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ORIGINAL ARTICLE

Intellectual Property Awareness, Participation and Application Among Administrators at Vocational Institutions in Ho Chi Minh City

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ABSTRACT
As vocational and college-level institutions increasingly engage in applied research, digital learning resource development, and industry collaboration, institutional administrators must convert intellectual property (IP) awareness into institutionally supported practice. This study examines the relationship among administrators' IP awareness, their participation in IP-related professional activities, self-reported application, and perceived enabling conditions in vocational secondary schools and colleges in Ho Chi Minh City. An explanatory sequential mixed-methods design combined a survey of 113 administrators from 15 institutions followed by semi-structured interviews with 15 purposively selected administrators with at least five years of management experience. Quantitative results were used to identify patterns across four analytical domains, and qualitative evidence was subsequently used to explain areas of convergence, divergence, and implementation difficulty. The administrators reported strong awareness of IP's institutional importance, but lower levels of regular participation and practical application, particularly in protecting research outputs and transferring innovative products. Internal policies, staff competence, specific legal guidance, external support, and inter-organizational collaboration emerged as enabling conditions. The study contributes an empirically grounded awareness-participation-application framework for understanding why favorable perceptions do not automatically produce IP governance capacity in vocational education. It recommends differentiated action by state management agencies and institutions, including operational guidance, internal rules, designated focal points, practice-oriented training, and external support networks.

1. INTRODUCTION

Within educational institutions, activities related to teaching and training, scientific research, learning resource development, technical innovation, and industry collaboration may generate various forms of intellectual property. Intellectual property (IP), therefore, concerns not only legal compliance but also the governance of education, research, innovation, and technology transfer. In the context of the knowledge economy, educational institutions are increasingly regarded not merely as organizations that generate and disseminate knowledge, but also as agents responsible for creating, protecting, and exploiting intellectual outputs. This process requires appropriate governance structures and effective mechanisms for engagement with enterprises and regulatory authorities (Karytinos & Ingham, 2015).

The effectiveness of IP management depends not only on awareness but also on the ability of administrators and academic staff to translate such awareness into concrete practices. These practices include identifying intellectual assets, determining ownership rights, protecting research outputs, integrating IP-related content into education and training, and facilitating technology transfer. Previous studies have shown that lecturers and learners generally acknowledge the importance of IP; however, their knowledge and competencies remain limited in areas such as registration procedures, confidentiality, commercial exploitation, and access to professional support services (Tinao et al., 2018).

In Vietnam, several educational institutions have established internal regulations and IP management models. Nevertheless, implementation remains inconsistent, as reflected in unclear institutional policies, a lack of designated personnel, ineffective coordination mechanisms, and limited technology-transfer activities (Le & Nguyen, 2020; Ngo, 2021). Existing studies have also indicated considerable variation in the IP awareness and knowledge of lecturers and students (Ly, 2024; Tran, 2022). These limitations are also associated with restricted professional development opportunities, insufficient institutional support, and limited access to IP experts.

Although previous research has examined IP awareness among lecturers and students and IP management models in universities, three limitations remain. First, these studies seldom distinguish vocational secondary schools and colleges from research-intensive universities, even though vocational institutions rely more heavily on applied training, workshop-based products, industry-linked innovation, and learning resources whose ownership and transfer arrangements are often institution-specific. Second, prior work usually treats awareness, participation, and application as separate descriptive topics rather than as connected stages through which institutional capacity develops. Third, limited evidence is available on how organizational and regulatory conditions explain the gap between favorable perceptions and actual management practice. To address these gaps, this study focuses on administrators because they translate legal requirements into internal rules, allocate responsibilities, organize professional development, and coordinate protection and transfer processes. The study therefore asks: (1) What are administrators' levels of IP awareness, participation, and self-reported application? (2) Which enabling conditions are perceived to shape application? and (3) How do interview accounts explain the observed quantitative patterns? Its novelty lies in proposing and empirically examining an awareness-participation-application sequence conditioned by institutional and external support in the under-researched context of vocational education in Ho Chi Minh City.

