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Transforming the Internship Learning Model in Higher Education to Face the World of Work 5.0

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Abstract. University graduates are expected to become agents of change and enhance positive transformation in knowledge, skills, behavior, and character. In this context, the individuals must work in line with their competencies, interests, and talents. This research aimed to design an internship learning model that enhances graduates' work readiness, specifically in terms of mental health, independence, and efficiency, by developing knowledge, skills, attitudes, and positive character traits. A Research and Development method was adopted using experimental, observational, interview, and assessment methods. The trial was conducted on a sample of 200 students from the Vocational School of Universitas Muhammadiyah Surakarta [UMS]. Meanwhile, the internship learning model was implemented using 100 students each in an experimental and control group. The results showed that the internship model: industry and technopreneurship consisting of three stages, namely pre-immersion, immersion, and post-immersion, was valid and reliable in equipping graduates with the mental resilience and independence skills required to be effective in the workplace. The hypothesis that internship model in industry and technopreneurship could improve students' knowledge, skills, and practical behavior toward a progressive transformation to meet the challenges of Society 5.0 was confirmed. As a recommendation, a model should be adopted to cultivate graduates capable of addressing societal challenges and social issues arising from technological integration, while preparing for greater professional responsibilities in the future.

Keywords: internship; learning; transformation; technopreneurship; vocational.

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1. Introduction

A key goal of higher education is to equip graduates with the independence and mental resilience required to create jobs (Suranto et al., 2024). As emphasized in previous studies, graduates are not only prepared to seek employment but also to become job creators (Suranto & Rahmawati, 2013). Generally, higher education serves to prepare students for entry into the workforce or for professional roles that correspond with their specific aspirations, career goals, or fields of study (Temtama et al., 2019).

Based on prior research, the readiness of vocational education graduates comprises several important dimensions, including technical competencies relevant to industry demands, ability to adapt to technological advancements, and strong understanding of both the business environment and industrial dynamics (Husnan et al., 2023; Octaviani & Arumsari, 2023). Vocational education graduates are also expected to possess teamwork skills, problem-solving abilities, and a solid entrepreneurial mindset, together with a spirit of independence (Husnan et al., 2023).

The Society 5.0 era and the advancement of artificial intelligence, characterized by a rapid rate of change, high levels of competition, as well as increasing complexity in the fields of technology and science, demand that learning in higher education should be adaptive and responsive (Barliana et al., 2020). Equally important is collaboration among stakeholders and a collective readiness to face the challenges of transformation, both of which are considered very important to achieving meaningful progress (Afrizal et al., 2021).

The Society 5.0 era represents a collaborative dynamic between humans, as the central focus, and technology, as the empowering tool (Eliwatis et al., 2022; Harahap et al., 2023; Marpaung, 2023). Therefore, learning in this era emphasizes the holistic development of humans, who are rational, knowledgeable, and ethical beings, supported by the advancements in modern technology. The defining characteristics of Society 5.0 include the comprehensive utilization of information, the application of advanced communication technologies, community-centric approaches, active public participation, and a strong emphasis on sustainability, inclusivity, and effectiveness. It also includes the increasing integration of Artificial Intelligence [AI] and the disruption of various economic sectors (Marpaung, 2023; Yunarti et al., 2022).

Regardless of the push toward work-ready education, the unemployment rate among secondary school graduates in Indonesia has been observed to remain relatively high, February 2024 (Nola, 2024), where it was stated that the highest unemployment rate was found among Vocational High School [SMK] graduates, at 8.62% (Nola, 2024), General High School [SMU] graduates followed at 6.73%, while Higher Education graduates [D4 to S3] recorded an unemployment rate of 5.63%, associate degree holders [D1 to D3] showed the lowest unemployment rate at 4.87%, over the past four years (2021–2024), the unemployment rate for vocational school graduates has remained significantly high. However, it has shown a steady decline from 11.45% in February 2021, to 10.38% in 2022, 9.60% in

2023, and finally down to 8.62% in 2024 (Nola, 2024). Regardless of the fact that the downward trend is promising, it also emphasizes the presence of persistent challenges demanding focused attention.

Several academic educational institutions have begun implementing internships, and their graduates have proven to possess specialized skills and find employment. Within this context, some significant issues requiring evaluation include the inconsistency between curricula and industry needs, limited access to job information and opportunities, increasingly competitive labor markets, inadequate understanding within business and industry sectors regarding the potential of vocational graduates, limited employment availability, as well as inconsistent graduate quality (Nola, 2024; Suminar et al., 2024; Young et al., 2025).

Based on previous explorations, progressive transformations in internship learning models reflect a shift from traditional internship patterns to more structured programs relevant to the needs of modern industry (Marpaung, 2023; Yunarti et al., 2022). Some forms of this transformation include project-based internships, digital internships, and internships integrated with the educational curriculum (Rahaju et al., 2024).

Furthermore, changes have occurred in the learning approach during internships, through the implementation of modeling, scaffolding, coaching, and gradual fading strategies to guide interns to become more independent. Deep learning-based internships are also a key approach that emphasizes in-depth understanding, not just memorization (David, 2020). Deep learning internships aim to enable students to not only read but also understand; not just calculate but also analyze; not only memorize but also apply knowledge and create innovation (Wang & Hsieh, 2022).

Educators, as the primary drivers of transformation in this era, must have comprehensive competencies, specifically considering the fact that the demographic is not only tasked with delivering academic content effectively but is also expected to inspire students to think critically, creatively, and adaptively in response to rapid societal and technological shifts (Anute & Tilak, 2024). Within this context, internships in the Society 5.0 era emphasize not just skill acquisition, but also the cultivation of character, ethical values, and exemplary professional behavior.

As knowledge becomes increasingly accessible and replaceable by machines, the soft and hard skills embodied by human students remain uniquely irreplaceable (Gymnastiar et al., 2023). Based on the provided insight, it can be inferred that internship programs are undergoing a progressive transformation to better align with the evolving dynamics of the modern labor market and industrial development (Haskin et al., 2024; Purwanto et al., 2023; Rangga et al., 2020; Suranto et al., 2024). A comprehensive evaluation of internship learning models is essential to increase the effectiveness of graduates in addressing the demands of the modern job market. In Indonesia, several educational institutions have begun implementing Recognition of Prior Learning [RPL] as part of the

Independent Campus [*Merdeka Belajar Kampus Merdeka*] policy. This initiative essentially motivates students to gain multidisciplinary skills that better prepare the demographic for entry into the workforce. The experiential learning model at the heart of this policy focuses on developing both hard and soft skills while enhancing the readiness of students for professional environments.

