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Innovation Capability Building through Integrated Professional Certification: Evidence from Acupressure Sport Massage Pathway within Indonesia's Higher Education Ecosystem

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ABSTRACT

In service-based sector, there is a need for institutional arrangements to link knowledge, competence standards, professional recognition, and industry's demands to foster innovation capability building. This study examines acupressure sport massage certification to explore the potential of integrated professional certification to facilitate innovation capability building within Indonesia's sport and wellness higher education ecosystem. Employing an exploratory case study design, data were collected via field observations, document analysis, and semi-structured interviews with ten informants from professional certification bodies, competence certification institutions, training providers, and higher educational institutions. Thematic content analysis identifies four major problems: fragmented certification governance, inconsistent alignment between curricula and competence standards, uneven certification infrastructure, and competing demands for speedy certification and credible quality assurance. The findings indicate that certification should be seen not merely as an employability tool, but largely as an institutional mechanism for transforming academic learning into standardized, assessed, and recognized capabilities. This study moves the discussion on innovation capability building to emerging service-based sector in the context of developing countries, thereby enriching existing discourses on STI policy and innovation management. Policy implications involve improving university–certification body collaboration, aligning academic curricula with national competence standards, defining professional classification, and making certification process accessible but challenging.

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I. INTRODUCTION

Nowadays, the development of innovation capability is a strategic issue for developing countries aiming to enhance human capital, institutional coordination, and sectoral competitiveness. Innovation capability is not merely the capacity to develop new products or technologies, but also the capacity of individuals, organizations, and systems to absorb knowledge, transform it into practical competence, and use it to generate economic and social value (Cohen & Levinthal, 1990; Lundvall, 1992; Teece, 2007). Capability building, therefore, is closely related to education, training, certification, and institutional arrangements that facilitate knowledge transfer from formal learning to professional and industrial practices. In developing countries, these mechanisms are especially crucial, as innovation is often limited due to lack of not only technological resources, but also institutional coordination, coherence of standards, and alignment between education systems and labor market's needs (Freeman, 1987; Nelson, 1993).

Higher educational institutions, particularly universities, are key element of these mechanisms. In addition to providing academic knowledge, universities are also expected to produce human capital that are responsive to industry's demands (Etzkowitz & Leydesdorff, 2000; Perkmann et al., 2013). This is particularly true in applied and service-based sector, where innovation relies on embodied skills, professional standards, service quality, and workers' adaptability to changing market demands. Within this environment, capability building requires not only curricula reform, but also institutional arrangements integrating universities, professional associations, certification bodies, training providers, and industry actors into a coherent competence development and recognition ecosystem.

In this sense, professional certification serves as an institutional mechanism. Certification is not merely a marker of individual's competence to employers, but also a process that formalizes, measures, and validates employees' knowledge, skills, and professional standards (Gibb, 2018; Mulder, 2017). Through certification, academic learning can be translated into recognized competence. Likewise, industry's expectations can be integrated into curricula design and assessment criteria. Thus, certification plays a role in innovation capability building by reinforcing the link among knowledge production, competence formation, quality assurance, and labor market recognition. However, the effectiveness of certification in practice depends on how well it is institutionally embedded, aligned with national competence standards, and coordinated among relevant actors.

This topic is deemed relevant to sport and wellness field. The wellness, sport health, and complementary therapy fields are growing worldwide in which practitioners are required to possess both theoretical knowledge and certified practical skills (Guidotti et al., 2023; WHO, 2019). In this field, innovation may manifest itself as new service models, hybrid professional roles, recovery and fitness practices, as well as the incorporation of traditional and modern health-related knowledge. One of the emerging competence fields is acupressure sport massage, which encompasses sport recovery, wellness practice, and complementary therapy. However, it is important to note that in the context of Indonesia, the institutional pathway to integrate certification system into competence field remains inadequate. The National Professional Certification Agency (BNSP) is an independent body with the mandate of work competence certification, while sport massage is a practical competence field related to sport recovery, physical conditioning, and provision of sport and wellness services. Acupressure sport massage, therefore, is seen as a hybrid competence that integrates sport massage practice with knowledges and techniques of acupressure. The question here is not whether there is certification, but whether this hybrid competence can be institutionally categorized, aligned with national competence standards, and embedded in higher education systems through a credible and quality-assured certification pathway. Therefore, technical training for this competence is needed not only for its development, but also for its professional recognition, quality assurance, and clear institutional positioning in sport and wellness field.

However, in Indonesia, the development of such competence is still limited due to fragmented institutional arrangements. At policy-system level, the creation or reinforcement of university-based professional certification bodies, especially the Professional Certification Institution (LSP) P1, can be considered a strategic institutional mechanism. Unlike BNSP, universities are not certification bodies, but they serve as capability building institutions that train students by providing curricula, hands-on training, and competence-based assessment readiness. In other words, BNSP and licensed LSPs possess certification authority, while universities provide structured learning pathways, infrastructure, and

student preparation. This distinction is crucial to establish university's position as an educational institution that transforms academic learning into certifiable professional capabilities, thereby preventing it from being seen merely as a place to obtain a certificate.

Sport education programs are still criticized for being more theoretical than practical, whereas employers are increasingly looking for graduates possessing applied skills that meet professional standards (Wohlfart et al., 2021; Yudhistira & Purwanto, 2022). Meanwhile, new skills, such as acupressure sport massage, have not been sufficiently institutionalized as sport-based professional skills. In many instances, acupressure is often categorized in spa or traditional therapy field, thereby diluting its status as a distinct competence that can be applied in sport recovery and wellness services. This is a wider issue of capability building: universities can produce graduates who possess academic knowledge, but prevailing system does not always offer clear pathways to convert that knowledge into certified, industry-recognized professional capabilities.