2. LITERATURE REVIEW

2.1. Intellectual Property and Its Management in Educational Institutions

According to the World Intellectual Property Organization (2020), intellectual property refers to "*creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce*".

Under Vietnamese law, the term is expressly defined as intellectual property rights, meaning "the rights of organizations and individuals to intellectual assets, including copyright and copyright-related rights, industrial property rights, and rights to plant varieties" (The Office of the National Assembly of Vietnam, 2025). Accordingly, in this study, intellectual property (IP) is understood as encompassing both the outcomes of intellectual creation and the system of rights associated with the creation, ownership, protection, and exploitation of such outcomes.

Within educational institutions, intellectual assets are the outputs of intellectual labor arising from education and training, scientific research, and technological activities. These assets may take the form of textbooks, teaching materials, scientific reports, software, databases, inventions, utility models, industrial designs, technical know-how, and other creative outputs produced by administrators, lecturers, and learners (Pham, 2019).

IP activities in educational institutions are therefore understood as systematically organized activities aimed at creating, protecting, exploiting, and applying intellectual assets in support of education, research, and social development. The management of IP activities extends beyond the registration of IP rights. It also encompasses the identification of intellectual assets; the determination of authorship and ownership; administrative management; the establishment, enforcement, and protection of rights; and the exploitation and transfer of creative outputs (Pham, 2019; Pham & Nguyen, 2018a).

Doan (2009) conceptualizes this process as a cycle comprising the creation of intellectual assets, their protection and exploitation, the generation of benefits, and the motivation for continued creativity. According to the author, the absence of IP registration, insufficient access to patent information, and the lack of specialized support units may

constrain the transfer and commercialization of research outputs. From an international perspective, Karytinos and Ingham (2015) similarly argue that the increasingly important role of educational institutions in innovation requires an appropriate governance structure, within which technology transfer offices serve as key intermediaries connecting educational institutions, enterprises, and the broader IP system.

2.2. Administrators' awareness, engagement, and role in intellectual property activities

Awareness of intellectual property (IP) should be distinguished from IP knowledge and practical competence. Tinao et al. (2018) claim that learners and lecturers recognize the importance of IP while also expressing a need for additional knowledge and support concerning confidentiality, registration procedures, patent information, and commercial exploitation. Thus, an individual may acknowledge the importance of IP without necessarily possessing the ability to identify intellectual assets, determine ownership, complete protection procedures, or exploit creative outputs.

Participation in training and awareness-raising activities, together with the integration of IP into educational curricula, can enhance understanding and facilitate its practical application. Common approaches include short workshops, specialized modules, and the incorporation of IP-related content into academic courses (Tinao et al., 2018). Luniachek et al. (2021) similarly indicate that lecturers have a considerable need for IP-related professional development, whereas this subject has not yet been adequately integrated into professional development programs.

At the institutional level, administrators play an important role in developing policies, assigning responsibilities, organizing professional development, and establishing appropriate support mechanisms. Pham (2019) and Ngo (2021) emphasize the necessity of internal regulations, clearly defined responsibilities, dedicated support units, and effective coordination mechanisms for IP management.

For conceptual consistency, this study uses four distinct terms. IP awareness denotes administrators' perception of the relevance and institutional value of IP; participation refers to their involvement in communication, training, dissemination, and self-directed learning; IP application denotes self-reported use of IP principles in management, curriculum and learning-resource development, protection of research outputs, and transfer of creative products; and IP management refers to the broader institutional system of policies, responsibilities, procedures, and support arrangements through which intellectual assets are identified, protected, and exploited. This distinction prevents favorable attitudes from being interpreted as evidence of practical competence or institutionalized governance.

2.3. Factors influencing the application of intellectual property practices

Domestic studies indicate that IP activities in many educational institutions continue to face difficulties due to unclear regulations, uneven levels of awareness, and underdeveloped management structures (Pham, 2019). The application of IP practices depends not only on individual awareness but also on institutional policies, human resources, legal guidance, and organizational support mechanisms.

