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Quality Analysis of PDCA-Based Edupreneurship in 21st-Century Higher Education

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ABSTRACT

The objective of this qualitative descriptive study is to evaluate the effectiveness of the PDCA (Plan, Do, Check, Act) cycle in enhancing the quality of entrepreneurship education, or "edupreneurship," within universities, with a focus on Tangerang Raya University. This research engaged key stakeholders from the university, including the Vice-Rector for Academic and Student Affairs, deans and vice deans of the Faculty of Economics, Business and Humanities, the Faculty of Teacher Training and Education, and the Faculty of Engineering, as well as coordinators of study programs and students participating in edupreneurship initiatives. The findings indicate that the PDCA cycle significantly contributes to the improvement of edupreneurship quality and achievements at Tangerang Raya University. By facilitating the identification of weaknesses, the PDCA cycle enables continuous enhancements in the entrepreneurial education process. Despite its effectiveness, the implementation of the PDCA cycle in edupreneur programs encounters several challenges. These include constraints such as limited resources (budgets, teaching staff, and facilities), implementation hurdles, varying levels of engagement among members, shifting priorities, challenges in identifying opportunities, time limitations, difficulties in impact assessment, collaboration challenges, member turnover, and environmental uncertainties.This study underscores the PDCA cycle's potential in fostering edupreneurship within universities. However, it also highlights the necessity for addressing the aforementioned obstacles to fully leverage the PDCA cycle's capabilities in enhancing the quality of edupreneurship education. Addressing these challenges is essential for the sustained success and effectiveness of edupreneur programs driven by the PDCA quality management cycle.

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1. INTRODUCTION

Throughout history, education has evolved alongside other social systems, reflecting the changes in science, philosophy, culture, and economics. These shifts have significantly influenced the objectives, content, and methods of education (Eiff et al., 2020; García-Morales et al., 2021). In the 21st century, education faces challenges in preparing graduates for global challenges and a complex job market (O. & C.O., 2021). Higher education institutions are tasked with enhancing graduate competencies, focusing on the abilities and skills needed for the 21st-century workforce (Vargas & Andrés Javier, Bernate, J, 2020). Moreover, universities are expected to align with the guidelines set by the International Commission on 21st-century education to construct an educational framework suitable for Indonesia, aiming to equip college graduates for the demands of a challenging job market and global adversities (Aver et al., 2021). To navigate these challenges, universities should concentrate on bolstering the skills and capabilities of their graduates. This includes fostering literacy, creativity, innovation, critical thinking, problem-solving, metacognition, and enhancing communication and collaboration skills (Ghafar, 2020). These competencies are crucial for graduates to successfully meet the complex demands of today's job market and to thrive in the face of 21st-century global challenges.

In the midst of the rapid transformation of the 21st century, ensuring the quality of higher education graduates is more important than ever. To achieve this, institutions need to adopt effective quality management strategies such as the PDCA cycle. PDCA, developed by William Edwards Deming (Vásquez et al., 2022), is a management cycle involving four main steps: Plan, Do, Check, and Act (Vásquez et al., 2022;Vásquez et al., 2022). The PDCA approach is used to implement continuous improvement in various fields, including the quality of education (Wang et al., 2022).

In the field of higher education, ensuring sustainable quality management means ensuring that students receive high-quality education (Eryılmaz et al., 2016). The PDCA cycle is believed to be a process of continuous improvement that allows institutions to identify areas for improvement and students to be motivated, develop and implement strategies to address them, and evaluate their effectiveness (Chojnacka-Komorowska; Kochaniec, 2019). In the context of edupreneurship, the PDCA cycle can be a valuable tool to ensure quality management in higher education (Arias et al., 2018).

PDCA quality analysis can help educational institutions plan and implement programs that are relevant to the needs of today's business world (Mittal & Raghuvaran, 2021). The planning step involves identifying the needs and expectations of stakeholders, developing programs that are in accordance with the objectives of the institution, and formulating the necessary strategies and tactics. After planning, the implementation step (Do) involves the implementation of entrepreneurship and innovation programs in the curriculum as well as activities outside the classroom. This step includes teaching, training, mentoring, and developing skills relevant to the business world. The next step is checking, where evaluation is carried out on the programs that have been implemented. This evaluation involves collecting and analyzing data on the success of the program, input from participants, and feedback from other stakeholders. The results of this evaluation will assist the institution in evaluating the effectiveness of the program and identifying areas of improvement needed. The final step is corrective action (*Act*), where based on the results of the evaluation, educational institutions will take steps to improve existing programs. This can involve changes in teaching methods, adding resources, or refining marketing strategies (Larina, 2015). Using PDCA quality analysis, higher education institutions can systematically plan, implement, check, and take corrective actions on their entrepreneurial programs. This will help improve the relevance and quality of education tailored to the needs of today's business world.