Employability has been previously defined as more than merely getting a first job; it refers to the ability to adapt oneself, manage careers, and respond to changing labor market conditions (Bridgstock, 2009; Tomlinson, 2007; Yorke, 2006). Graduates of sport education programs frequently pursue multiple and non-linear career paths, with many of them transitioning among sport, wellness, education, entrepreneurship, and other service-related careers (Minten, 2010; Minten & Forsyth, 2014; Sleap & Reed, 2006). These prior findings, although useful, were conducted at individual or curricula level and were focused on employability. There also has been less focus on institutional and policy processes that enable higher education programs, certification systems, and industry partners to collaborate in developing professional competence in today's service-based sector.

Likewise, studies on competence-based education have demonstrated the need for the linkage of learning outcomes, competence assessment, and industry's standards (Mulder, 2017). However, certification systems are often placed outside of higher education programs, creating a parallel, non-integrated pathway between both elements for capability building. This separation would reduce universities' contribution to sectoral innovation, as students can master academic skills without being formally recognized for their applied skills. On the other hand, certification bodies can evaluate competence without adequate alignment with curricula design, learning processes, and long-term professional development. This gap suggests that certification should be considered an integral element of a broader system of innovation capability building rather than merely an employability tool.

This study, therefore, aims to fill this gap by examining the implementation of acupressure sport massage certification pathway within Indonesia's higher education ecosystem. It explores the opportunities and barriers of integrating professional certification into academic programs as seen by certification bodies, training providers, and higher education stakeholders. Specifically, this study examines the potential of professional certification to facilitate innovation capability building through curricula redesign, competence assessment, and labor market alignment in sport and wellness field.

This study offers three contributions to existing literature on STI policy and innovation management. Firstly, it moves the discussion on innovation capability building beyond technology-intensive sectors to service-based sector, where innovation is heavily reliant on human resource capability, professional standards, and institutional coordination. Secondly, it views professional certification as an institutional mechanism for translating academic knowledge into recognized professional capabilities. Thirdly, it offers empirical evidence in the context of a developing country, Indonesia, where the governance is still fragmented, the certification system is still not fully developed, and the higher education–industry linkage is still weak, all of which remain impeding the development of emerging professional capabilities. Furthermore, this study provides policy-relevant insights on the potential of integrated certification pathways to enhance human capital capability, service-based sector competitiveness, and innovation-oriented higher education reform.

II. ANALYTICAL FRAMEWORK

A. Innovation Capability Building in Service-Based Sector

Innovation capability building is becoming a key priority for developing countries to enhance human capital quality, institutional coordination, and sectoral competitiveness. Innovation capability is the ability of individuals, organizations, and systems to learn, absorb, adapt themselves, and apply knowledge in productive and socially useful ways (Cohen & Levinthal, 1990; Teece, 2007). Regarding innovation systems, capability building requires interaction

among actors, institutions, rules, standards, and learning processes that enable knowledge circulation and its economic use (Freeman, 1987; Lundvall, 1992; Nelson, 1993).

In many developing countries, innovation capability is often limited due to lack of not only technological mastery, but also institutional coordination, reliable standards, and alignment between education systems and labor market's needs. These challenges are especially sound in service-based sector, where innovation depends heavily on workforces' skills, credentials' credibility, practice standardization, service quality, and trust from service recipient. This is a situation commonly demonstrated in sport and wellness field, where new recovery services, sport therapy, complementary wellness, hybrid professions, and business models that integrate scientific, practical, and traditional knowledge are potential avenues for innovation. Acupressure sport massage is particularly relevant because it encompasses sport recovery, wellness practice, and complementary therapy, suggesting that it needs to be technically trained, professionally recognized, certified, and have a more defined institutional role in sport and wellness field.

B. Higher Education–Industry Linkage and Capability Formation

Higher educational institutions are key actors within innovation systems, as they create knowledge, build human capital, and link academic learning to societal and industrial needs (Etzkowitz & Leydesdorff, 2000; Perkmann et al., 2013). In applied fields, universities can support innovation capability by linking curricula, practical learning, assessment, and professional standards in a meaningful way. Therefore, universities should not only impart theoretical knowledge, but also cultivate students' ability so that they can adapt themselves to changing labor market landscape and demonstrate relevant competence.

This is a very pertinent issue in sport education field. Previous studies has indicated that sport graduates have a variety of career pathways that are not necessarily linear, with many of them pursuing sport, wellness, education, fitness, entrepreneurship and other service industry careers (Minten, 2010; Minten & Forsyth, 2014; Sleap & Reed, 2006). Employability is not merely about securing a first job; it also concerns the ability to adapt oneself, manage career transitions, and respond to changing labor market conditions (Bridgstock, 2009; Tomlinson, 2007; Yorke, 2006). In contrast, sport-related higher education programs are often irrelevant with industry's standards. Graduates might possess theoretical knowledge, but not applied experience, professional recognition, or industry-relevant credentials (DeLuca & Braunstein-Minkove, 2016; Wohlfart et al., 2021). This condition results in a gap between knowledge and competence, reducing graduates' readiness and university's contribution in building capabilities in service-based sector.

This is particularly noticeable in new competence fields, such as acupressure sport massage. These skills are important to sport recovery and wellness services but are still inadequately taught in higher education programs or identified as a sport-based professional competence. Academic learning outcomes may not be recognized in labor market if graduates are not formally certified, thereby necessitating the effort of higher education systems in aligning students' capability development with industry's standards.

C. Competence-Based Education and Professional Certification

Competence-based education (CBE) is a learning approach that focuses on learning outcomes, performance standards, assessment criteria, and skills that can be applied to real-world tasks (Mulder, 2017). In applied fields, it facilitates capability building by enabling students to acquire conceptual knowledge as well as skills that can be applied in occupational contexts. However, without credible external assessment and certification, curricula redesign would be ineffective.

Professional certification is a formal process for assessing, recognizing, and sharing competence with employers, clients, and actors in related professions (Gibb, 2018; Mulder, 2017). Certification in labor market saturated by information asymmetry can alleviate uncertainty by demonstrating that an individual has attained a certain level of competence. It enhances graduates' career readiness, employability, and competitiveness, beside also improves service quality, accountability, and trust for industries.