(1) Institutional IP policies: Internal regulations help define ownership rights, the responsibilities of relevant parties, and procedures for the disclosure, registration, protection, and exploitation of intellectual assets. Pham (2019) argues that coordination can be effective only when duties, authority, and responsibilities are clearly specified. Research on the Unicamp model also demonstrates that IP policies, dedicated technology transfer units, professionally qualified personnel, and benefit-sharing mechanisms are important conditions for the protection and transfer of research outputs (Pham & Nguyen, 2018a).

(2) Specific legal guidance: IP activities involve multiple stages, ranging from the identification of intellectual assets and the determination of ownership to the establishment of rights and commercial exploitation. Legal provisions therefore need to be translated into specific procedures appropriate to the educational and research activities of each institution (Pham, 2019; Pham & Nguyen, 2018a).

(3) Staff qualifications and competencies: IP knowledge enables administrators and lecturers to identify relevant rights, make lawful use of the intellectual products of others, and protect the outputs they create. Luniachek et al. (2021) argue that lecturers are both participants in IP-related relationships and responsible for developing learners' IP competencies. Accordingly, professional development should encompass knowledge of the creation, enforcement, protection, and commercialization of IP rights.

(4) Support from regulatory and specialized agencies: Luniachek et al. (2021) show that responsibility for organizing IP-related professional development is attributed to both government authorities and educational institutions, whereas responsibility for protecting IP rights is perceived by participants as resting primarily with

specialized agencies and central regulatory authorities. Preferred forms of support include expert consultation, online courses, seminars, and training programs organized by educational institutions or specialized agencies.

(5) Collaboration with external organizations: Partnerships with enterprises, IP authorities, and consultancy organizations enable educational institutions to access specialized expertise and facilitate the protection and transfer of research outputs. The effectiveness of such collaboration depends on clearly established mechanisms governing ownership rights, confidentiality, benefit sharing, and the responsibilities of the parties involved (Karytinos & Ingham, 2015; Pham & Nguyen, 2018b).

2.4. Research gap and analytical framework

The reviewed literature converges on the importance of IP for innovation and on recurring barriers such as unclear policies, limited competence, and weak support structures. It differs, however, in analytical emphasis: awareness studies focus mainly on individuals, whereas management-model studies emphasize organizational arrangements. Few studies connect these levels in vocational education. The present study integrates them through an analytical framework in which awareness provides an attitudinal foundation, participation creates opportunities to acquire procedural knowledge, and application represents the translation of that knowledge into management and educational practice. This sequence is not assumed to be automatic. Internal policies, staff competence, specific legal guidance, support from supervisory and specialized agencies, and collaboration with external organizations are treated as enabling conditions that may strengthen or constrain the movement from awareness and participation to application. The framework is used as an organizing and interpretive device rather than as a causal model, because the cross-sectional and descriptive design does not permit causal inference.

3. MATERIALS AND METHODS

3.1. Research design

The study adopts an explanatory sequential mixed-methods design (QUAN → qual). The quantitative phase was primary and was used to highlight patterns in administrators' IP awareness, participation, application, and perceived enabling conditions. The qualitative phase followed the survey and was designed to explain why awareness did or did not translate into regular participation and practical application. Integration occurred at three points: interview participants were selected from the survey pool; interview questions were informed by high-, moderate-, and low-rated survey items; and the two datasets were connected during interpretation through joint comparison of numerical patterns, thematic explanations, and representative quotations. Qualitative findings were used to confirm, qualify, or challenge the survey interpretation rather than merely to provide illustrations.

3.2. Participants and sampling method

The quantitative phase included 113 administrators from 15 public and non-public vocational secondary schools and colleges in Ho Chi Minh City. Eligible participants were members of institutional leadership teams or administrators in faculties, departments, and units responsible for training, administration, scientific research, technology, or industry collaboration. Individuals without a formal management assignment or without direct familiarity with institutional educational, research, or innovation activities were excluded. The institutions were purposively selected to obtain variation in institutional level, ownership type, and operational profile rather than to produce a statistically representative citywide sample.