It emphasizes autonomy and flexibility, providing students with the opportunities to take courses and participate in learning activities beyond the traditional classroom, such as internships at diverse institutions, to enrich their educational journey (Sulaowady et al., 2024; Syahruddin & Tambaip, 2024). Therefore, there is a growing need for more active, contextual, and student-centered learning models. These include approaches such as *learning by doing, learning is fun, project-based learning, outcome-based learning,* and *deep learning*, all of which extend beyond the classroom into real-world contexts through direct engagement with industrial environments and production settings (Fakhrudin et al., 2023; Hill et al., 2016).

Based on observations, a very effective way to strengthen the skills and adaptability of graduates is through the organization of progressive internship programs. These programs aim to refine the abilities of students and harmonize each closely with the competencies demanded by the present labor market. Regardless of this insight, vocational education continues to face significant challenges related to life skills. These include limited mental preparedness among students, mismatches between internship expectations and actual implementation, low self-confidence, indecisiveness, poor workplace adaptability, as well as underdeveloped physical and mental readiness. As stated in previous studies, emotional management, resilience, creativity, and psychological endurance also remain areas of concern (Suminar et al., 2024).

Internship is crucial in connecting theoretical instruction to real-world application, particularly in vocational training. The role has been emphasized as a strategic component in educational development at vocational schools. In this context, a clear consistency is established with theories, concepts, and previous analyses, showing the tangible impact of internship on vocational education and enforcing the relevance within the broader field of research. Different theories have also been connected with practice by applying learned concepts to real-world situations. This enhances understanding and provides opportunities for reflection on existing knowledge. Internship produces empirical data related to the research, experiences, effectiveness of on-the-job training, work readiness of graduates, and curriculum development. Curriculum relevance can also be directed to industry needs, ensuring that university education stays current and applicable.

A comprehensive method is used to produce top graduates by reforming education policies, designing an adaptive and contextual internship curriculum, and supporting future-oriented research. Collaboration among educational institutions, industry, and government is crucial for building an effective and sustainable internship ecosystem. This is accomplished through policy reform by

integrating internship into the national curriculum, setting quality standards, and forming strategic partnerships with businesses and industry. In addition, internship curriculum should include three stages, namely pre-immersion (preparation), immersion (implementation), and post-immersion (reflection and evaluation), with a collaborative and reflective learning method to develop innovative models for the needs of the workforce.

Based on the concepts outlined above, this study aims to design and develop an internship program model that, (a) equips students with life skills in accordance with workforce requirements, and (b) enhances these skills through a structured internship framework consisting of three stages namely pre-immersion, immersion, and post-immersion (Kemendikbudristek, 2023). In response to the evolving demands of the modern era, both educational curricula and internship models must be designed to be more focused, in-depth, and capable of enhancing students' comprehension and retention of learning materials (Anthony et al., 2022).

A new problem arises: some vocational college graduates are still unprepared for work, unskilled in the tools available in companies, and unemployed. Therefore, the initial approach to improving and seriously implementing internships in companies is based on the talents or passions of students. Why many graduates are not absorbed into the job market is undoubtedly influenced by various factors. One fundamental factor is students' lack of understanding of their interests and potential from the outset. Every student should first identify their passion or calling, whether they want to work immediately after graduation, continue their education to a higher level, or choose the path of independence through entrepreneurship. Therefore, early potential detection both academically and through talent is crucial.

By recognizing their potential early on, students can be more focused in choosing the appropriate path and have a greater chance of success in their chosen field. If someone works or achieves according to their passion, they will experience the 4Es, namely: Enjoy their work, Easy work feels easier to do, Excellent achieves, and earn able to produce economic results (Suranto et al., 2024). It is hoped that the objectives of the internship model can be achieved so that students are more independent and the transformation of the internship model can be implemented.

The cognitive apprenticeship model in educational practice is a learning process that allows students to learn directly from experts through imitation and support in real-world contexts, focusing on cognitive and metacognitive aspects. This model emphasizes six interconnected learning strategies, namely modeling thoughts and skills, coaching through feedback and guidance during student tasks, scaffolding to become independent, articulation to promote students in verbalizing thinking, reflection to identify areas for improvement, as well as exploration to investigate and solve problems independently (Denen & Burner, 2007).

The internship model was developed as a form of experiential, out-of-classroom learning that focuses on the cultivation of life skills through direct engagement in real workplace settings. This approach aims to promote a more comfortable and meaningful learning experience, reduce stress, facilitate the exploration of individual potential, and strengthen the adaptability of students to real-world professional environments (Wagiran et al., 2019; Yoto & Marsono, 2020). The motivation for researching unemployment and internship programs stems from the need to gain a deep and comprehensive understanding of the underlying causes of the issue, as well as the strategies and efforts aimed at mitigating it.

This research aims to identify the causes of graduate unemployment, formulate appropriate solutions through internships, and design effective policies to transform internships. Furthermore, the research findings are expected to be used to optimize human resource utilization to improve community welfare and encourage inclusive and sustainable economic growth. The question constitutes a hypothesis in line with the main objective formulated, the following questions:

Ha: The internship program learning model, implemented through the stages of pre-immersion, immersion, and post-immersion, has a positive impact on enhancing work readiness and fostering the independent mentality of students in the Society 5.0 era.

2. Literature Review

2.1 Progressive transformation for learning activities

The progressive transformation of internship learning refers to the evolving nature of internship programs organized with the aim of continuously enhancing learning experiences of students, which comprise skill development, knowledge acquisition, and personal growth. This transformation includes a shift from traditional, unstructured internships to more targeted and strategic programs that deliver tangible benefits for students, industry, and society at large (Lindqvist et al., 2024; Tjibtady et al., 2019).