It is no longer undeniable that in the 21st century, higher education faces increasingly complex and dynamic challenges. As an educational institution responsible for preparing its graduates to enter the competitive world of work, universities need to ensure that the quality of their graduates is in line with the demands of the times. In an effort to improve the quality of graduates, the PDCA (*Plan-Do-Check-Act*) quality analysis approach has now been adopted by many higher education institutions (Sulisworo, 2016). Higher education has an important role in providing the growth of entrepreneurial

spirit. This can be started by providing education to students to be able to start a business in college. Many universities implement entrepreneurship-based curriculum as a subject that their students must teach. This is one of the important strategies in building *self-potency*, creativity, and *soft skills* in students through the development of education-based entrepreneurial competencies or edupreneurship (Nurjaya et al., 2020).

PDCA (Plan-Do-Check-Act) quality analysis in relation to entrepreneurship in higher education is an important approach in ensuring the quality and success of educational programs aimed at developing the spirit of entrepreneurship (edupreneurship) and innovation among students (OECD, 2016). Higher education has a crucial role to play in preparing young people to become successful and innovative entrepreneurs in an increasingly competitive job market. Student readiness in edupreneur skills will build success in entrepreneurship (Chen et al., 2022). To achieve these goals, higher education institutions need to adopt an approach that focuses on entrepreneurship and innovation in the planning and implementation of curricula and activities outside the classroom. With this entrepreneurship education, it is hoped that it can form a spirit of leadership, creativity, and creative thinking and can work together (Peschl et al., 2021).

Several studies have examined the cycle of Plan, Do, Check, Action (PDCA). Morgan & Stewart (2017) conducted research on PDCA to improve team skills and behavior in the classroom. Aggarwal (2020) examines the existence of continuous assessment and improvement in the PDCA cycle in a course. Riis et al. (2017) explore the Plan-Do-Check-Act on problem-based learning. There are also those who research related to the use of the PDCA model in improving product quality (Arredondo-Soto et al., 2021), applying the Plan-Do-Check-Act (PDCA) cycle in the packaging process (Nguyen et al., 2020), and learning pedagogy using the PDCA cycle (Loyd &; Gholston, 2016). From the various literature above, there is no discussion of the PDCA cycle in entrepreneurship education or can be called edupreneurship in the 21st century in universities.

This study examines the application of the PDCA cycle in higher education with a focus on edupreneurship and its potential to enhance educational quality in universities. Edupreneurship encourages students to transfer knowledge, skills, attitudes, and achievements, thereby fostering a culture of innovation (Gedeon, 2017) and enabling students to identify opportunities and engage in value creation within the higher education environment (Darwish, 2019; Raharjo et al., 2014). Furthermore, this research aims to offer empirical and scientific insights for the educational sector, particularly universities, to elevate the standard of competitive education through the implementation of the PDCA cycle.

2. METHODS

This research method uses a qualitative approach. The qualitative approach is inductive, not starting from theoretical deduction but from the field, namely empirical facts (Sugiyono, 2016). The author goes into the field, studies a process or discovery that occurs naturally, records, analyzes, interprets and reports and draws conclusions from the process (Sitika et al., 2021). The purpose of this study is to obtain an overview of the PDCA process implemented in edupreneurship programs in universities.

The research was conducted at the University of Tangerang Raya, Banten Province, Indinesia, collecting research data using interview, observation, and documentation techniques. The interview involved the Vice-Rector for Academic & Student Affairs, Dean and Vice Dean at three faculties, namely the Faculty of Economics, Business and Humanities, the Faculty of Teacher Training and Education, and the Faculty of Engineering. The interview also involved the coordinator of the study program and students involved in edupreneurship. Documentation using checklist sheets includes documentation of activities and collection of documents related to eduprenership activities held in the form of portfolios, manuscripts and photos of activities. Furthermore, observation uses observation guideline sheets that contain dimensions of planning, action, evaluation and improvement.