Within participating institutions, administrators meeting the inclusion criteria were invited through institutional contact points. Purposive sampling was appropriate because the study required respondents with direct knowledge of IP-related decisions and practices, but it also limits population-level generalization. Fifteen survey participants were subsequently selected for interviews using maximum-variation criteria: management level, institutional type, professional responsibility, years of experience, and variation in survey responses. All interviewees had at least five years of management experience. The interview sample was considered adequate for explanatory purposes because selection continued until the principal survey patterns had been addressed and later interviews produced limited additional explanatory content. Participants were coded CBQL1-CBQL15 to preserve anonymity.

3.3. Research Instruments

The questionnaire was developed deductively from the concepts and recurring indicators identified in the reviewed literature and Vietnamese IP regulations. It contained demographic questions, one open-ended question,

and 20 items across four domains: IP awareness; participation in IP communication, training, and dissemination; self-reported IP application in management and education; and perceived enabling conditions. Items used a five-point agreement scale from 1 (strongly disagree) to 5 (strongly agree). To improve content alignment, the research team mapped each item to the study objectives and analytical framework, reviewed wording for relevance to vocational education, and revised overlapping or ambiguous expressions before administration. Because the study did not employ a previously validated scale and item-level reliability statistics were not available for reporting, the findings should be interpreted as descriptive evidence rather than as validation of a psychometric instrument. Future studies should undertake formal expert validation, pilot testing, and construct-reliability analysis.

The semi-structured interview guide mirrored the four quantitative domains but emphasized mechanisms and examples. Questions probed how administrators interpreted IP responsibilities, why training remained irregular, what impeded protection and transfer activities, and which institutional or external conditions could make implementation feasible. Follow-up prompts were adapted to each participant's survey profile, allowing the qualitative phase to explain both typical and divergent responses.

3.4. Data collection and analysis

Quantitative data were analyzed in SPSS 26.0 using frequencies, percentages, and item means. Descriptive statistics were selected because the research questions concern the current distribution and relative pattern of responses, the sample was purposive, and the study did not claim population estimates or causal relationships. Means were interpreted together with response distributions to avoid treating ordinal responses as precise interval measurements. Comparisons across domains were used analytically to identify the awareness-participation-application gap, not as inferential tests of statistical significance.

Interviews lasted approximately 30-45 minutes, were audio-recorded with consent, transcribed, and analyzed thematically. Initial codes were generated from the analytical framework and supplemented with inductive codes emerging from participants' accounts. Related codes were grouped into themes concerning translation of awareness into action, procedural uncertainty, organizational responsibility, resource constraints, and external support. Integration was conducted through a joint-display logic: each quantitative pattern was compared with confirming, qualifying, or discrepant interview evidence. Quotations were retained when they clarified a mechanism or an implementation condition rather than merely repeating a numerical result.

Data were collected in May 2026 from administrators working at vocational secondary schools and colleges.

3.5. Research ethics

Participants were informed of the study's purpose, the voluntary nature of their participation, their right to decline or withdraw from the study at any time, and the ways in which the collected data would be used. No personally identifiable information or identifying details of the participating educational institutions were disclosed. Survey and interview data were used exclusively for research purposes, and interview responses were reported using participant codes rather than the participants' actual names.

3.6. Methodological limitations

The design has four principal limitations. The sample of 113 administrators was purposively recruited from 15 institutions in one city and therefore cannot be treated as representative of all vocational institutions in Vietnam. The relatively small sample constrains subgroup analysis. Measures were self-reported and may be affected by social-desirability bias or differences in respondents' interpretation of IP practice. Finally, the cross-sectional design and descriptive statistics identify patterns and perceived conditions but cannot establish causal effects. These limitations are partly mitigated by institutional variation and qualitative explanation, but they should frame the scope of the conclusions.