From innovation capability standpoint, certification should not be viewed solely as a single credential, since it serves as an institutional mechanism for capability building by formalizing professional standards, establishing assessment criteria, providing quality assurance, and connecting education and recognized competence. However, it requires institutionalization and coordination. If certification is not aligned with curricula design, students may have to obtain credentials outside university system, which may

be of variable quality and cost. If certification bodies, universities, training providers, and professional associations are not well-coordinated, competence standards would not be properly aligned with learning processes.

This is especially relevant in Indonesia, where certification process typically involves multiple actors, such as professional certification bodies, competence certification institutions, training providers, associations, and higher educational institutions. This plurality can be beneficial in terms of flexibility but would also lead to fragmentation if the actors' roles, standards, and pathways are not clear. Weak institutional positioning would lead to less professional recognition for acupressure sport massage, particularly when it is categorized in spa or traditional therapy field and not distinctly developed as a professional competence in sport and wellness field.

D. Regulatory and Multi-Stakeholder Governance of Certification

A multi-stakeholder governance structure is needed to integrate professional certification into higher education systems. In the context of Indonesia, BNSP is the institutional authority for work competence certification, while competence standards, such as the Indonesian National Work Competence Standard (SKKNI), are formal references for defining knowledge, skills, and work attitudes. However, acupressure sport massage is a cross-over of many fields: sport, wellness, complementary therapy, employment, and higher education. This means its institutionalization needs to be coordinated among sport-related institutions, health or medical institutions, employment institutions, higher educational institutions, professional associations, certification bodies, and training providers.

Multi-stakeholder relationship is a key aspect of innovation capability building. If there is no clarity in regulation and coordination among actors, certification would be fragmented and not well-aligned with curricula design. Conversely, when regulatory standards, university curricula, professional assessment, and industry's needs are well-aligned, certification would function as innovation infrastructure that supports human capital development, professional recognition, service quality, and labor market mobility.

E. Integrated Certification Pathways within Higher Education Systems

Integrated certification pathway is an institutional arrangement in which curricula, competence standards, practical training, assessment, and certification are linked within or in parallel to higher education systems. Within this scheme, certification is not seen as an after-the-fact process upon graduation, but instead as a process of learning and building capabilities. Students learn theory in academic courses, apply the theory in practice-based learning, and demonstrate their competence in certification based on national or professional standards.

Integrated certification pathways provide several advantages: they can enhance the relevance of higher education systems by aligning learning outcomes with industry-recognized professional capabilities, validate graduates' capabilities through industry's assessment, facilitate upgrading of service-based sector by providing standardized and quality-assured skills, and facilitate better coordination among universities, certification bodies, training providers, professional associations, and policymakers. For sport and wellness education programs, this integration is especially significant, as students could pursue a variety of careers that demand both practical and formal recognition.

Acupressure sport massage is a good example in this regard. It is a hybrid competence involving sport recovery and complementary wellness practice, and thus needs to be mapped, assessed, quality assured, and institutionalized. If professional certification on this competence is not integrated into academic curricula, students would acquire relevant skills without being awarded formal qualifications. On the other hand, there would be certification that is not aligned with academic learning, but rather is present outside of universities. In both case, the capacity building function of higher education systems would be underdeveloped. An integrated pathway, therefore, can serve to establish a more specific professional image for acupressure sport massage and differentiate sport therapists from traditional masseurs/physiotherapists by building their competence in accordance with national competence standards in sport and wellness field.

F. Research Gap and Conceptual Positioning

Existing literature on graduate employability has made it clear that there is a link among higher education, skills development, and labor market outcomes (Bridgstock, 2009; Tomlinson, 2007; Yorke, 2006). Prior studies on sport education have revealed a variety of career pathways for graduates, despite also showing the lack of consistency in curricula–industry alignment (Minten, 2010; Minten & Forsyth, 2014; Wohlfart et al., 2021). Whereas, in the context of competence-based education and certification, the

focus is on standards, assessment, and competence recognition, all of which are viewed as important aspects of professional development (Gibb, 2018; Mulder, 2017).

Nonetheless, three gaps remain key challenges in this sense. Firstly, certification is often seen as an employability tool, not as an institutional mechanism for innovation capability building. Secondly, there has been less focus among universities, certification bodies, training providers, and professional associations in fostering capability building processes in emerging service-based sector. Thirdly, empirical evidence in the context of developing countries is still limited, particularly concerning the role of integrated certification pathways in professional standardization, quality assurance, and innovation capability in service-based sector.

This study aims to fill these gaps by examining the integration of acupressure sport massage certification into Indonesia's sport and wellness higher education ecosystem. It proposes professional certification as a tool connecting academic curricula, competence standards, practical assessment, professional recognition, and industry's demands. In line with that direction, this study address the following questions: (1) how integrated professional certification can help in the process of innovation capability building within Indonesia's sport and wellness higher education ecosystem; (2) what are the institutional, curricula, and quality assurance barriers to the integration of professional certification; and (3) what policy and management mechanisms are required to align universities, certification bodies, training providers, and sport and wellness field actors.

This study suggests that certification can serve as a capability building tool when it is integrated into higher education systems and aligned with industry's standards. At individual level, certification enhances graduates' professional capabilities and labor market recognition. At institutional level, it encourages curricula and assessment alignment with competence standards. At industrial level, it helps in building trust, standardization, and service quality. At policy-system level, it helps in building human capital capability, facilitating professional mobility, and enhancing innovation capability in developing country's service-based sector.

III. METHODOLOGY

A. Research Design

This study employs an exploratory qualitative case study design (Sekaran & Bougie, 2016) to explore the potential of professional certification as an institutional mechanism for innovation capability building within Indonesia's sport and wellness higher education ecosystem. Qualitative design was deemed suitable for this study because it aims to gain insight into actors' perceptions, experiences, and institutional practices regarding certification governance, competence standardization, curricula alignment, and professional capability formation.