Data were collected and analyzed using qualitative descriptive and triangulation techniques to obtain accurate and accountable data by matching data obtained through interviews, documentation, and observations monitored and guided by the research team. The procedure for data collection and data analysis is described as follows:

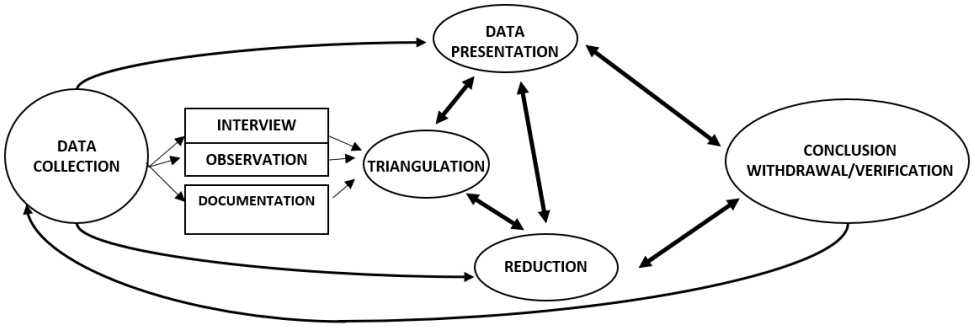

Figure 1. Data Collection and Analysis Procedures

3. FINDINGS AND DISCUSSION

3.1. Finding

The findings in this study discussed from three domains that are a forum for students in supporting edupreneur activities in universities. The domains to be discussed are starting from student lecture activities, Student Activity Units, and student activities outside lectures.

3.1.1 Lecture Activities

Edupreneur development to students is realized through lecture activities through Entrepreneurship courses. Entrepreneurship courses not only equip students with business knowledge, but also develop the attitudes, skills, and thinking necessary to become innovative, competitive, and positively contributing individuals in society and the economy. Ensuring the quality of the lecture process, the PDCA process was developed in edupreneur lecture activities in entrepreneurship courses. The application of the PDCA cycle in lectures helps ensure that the learning process continues to be improved and refined from semester to semester. By applying PDCA principles, lecturers can better plan teaching, carry out effective teaching, evaluate student understanding, and take corrective actions needed to improve learning outcomes (Aggarwal, 2020). The following are edupreneur-based lecture activities that can be implemented with the PDCA (Plan-Do-Check-Act) cycle approach:

Table 1. PDCA-Based Edupreneur Lecture Activities

PDCA Stage	Activity	Description
Plan	Setting Goals	Define the purpose of the activity, such as developing entrepreneurial skills and innovating among students
	Identify Opportunities	Identify opportunities or challenges relevant to the business world or a particular industry, which will be the focus of activity
	Lesson Plan	Lecturers plan curriculum and course materials for one semester, including learning objectives, teaching methods, and resources needed
Do	Teaching in class	Lecturers carry out the teaching process in accordance with the plan that has been prepared, deliver material, facilitate discussions, and assign assignments to students
	Opportunity Introduction	Start with an introductory session on the concept of edupreneurship, how important innovation is, and how to take advantage of opportunities

PDCA Stage	Activity	Description
	Case Discussion	Discuss real-life case studies of startups or innovations in a particular industry. Discuss how businesses identify opportunities and overcome challenges.
	Conduct practicum activities or collaborative projects	In courses involving practicum or projects, lecturers and students carry out practical activities in accordance with planning. Divide students into small teams and assign tasks to identify potential opportunities in specific industries and devise innovative solutions
Check	Collect and evaluate task results	Lecturers collect and assess assignments given to students to check their understanding of the material.
	Hold an exam or quiz	Dosen melaksanakan evaluasi terstruktur seperti ujian atau kuis untuk mengukur pemahaman mahasiswa terhadap materi perkuliahan.
Act	Provide feedback	Lecturers carry out structured evaluations such as exams or quizzes to measure students' understanding of the course material.
	Tailor teaching	Lecturers analyze the results of evaluation and feedback to determine whether there needs to be adjustments in the way of teaching or material delivered.

Based on Table 1 above, lecture activities have been supported by the existence of PDCA-based entrepreneurship courses. The orientation of entrepreneurship courses in each faculty has differences, especially in the learning outcomes of each faculty. For example, at the Faculty of Teacher Training and Education, the organization in the entrepreneurship course to be achieved is in the business in the field of education where one example is opening a *Daycare* business , especially in the Early Childhood Education Study Program. At the Faculty of Business Economics and Humanities, it is directed to building businesses related to economics and business, as one example is the Coffee Shop and *Franchise* established by students. At the Faculty of Engineering, oriented towards development and innovation in the world of industry and business in the fields of engineering, information and technology, for example as *a web developer*.