4. RESULTS AND DISCUSSION

4.1. Current status of intellectual property awareness, participation, and application in vocational education

4.1.1. Administrators' awareness of the role of intellectual property

The results presented in Table 1 indicate that the administrators expressed a high level of agreement regarding the role of intellectual property (IP) in vocational secondary schools and colleges, with item mean scores ranging from 4.12 to 4.35. The highest-rated statement was that IP plays an important role in the development of vocational education (A1, M = 4.35), followed by the view that IP serves as a tool for managing innovation (A4, M = 4.31).

These findings suggest that the participants perceived IP not only as a mechanism for protecting rights but also as an element associated with institutional innovation and development.

Table 1. Administrators' awareness of the role of intellectual property in vocational education (n = 113)

Code	Survey Item	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)	Level 5 (%)	Mean score
A1	Intellectual property is an important factor in the development of vocational education.	0.00	1.77	8.85	40.71	48.67	4.35
A2	I clearly understand the role of intellectual property in education and training activities.	0.88	1.77	11.50	41.59	44.25	4.28
A3	Intellectual property plays an important role in enhancing the institution's reputation and brand.	0.88	3.54	14.16	46.02	35.40	4.12
A4	I regard intellectual property as a tool for managing innovation.	0.00	0.88	10.62	44.25	44.25	4.31
A5	I recognize the need to protect intellectual property rights in education and training activities.	0.88	1.77	12.39	42.48	42.48	4.24

The role of IP in education and training activities and the need to protect IP rights in such activities were also rated highly. However, the proportion of neutral responses to these two statements remained notable, suggesting that some administrators may have developed only a general awareness of IP and may not yet have a clear understanding of specific areas such as copyright, patents, industrial designs, or rights relating to the exploitation of creative outputs.

The lowest mean score was recorded for the role of IP in enhancing institutional reputation and brand. Although the score remained relatively high, this result suggests that the relationship between the creation, protection, and exploitation of intellectual assets and an institution's reputation, standing, and competitiveness has not yet been fully recognized. Previous studies, however, have argued that IP is increasingly becoming an important instrument through which educational institutions manage innovation, strengthen collaboration with enterprises, and enhance the value of research and creative output (Karytinos & Ingham, 2015; Doan, 2009).

The awareness results establish the first element of the analytical framework but also reveal its boundary: high perceived importance cannot be equated with procedural knowledge or governance capacity. This distinction extends awareness-oriented studies such as Tinao et al. (2018), which similarly reported favorable attitudes alongside knowledge gaps, by locating the problem within administrators' institutional role. In vocational institutions, administrators must interpret ownership of learning materials, workshop products, software, and industry-linked innovations; therefore, generalized approval of IP may coexist with uncertainty about operational decisions.

4.1.2. Participation in intellectual property awareness-raising and dissemination activities

Table 2. Level of participation in intellectual property awareness-raising and dissemination activities (n = 113)

Code	Survey item	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)	Level 5 (%)	Mean score
B1	I have participated in intellectual property awareness-raising activities organized by my institution.	2.65	5.31	14.16	46.90	30.97	**3.98**
B2	I regularly organize or participate in intellectual property training activities.	3.54	7.08	19.47	42.48	27.43	**3.75**
B3	The institution integrates intellectual property awareness-raising content into its programs and activities.	1.77	5.31	17.70	44.25	30.97	**3.82**

B4	I participate in disseminating intellectual property knowledge to students.	2.65	4.42	16.81	43.36	32.74	**3.91**
B5	I independently study documents and policies related to intellectual property.	3.54	5.31	18.58	45.13	27.43	**3.86**

The results presented in Table 2 indicate that the administrators' participation in intellectual property (IP) awareness-raising and dissemination activities was relatively high, with mean scores ranging from 3.75 to 3.98. However, these values were lower than those recorded for the awareness items in Table 1, suggesting that positive perceptions of the role of IP had not yet been fully translated into regular and systematic participation.

