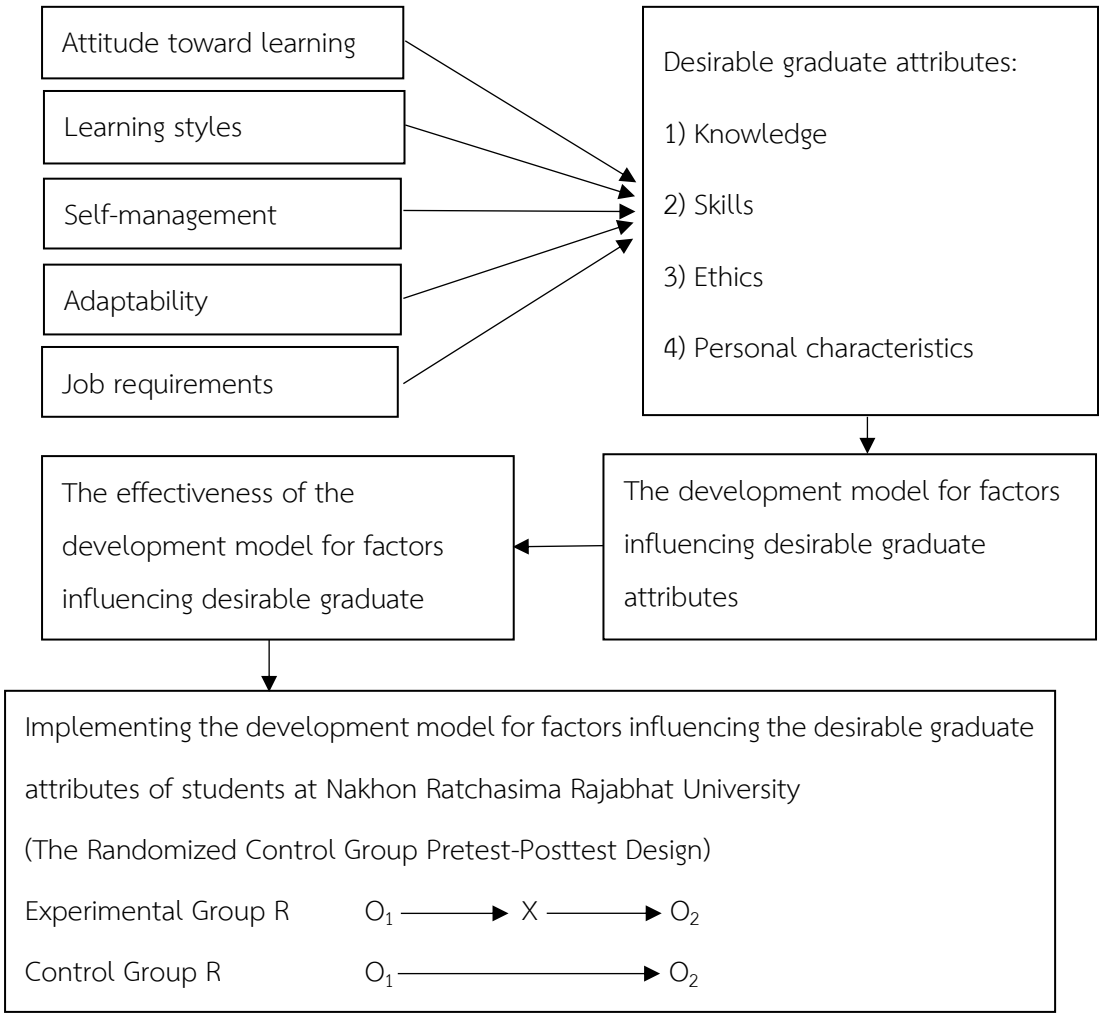

Figure 1 Conceptual framework

Methodology

Phase 1: The examination of factors influencing the desired attributes of graduates among students at Nakhon Ratchasima Rajabhat University

Population and sample groups

The population consisted of 10,865 undergraduate students from Nakhon Ratchasima Rajabhat University in the 2024 academic year. The sample group of 375 students was determined using the Krejcie and Morgan (1970) table, with a 95% confidence level and a 5% margin of error. A stratified random sampling method was used to select the participants. These participants were enrolled in years 1 to 4 across six faculties: the Faculty of Education, the Faculty of Humanities and Social Sciences, the Faculty of Management Science, the Faculty of Science and Technology, the Faculty of Industrial Technology, the Faculty of Public Health, and the Faculty of Nursing.