By applying PDCA's quality analysis approach in entrepreneurship to higher education, educational institutions can ensure that the programs offered are in accordance with market needs, produce graduates who are ready to face the business world, and continuously make improvements to improve the quality of education provided. Based on documentation studies, edupreneur development through PDCA-based entrepreneurship lectures is effective in increasing entrepreneurship in Tangerang Raya University students. This is shown through the graph below:

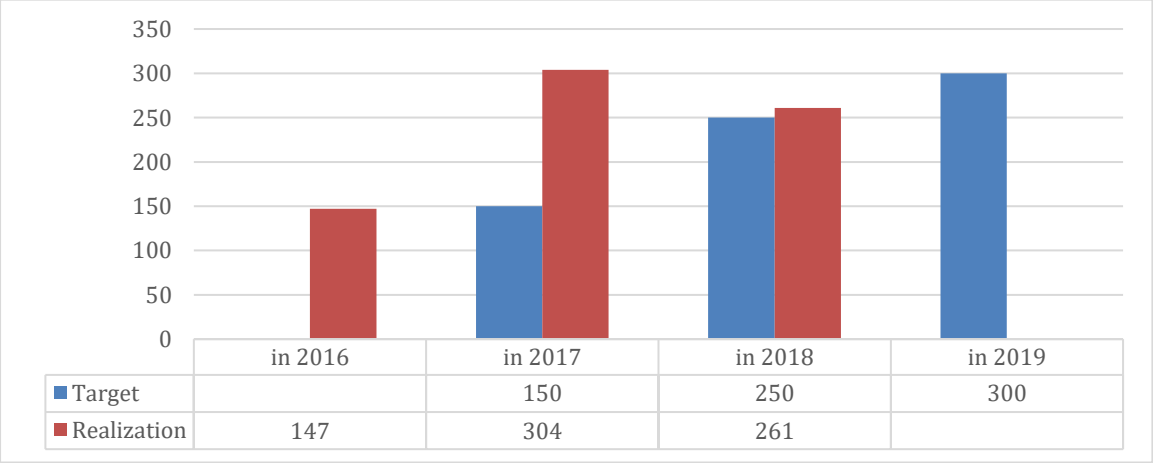

Figure 2. Entrepreneurial Students

The graph shows an increase in the graph of students who are interested in entrepreneurship. This finding certainly shows the effectiveness of PDCA to improve the quality of edupreneurship through the lecture process. This is urgent so that further studies are held on the role of entrepreneurship in education, especially in universities. Entrepreneurs contribute a very important role to state life, one of which is in the labor sector. Entrepreneurship is one of the factors of production that plays an important role in development. The main source of prosperity can be seen from economic development which is dominated by the entrepreneurial role of economic actors.

3.1.2 Student Activity Unit

Applying the PDCA-based edupreneur concept through student activity units is a very relevant and effective approach to help students develop entrepreneurial and innovative spirits. In universities where research is located, student activity units that support entrepreneurial activities have been operating but have not been carried out optimally. Nevertheless, the PDCA concept is an applied quality concept. The following are the PDCA steps implemented in developing edupreneurship through the Student Activity Unit:

Table 2. PDCA-Based Edupreneur Through Student Activity Unit

PDCA stage	Activity	Description
Plan	Determining SME Edupreneurial Goals	Setting edupreneurial goals to be achieved through student activity units. This could include the development of entrepreneurial skills, innovation in SME activities, or social contribution through projects
	Identify Opportunities	Identify opportunities or problems that SMEs want to address. It could be a business opportunity, skills training, or social service
	Activity Plan:	Design an activity plan including the type of event or project to be executed, the target audience, and the resources needed.
Do	Product or Service Development	If edupreneur activities through student activity units involve developing products or services, invite members to design, develop, and test products or services that match the opportunities identified
	Training and Workshops	Student activity units include training sessions and workshops that support the development of entrepreneurial and innovative skills for members.
	Social Activities	carry out activities such as social actions, awareness campaigns, or community development programs
Check	Activity Evaluation	Evaluate the achievement of goals. Are edupreneurial goals achieved? What went well and what needs to be improved?
	Member Feedback	Ask for feedback from members of the student activity unit regarding the activities that have been carried out. Do they feel they have gained valuable benefits and experiences?
Act	Activity Improvement:	Based on the results of evaluation and feedback, make improvements to the plan and implementation of subsequent activities.
	Innovation	Invite members of the student activity unit to think innovatively and find new ways to increase the positive impact of student activity unit activities
	Advanced Development	Collaborate with external partners

Table 2 reveals that although the PDCA cycle is methodically and quantifiably structured, its potential to enhance entrepreneurship in the university setting has not been fully realized. This shortfall is primarily due to the lack of a specialized student activity unit dedicated to entrepreneurial activities. As the university is in its nascent stages and still evolving, it faces difficulties in promoting entrepreneurship through the programs offered by the student activity units.