The highest mean score was recorded for prior participation in IP awareness-raising activities organized within the institution. This finding indicates that most administrators had been exposed to IP-related communication activities. Participation in disseminating IP knowledge to students was also rated relatively positively. This suggests that administrators had begun to contribute to the transmission of IP knowledge to learners, consistent with the role of educational institutions in fostering awareness of and respect for IP rights.

Nevertheless, the item concerning the regular organization of or participation in IP training activities received the lowest mean score, indicating that although such activities had been implemented, they were not conducted on a sufficiently regular basis. The interview findings similarly revealed that these activities remained dependent on the funding and planning arrangements of specific institutions: "We previously proposed organizing IP training, but the initiative was not implemented because no dedicated budget was available" (CBQL6).

The integration of IP awareness-raising content into institutional programs and the independent study of IP-related documents and policies received neutral-response rates of 17.70% and 18.58%, respectively. These results suggest that IP content may have been incorporated into certain institutional programs, but had not yet been systematically developed into structured materials, specialized modules, or formal professional development activities.

Viewed through the analytical framework, the lower participation scores indicate a weak intermediate mechanism between awareness and practice. Prior studies identify workshops, modules, and curriculum integration as common educational responses (Tinao et al., 2018; Luniachek et al., 2021), but the present evidence suggests that occasional exposure is insufficient when participation depends on ad hoc budgets and individual initiative. The qualitative account adds an organizational explanation: irregular participation reflects planning and resource arrangements, not merely personal motivation. This finding shifts attention from the existence of training events to their institutionalization as recurrent professional development.

4.1.3. Level of intellectual property application in institutional management and education and training

Table 3. Ability to apply intellectual property in institutional management and education and training (n = 113)

Code	Survey item	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)	Level 5 (%)	Mean score
C1	I apply IP-related legal provisions in institutional management.	3.54	7.08	22.12	45.13	22.12	**3.67**
C2	I apply IP principles when designing curricula and learning resources.	4.42	8.85	24.78	41.59	20.35	**3.58**
C3	I use IP mechanisms to protect the institution's research output.	5.31	9.73	26.55	39.82	18.58	**3.44**
C4	I participate in transferring creative output associated with IP.	6.19	10.62	29.20	37.17	16.81	**3.39**
C5	I integrate IP content into teaching activities.	4.42	7.96	23.89	42.48	21.24	**3.61**

The results presented in Table 3 show that administrators' self-reported application of intellectual property (IP) ranged from 3.39 to 3.67, which was notably lower than the level of awareness reported in Table 1. This finding

indicates that although administrators highly value the role of IP, the translation of awareness into management, education and training, protection, and technology transfer practices remains limited.

The highest mean score was recorded for the application of IP-related legal provisions in institutional management. This was followed by the integration of IP content into teaching activities and the application of IP principles in curriculum and learning resource design. However, these practices were not rated highly by all participants, and a considerable proportion selected either the neutral or disagreement categories. The comment from Administrator 2 clearly illustrates the gap between understanding regulations and applying them in practice: "I understand the basic provisions of the Intellectual Property Law, but I am still unsure how to apply them specifically when handling institutional records and internal documents."

The two lowest-rated items were the use of IP to protect institutional research output and the transfer of creative products associated with IP. These findings suggest that institutions continue to face difficulties in activities requiring specialized procedures, designated focal points, and coordination with enterprises or IP authorities. The lack of clearly assigned responsibility for IP protection was also reflected in the comment from Administrator 10: "The institution has internally funded research projects, but it has never prepared an application for IP protection. We do not know who should be responsible for this task."

This finding is consistent with Pham (2019), who argues that IP management should encompass the entire process of identifying intellectual assets, establishing rights, protecting those rights, and exploiting intellectual assets, rather than merely disseminating legal regulations. Doan (2009) similarly identifies the absence of dedicated support units, limited registration for IP protection, and weak links with enterprises as major barriers to the transfer of research output. Likewise, the model adopted at Viet Nam National University Ho Chi Minh City indicates that IP protection and transfer require coordination between administrative management units and specialized advisory and support units (Ngo, 2021).