Case study approach was chosen because the integration of acupressure sport massage certification into higher education systems is a context-specific phenomenon involving multiple actors, such as higher educational institutions, professional certification bodies, competence certification institutions, and training providers. This study did not measure the quantitative results of certification, but instead the perceived opportunities, barriers, and institutional needs for integrating certification into higher education systems. This approach is deemed appropriate for examining innovation capability building as a process influenced by institutional coordination, actors' roles, standards, and governance arrangements.

This study is part of a larger participatory action research program to create an integrated acupressure sport massage certification scheme within higher education systems. This pre-cycle phase aimed to document existing certification landscape, identify gaps in capabilities, and understand the institutional conditions needed prior to the development and piloting of an integrated certification scheme. This study, therefore, did not necessarily assess the implementation of a full certification scheme, but instead provided an empirical basis for future examination and scheme development.

B. Research Context

This study was carried out in Indonesia, where professional certification is becoming a more common tool to enhance higher education graduates' preparedness, competence recognition, and relevance to labor market. The competence field selected was acupressure sport massage, which encompasses sport recovery, wellness practice, and complementary therapy. This competence is applicable to sport education, since it can extend graduates' career opportunities beyond traditional teaching and coaching positions. However, its institutional status is not clear, since acupressure is associated with spa or traditional therapy field, while sport massage is linked to sport science and recovery services.

This context is relevant when examining innovation capability building in developing country's service-based sector. Certification system involves multiple institutional actors with varying mandates. This study adopted a multi-stakeholder approach to certification problem. Therefore, the coordination of stakeholders was analyzed as a dimension. The analysis focused on the role of higher educational institutions, certification bodies, training providers, sport-related actors, health or complementary therapy stakeholders, and employment-related regulatory institutions in supporting or hindering the creation of an integrated certification pathway. Professional certification bodies are responsible for competence assessment and certification, while training providers and associations are engaged in skill development. Higher educational institutions, on the other hand, are expected to train graduates to possess academic knowledge and professional competence. The relationship among these actors is what would distinguish certified, industry-recognized capabilities from academic learning outcomes.

C. Informant Selection

The informants were purposively selected based on their knowledge, institutional position, and direct involvement in professional certification, competence assessment, training, and higher education systems. This approach allowed the researchers to acquire in-depth knowledge regarding certification governance, its operational processes, competence standards, and the possibility of integrating it into university curricula. Ten informants participated, encompassing professional certification bodies, competence certification institutions, sport massage and acupressure-related certification institutions, and higher education-based professional development institutions. They represented chairpersons, board members, scheme committee members, certification managers, quality managers, administration managers, and higher education certification administrators. All of them offered a variety of perspectives on certification process, quality assurance, institutional needs, and curricula integration.

D. Data Collection

Data were collected via semi-structured in-depth interviews, document analysis, and field observations. Semi-structured interviews were performed to delve into the main themes and to give informants the freedom to describe institutional practices, existing problems, and experiences in their own words (Gunawan et al., 2022). The interview protocol was based on previous studies on professional certification management and tailored to this study's scope.

The interviews focused on four general themes: (1) the institutional structure, working scope, and business processes of certification bodies; (2) certification governance, such as the role of competence standards, assessment processes, certification schemes, and quality assurance; (3) the obstacles and facilitators of certification implementation, such as infrastructure, cost, competence test facilities, institutional legitimacy, and coordination among actors; (4) the feasibility of integrating acupressure sport massage certification into higher education curricula.

The interviews were conducted for about 60–90 minutes with informants, audio-recorded with their permission, and transcribed verbatim. To ensure that data collection was voluntary, confidential, and used responsibly, informed consent was obtained prior to data collection.

Field observations were carried out by visiting institutions related to the certification. This stage aimed to gain background information and record existing facilities, administrative procedures, arrangements for competence tests, and institutional practices. The interview results were supplemented and corroborated with photos and field notes from the visit. Where available, relevant documents, such as certification procedures, competence scheme information, and institutional documents, were also reviewed.

E. Data Analysis

Thematic content analysis was employed to identify patterns, meanings, and institutional issues in interview transcripts, field notes, and supporting documents. There were two coding phases: initial and focused coding. At the initial coding, the researchers repeatedly read the transcripts to identify key statements and emerging themes related to certification governance, curricula alignment, competence standards, quality assurance, institutional barriers, and professional recognition. This phase also included examination on regulatory positioning, stakeholder coordination, distinction between sport massage and acupressure sport massage, and university-based LSP readiness.

Next, at the focused coding, codes were clustered into larger analytical categories using the innovation capability building framework developed in this study. Triangulation of interviews, observations, documents, repeated transcript comparison, and direct quotations were used to enhance the analysis's credibility (Nyumba et al., 2018). Ethical issues were

addressed using informed consent, voluntary participation, confidentiality, and informant labels that were anonymized.

IV. RESULTS

Four main findings resulted from thematic content analysis helps in understanding how professional certification can play a role in innovation capability building within Indonesia's sport and wellness higher education ecosystem, despite also highlighting the certification's limitation in its ability to do so. These four themes are fragmented governance and institutional capability gaps; weak knowledge-to-competence conversion within higher education systems; certification, quality assurance, and professional capability recognition; and embedding certification as a higher education–industry capability building mechanism.

The findings indicate that acupressure sport massage certification is not merely a technical issue of training and evaluation. Instead, the certification is part of a wider institutional process encompassing governance coordination, curricula alignment, competence standardization, quality assurance, and professional recognition. These dimensions help in determining the potential of certification as a capability building tool that connects higher education, certification bodies, and sport and wellness field.

A. Fragmented Governance and Institutional Capability Gaps

The first finding is that there is a lack of governance concerning acupressure and sport massage certification. Informants reported that the institutionalization of acupressure certification in Indonesia still occur at a weak state, as this competence's professional recognition is still inadequate. While competence test is possible, acupressure is frequently categorized in spa or traditional therapy field. One informant said, "acupressure competence test can be conducted at the LSP, for example CIDESCO, COHESPA, ASTI, it is included in SPA" (Informant 4). Another similarly noted, "In fact, here, it is in the SPA, this is actually acupressure" (Informant 2).