Research instruments

The data collection instrument used in this study was a behavioral measurement tool, divided into three sections: general information, desirable graduate attributes, and influencing factors. The measurement of desirable graduate attributes demonstrated content validity, having been evaluated by five experts, resulting in a consistency index ranging from 0.60 to 1.00 and discriminative power between 0.49 and 0.87 (based on the criterion of 0.20) (Kanchanawasi, 2015). The reliability coefficient was 0.98. Similarly, the tool assessing the factors influencing desirable graduate attributes had a consistency index between 0.60 and 1.00, with item-specific discriminative powers ranging from 0.59 to 0.86. The reliability coefficients for this tool were 0.94, 0.934, 0.93, 0.95, and 0.91, indicating a high level of reliability.

Data collection

Following the approval of the Research Ethics Committee, the questionnaire was administered to a total sample of 375 participants. Data collection was conducted from August 5 to August 16, 2024.

Data analysis

The completeness of the questionnaire was verified, and the data were recorded and analyzed using basic statistics, including mean, percentage, and standard deviation. Pearson correlation statistics were employed to determine the relationship between independent and dependent variables. Furthermore, a stepwise multiple regression analysis was conducted to predict the factors influencing the desired characteristics of graduates.

Phase 2: The development of a model for enhancing factors influencing the desired attributes of graduates from Nakhon Ratchasima Rajabhat University

The developmental model for factors influencing desirable graduate attributes of students at Nakhon Ratchasima Rajabhat University referred to a learning unit designed to enhance understanding of the factors influencing the cultivation and development of these attributes in the university's students. The model comprised five key components: Principles and Rationale, which highlighted the

importance and necessity of developing desirable graduate attributes; Objectives, which set clear goals for the development process; Implementation Methods, which outlined the steps and strategies used in the development; Content, which provided essential knowledge to support learning and development; and Measurement and Evaluation, which assessed the effectiveness of the developmental process and ensured that the graduate attributes aligned with defined standards. Together, these components formed a comprehensive framework for fostering desirable attributes in students. The researcher developed a framework for enhancement in the form of learning modules. The findings from Phase 1 of the study revealed that three factors significantly influence the development of desirable graduate attributes. Consequently, these factors were incorporated into the creation of the three learning modules.

Target group for the research

The target group for this research comprised nine higher education faculty members, selected through purposive sampling to ensure the inclusion of individuals with significant expertise and involvement in teaching and research during the 2024 academic year. To meet the selection criteria, these faculty members were required to hold a doctoral degree in fields such as Educational Administration, Curriculum Research and Development, Educational Measurement and Evaluation, or Curriculum and Instruction. Furthermore, the participants were chosen based on their active engagement in either teaching or research activities during the specified academic year, ensuring that they possessed the relevant knowledge and experience to provide valuable insights for the study.

Research instrument

The primary instrument was an evaluation tool for the effectiveness of the development model influencing the desired characteristics of graduates, which consisted of two sections, namely, general information and an assessment of effectiveness in four areas: utility, feasibility, accuracy, and appropriateness. The instrument's validity was reviewed by nine experts, revealing a consistency index ranging from 0.80 to 1.00, which was within an acceptable range.

Data collection

Data was collected between August 1 and August 30, 2024, following approval from the Research Ethics Review Committee. Measures were implemented to prevent rights violations and to maintain the confidentiality of the participants. All evaluation forms were collected and verified for completeness before analysis.