The application pattern is the central empirical contribution of the study. Practices closest to routine administration and teaching were more common, whereas protection and transfer activities requiring specialized procedures, ownership decisions, documentation, valuation, and external coordination were weaker. This differentiation helps explain why the awareness-application gap is not uniform. It is widest where action crosses organizational boundaries or requires specialized expertise. The result complements university-based management studies (Doan, 2009; Ngo, 2021) while showing that vocational institutions face a distinctive implementation challenge around applied products and industry collaboration.

4.1.4. Factors influencing administrators' application of intellectual property

Table 4. Administrators' perceptions of the conditions influencing the application of intellectual property (n = 113)

Code	Survey item	Level 1 (%)	Level 2 (%)	Level 3 (%)	Level 4 (%)	Level 5 (%)	Mean score
D1	The lack of internal institutional policies affects the application of intellectual property practices.	0.88	2.65	10.62	43.36	42.48	**4.15**
D2	The lack of specific legal guidance reduces the effectiveness of intellectual property application.	1.77	3.54	12.39	45.13	37.17	**4.02**
D3	Staff qualifications and competencies affect the application of intellectual property practices.	0.88	3.54	13.27	40.71	41.59	**4.11**
D4	Support from supervisory authorities remains limited.	1.77	4.42	14.16	46.02	33.63	**3.94**
D5	Collaboration with external organizations affects the effectiveness of intellectual property application.	1.77	2.65	11.50	44.25	39.82	**4.06**

The results presented in Table 4 indicate a relatively high level of agreement among administrators that the application of intellectual property (IP) is influenced by both internal and external institutional conditions, with mean scores ranging from 3.94 to 4.15. These findings suggest that limitations in the application of IP practices arise not only from individual awareness but also from institutional policies, staff competencies, legal guidance, and support mechanisms.

The highest-rated item concerned the influence of inadequate internal policies on the application of IP practices. This finding indicates that administrators place particular emphasis on the establishment of clear regulations regarding ownership rights, the responsibilities of relevant parties, registration procedures, and mechanisms for exploiting creative outputs. The comment provided by Administrator 1 directly reflects this concern: "Without clear internal IP regulations, lecturers do not know the extent of their rights and are even less willing to exploit their innovations outside the institution." This finding is consistent with the management practices adopted at Tsinghua University, where IP policies are used to define the scope of application, ownership rights, disclosure obligations, and mechanisms for sharing benefits derived from intellectual assets (Pham & Nguyen, 2018b).

Staff qualifications and competencies were also regarded as an important condition. This finding may partly explain the limited application of IP practices, particularly in relation to the protection of research outputs and the transfer of creative products. Luniachek et al. (2021) similarly found that educational personnel have a substantial need to improve their knowledge and skills concerning the creation, protection, and commercialization of IP rights, while available professional development opportunities remain insufficient.

The next two conditions were collaboration with external organizations and the availability of specific legal guidance. A total of 84.07% of participants agreed that relationships with enterprises, research institutes, or consultancy organizations influence the effectiveness of IP application. This finding is consistent with the view that technology transfer offices and professional partners serve as important intermediaries connecting educational institutions, enterprises, and the IP protection system (Karytinos & Ingham, 2015). In addition, the agreement rate of 82.30% for Item D2 indicates that general legal provisions need to be translated into specific guidance appropriate to training activities, learning resource development, applied research, and industry collaboration within educational institutions.

The item with the lowest mean score concerned support from supervisory authorities. This result suggests that the level of support may vary across institutions or depend on the type of institution and its directly responsible governing authority.

The enabling-condition results challenge an exclusively individual explanation of limited application. Internal policies and staff competence were rated most strongly, but legal guidance and external collaboration were also prominent. In the proposed framework, these factors operate as organizational bridges: policies allocate rights and responsibilities; competence supports correct decisions; guidance translates general law into procedures; and external networks supply expertise unavailable internally. The findings, therefore, support a multi-level interpretation of IP governance in which awareness is necessary but becomes actionable only when institutional and inter-organizational conditions reduce uncertainty and coordination costs.