Internships in the Society 5.0 era are designed to adapt to the development of workplace skills, such as digital literacy, critical thinking, creativity, collaboration, and problem-solving skills (Marpaung, 2023). The internship program is relevant to industry needs as well as utilizes technology and AI to support more effective and innovative learning processes (Razak et al., 2018; Supriyanto et al., 2023).

Furthermore, the transition into Society 5.0 is associated with a host of challenges, specifically for educators, students, and industry partners. Higher education is expected to integrate innovations from the industry 4.0 era while embracing the rising demands of Society 5.0, which presents both a significant challenge and a strategic opportunity (Wu et al., 2024). The results of other studies, along with the research conducted here, both provide the suitability and significance of the internship model in supporting work readiness.

A key aspect of this transformation is the increased active inclusiveness of students. Rather than positioning students as passive recipients of information,

progressive internships treat the demographic as active participants engaged in projects, discussions, and decision-making processes. This approach aims to strengthen students' roles in a more participatory and contextual learning process (Chand & Deshmukh, 2019). Relevant skills development, through the internship program that focuses on developing skills according to industry needs, including technical skills (hard skills) and non-technical skills (soft skills) such as communication, leadership, management, and teamwork (Ruggeiro & Boehm, 2017). Project-based internship learning involves students being involved in real-life projects that provide opportunities to apply theories learned in class to real-world work situations (Indarti, 2016).

The internship program also plays a crucial role in shaping professional network transformation. Through direct interaction with industry practitioners, participation in networking events, and involvement in various forms of collaboration, students can build a broad and strategic professional network. Furthermore, internship program assesses students' achievements and experiences. This feedback, which is often gathered from multiple stakeholders, is essential to enhancing the quality and effectiveness of the internship experience (Suyanto et al., 2017).

In addition to the internship program, the learning model experiential learning theory is highly relevant to internship since the concept provides a form of learning through real-world experiences. This matches the developed model pre-immersion, immersion, post-immersion, and experiential learning theory in line with Kolb's cycle, experience, reflection, understanding and application. The theory of Work Integrated Learning [WIL] combines real-world work experiences with academic learning, providing a framework for vocational internship programs that outline the structure, responsibilities, and benefits for students and industry. Competency Based Education [CBE] is also connected to internship, emphasizing the achievement of specific competencies to prepare graduates for the workplace.

2.2. Progressive transformation for internship activities

The transformation of internship programs includes mastery of subject matter, skill enhancement, and cultivation of positive behaviors. Students are expected to enhance respective technical knowledge while also sharpening key competencies such as communication, time management, and problem-solving. These programs promote the development of professional attitudes and initiative. Through internship participation, students gain not only technical and non-technical skills but also essential workplace attributes such as critical thinking, proactive engagement, teamwork, adaptability, responsibility, and the ability to evaluate themselves constructively (Antony & Tripathi, 2023; Anik et al., 2022; Narain & Dwivedi, 2025; Ngobeni et al., 2024; Rouvrais, 2020; Shu & Chun, 2017).

2.3. Transformation of the Society 5.0 Era

Transformation in the Society 5.0 era involves the integration of advanced technologies such as AI, Internet of Things, and robotics into various aspects of life, with the goal of creating a more prosperous and sustainable society (Anute & Tilak, 2024). At the heart of this transformation is the strategic use of technology

to tackle social, economic, and environmental challenges, while simultaneously improving the entire quality of human life. Within this context, internship programs aim to train, empower, and prepare students by equipping each individual with essential knowledge, skills, character traits, constructive habits, and valuable work experience, which invariably shapes positive professional behaviors (Shu & Chun, 2017; Suminar et al., 2024).

The programs function as a very important bridge between theoretical education and practical application. Each offer students not only an introduction to the dynamics of the working world but also the opportunity to apply academic knowledge in meaningful ways (Rouvrais, 2020). Furthermore, internships have been shown to improve students' skills and competencies as well as encourage increased understanding in the affective, cognitive, and psychomotor domains (Anik et al., 2022).

2.4. Life Skills, Hard Skills, and Soft Skills for Independence and Work Readiness

Internship learning requires a combination of life skills, both hard and soft. Hard skills relevant to a specific field of work, such as technical skills, foreign languages, or data analysis, should be mastered. Furthermore, soft skills such as effective communication, teamwork, problem-solving, and time management are also crucial for success in internships and the workplace. Learning emphasizes the development of life skills, which is a relevant choice for students facing various life challenges. With life skills, students are expected to behave normally, not feel stressed, and act proactively, creatively, and innovatively in finding solutions to problems they face (Eka et al., 2021). The concept of life skills is applied in learning as a form of provision to prepare students to have the specific skills and competencies needed in various aspects of life (Ratih et al., 2023).

The indicators of life skills cover several aspects, including self-awareness, the ability to understand oneself (physically and spiritually), including awareness of mental health and character. Personal skills include mastery of emotional intelligence and the ability to recognize and develop one's potential. Rational thinking skills refer to logical and scientific reasoning, paired with a healthy, reflective mindset. Accordingly, social skills include the capacity to interact, adapt, communicate effectively, and build meaningful networks. Academic skills cover intellectual and cognitive abilities that support academic success, while vocational skills relate to job-specific competencies, powered by creativity and innovation (Aini, 2021).

3. Methodology

3.1 Model development

The development of a progressive transformation internship model serves as a strategic approach to enhance the skill sets, life skills, mental resilience, strong character, and academic mastery of students, all fused with hands-on, real-world experience. This model is designed to cultivate individuals who are better equipped to adapt and thrive amid the shifting demands of the professional world (Aini, 2021).

The model proposed in this study integrates two core variables, including the internship experience as a medium for experiential learning, and life skills as the targeted learning outcomes. Its development followed a rigorous ten-stage process, namely (1) problem identification, (2) data collection, (3) model design, (4) preliminary validation, (5) revision of the initial model, (6) pilot implementation, (7) product refinement, (8) broader usage trials, (9) advanced revision, and (10) mass production for large-scale application (Suranto & Rahmawati, 2013).

3.2 Model Structure

The model structure is a conceptual framework composed of three primary latent variables, namely student conditions, internship program learning, and outcome achievement, specifically in the form of independence in work readiness. The number of indicators, particularly those related to outcome achievement, was determined using a recognized expert system method, and was further reinforced through focus group discussions.