3.1.3 Activities Outside of Lectures

Student activities outside lectures related to eduprenuer can be observed with their creation and innovation in developing a business unit they founded. Systematically the PDCA cycle in edupreneurship through activities outside lectures at Tangerang Raya University is mapped as follows:

Table 3. PDCA-Based Edupreneur Through Activities Outside of College

PDCA stage	Activity	Description
Plan	Setting edupreneurial goals	Organizing entrepreneurial skills development workshops for students outside the lecture environment
	Identify Opportunities	Identify students' needs and interests related to the entrepreneurial skills they want to learn.
	Action Plan	Plan the schedule, materials, and format of the workshop. Also, determine evaluation methods to measure the success of the workshop.
Do	Business Development Workshop:	Conduct interactive workshops covering topics such as business planning, marketing strategy, financial management, and business presentations.
	Individual Mentoring	After the workshop, it provides an opportunity for participants to consult individually with a mentor or facilitator to discuss their business ideas.
Check	Workshop Evaluation	Evaluate the workshop by collecting feedback from participants about the material, delivery, and its impact on their understanding.
	Participant Progress Monitoring:	Observe participants' progress in applying the skills they learned in the workshop.
Act	Material and Method Improvement	Based on feedback, improve and improve the workshop material and teaching methods.
	Advanced Session:	Plan follow-up sessions or regular meetings to track attendee progress, discuss challenges, and provide further guidance.
	Business Plan Development:	Encourage participants to develop a concrete business plan based on what they have learned in the workshop.

The implementation of the PDCA (Plan-Do-Check-Act) cycle in higher education, particularly in fostering entrepreneurial activities, demonstrates a structured and measurable design. Nonetheless, its full potential is yet to be realized due to the absence of dedicated student activity units for entrepreneurship. This gap is attributed to the university's nascent stage and developmental challenges, hindering the establishment of such units to support entrepreneurial endeavors. The PDCA cycle's application extends beyond academic lectures, facilitating workshops for the development of entrepreneurial skills that are tailored to the participants' needs, thereby enhancing impact. This methodological approach nurtures entrepreneurial competencies, fuels innovation, and emboldens students to undertake business ventures confidently.

Entrepreneurial activities led by student business units yield diverse products, categorized as follows:

1. Technology Products
    - Mobile Apps: Applications for various needs including education, health, time management, and entertainment.
    - Electronic Devices: Unique devices for educational purposes, healthcare, or Internet of Things (IoT) applications.
    - Gadget Accessories: Innovative or functional accessories for electronic devices.
2. Fashion and Lifestyle Products

- Clothing and Accessories: Design and production of fashionable items.
- Beauty Products: Innovative skincare, haircare, and cosmetics.
- Health Products: Fitness-related products, including attire and equipment.

3. Art and Creativity Products
   - Visual Arts: Saleable or exhibitable art pieces.
   - Crafts: Handmade jewelry, decor, or textile goods.
   - Music and Entertainment: Production of musical content and events.
4. Food and Beverage Products
   - Healthy Food: Nutritional snacks and natural drinks.
   - Culinary Products: Unique culinary dishes.
   - Beverages: Non-alcoholic and innovative drinks with appealing packaging.
5. Service and Consulting Products
   - Design Services: Graphics, interior, and creative design services.
   - Business Consulting: Consultancy in business strategy and management.
   - Training and Education: Specialized training and courses.
6. Sustainable and Social Products
   - Eco-Friendly Products: Environmentally responsible goods.
   - Social Products: Offerings that contribute positively to society.
7. Digital Products
   - Digital Content: E-books, podcasts, videos, and online courses.
   - Web Applications: Task management, financial planning, and collaborative tools.

These initiatives exemplify the broad spectrum of entrepreneurial ventures that can emerge from an education system enriched by the PDCA cycle, highlighting the cycle's role in fostering a dynamic and innovative entrepreneurial ecosystem within higher education.