4.2. Policy and institutional implications

The implications should be differentiated by level of responsibility. State management agencies can reduce regulatory ambiguity and create shared support infrastructure, whereas institutions must translate that support into internal governance routines. Feasibility depends on proportional implementation: large colleges may sustain specialized units, while smaller institutions may rely on designated focal persons and shared external services. The priorities below are ordered according to the empirical prominence of enabling conditions and the weakness of protection and transfer practices.

(1) Institutional level: Establish proportionate internal IP rules. Each institution should define intellectual-asset disclosure, authorship and ownership, use of institutional resources, protection decisions, benefit sharing, confidentiality, and transfer procedures. Implementation requires leadership approval, consultation with lecturers and relevant units, standardized forms, and annual review. Larger colleges may adopt a comprehensive regulation; smaller institutions may begin with a concise procedure and decision matrix. This recommendation is directly linked to survey item D1, the highest-rated enabling condition.

(2) Institutional level: Provide role-based, practice-oriented professional development. Training should address copyright in learning resources, ownership of lecturer- and student-created products, lawful use of digital content,

disclosure of innovations, protection routes, and transfer agreements. Feasibility is improved through short case-based sessions embedded in existing professional development plans, with completion records and follow-up consultation. Priority should be given to administrators and staff handling research, training, digital resources, and enterprise relations.

(3) Institutional level: Assign a focal point and an inter-unit workflow. The focal person should receive disclosures, conduct preliminary screening, maintain records, coordinate expert advice, and monitor protection or transfer procedures. The model should match institutional capacity: a specialized unit for larger colleges, or a trained officer supported by an interdepartmental group for smaller institutions. Minimum conditions include a written mandate, allocated work time, access to legal and technical expertise, and a modest operating budget.

(4) Policy and network level: Develop shared IP support services. Supervisory authorities, IP agencies, industry associations, universities, law firms, and enterprises should provide standardized guidance, expert rosters, model documents, and referral pathways. Cluster-based support can make searches, applications, valuation, and contract advice affordable for institutions that cannot maintain specialist staff. Implementation should specify service standards, confidentiality requirements, cost-sharing arrangements, and responsible contact points.

(5) Policy and institutional level: Integrate communication with governance processes. State agencies should produce vocationally relevant guidance and cases, while institutions should embed IP content in staff induction, student orientation, research procedures, entrepreneurship activities, digital-learning policies, and enterprise collaboration. Communication should be linked to concrete actions, where to disclose an output, whom to consult, and which forms to use - rather than limited to general legal information. Effectiveness can be monitored through participation, disclosure, protection, and transfer indicators.

5. CONCLUSION

This study identifies a consistent sequence in which administrators' favorable IP awareness exceeds their participation in structured learning activities and, in turn, their self-reported practical application. The gap is most visible in protecting research output and transferring creative products tasks that require specialized procedures, assigned responsibility, and coordination beyond routine teaching and administration. The evidence therefore suggests that IP governance capacity in vocational education cannot be inferred from awareness alone.

Academically, the study contributes an awareness-participation-application framework conditioned by institutional and external support. It connects individual perceptions with organizational governance and adds evidence from vocational secondary schools and colleges, whose applied training and industry-linked output differ from the university settings emphasized in prior research. Practically, the findings support differentiated responsibilities: state management agencies should provide operational guidance and shared support infrastructure, while institutions should establish proportionate internal rules, focal points, workflows, and role-based training.

The conclusions remain bounded by purposive sampling, a relatively small sample, one-city coverage, self-reported measures, the absence of formal psychometric validation, and a cross-sectional descriptive design. Accordingly, the results should be interpreted as analytically transferable patterns rather than population estimates or causal effects. Future research should validate the measurement instrument, include larger multi-regional probability or stratified samples, compare institutional types, and use longitudinal or intervention designs to test whether strengthened policies, training, and support networks improve disclosure, protection, and transfer outcomes.

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