3.2.1 Student Condition Variables

This variable represents the initial state of student readiness prior to entering the internship program. It is reflected through indicators such as administrative preparedness for internships, personal motivation, communication ability, mental readiness, technical and non-technical preparedness, basic knowledge and skills, discipline, as well as affective and cognitive comprehension related to internship expectations (Antony & Tripathi, 2023; Dekawati & Kokoy, 2023; Rohmah et al., 2023).

3.2.2 Internship Program Learning Variable

This variable encapsulates both learning process and practical experiences gained by students during the internship. Key indicators associated with the variable include participation in effective and cognitive workshops, psychomotor training exercises, workplace problem-solving, the production of measurable work outcomes, application of the 5R work-environment principles (Tidy, Neat, Clean, Maintain, Diligent), preparation of job activity reports, performance evaluations, assessment using Key Performance Indicators [KPI], formulation of follow-up plans, and development of adaptive skills during the internship (Antony & Tripathi, 2023; Dekawati & Kokoy, 2023; Rohmah et al., 2023).

3.2.3 Independence in Work Readiness Variable

This variable measures the outcomes of the internship learning process, particularly regarding the preparedness of a student for employment. Indicators within this context include critical thinking ability, emotional resilience, personal maturity, mastery of relevant knowledge and technical skills, independence, competency, communicative ability, psychosocial adjustment, readiness for lifelong learning, vocational and academic preparedness, administrative competence, networking ability, managerial and leadership skills, as well as the capacity to generate creative and innovative ideas (Antony & Tripathi, 2023; Dekawati & Kokoy, 2023; Rohmah et al., 2023). The model introduces novelty through its structured progression across the pre-immersion, immersion, and post-immersion stages.

Pre-immersion serves as the initial phase of on-campus preparation for students prior to entering respective internship placements, where internships are divided into two categories, namely internships in industry or internships in MSMEs strengthening entrepreneurship. It includes introductory sessions at the onset of the industry-based internship.

The pre-immersion module, which is designed specifically as a skill sheet, comprise a broad range of preparatory materials, such as reinforcement of domain-specific knowledge and technical skills, mentoring, assessment of initial competencies, development of internship concepts and prototypes, foundational hard and soft skills, orientation to internship expectations, cultivation of the internship-ready mindset and character, as well as training in basic managerial capabilities, measured through practical tests, pre-tests, and post-tests, and portfolios. Pre-immersion activities are conducted in a participatory, interactive manner, focusing on practical skills, project-based learning, collaboration, and direct feedback for work improvement (Suranto et al., 2024).

Immersion is a strengthening stage where activities aim to allow students to directly dive into the world of work, enabling them to learn firsthand the mentality of a competitive workforce. They are expected to engage in activities and explain outcomes, demonstrate sound decision-making, enhance their knowledge and abilities, produce quality work, solve problems effectively, gain practical experience, think critically, adapt to various situations, develop advanced competencies, and strengthen both hard and soft skills.

Post-immersion, which is the culminating phase, allows students to reflect on themselves, evaluate, and follow up on their work experiences after completing a series of internship activities. Through the transformation and transfer of knowledge, skills, and adaptive skills, students are given the opportunity to review what they have learned, both theoretically and practically, during the program. This activity involves various activities such as presentations of work results, evaluations of work projects, group discussions, and sharing sessions with mentors or supervisors.

Participants present the development of internship results or internship ideas they developed during the program, including challenges faced, solutions that have been implemented, and the potential for sustainability of the internship according to the six-month timeframe. During the internship, they would have received a number of benefits: pocket money, living expenses, experience, technical and non-technical knowledge and skills, as well as the opportunity to become employees at the internship location (Suranto et al., 2024).

3.3 Model Components

The developed model components comprise a combination of logic and procedures that constitute the content of the internship learning model tailored toward improving work readiness, as shown in Table 1.

Table 1: Components of the internship transformation model

Model Components	Initial condition criteria for students	Progressive Transformation of Internship Learning	Work Independence Readiness
Model Content	Administrative Readiness	Affective and cognitive workshops	Critical thinking readiness
	Motivation	Practical training	Emotional readiness
	Communication Skills	Problem-solving	Personal readiness
	Mental Readiness	Producing work results	Knowledge/skills mastery
	Internship Readiness	5R culture	Independence
	Basic Knowledge	Report preparation	Competence
	Basic Technical Skills	Performance evaluation	Communication readiness
	Non-Technical Skills	KPI measurement	Psychosocial readiness
	Discipline	Follow-up plan development	Continuous learning readiness
	Cognitive-Affective Understanding	Adaptive internship skills	Vocational readiness
			Academic readiness
			Administrative readiness
			Networking readiness
			Management skills
			Leadership skills
			Innovative and ideational skills
Outcomes	Goodness of fit model formulation and work readiness trend table		

Source: Data processing (2025)

3.4 Model Design

The internship model developed in this study functions as a comprehensive learning tool, strategy, and method aimed at enhancing the life skills of students (Bunyamin et al., 2022). Designed with structured learning scenarios, model facilitates effective implementation by educational practitioners. Operationally, it integrates theoretical instruction within academic institutions with practical experience in work environments. Students engage in classroom-based theoretical learning, followed by immersive internships with industry and business partners.

The present study adopted a non-equivalent control group design, comprising two groups, namely an experimental group and a control group (Creswell, 2013). The experimental group received the internship model intervention, while the control group did not participate in the internship program. This trial was

conducted using a quasi-experimental approach, in which the treatment consisted of a one-semester internship learning program designed as a short-term educational intervention. Accordingly, the Experimental Group was exposed to the internship model, while the Control Group carried out conventional instruction limited to theoretical and practical learning through internal workshops or collaborations with small-scale industrial partners.

For evaluation, four observation codes were adopted, namely O1, denoting the initial observation in the experimental group prior to treatment; O2, representing the final observation following the implementation of the internship model; O3 was the initial observation for the control group; and O4 representing the final observation after the control group had completed its learning period. This design enabled a rigorous and objective analysis of the effectiveness of the internship model in enhancing students' work readiness and life skills development (Creswell, 2013; Suranto et al., 2024).