Data analysis

The data were analyzed using statistical software to determine frequency, percentage, mean, and standard deviation. The interpretation was based on the criteria established by Kanchanawasi (2015). Qualitative data derived from the feedback of nine experts were meticulously analyzed through a rigorous content analysis process. The transcribed data were systematically organized through detailed categorization, interpretative analysis, and examination of interrelationships to synthesize and classify the information into well-defined thematic categories.

Phase 3: The trial implementation of the development model for factors influencing the desirable attributes of graduates from Nakhon Ratchasima Rajabhat University.

Experimental group and control group

The experimental process began with a pre-test on August 30, 2024, from 1:00 to 2:00 PM at Room 9.06.06, Chalermprakiat Building, Nakhon Ratchasima Rajabhat University, which included 30 items and a 43-item assessment of desirable graduate attributes. Three developmental models targeting self-management, learning attitude, and learning style were then implemented through structured learning units, which featured lectures, activities, worksheets, and post-unit assessments. The intervention took place over four Fridays, from September 6 to 27, 2024, from 1:00 to 5:00 PM, at the same venue. A post-test, using the same instruments, was conducted on October 4, 2024, during the same time and location. The experimental group consisted of 30 Primary Education students from Section 1, enrolled in the "Spirituality of Teaching" course in the first semester of the 2024 academic year, who participated in the intervention, while the control group, also comprising 30 students from Section 2 of the same course, did not receive the developmental intervention.

Research instruments

The pre- and post-learning tests evaluated factors influencing desirable graduate attributes. These tests were developed and their content validity was assessed by five experts, revealing validity coefficients between 0.60 and 1.00 and difficulty levels from 0.44 to 0.66. Discrimination indices ranged from 0.22 to 0.66, with a reliability coefficient of 0.76. The desirable graduate attributes questionnaire measured four components: knowledge, skills, ethics, and personal characteristics, using a five-point scale. Its discrimination indices ranged from 0.47 to 0.86, with an overall reliability coefficient of 0.98.

Data collection

Data collection was conducted over a three-week period using pre- and post-tests for both the experimental and control groups, along with recording the responses from the questionnaires.

Data analysis

The comparison of the mean scores before and after the learning process between the experimental group and the control group was conducted using an independent sample t-test. The comparison of the mean scores before and after the learning process within both the experimental group and the control group was conducted using a dependent sample t-test. The analysis of the desirable graduate attributes before and after the learning process was conducted using both independent and dependent sample t-tests.

Research results

1. The desirable graduate attributes of students at Nakhon Ratchasima Rajabhat University were rated highly, with ethics receiving the highest average score, followed by knowledge, personal characteristics, and skills. Students demonstrated an ability to apply knowledge for future development, particularly excelling in interpersonal skills, though entrepreneurial skills needed further enhancement. In terms of ethics, students emphasized academic integrity and respect for individual rights. Personal characteristics such as acceptance of diversity and social responsibility were also highly rated. Factors influencing these attributes were similarly rated high, with attitudes toward learning having the greatest impact, followed by adaptability, learning styles, work motivation, and self-management. Students exhibited adaptability and responsibility, valuing self-development and openness to diverse opinions. Statistically significant factors influencing graduate attributes at the 0.01 level included self-management (X1), attitudes toward learning (X3), and learning styles (X2), predicting graduate attributes by up to 81%. This highlights the critical role of self-management and positive attitudes toward learning in developing graduates.

Table 1 Regression Analysis of Factors Affecting Desirable Graduate Attributes of Nakhon Ratchasima Rajabhat University Students.

Predictors	b	Std. Error	β	t	p
Constant	0.804	0.087		9.201**	0.000
Self-management (X_1)	0.331	0.049	0.368	7.480**	0.000
Attitude toward learning (X_3)	0.305	0.044	0.340	6.224**	0.000
Learning style (X_2)	0.198	0.051	0.226	3.865**	0.000
R= 0.901, R^2 = 0.812, Adjusted R^2 = .810, p = 0.000					

**p ≤ 0.01

Table 1 illustrates that three factors significantly influenced the desirable attributes of graduates from Nakhon Ratchasima Rajabhat University at the 0.01 level. These factors, ranked from highest to lowest impact, were self-management (X_1), attitudes toward learning (X_3), and learning styles (X_2). Collectively, these factors could predict graduate attributes by up to 81.00%.