Success in edupreneurship doesn't always come instantly. It takes time, effort, and dedication to build and develop activities outside of college into something valuable and impactful. And the most important thing that should not be forgotten is that edupreneur activities must be able to help facilitate students to develop knowledge, skills, and attitudes. Lackeus (2015) provides an overview of current developments over time in the education system, with shifting definitions, pedagogical approaches, and varying emphasis on theory rather than practice, as follows:

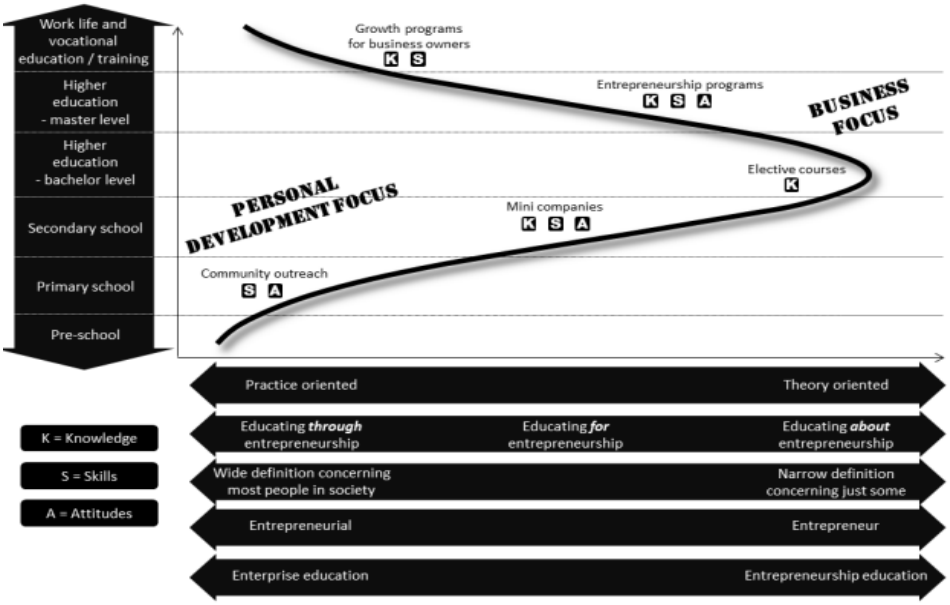

Figure 3. Entrepreneurship Scheme in Education

3.2. Discussion

3.2.1 PDCA-Based Edupreneur through Lecture Activities

Higher education today not only aims to transfer knowledge, but also to develop skills and attitudes relevant to the demands of the times (Žalėnienė &; Pereira, 2021). In this case, edupreneurship planning in 21st Century competency-based universities is important to prepare students to become individuals who are adaptive, innovate, and contribute significantly to society and the world of work (Haderer &; Ciolacu, 2022).

Good course planning to build 21st Century entrepreneurship involves a holistic approach and focuses on developing skills, attitudes, and knowledge relevant to the demands of the modern business world (Islami, 2019). Edupreneur planning through lecture activities at Tangerang Raya University is well designed and implemented in three stages, namely determining goals, identifying opportunities, and planning learning. Edupreneurship planning at Tangerang Raya University is aligned with the needs of 21st century education skills consisting of creative, collaborative, communicative, and critical thinking. Planning related to the achievement of graduate profiles in each study program is adjusted to the formulation of a curriculum that supports entrepreneurial spirit development activities. Good program planning should include several aspects namely setting goals and objectives, identifying areas that need improvement, determining resources, financial planning, curriculum development and instructional planning (Damavandi et al., 2011; Shu-Hsiang et al., 2015; Ndihokubwayo et al., 2022; Lin & Benneker, 2022). Elçiçek &; Erdemci (2021) revealed that to be able to meet the demands of the 21st century, edupreneurship planning must explore 21st century skills including information and technology literacy, critical thinking and problem solving, entrepreneurship and innovation, social responsibility and leadership, and career awareness (Elçiçek &; Erdemci, 2021).

The implementation of edupreneurship through the learning process in lectures at Tengerang Raya University is an effort to combine education and entrepreneurship in a higher education environment. There are 4 activities that are synergized to shape the entrepreneurial spirit through the lecture process, namely teaching in class, introducing opportunities, discussing cases, and conducting practicum activities or collaborative projects. Edupreneurship should involve the integration of entrepreneurial principles in curriculum and learning activities to equip students with the skills, attitudes, and knowledge necessary to become successful entrepreneurs in the future (Abbas et al., 2022). Edupreneurship through the process of learning and important lectures offers edupreneurship courses, integrates edupreneurship into the curriculum, provides experiential learning opportunities, and encourages collaboration and networking (Raitskaya &; Tikhonova, 2019).