3.5 Sample and Model Testing

The present study adopted the use of a quantitative method approach, to comprehensively explore and validate the internship model. The qualitative component included data collection through questionnaires and observations, providing in-depth insights into participant experiences. Concurrently, the quantitative approach focused on data drawn from both the experimental and control groups, which comprised students enrolled in vocational education programs integrated with internship activities.

The exploration design followed a quasi-experimental framework using a random sampling method, in accordance with the developmental study stages proposed by Borg and Gall (Suranto & Rahmawati, 2013). Data were collected through various instruments, including questionnaires, observations, documentation, interviews, and literature reviews. The questionnaire data were subjected to validity and reliability testing in order to ensure the comprehensiveness and consistency of the study instruments.

This research adopted a quantitative method using numerical data from 200 students. The experimental group consisted of 100 male students, including 89 vocational and 11 general high school graduates, respectively**.** 92 interns in industry and eight interns in technopreneurship MSMEs. These participants came from middle- and lower-income families. The control group also consisted of 100 male students, comprising 90 vocational and 10 high school graduates, respectively. 94 participants learned practical skills in the workshop and six people learned technopreneurship theory on campus.

The economic backgrounds of the families were mostly lower-middle-class. The research design adopted a quasi-experiment to examine the causal relationship between variables without fully randomizing the subjects (Creswell, 2013). This method provided treatment through interventions using the apprenticeship learning method. Additionally, experimental and control groups were included with non-random assignment. Activities were measured before and after

treatment using pre-tests and post-tests to observe changes in realistic field conditions.

The stages and tasks of internship were consistent with three phases, namely pre-immersion, immersion, and post-immersion. Internship assignments for students comprised (1) participation in a pre-internship briefing and completion of necessary administrative documents; (2) learning about the work system, division of responsibilities, and internship company; (3) creating a portfolio outlining the skills to be developed; (4) coordinating with the field supervisor and attending a company orientation; (5) adhering to applicable regulations and work culture; (6) completing technical tasks at the workplace and improving collaboration with employees; (7) documenting daily activities in a logbook, submitting weekly reports, and preparing a presentation on internship experience; and (8) completing questionnaires before and after internship and submitting a final report.

The development of skills is evidence by the awarding of an internship certificate. Furthermore, students must provide feedback and evaluate the entire internship experience.

4. Results and Discussion

4.1 Result Data

Stages in study, development, and instrument testing, the present exploration progressed through a series of systematic stages, including model development and instrument testing. Each stage is measured using a pretest-posttest questionnaire and combined with portfolios and performance at the internship site, according to the indicators for each stage. The results of the average development of treatment and non-treatment assessments in tables 7 to 14. The hypothesis, the internship program learning model implemented through pre-immersion, immersion, and post-immersion stages has a positive impact on increasing work readiness and fostering an independent mentality in students in the Society 5.0 era, which is declared accepted, meaning that the internship model has a very significant impact on students' work readiness.

The initial phase comprised a pilot test of the questionnaire instrument to examine its validity and reliability. After the evaluation of goodness of fit (GoF), model validation was conducted using Confirmatory Factor Analysis (CFA), a method designed to measure the strength of the relationships between manifest indicators and respective corresponding latent variables. CFA was used to determine model's effectiveness and to assess how well the indicators represented respective constructs or latent variables (Creswell, 2013).

The final phase consisted of a comprehensive validation of the instrument, which was aimed at verifying the authenticity of the developed model and confirming its compliance with GoF criteria based on structural equation modeling. GoF evaluation was used to assess how well the sample data covariance corresponds with that of the population. If the results of the evaluation show a satisfactory fit between model and empirical data, no further revisions are required.

Accordingly, models were considered empirically valid and suitable for further effectiveness testing, as detailed Table 2.

Table 2: Goodness of fit index value of the internship model

No	Index	Cut of Value	Results	Description
1	Kai Square (p)	Small (p > 0.05)	262.312 (0.0766)	Fulfilled
2	CFI	≥ 0.90 (max 1)	0.9012	Fulfilled
3	GFI	≥ 0.90 (max 1)	0.9004	Fulfilled
4	AGFI	≥ 0.90 (max 1)	0.9082	Fulfilled
5	RMSEA	≤ 0.08 (Min 0)	0.0744	Fulfilled

Source: Data processing (2025)

The next stage is to test the reflection of the student criteria variables, shown in Table 3, and the reflection of the internship learning criteria variables in Table 4.

Table 3: Initial condition criteria for students

No	Aspect	Alpha	t-a	Determination
1	Administrative Readiness	0.75	Reff	Valid
2	Motivation	0.78	10.48	Valid
3	Communication Skills	0.79	10.62	Valid
4	Mental Readiness	0.72	10.24	Valid
5	Internship Readiness	0.70	11.03	Valid
6	Basic Knowledge	0.94	10.87	Valid
7	Basic Technical Skills	0.88	10.32	Valid
8	Non-Technical Skills	0.83	9.44	Valid
9	Discipline	0.96	10.40	Valid
10	Cognitive-Affective Understanding	0.64	8.22	Valid

Source: Data processing (2025)

Table 4: Internship learning criteria

No	Aspect	Alpha	t-a	Determination
1	Affective and cognitive workshops	0.72	Reff	Valid
2	Practical training	0.81	15.91	Valid
3	Problem-solving	0.94	25.47	Valid
4	Producing work results	0.88	18.21	Valid
5	5R culture	0.95	22.24	Valid
6	Report preparation	0.76	16.90	Valid
7	Performance evaluation	0.82	19.66	Valid
8	KPI measurement	0.89	16.24	Valid
9	Follow-up plan development	0.76	16.26	Valid
10	Adaptive internship skills	0.88	17.22	Valid

Source: Data processing (2025)