The issue is not that there are no certification systems available, but that there is no clear institutional category that recognizes acupressure as a distinct competence relevant to sport. This is an institutional capability gap from capability-building standpoint: there are certification actors and procedures, but they are not well coordinated to establish, categorize, and validate acupressure sport massage as an emerging competence in sport and wellness field.

The findings also indicate that there is a lack of institutional readiness. There are already competence test facilities for several certification bodies, with one informant stating that he had 14 Competence Test Place (TUK) and another stating that he had 4 TUK. However, the situation with certification in higher educational institutions is still less developed. One higher education informant described the situation as "not yet implemented" for certification facilities in faculty and that they had recently been encouraged (Informant 10). This disparity indicates that certification process is not yet well-established in universities.

Informants also explained the LSP structure, which is "LSP P1 is basically and only for students, LSP P2 can be for campus partners, and LSP P3 can be for general informants" (Informant 10). This structure offers a possible route for university certification, but is not fully developed for accommodating new skills, such as acupressure sport massage. Overall, the fragmented governance, unclear institutional status, uneven infrastructure arrangement, and universities' limited readiness restrict the exertion of certification as an innovation capability building tool.

B. Weak Knowledge-to-Competence Conversion within Higher Education Systems

The second finding is that there is not yet a solid connection between academic learning and certified, industry-recognized professional capabilities in higher educational institutions. Informants highlighted that certification schemes are formally based on national standards. Competence units, indicators of success, and elements of assessment have been "arranged" (Informant 2), also the scheme and code should be "standard" (Informant 10) in accordance with SKKNI. These statements show that competence standards are already exist as formal references for certification.

However, the presence of national standards does not guarantee consistency with university curricula. The key challenge identified by informants was the lack of connection among academic courses, competence schemes, and assessment requirements. Students who have finished a massage course can go on to certification at LSP P1 (Informant 3) in principle. However, this mechanism has not been implemented systematically and continues to rely on institutional initiative, availability of facilities, leadership support, and coordination with certification bodies.

The dichotomy between training and certification also poses a structural issue. As one informant stated, “LSP can't really train” (Informant 9). This separation is necessary not only to ensure the assessment objectivity, but also to address coordination issues. The bridge between academic learning and competence assessment is curricula design, which is provided by universities. The homework is indeed connected to the curricula, as the same informant said, “The homework is actually related to the curricula” (Informant 9).

These findings suggest a gap between knowledge and competence. Theoretical or practical exposure may be provided to students in university courses, but not all of this learning is aligned with competence units, assessment indicators, and certification schemes. This suggests that the roles of higher education systems in fostering capability building are likely to be deemed unresponsive to labor market’s needs, hence the gap between educational outcomes and industry’s standards.

Variation in terms of depth and rigor in competence development was also reported by informants. The length of training varies from short courses to more intensive programs. There are several training courses that are dedicated to “massage for relaxation and fitness” (Informant 1), and several others that are dedicated to “specific case treatment” (Informant 3), which is level 4. The references to “150 credit hours” also indicate that several pathways offer more extensive training. Overall, the findings indicate a need for systematic curricula mapping to ensure that courses in sport massage, recovery, wellness, and acupressure fields are aligned with competence units, assessment criteria, and certification levels.

C. Certification, Quality Assurance, and Professional Capability Recognition

The third finding is related to certification as a tool for quality assurance and professional competence recognition. Informants described the certification process as a formal process comprising registration, document verification, plenary meetings, blank submission, and reporting to BNSP. These procedures suggest that certification is not merely a certificate-issuing process, but largely a system of competence validation and administrative legitimacy.

One of the primary concerns was quality assurance. Informants stressed the importance of certification based on actual skills and not on formal status or quick training. “It is unacceptable that educational institutions are compromised by only providing a week of training before issuing certificates” (Informant 2). Another emphasized the importance of competence being performance-based: “It's not about appointing a doctor; it's about being able to massage from start to finish” (Informant 4). These statements show a conflict between the need for speedy certification and the ideals of professional competence, rigor, and service quality.

Assessment thresholds and technical evaluation were also described by informants. There is a minimum passing standard for certification and assessment may examine the accuracy of certain techniques, such as tonification and sedation at acupressure points. This suggests that assessment of acupressure competence evaluates not only the ability to massage in general, but also technical capability, since both need to be demonstrated and deemed accurate.

Certification also gives professional legitimacy outside of local labor market. Informant 1 reported that certificates are officially printed by the Money Printing Public Corporation of the Republic of Indonesia (Peruri) with serial number and state logo, which further enhances their legitimacy. The same informant indicated that certification issued by BNSP could be used to facilitate overseas labor mobility, but this statement needs to be verified.

Cost and access also remain challenging issues. Certification fees vary from IDR 1 to 3 million, segmented according to informant group. Several institutions may opt for online assessment to cut costs, while others may need full offline assessment. These differences highlight the need for a balance between accessibility, cost efficiency, and assessment validity. Regarding capability building, the whole certification processes should not compromise service quality or professional standards and should be affordably accessed by all needing parties.

D. Embedding Certification as a Higher Education–Industry Capability Building Mechanism

The fourth finding suggests that there is a possibility to integrate professional certification as a capability building tool into higher education systems. The consensus of informants was that integration of certification would enhance graduates’ readiness and professional recognition. They also pointed out that institutional commitment, leadership support, curricula redesign, infrastructure development, and coordination with certification bodies are all necessary for integration’s success.

Leadership was viewed as one of the critical factors. “Changing old habits takes a lot of

determination and effort; the most important thing is the leadership's political will" (Informant 10). This indicates that the integration of certification would trigger not only disruption in curricula, but also institutional changes. For this reason, universities should have a leadership that commit to change curricula, allocate resources, build competence test facilities, and establish partnerships with certification institutions.

The findings also reveal a trend towards redefining the professional identity of sport massage and acupressure therapists. One informant said, "we are not traditional masseurs nor physiotherapists" (Informant 6), and another said, "Don't go with SPA, just make it different, stand-alone" (Informant 2). Thus, certification can contribute to the development of a more precise professional image by establishing competence criteria, assessment methods, skills, and service limits for acupressure sport massage.