The prediction equation in the form of raw scores was as follows:

$\hat{y} = 0.804 + 0.331(X_1) + 0.305(X_3) + 0.198(X_2)$

The prediction equation in the form of standardized scores was as follows:

$\hat{Z}_y = 0.368(ZX_1) + 0.340(ZX_3) + 0.226(ZX_2)$

2. The development of factors influencing the desirable characteristics of graduates from Nakhon Ratchasima Rajabhat University began with an examination of key elements: self-management (X_1), attitudes toward learning (X_3), and learning styles (X_2). Subsequently, the researcher synthesized and constructed a development model comprising five main components: principles and rationale, objectives, implementation methods, content, and assessment and evaluation. This model was reviewed by experts who provided feedback for improvement, particularly in the area of assessment, emphasizing the importance of behavioral measurement and the use of concise and clear questions. The evaluation results indicated that the model demonstrated a high level of effectiveness, especially concerning its usefulness and appropriateness. However, the assessment and evaluation processes needed enhancement to ensure they were more comprehensive and equitable.

3. The results of the experimental implementation of the development model for factors influencing the desirable characteristics of graduates from Nakhon Ratchasima Rajabhat University indicated that there was no statistically significant difference in the mean scores between the experimental group and the control group before the learning process. However, after the learning process, the experimental group achieved a statistically significantly higher mean score than the control group at the .01 level. Additionally, there was a significant difference in the mean scores before and after learning within the experimental group, with post-learning scores being markedly higher than pre-learning scores. In contrast, the control group exhibited no significant differences between their pre-learning and post-learning scores, as illustrated in Tables 2-5.

Table 2 A Comparison of the Average Pre-test and Post-test Scores on the Development Model Factors Affecting the Desirable Graduate Attributes of Students at Nakhon Ratchasima Rajabhat University between the Experimental Group and the Control Group.

Group	Pre-test					Post-test				
	n	M	SD	t	p	n	M	SD	t	p
Experimental Group	30	16.03	3.06	0.37	0.71	30	25.50	1.45	18.27**	0.00
Control Group	30	16.30	2.45			30	16.50	2.27		

*p ≤ 0.05, **p ≤ 0.01

Table 2 shows that the average pre-test scores on the development model factors affecting desirable graduate attributes of Nakhon Ratchasima Rajabhat University students were not significantly different between the experimental and control groups at the .05 level. However, the post-test scores revealed a statistically significant difference at the .01 level, with the experimental group scoring higher than the control group.

Table 3 A Comparison of the Average Pre-test and Post-test Scores on the Development Model Factors Affecting the Desirable Graduate Attributes of Students at Nakhon Ratchasima Rajabhat University in the Experimental and Control Groups.

Scores	Experimental Group					Control Group				
	n	M	SD	t	p	n	M	SD	t	p
Post-test	30	25.50	1.45	24.54**	0.00	30	16.50	2.27	1.43	0.16
Pre-test	30	16.03	3.06			30	16.30	2.45		

*p ≤ 0.05, **p ≤ 0.01

Table 3 shows that the average pre-test and post-test scores on the development model factors affecting desirable graduate attributes of Nakhon Ratchasima Rajabhat University students in the experimental group were significantly different at the .01 level, with post-test scores higher than pre-test scores. In contrast, the control group showed no statistically significant difference between pre-test and post-test scores at the .05 level.

Table 4 A Comparison of the Average Questionnaire Scores on Desirable Graduate Attributes Before and After the Learning Process Between the Experimental and Control Groups.

Group	Before the Learning Process Scores					After the Learning Process Scores				
	n	M	SD	t	p	n	M	SD	t	p
Experimental Group	30	4.60	0.55	0.54	0.59	30	4.79	0.34	2.15*	0.03
Control Group	30	4.53	0.49			30	4.56	0.47		

*p ≤ 0.05

From Table 4, it was observed that the mean questionnaire scores on desirable graduate characteristics before the learning process did not show a statistically significant difference between the experimental and control groups at the .05 level. However, after the learning process, the mean scores differed significantly between the two groups at the .05 level.