Table 5: Reflective power of work readiness variables

No	Aspect	Alpha	t-a	Determination
1	Critical thinking readiness	0.74	Reff	Valid
2	Emotional readiness	0.76	10.48	Valid
3	Personal readiness	0.78	9.83	Valid
4	Knowledge/skills mastery	0.85	10.20	Valid
5	Independence	0.76	9.50	Valid
6	Competence	0.81	10.61	Valid
7	Communication readiness	0.89	10.52	Valid
8	Psychosocial readiness	0.84	10.34	Valid
9	Continuous learning readiness	0.80	11.02	Valid
10	Vocational readiness	0.71	9.75	Valid
11	Academic readiness	0.88	10.21	Valid
12	Administrative readiness	0.79	9.26	Valid
13	Networking readiness	0.82	10.28	Valid
14	Management skills	0.88	9.24	Valid
15	Leadership skills	0.86	9.62	Valid
16	Innovative and ideational skills	0.79	9.34	Valid

Source: Data Processing (2025)

Based on the information presented in Table 5, it can be seen that the work readiness variable was predominantly reflected in the aspect of critical thinking readiness, as evidenced by its contribution of 0.74 or approximately 74.00%, along with other contributing factors. Accordingly, CFA showed that each indicator loading on the variable exceeded 0.5, reflecting significance, with a p-value < 0.05 (5%). This confirms that all indicators (manifest variables) significantly contributed to and accurately reflect the latent variable. The resulting coefficients, which were obtained through path analysis to compare the influence of exogenous and endogenous variables, are presented in Table 6.

Table 6: Direct Effects Path Analysis

Function	Endogen	Eksogen	γ	β	t-a	results	R^2
1	Internship learning criteria	Initial condition criteria for students	0.794		6.759	Sig	0.6782
2	Outcomes	Initial condition criteria for students	0.206		2.839	Sig	0.6195
		Internship learning criteria		0.497	4.932	Sig	

Source: Data Processing (2025)

Table 6 shows, two functions in the model, the first function explains the influence of students' initial conditions on internship learning. The second function explains the influence of students' initial conditions and internship learning on achievement outcomes. These two functions also explain the influence of students' initial conditions on achievement outcomes indirectly through internship learning. The first function yields the equation: internship learning = 0.794, with a calculated t-value of 6.759. The calculated t-value > t-table (α=5%) of 2.023 indicates an influence of internship learning on work readiness. Meanwhile, the contribution (reflection) of students' initial conditions on internship learning is

67.82%, indicating a relationship and, as a single variable, its contribution can be considered quite substantial. This indicates that the remaining contribution, 32.18%, will be shared by several other variables that can be developed. The exogenous factor is students' initial conditions, which, together with internship learning, influence achievement outcomes. This significance is indicated by the calculated t-value > the t-table for each exogenous variable. In equation form, the effect can be written as: Achievement Results = 0.206 student initial conditions + 0.497 internship learning. Together, the two contribute 61.95% to the achievement results. This means that the achievement results (work readiness) indicate that work readiness is quite significant. However, other variables still influence student work readiness, such as the work environment, networking, student behavior, and other variables.

Meanwhile, interview validity activities showed that the answers of students reflected real-life experiences. Average score changes in achievement aspects in the pre-immersion stage of the experimental group Table 7, and average score changes in achievement aspects in the pre-immersion stage of the control group Table 8. For Table 9 average score changes in achievement aspects in the immersion stage of the experimental group, and Table 10 average score changes in achievement aspects in the immersion stage of the control group. Table 11 average score changes in achievement aspects in the post-immersion stage of the experimental group and Tabel 12 average condition of change scores of achievement aspects in the post-immersion stage of the control group.

That the mental state of students in the internship, pre-immersion, immersion and post-immersion stages has increased significantly. The average score of participants in the first week of 2.5-2.9 is said to be quite good, and a score of 2.91 to 3.3 is said to be good and 3.31-3.7 and above is very good. The guide was structured around the research indicators and themes, recorded in full, accurately and relevantly assessed by the field supervisor. This was supported by a review that confirmed the literature used was truly relevant, reliable, and current, including accredited journals, scientific books, and credible documents to support theories, conceptual frameworks, and data interpretation.

Table 7: Average score changes in achievement aspects in the pre-immersion stage of the experimental group

No	Indicators	Week-1	Week-2	Week-3	Week-4	Week-5
1	Training Provision	2,8	3,1	3,1	3,3	3,5
2	Work Spirit	2,7	3,0	3,2	3,3	3,4
3	Motivation	2,8	3,1	3,2	3,2	3,3
4	Work Ethic	2,7	2,9	3,0	3,2	3,3
5	Documents	2,8	3,0	3,1	3,2	3,4
6	Work Information	2,9	3,0	3,0	3,2	3,3
7	Work Orientation	2,7	2,9	3,0	3,0	3,1

Source: Data processing (2025)

Table 8: Average score changes in achievement aspects in the pre-immersion stage of the control group

No	Indicators	Week-1	Week-2	Week-3	Week-4	Week-5
1	Training Provision	2,8	2,9	2,9	3,0	3,1
2	Work Spirit	2,8	2,9	2,9	2,9	3,0
3	Motivation	2,7	2,8	2,8	2,8	2,9
4	Work Ethic	2,6	2,7	2,8	2,7	2,9
5	Documents	2,7	2,8	2,8	2,9	2,9
6	Work Information	2,6	2,7	2,7	2,9	2,9
7	Work Orientation	2,8	2,8	2,9	2,8	2,8

Source: Data processing (2025)

Table 9: Average score changes in achievement aspects in the immersion stage of the experimental group

No	**Indicators**	**Week-1**	**Week-2**	**Week-3**	**Week-4**	**Week-5**
1	Portfolio creation	2,7	2,8	3,0	3,1	3,3
2	Work orientation	2,8	2,9	3,1	3,2	3,4
3	Work motivation	2,8	2,9	3,0	3,2	3,4
4	Work discipline	2,8	2,9	3,0	3,2	3,3
5	Logbook	2,9	2,8	3,1	3,2	3,3
6	Weekly reports	2,9	2,9	3.1	3,2	3,2
7	Internship presentations	2,9	2,9	3,1	3,3	3,5
8	Competency development	2,8	3,0	3,2	3,3	3,5

Source: Data processing (2025)

Table 10: Average score changes in achievement aspects in the immersion stage of the control group