Next is the evaluation (check) and follow-up (act) edupreneur through lecture activities. Evaluating entrepreneurship education through college programs is essential to ensure its effectiveness and identify areas for improvement. For evaluation, entrepreneurship lecturers at Tangerang Raya University carry out structured evaluations such as exams or quizzes to measure students' understanding of edupreneurship lecture material. Several other approaches can be used to evaluate edupreneurship learning, including: a) formative assessment (Wibowo, 2017), b) Feedback from students (Firmansyah et al., 2020), c) Business project tasks (Rezaeinia et al., 2022), d) Business Presentation (Russo et al., 2023), e) Written Report (Tumiran et al., 2021), f) Team Evaluation (Cristina & Ferreira, 2020), g) special exams or tests (Yalçin & Kurnaz, 2021), h) Portfolio (Villamil & Hallstedt, 2021), i) self-evaluation (Leicht, 2018), and j) end-of-semester evaluation (Okmawati, 2020). For follow-up, lecturers analyze the results of evaluation and feedback to determine whether there needs to be adjustments in the way of teaching or material delivered. Follow-up has an important role in education and entrepreneurship. Through follow-up, evaluation, improvement, development, monitoring, and improvement of program quality can be carried out (Basyirah &; Wardi, 2020). Thus, evaluation and follow-up become an integration of learning management functions that cannot be separated. Follow-up helps ensure the success and sustainability of the program and provides optimal benefits for learners or participants of the entrepreneurship program.

3.2.2 PDCA-Based Edupreneur Through Student Activity Unit

PDCA-based edupreneurship through Student Activity Unit is an approach that combines entrepreneurial principles with the PDCA (Plan-Do-Check-Act) cycle to develop entrepreneurial skills and 21st Century competencies in students through student activity units that stand on campus. Research findings show that the PDCA cycle has been designed for this activity, but its effectiveness has not been optimal because there is no student activity unit that specifically accommodates entrepreneurial activities because the university is still relatively new and in the Development stage. Other factors that become obstacles to edupreneur development through student activity units include: a) limited resources (limited budget, teaching staff, and facilities); b) difficulties in implementing the PDCA cycle; c) the level of member engagement; d) changes in priorities; e) difficulty identifying opportunities; f) time constraints; g) difficulty in evaluating impacts; h) difficulties in collaboration; i) change of members; and j) environmental uncertainty (Zakaria et al., 2022)(Dzisi &; Odoom, 2017)(Chung &; Kim, 2013). Thus, the implementation of PDCA does not stand independently to succeed in achieving edupreneurship goals, but needs to be supported by other factors that encourage optimization in the field.

3.2.3 PDCA-Based Edupreneurs Through Activities Outside of College

PDCA-based edupreneurship through activities outside lectures at Tengerang Raya University is an approach that combines entrepreneurial principles with the PDCA (Plan-Do-Check-Act) cycle to develop entrepreneurial skills and 21st Century competencies in students through activities outside of lectures. At the plan stage, set goals, identify opportunities, and develop an activity plan. At the do stage, business development workshops and individual mentoring are held. At the check stage, evaluation and monitoring of student performance progress are carried out. And finally, at the act stage, follow-up is carried out in the form of material and method improvements, follow-up sessions and sustainable business plan development.

PDCA-based edupreneurs through activities outside of lectures at Tengerang Raya University have proven effective in helping students develop entrepreneurial skills, inspire innovation, and encourage courageous attitudes to take action in starting a business. Students both in teams and individuals are able to innovate to produce several products such as technology products, fashion and lifestyle products, art and creativity products, food and beverage products, service and consulting products, sustainable and social products, and there are also digital products.

Innovation and activity are the keys to success in building eduprenership in higher education (Bagaria et al., 2022). PDCA helps actors involved in edupreneurs synergize to be able to integrate various resources to support program goals. PDCA encourages business owners or aspiring entrepreneurs to develop their entrepreneurial skills in planning, decision making, innovation, and management (Malega et al., 2021). PDCA helps in detecting market changes, trends, or challenges affecting the business. By regularly evaluating and taking appropriate actions, business owners can quickly adapt (Pan et al., 2022). Thus the consistent application of the PDCA cycle, entrepreneurs can build adaptive, innovative, and competitive businesses in the face of market changes and dynamic business environments.