Table 5 A Comparison of the Average Questionnaire Scores on Desirable Graduate Attributes before and after the Learning Process within the Experimental and Control Groups.

Scores	Experimental Groups					Control Groups				
	n	M	SD	t	p	n	M	SD	t	p
Post-test	30	4.79	0.34	4.38**	0.00	30	4.53	0.49	0.04	0.96
Pre-test	30	4.60	0.55			30	4.53	0.42		

**p ≤ 0.05, **p ≤ 0.01

Table 5 shows that the mean questionnaire scores on desirable graduate characteristics in the experimental group significantly increased after learning at the .01 level. In contrast, the control group showed no significant difference at the .05 level between pre- and post-learning scores.

Conclusion and Discussion

1. The research findings highlight that graduates from Nakhon Ratchasima Rajabhat University are rated highly in desirable characteristics, especially ethics, due to the university's focus on moral development through curricula and activities (Sukittimaythee, 2021; Payutto, 2018). The integration of technology, like Zoom and Microsoft Teams, enhances learning effectiveness, boosting academic achievement (Luenam et al., 2022). Key factors influencing graduates' attributes include self-

management, attitudes toward learning, and learning styles, with self-management having the greatest impact. These factors predict 81% of graduates' desirable traits, while adaptability and work-related aspirations show no significant effects (Phueaktai et al., 2024).

2. The development model for factors influencing desirable graduate characteristics at Nakhon Ratchasima Rajabhat University focuses on self-management (X_1), attitudes towards learning (X_3), and learning styles (X_2), all crucial for student development (Dikmen, 2020). The model includes principles, objectives, methodologies, content, and evaluation, validated by experts but with recommendations for clearer behavioral measurement. Its effectiveness, particularly in utility, was rated highly, supported by frameworks that link theory to practice and align with labor market needs (Meng, 2023; Prawatrungruang & Anannawee, 2024).

3. The study on the experimental application of the development model at Nakhon Ratchasima Rajabhat University found no significant difference between the experimental and control groups before instruction, indicating a lack of foundational knowledge (Suskie, 2018). However, post-instruction, the experimental group's scores were significantly higher, thanks to three core learning modules that enhanced self-management, attitudes toward learning, and engagement through diverse learning styles (Okolie et al., 2022). A significant improvement was seen in the experimental group's pre- and post-scores, while the control group showed no change. This highlights the impact of meaningful learning engagement on academic achievement.

Recommendations

Recommendations for implementing research findings

Before implementing this model, administrators, faculty, and students should develop a thorough understanding of the learning units, which consist of three distinct modules. Each learning unit includes the principles and rationale, objectives, implementation methods, content, and measurement and evaluation components. All stakeholders must comprehend these elements accurately to ensure the effective application of the model. The use of any learning unit requires a preliminary investigation to identify the factors influencing the development of desirable graduate attributes. Following this, the development of the learning units should align with the findings of the survey. Therefore, the implementation of this model must proceed in the prescribed three phases sequentially at all times. Potential challenges in implementing this developmental model include students' difficulty in understanding certain concepts, such as prioritizing tasks and managing time effectively using techniques like the Eisenhower Matrix, SMART Criteria, and Time Blocking. To address

this, instructors should provide clearer examples or utilize simpler methods for better comprehension. Additionally, during assessments, some students may engage in copying, leading to results that do not accurately reflect their development. Therefore, a robust and realistic evaluation and assessment process should be implemented to ensure accurate measurement of progress.

Recommendation for further research

A deeper investigation into entrepreneurial skills and emergency response capabilities is crucial for curriculum development. Long-term monitoring of graduate attributes, along with employer feedback, will help align skills with labor market demands. Expanding research to other universities and diverse samples will enable comparisons and validate the model's reliability. Additionally, studying social, cultural, and environmental factors will provide a comprehensive understanding of what influences graduate success.

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