Integrating certification into higher education systems can also help to broaden career options for sport education graduates. Integrated certification would create opportunities outside of teaching or coaching, such as in sport recovery, wellness services, entrepreneurship, and complementary therapy. In this regard, certification would help in improving employability and service-based sector innovation by increasing graduates' professional capabilities.

Nonetheless, integration is still limited due to cost issue, lack of students' confidence, poor competence test facilities, and lack of coordination between training and assessment as well as between universities and certification bodies. These barriers necessitating a systemic approach for realizing seamless integration of certification. The measures required in this sense are better institutional recognition, curricula matching with national competence standards, credible quality assurance, and better coordination among universities, certification bodies, professional associations, and policymakers.

V. DISCUSSION

This study explores the potential of integrated professional certification in supporting innovation capability building within Indonesia's sport and wellness higher education ecosystem. The findings indicate that acupressure sport massage certification serves not merely as a technical evaluation of individual's competence, but largely as an institutional mechanism that allows the linkage of academic knowledge, competence standards, professional recognition, and labor market's needs. The findings also reveal that this mechanism is still not fully developed due to weak governance, low alignment between curricula and competence standards, poor certification systems, and conflicting demands for speedy certification and credible quality assurance.

A. Certification as an Institutional Mechanism for Innovation Capability Building

The findings confirm the idea that professional certification can serve as an institutional tool for innovation capability building. Innovation capability of an individual, organization, or system is generally defined as the ability to learn, internalize, modify, and utilize knowledge to create useful products (Cohen & Levinthal, 1990; Teece, 2007). Within this study's scope, certification is a tool that can be exerted to build capabilities by turning academic learning into standardized, assessed, and recognized professional competencies.

In service-based sector, such as sport and wellness field, innovation relies on human element, service quality, professional credibility, and trust. In contrast to technology-intensive industries, where innovation is often related to research and development activities, product design, or technological upgrading, innovation in sport and wellness services is closely related to embodied skills, professional standards, and capacity to provide reliable services. Acupressure sport massage is an example of such service innovation, since it is an emerging professional competence that integrates sport recovery, wellness practice, and complementary therapy.

This study demonstrates that certification can be used to formalize this competence in the form of competence standards, assessment processes, and quality assurance systems. In this regard, certification's role goes beyond labor market alignment; it is integrated into institutional structures needed for the development, recognition, and dissemination of professional capability. By highlighting certification's role in a broader process of capability building in emerging service-based sector, this study enriches existing literature on certification, which tends to focus on signaling and employability functions (Gibb, 2018; Mulder, 2017).

B. Graduate Employability to Multi-Level Capability Building

The findings also indicate that the benefit of certification cannot be seen solely in terms of graduate employment. Employability has been demonstrated in previous studies to be more than merely securing a first job; it also concerns adaptability, career management, professional

identity, and responds to changing labor market landscape (Bridgstock, 2009; Tomlinson, 2007; Yorke, 2006). This is especially true for sport education graduates, whose career paths tend to be non-linear and multifaceted (Minten, 2010; Minten & Forsyth, 2014; Sleap & Reed, 2006).

This study enriches existing discourses by demonstrating that employability is part of a larger process of capability building. Certification helps in improving capability building in four ways: (1) at personal level, it enhances students' hands-on skills, career readiness, and professional recognition; (2) at institutional level, it promotes the integration of competence standards, assessment criteria, and practical training into academic curricula; (3) at industrial level, it helps in establishing professional standardization, service credibility, and trust; and (4) at policy-system level, it helps in improving human capital development, skill recognition, and service-based sector competitiveness.

This multi-level interpretation is crucial, since this study broadens existing discourses from a narrow employability debate to wider discussion on STI policy and innovation management. Thus, the question here is not merely whether certification leads to employment, but also whether certification contributes to a more coherent system for developing professional capability in an emerging field. In the context of developing countries, where institutional coordination and standard-setting mechanisms are often inconsistent, this systemic function becomes particularly important.

C. Governance Fragmentation and the Limits of Certification-Based Capability Building

Although certification's potential to support capability building is evident, the findings show that it is still hindered by fragmented governance. Acupressure is frequently categorized in spa or traditional therapy field, while sport massage is more closely associated with sport science and recovery programs. This ambiguous institutional status makes it difficult to establish the recognition of acupressure sport massage as a distinct sport and wellness skill. Consequently, this competence is not well-defined, does not have solid institutional legitimacy, and does not have clear pathway for capability building.

From innovation system standpoint, governance fragmentation is important because capability building requires interaction among actors, institutions, standards, and learning processes (Freeman, 1987; Lundvall, 1992; Nelson, 1993). However, if universities, certification bodies, training providers and professional associations are not well-integrated, knowledge and standards would not flow seamlessly through the system. Consequently, there may be certification, but it is not aligned with curricula design, student learning, and ongoing professional development.

This governance challenge is also reflected in the distinction between training and certification. This is relevant to assessment objective, as certification bodies do not necessarily need to offer training. However, if not coordinated, this distinction would create discrepancies between learning processes and competence assessment. Universities can provide relevant academic knowledge, but not in a way that is aligned to certification schemes. Similarly, competence can be assessed by certification bodies, but not sufficiently aligned with academic curricula. This results in a parallel system in which education and certification exist side by side, but do not fully reinforce each other.

Thus, the primary problem here is not the absence of certification, but the lack of integrated governance system linking certification to capability building. This suggests that certification process needs to be part of a coordinated ecosystem involving universities, certification institutions, professional associations, and policymakers to support innovation capability building.

D. Higher Education–Industry Linkage in Emerging Service-Based Sector

This study also highlights the importance of higher education–industry linkage in emerging service-based sector. Universities are supposed to play a role in innovation systems by generating knowledge, training human resources, and aligning academic learning with societal and industrial needs (Etzkowitz & Leydesdorff, 2000; Perkmann et al., 2013). However, the findings suggest that this role remains incomplete when curricula are not systematically aligned with prevailing competence standards and professional certification pathways.