Edupreneur or who can be referred to as an education entrepreneur in simpler language, is someone who transforms knowledge, attitudes, and skills into benefits for others through teaching, training, or providing services to the community (Masitha et al., 2018). Generalizing from existing case studies from private universities, the researcher expressed a scientific view on Edupreneurship activities with the PDCA Cycle in higher education in the 21st century. The existence of Eduperneurship in higher education shows that there is quality in the field of entrepreneurship education (Raza et al., 2021). With this case study, we see that universities to achieve 21st century education are one of them with applied entrepreneurship education. This is shown by the curriculum that has been formulated so that there are entrepreneurship courses. So that with the goal of achieving graduate learning from entrepreneurship courses that require students to think critically, creatively,

collaborate and be good at communicating where all these aspects are achievements that must be mastered in the 21st century.

The Plan-Do-Check-Act (PDCA) cycle is a learning and improvement cycle that evolved from Edward Deming (Valenciano et al., 2019). The PDCA cycle in the context of edupreneurs can be interpreted as a method that can be used to develop and improve the spirit of entrepreneurship in the field of education. The cycle of continuous improvement in edupreneurs through PDCA in Higher Education in the 21st Century can be seen in figure 6 below:

Figure 4. PDCA Cycle On Edupreneurship

By implementing the PDCA cycle, edupreneurship can continuously improve and develop their educational initiatives. This cycle allows for continuous improvement and adaptation based on continuous evaluation, thus achieving better results and in accordance with the established educational goals. Educational edupreneurship includes elements of creativity, innovation, the courage to take risks, and the courage to change the world of education with new and innovative ideas. Their results showed that entrepreneurial intentions were significantly predicted by personal attractiveness and perceived feasibility, and that students' entrepreneurial intentions were more of a choice than a necessity. Because in other studies, it is stated that the entrepreneurial spirit is determined by environmental factors (Valenciano et al., 2019).

The author argues that the theory of planned behavior is very useful and provides a good theoretical framework for understanding the antecedents of entrepreneurial intentions. An edupreneur has various goals, such as increasing access to education, innovating in learning, and achieving financial benefits through his business. To achieve this goal, they must have knowledge and skills in the field of education. This relates to criteria in 21st century education which include (Etistika Yuni Wijaya et al., 2016):

1. Critical Thinking: Edupreneurs encourage students to think critically about the information presented to them.
2. Creativity: Edupreneurs encourage students to generate new ideas and see different perspectives. They create learning environments that facilitate exploration, innovation, and creative problem solving.
3. Collaboration: Edupreneurs encourage students to work together and collaborate in achieving common goals. This collaboration trains students in universities to work in teams and reward each member's contribution.

4. Effective Communication: Edupreneurs teach students to communicate effectively. Verbal and non-verbal communication skills, including the ability to convey ideas clearly, listen attentively, and interact with others effectively.

By meeting these criteria of 21st century education, edupreneurs can create learning experiences that are more relevant, interactive, and prepare students for the demands of an ever-evolving world. The findings and discussion above explain that the use of a continuous cycle to see the achievement of a program in this case, namely PDCA in edupreneurship in universities in the 21st century, has achievements in terms of activities in lectures and activities outside lectures, but there are still obstacles in accommodating students to play an active role in a forum called the Student Activity Unita, So that this cannot be continued because universities are still in new conditions and the building stage so that it becomes an inhibiting factor of other cycle planning cycles.

4. CONCLUSION

The PDCA (Plan-Do-Check-Act) cycle has been instrumental in enhancing the quality and achievements of entrepreneurship education, or "edupreneurship," at Tangerang Raya University. This cyclical process enables edupreneurs to identify weaknesses and continuously refine the entrepreneurial education process, thereby fostering a more effective and dynamic learning environment. Despite its efficacy, the successful implementation of the PDCA cycle in edupreneur programs encounters several challenges. These include limited resources such as budgets, teaching staff, and facilities; difficulties in implementing the PDCA cycle; varying levels of member involvement; shifting priorities; challenges in identifying opportunities; time constraints; evaluating impacts; collaboration difficulties; member turnover; and environmental uncertainty. To mitigate these challenges and ensure the sustainability of PDCA quality management in edupreneurship, educators and higher education institutions are advised to proactively address the factors that impede the PDCA cycle's effectiveness. This involves securing adequate resources, fostering a supportive environment for PDCA implementation, encouraging active participation from all members, and adapting to changing priorities and environmental conditions. Additionally, it is essential to develop strategies for identifying opportunities, managing time efficiently, evaluating impacts accurately, enhancing collaboration, and managing member turnover. Future researchers are encouraged to explore other aspects related to the quality of edupreneurship, employing a broader scope of variables and contemporary quality management models. Investigating these areas could provide further insights into optimizing edupreneurship education and supporting the development of 21st-century edupreneurs through innovative and effective pedagogical approaches.

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