No	Indicators	Week-1	Week-2	Week-3	Week-4	Week-5
1	Portfolio creation	2,6	2,7	2,7	2,8	2,8
2	Work orientation	2,5	2,7	2,7	2,8	2,8
3	Work motivation	2,6	2,6	2,8	2,8	2,8
4	Work discipline	2,5	2,6	2,7	2,7	2,7
5	Logbook	2,5	2,5	2,6	2,7	2,7
6	Weekly reports	2,6	2,6	2.6	2,7	2,7
7	Internship presentations	2,7	2,7	2,7	2,7	2,8
8	Competency development	2,6	2,6	2,7	2,7	2,7

Source: Data processing (2025)

Table 11: Average score changes in achievement aspects in the post-immersion stage of the experimental group

No	Indicators	Week-1	Week-2	Week-3	Week-4	Week-5
1	Internship Spirit	2,7	2,9	3,1	3,2	3,3
2	Work Motivation	2,8	3,0	3,1	3,2	3,4
3	Skills	2,8	3,0	3,2	3,2	3,4
4	Work Culture	2,7	2,9	3,0	3,1	3,3
5	Work Knowledge	2,9	3,1	3,2	3,3	3,4
6	Work Experience	2,9	3,1	3,1	3,2	3,4
7	Work Skills	2,8	3,0	3,0	3,2	3,5
8	Work Readiness	2,8	3,0	3,1	3,2	3,4

Source: Data processing (2025)

Table 12: Average condition of change scores of achievement aspects in the post-immersion stage of the control group

No	Indicators	Week-1	Week-2	Week-3	Week-4	Week-5
1	Internship Spirit	2,6	2,8	2,9	2,9	2,9
2	Work Motivation	2,8	2,8	2,7	2,8	2,9
3	Skills	2,7	2,8	2,9	2,9	3,0
4	Work Culture	2,7	2,6	2,8	2,8	2,9
5	Work Knowledge	2,5	2,7	2,9	2,9	3,0
6	Work Experience	2,8	2,8	2,9	2,9	2,8
7	Work Skills	2,9	2,8	3,0	2,9	3,0
8	Work Readiness	2,6	2,7	2,8	2,8	2,9

Source: Data processing (2025)

Table 13 presents combined participant scores the development of achievement aspects of the experimental group (internship treatment) in industry and MSMEs technopreneurship, while Table 14, illustrates the achievement aspects of the control group (no internship). The data in both tables show an increase in achievement in work readiness from the first week to the fifth week. For example, in the aspect of critical thinking readiness skills, the average score of participants in the first week was 2.63, which is said to be a sufficient start, increased to 2.76 in the second week, and continued to increase to 3.14 in the fifth week, having a better meaning, the development of achievement aspects through the internship (industry and technopreneurship) is seen to increase more quickly.

Table 13: Development of achievements of experimental group results

	Week/Period				
Indicator	1	2	3	4	5
Critical thinking readiness	2.63	2.76	2.98	3.04	3.14
Emotional readiness	2.50	2.66	2.74	2.88	3.02
Personal readiness	2.54	2.64	2.72	2.80	2.98
Knowledge/skills mastery	2.80	2.92	2.98	3.02	3.12
Independence	2.52	2.58	2.64	2.88	3.04
Competence	2.62	2.68	2.88	2.98	3.14

Communication readiness	2.50	2.58	2.72	2.84	2.96
Psychosocial readiness	2.64	2.72	2.88	2.96	3.18
Continuous learning readiness	2.60	2.68	2.74	2.90	3.02
Vocational readiness	2.66	2.78	2.86	2.98	3.22
Academic readiness	2.60	2.76	2.83	2.95	3.08
Administrative readiness	2.54	2.68	2.75	2.88	2.94
Networking readiness	2.50	2.66	2.72	2.80	2.96
Management skills	2.64	2.76	2.88	2.98	3.20
Leadership skills	2.60	2.68	2.77	2.89	3.06
Innovative and ideational skills	2.64	2.78	2.88	2.99	3.10

Source: Data processing (2025)

Table 14: Development of achievements of the control group results

	Week/Period				
Indicator	1	2	3	4	5
Critical thinking readiness	2.60	2.65	2.71	2.75	2.88
Emotional readiness	2.52	2.58	2.67	2.71	2.82
Personal readiness	2.60	2.64	2.74	2.83	2.92
Knowledge/skills mastery	2.63	2.66	2.77	2.86	2.90
Independence	2.64	2.72	2.77	2.79	2.82
Competence	2.54	2.65	2.69	2.72	2.78
Communication readiness	2.58	2.62	2.69	2.76	2.86
Psychosocial readiness	2.52	2.60	2.68	2.72	2.70
Continuous learning readiness	2.60	2.66	2.77	2.73	2.79
Vocational readiness	2.61	2.63	2.74	2.74	2.70
Academic readiness	2.60	2.56	2.68	2.70	2.72
Administrative readiness	2.61	2.63	2.64	2.70	2.68
Networking readiness	2.56	2.59	2.63	2.80	2.88
Management skills	2.49	2.73	2.82	2.84	2.79
Leadership skills	2.54	2.56	2.64	2.78	2.90
Innovative and ideational skills	2.58	2.66	2.72	2.80	2.83

Source: Data processing (2025)

Internship program achievements in internship industry and MSMEs technopreneurship, students received training and coaching focused on mental toughness, work enthusiasm, motivation, work ethic, and national awareness, covering emotional and cognitive aspects. During the immersion stage, the

workforce was directly entered with a hands-on learning method in production, healthcare, or other productive sectors. Knowledge, experience, and skills were acquired in problem-solving, decision-making, reporting, and Health, Safety and Environment implementation in developing personal growth plans. The post-immersion stage enabled students to perform real work, gaining increased enthusiasm, motivation, skills, knowledge, work experience, work culture, and life skills. Control group participants studied and practiced independently at the workshop and business theory (technopreneurship) practice location.

4.2 Discussion

The internship activities comprise workshops, which are specifically aimed at reinforcing knowledge, skills, and attitudes, competency training, as well as the strengthening of affective, cognitive, and psychomotor domains. The program also enhances both hard and soft skills. This is evidenced by the fact that students received hands-on training in problem-solving (Evans et al., 2024), reported on their preparation for the program, were evaluated against KPIs, and formulated follow-up plans. Collectively, the comprehensive approach had a positive impact on reinforcing the work readiness of students, covering psychosocial, cognitive, emotional, spiritual, personal, continuous learning, communication, health management, vocational, and academic skills (Eka et al., 2021).