For acupressure sport massage, students can learn the necessary knowledge from sport massage or related courses, but the knowledge acquired does not necessarily mean they possess the capability to become certified professionals. This leaves a gap between knowledge and competence. At higher educational level, this gap hampers graduates' career readiness. From innovation capability standpoint, this gap reflects universities' inadequate capacity to keep up with competence standards in service-based sector.

This drawback can be addressed via integrated certification pathways, which connects curricula, competencies, practical training, and assessment. Such integration would enable universities to go beyond teaching theory to become active institutions capable of cultivating professional capabilities. Even though universities are not necessarily expected to certify and assess competencies, they are highly encouraged to collaborate with certification bodies, professional associations, and industry stakeholders to ensure that learning outcomes, practical training, and assessment standards are well-aligned.

These findings are important for STI policy enrichment, since institutional arrangements for innovation in service-based sector are likely to be different from those of in technology-intensive sectors, mainly because capability building in sport and wellness field is grounded in people, practices, standards, and trust. Thus, policy interventions for innovation in this sector should accommodate not only research outputs or technological products, but also competence systems, certification schemes, and professional standardization.

E. Quality Assurance and Tension between Access and Credibility

The findings show that there is a clear conflict between the expansion of access to certification and credible quality assurance. On the one hand, certification can enhance access to professional recognition and career mobility. Cost segmentation, online assessment, and flexible certification arrangements enable students and practitioners to engage in certification, even if they are unable to do so due to financial or geographic barriers. On the other hand, informants voiced concerns that certification held only in a short course or within short duration would dilute the ideals of professional competence.

The whole certification processes must uphold credibility. Mere credentialing is insufficient, since individual's capability must also be demonstrated and assessed based on competence standards before it can be declared adequate. If these conditions are not met, administrative certification would only lead to credential inflation instead of real capability. This would undermine the credibility of certification and its usefulness for graduates, employers, and service users. However, certification would also be hard to access if the processes are deemed too strict or unaffordable, since it would discourage students or practitioners who do not have sufficient financial means to pursue it.

Thus, there is a need for an effective certification scheme that is both credible and accessible. Regarding practical skills, such as acupressure sport massage, hybrid options may be considered, but hands-on assessment is still crucial to ensure that technical skills are adequately demonstrated. To minimize access barriers to certification, universities can contribute by providing curricula-integrated training, competence test facilities on campus, and institutional partnerships with certification bodies.

F. Professional Identity and Service-Based Sector Innovation

The other significant finding is the attempt to develop a more professional image for the practitioners of acupressure sport massage. It was pointed out that sport therapists should not be seen as the same as traditional masseurs or physiotherapists. This distinction is important as it affects recognition, regulation, teaching, and value of their competence in labor market.

Acupressure is frequently categorized in spa or traditional therapy field, which restricts its development as a professional competence related to sport. To play a role in innovation in sport and wellness field, acupressure sport massage must be equipped by more precise competence boundaries, professional standards, and institutional legitimacy. Certification can help in this process by establishing (1) a set of knowledge and skills that must be possessed and demonstrated by acupressure sport massage practitioners, (2) the procedures to evaluate their competencies, and (3) a clear definition regarding working scope to distinguish them from related professions.

This measure would have wider implications for innovation in service-based sector. New service-based sector tends to grow as new professional jobs and mixed skills emerge, but specific skills with high potential need to be institutionally recognized to be declared credible and sustainable. In this sense, integrated certification can assist in establishing acupressure sport massage as a well-defined professional skill in sport and wellness field.

G. STI Policy Implications for Developing Countries

The findings have several policy and innovation management implications for STI policy in developing countries. Firstly, capability building is a multi-actor process. There is a need for coordination among governmental agencies, universities, certification bodies, professional associations, and industry actors in terms of standards, curricula, assessment, and quality

assurance. If this coordination is not properly implemented, certification systems would be disjointed and cannot facilitate sectoral innovation.

Secondly, regulatory positioning is required to define the scope of acupressure sport massage as spa therapy, traditional therapy, sport recovery, or a separate sport and wellness competence. This classification is not merely administrative, since it would practically affect curricula design, competence standards, assessment criteria, professional boundaries, and labor market recognition of acupressure sport massage. Thus, there is a need for coordination among stakeholders in employment, sport, health, and higher education sectors to prevent disarticulated certification processes.

Thirdly, professional certification should be seen as an integral element of innovation infrastructure. This is important, since innovation infrastructure is not merely about labs, research funding, or technology platforms in emerging service-based sector. Instead, it also concerns competence standards, certification processes, assessment indicators, and quality assurance systems that facilitate the recognition and enhancement of human resource capability.

Fourthly, universities are encouraged to create integrated certification pathways in applied fields. This involves curricula mapping, collaboration with certification bodies, establishment of competence test facilities, and leadership commitment. One possible pathway is through university-based LSP P1 model, which requires institutional support and resources as well as alignment with national competence standards.

Fifthly, the institutionalization of new skills, such as acupressure sport massage, should be clarified by policymakers. Without being categorized in suitable field, these competencies would fail to develop practitioners' professional skills and innovativeness. Proper classification and standard setting would help in facilitating professional recognition, service quality, and labor mobility.

Lastly, there should be a balance between access and quality in certification policy. Quality assurance is essential, but there is a need for affordable certification pathways. Regarding hands-on service competencies, the assessment should focus on skill demonstration, ethical practice, and technical accuracy. This is crucial to make sure that certification does not merely serve as an award for formal qualifications but generates enhancement in capability.

H. Proposed Acupressure Sport Massage Certification Scheme

Based on this study's findings, the proposed acupressure sport massage certification scheme illustrated in Figure 1 should not be merely treated as a short training-to-certificate scheme. Instead, it should be viewed as a sequenced pathway of academic preparation, competence mapping, hands-on learning, external evaluation, and professional recognition. The scheme begins with higher education courses related to sport massage, anatomy, sport recovery, wellness practice, and basic acupressure principles. Subsequently, these courses should be aligned with relevant competence standards and assessment indicators. This suggests that within ideal setting, practical training should involve credible partner training institutions, while competence assessment should involve an authorized certification body to ensure objectivity and credibility.

The scheme proposed necessitates multi-stakeholder coordination, with each actor assuming distinct role: (1) universities prepare students and integrate professional certification into academic curricula; (2) certification bodies certify and assess competencies; (3) professional associations contribute in occupational identity and ethical boundaries; (4) sport and wellness field actors provide labor market relevance; and (5) employment, sport, health, and higher education stakeholders provide regulatory legitimacy. This scheme would enable acupressure sport massage to be legitimately recognized as a distinct sport and wellness competence, thereby preventing it from being incorrectly categorized in spa or traditional therapy field.

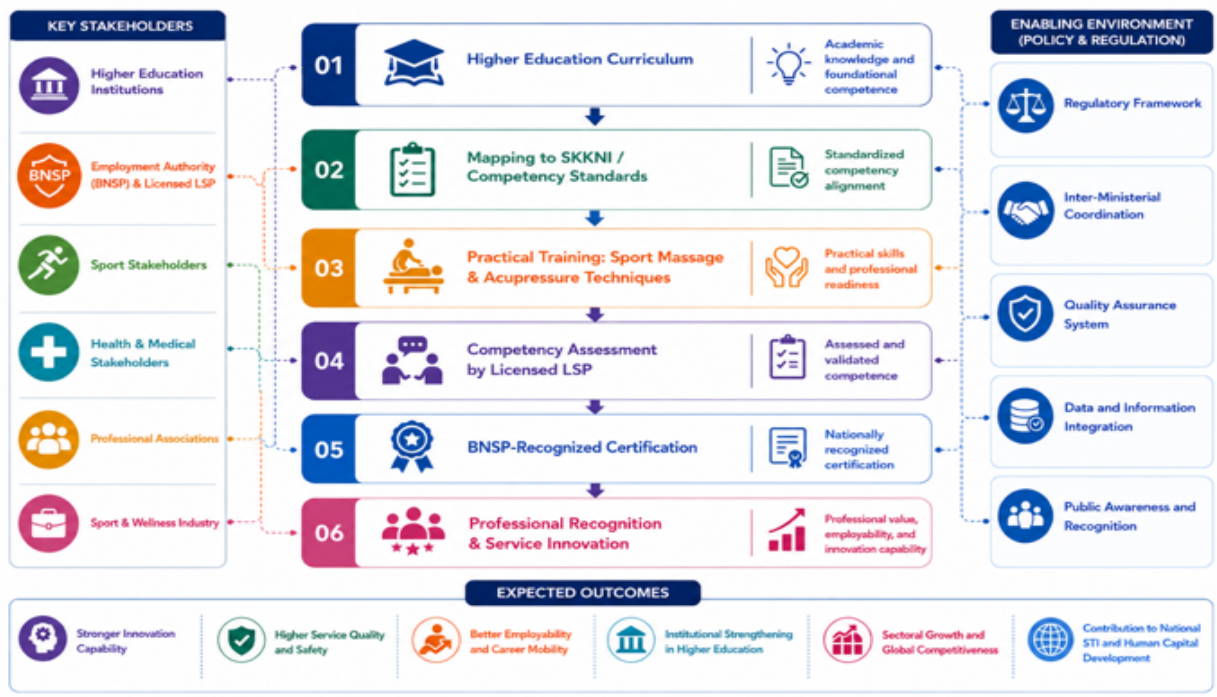

Figure 1. *Proposed Multi-Stakeholder Scheme for Acupressure Sport Massage Certification within Higher Education Ecosystem.*

VI. CONCLUSION

This study explores the role of integrated professional certification in supporting innovation capability building within Indonesia's sport and wellness higher education ecosystem. By examining acupressure sport massage certification, this study demonstrates that certification should be viewed not merely as an employability tool, but largely as an institutional mechanism for transforming academic learning into standardized, evaluated, and recognized capabilities.

As the findings show, this certification's function is still limited due to lack of coordination in governance, unclear institutional role, inconsistent certification systems, poor alignment between curricula and competence standards, and conflicting demands for speedy certification and credible quality assurance. These barriers hinder the possibilities for higher educational institutions to develop sport and wellness knowledge into recognized professional competence.

This study contributes to existing discourses on STI policy and innovation management, as it moves the discussion on innovation capability building to emerging service-based sector, where innovation relies on human resource capability, professional standards, and service quality. It also proposes professional certification as an institutional mechanism for innovation capability building, especially in the context of developing countries, where education–industry linkage and professional standards are often uneven.

At policy-system level, universities should (1) ensure that curricula in sport and wellness field are aligned with national competence standards, (2) improve the assessment of sport and wellness field through practice, and (3) collaborate with certification bodies and professional associations. Policymakers should encourage better inter-sectoral coordination among higher educational institutions, certification systems, and industry, as well as better quality assurance and clearer regulatory classification. Moreover, technical rigor and professional ethics should also be upheld throughout certification processes, and it should remain available to students and graduates. In particular, the institutionalization of acupressure sport massage certification needs regulatory clarification and multi-stakeholder coordination among higher educational institutions, BNSP-licensed certification bodies, employment authorities, sport-related institutions, health or complementary therapy stakeholders, and professional associations. If there is no regulatory and stakeholder alignment, certification would be disjointed and cannot serve properly as a capability building tool.

The exploratory design and small number of informants were recognized as this study's limitations. For this reason, further studies should involve students, graduates, employers, service users, and policymakers to more thoroughly

evaluate the implementation and effectiveness of integrated professional certification pathways. Moreover, comparative studies involving multiple regions or countries could also enhance comprehension regarding capability building through certification, labor mobility, and service competitiveness.

Overall, integrating professional certification for innovation capability building into Indonesia's sport and wellness higher education ecosystem is highly potential when it is properly institutionalized, quality assured, and well-connected to industry's standards and higher educational institutions' curricula.

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