The internship model transforms learning with project-based deep learning, emphasizing cognitive, affective, and psychomotor aspects, with the following profile dimensions: faith, good character, patriotism and esprit de corps spirit, critical reasoning, creativity, collaboration, independence, physical and spiritual health, and sound communication skills. This in-depth internship learning is conscious, meaningful, and enjoyable. This is supported by an immersive learning experience characterized by understanding, application, and reflection, within a framework of pedagogical practice, a learning environment, digital utilization, and learning partnerships.

An internship program can provide students with a gateway to directly entering the workforce if it is systematically designed and oriented toward developing relevant skills. The success of this program is determined by various variables and critical aspects, including student readiness, the quality of learning during the internship, the program's alignment with the Indonesian National Work Competency Standards [SKKNI], and a focus on developing skills and knowledge required by industry. Furthermore, the internship program must also encourage the development of a professional work attitude, the application of time management and responsibility principles, and a sound understanding of job descriptions and work targets.

The developed internship program adopts a collaborative model including the participation of educational institutions, business entities, and industry partners. It is structured and integrated to ensure active participation from campus-based collaborators. As a result, the program not only enhances the competencies and skills of students but also significantly contributes to strengthening the demographic's work readiness. It is also important to state that additional

competency certifications offered through the Professional Certification Institute [LSP] improve competitiveness and employability of graduates in the labor market (Bhandari et al., 2022).

The internship transformation program learning model, implemented through pre-immersion, immersion, and post-immersion stages, has a positive impact on improving work readiness in the Society 5.0 era. Internship learning also examines students' passions before internship placement. Internship programs have a positive impact on knowledge, skills, and character development (Agunawan et al., 2025; Suhartanto et al., 2024; Suyanto et al., 2017). Internship programs improve abilities and competencies (Ponamon et al., 2023; Rahaju et al., 2024). The internship program should not be perceived as a burden on businesses, industries, or the service sector. Rather, collaboration between higher education institutions and industry must be regarded as a strategic investment. As stated in a previous study, companies can organize internship programs.

The phase is often formalized with certification or official recognition from the host organization. As psychomotor development becomes the focal point, close collaboration with industry partners is essential to fulfilling the demand for high-quality human resources. These partnerships benefit educational institutions, companies, and students alike. The three-stage internship model has been successfully implemented at the Vocational School of Muhammadiyah University of Surakarta [UMS], where over 85% of graduates have entered the workforce in roles that are in line with respective competencies. The current industrial internship model in industry and MSMEs technopreneurship involves interns fulfilling the curriculum, while the company/industry's commitment to recruiting interns is very low, and students gain no new learning experiences during the internship.

However, through internships, companies can find potential workers who meet industry needs, for example, graduates can become employees directly at the internship site. In this internship model industry, nearly 80% of interns become employees at the internship site. Industrial internship participants immediately find employment at their internship location, and 40% of technopreneurship participants are able to establish independent businesses.

Meanwhile, 20% of participants who do not complete industrial internships are absorbed into the job market, and technopreneurship participants do not yet have independent businesses. Thus, this innovative internship model effectively prepares a workforce that aligns with industry expectations and meets the evolving demands of Society 5.0, ensuring that graduates are not only employable but also equipped to contribute meaningfully to the modern, technology-driven economy.

This success reflects that a systematically designed internship program, tailored specifically to workplace demands, can effectively shape the character of students and enhance the demographic's professional competitiveness. Other previous investigations showed that the achievement was supported by certification or

official recognition from an internship company. Active collaboration with business partners was essential for meeting the demand for quality human resources, while benefiting the education sector, the business world, and students. Internship indicators, including activities, positively influenced work readiness by strengthening psychosocial, cognitive, emotional, and spiritual aspects, as well as personal development, ongoing learning, communication, health management, vocational, and academic skills (Eka et al., 2021). This research has certain limitations, as it focused solely on heavy equipment mechanic students. There is a need to extend the study to include a wider range of competencies and study programs, involving a larger number of students and emphasizing internships that generate meaningful impact.

5. Conclusion

The results show that the developed internship model is a good fit and has strong applicability for enhancing the knowledge, skills, and behavior of professional interns in facing Society 5.0. The implementation of an internship learning model industry and MSMEs technopreneurship, based on pre-immersion, immersion, and post-immersion stages, significantly improves cognitive (knowledge), psychomotor (skills), and affective (attitudes and character) aspects.

Therefore, the model effectively bridges the gap between classroom theory and real-world practice while enhancing mental readiness, independence, and professionalism among graduates. These results support and reinforce the theory of contextual learning and the cognitive apprenticeship model, where the learning process occurs effectively through direct participation, modeling, mentoring, and reflection within a real-world context.

The significance of integrating affective dimensions into vocational learning design has been widely acknowledged in the literature. The model offers practical guidance for vocational education institutions to create more systematic and structured internship experiences. Additionally, the provision of intensive training and mentoring before, during, and after internship enhances collaboration with industry to maintain the relevance and quality of internship experience. The model is incorporated into a vocational curriculum designed to develop graduates who are technically skilled as well as adaptable and ethical in addressing the challenges of Industry 4.0 and Society 5.0.

Recommendations are aimed at educational institutions such as schools and universities to incorporate a stage-based internship model into vocational learning curriculum, offering pre-internship training and post-internship reflection sessions for students. Industry partners are expected to provide interns with meaningful roles and tasks that match the field of expertise, as well as assign active mentors who can offer constructive feedback. Furthermore, the government must develop internship policies that promote the active participation of industry and educational institutions in producing work-ready graduates and offer incentives to industries dedicated to quality internship programs.

6. Implications and Recommendations

The study findings are novel and provide valuable insights for education and motivation for developing internship learning. This industry and business internship program model can be implemented in courses on industrial internships, entrepreneurship, creative industry, technopreneurship, edupreneurship, socialpreneurship, and real-world work experience in industry at the university, academic, and vocational levels. Furthermore, this model can be applied in broader societal and community settings through educational initiatives, business incubators, and empowerment programs, as well as through counseling and mentoring, ensuring accessibility, effectiveness, independence, and sustainable productivity.

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