

Exploring the Gaps between Master's Degree Holders' Competence and Industrial Demands in Urban and Rural Planning: Senior Field Engineers' Observations and Reflexive Narrative

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Abstract: This paper examines the academic-work gap in terms of performance reality and performance expectations by expanding on the cultivation model of Master's students in the university context and the most recent industry requirements for talents' competence. The subjects of this paper are Master's degree holders, both academic and professional. The paper examines common issues encountered by enterprise professionals when employing Master's degree holders and proposes a university-enterprise joint cultivation model to achieve win-win outcomes for both higher education institutions and businesses.

Keywords: Urban and rural planning; Graduates with an academic Master's degree; Graduates with a professional Master's degree; University-enterprise joint cultivation model

1. Introduction

The majority of students pursuing an academic and professional Master's degree in urban and rural planning will work for design companies upon graduation. However, new graduates generally lack practical project experience, and their teamwork and social networking skills are less than satisfactory in the workplace (Engeström, 2001). Specifically, graduates holding a professional Master's degree are weak in problem analysis and solving abilities, while graduates holding an academic Master's degree have limited practical experience and professional skills (Li, et al., 2020). On the whole, it takes a relatively long time for new graduates to adapt to their roles, and they are expected to develop a stronger sense of responsibility, get more focused, and pay more attention to details, demonstrating a slow growth process (Brunhaver et al., 2017). There is a slight difference in work performance

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between the two types of graduates, which requires an analysis of the cultivation model and the directions of the academic and professional master's programs prior to the exploration of new cultivation models.

At the start of the 1950s, urban planning was a second-grade discipline under the first-grade discipline of architecture, with the main subject being urban planning and design, which featured the design of urban forms based on architectural forms (Abramson, 2006). With the expansion of subject coverage, the discipline of urban planning was upgraded to a first-grade discipline named the Study of Urban and Rural Planning, which proposed higher requirements for the Master's program regarding the cultivation of diverse and versatile talents, after being approved by the Office of the State Council Academic Degrees Committee and the Ministry of Education. Nevertheless, since the graduates still fail to meet the requirements of the positions in terms of professional abilities, universities have launched academic and professional master's programs to meet the demands of social and economic development. In 2011, the Evaluation Standards for Master's Programs in Architecture in Higher Education Institutions stated that academic Master's programs aim to cultivate talents that are capable of conducting academic research, while full-time professional Master's programs aim to cultivate high-level application-oriented professionals with professional competencies (Song & Huang, 2012).

The Ministry of Education defined the objective of academic Master's programs as the cultivation of scientific research personnel with solid theoretic knowledge, sound academic background, and strong scientific research skills. In particular, the objective highlights the cultivation of innovation, which could underpin high-level scientific research for the country. On the other hand, the Ministry of Education defined the objective of professional Master's programs as the cultivation of high-level application-oriented

professionals who have a good mastery of basic subject theories with extensive knowledge of their specialties and demonstrate strong problem-solving skills, professional competencies, and the serving capability in professional and technical roles or management positions. In particular, the objective highlights the cultivation of the awareness of studying practical problems and the ability to solve practical problems; its ultimate goal is to develop competency for the workplace. As a result, compared to the academic Master's program, the professional Master's program is more closely associated with social and economic development (Dos Santos et al., 2019).

This paper binds its analysis of the gap between the actual competence of the academic Master's programs, the professional Master's programs, and the industrial demands for manpower in the same field, in order to unravel what higher education at the Master's level can learn from the industrial sector to enhance educational quality. Specifically, there are two research questions underpinning this study: 1) What is the difference between masters' programs in a university context and the job requirements in the industry of urban and rural planning? 2) How is the compatibility among graduates with an academic Master's degree, graduates with a professional Master's degree, and the job requirements of the authentic design companies?

2. Literature Review

Engineering is a distinct field from the social sciences and humanities in that it has different requirements for graduates' competence and attributes. According to the Washington Accord Graduate Attribute Profile, engineering graduates are expected to master a total of 12 aspects as the comprehensive foundation of their overall competence (International Engineering Alliance, 2014). Among the twelve attributes are engineering knowledge, problem analysis ability, design and development of engineering solutions, investigation, modern tool

usage, an understanding of the relationship between engineers and society, environment and sustainability, engineering ethics, individual and teamwork, communication, project management and finance, and the ability to learn for life. Such a graduate attribute is now widely accepted in the global engineering field, including China, which has placed a high priority on joining the other Washington Accord signatories in 2016. (Koh & Zhuang, 2020). For example, the Chinese Engineering Education Accreditation Association's version of engineering graduate attributes draws heavily on the Washington Accord, with the addition of "communicating effectively in a cross-cultural setting with global visions" to the list (Zhuang & Xu, 2018). Similar accounts of student attributes exist in other internationally recognized standards, such as the Conceive-Design-Implement-Operation (CDIO) pattern (Crawley et al., 2014).

3. Methodology: Reflexive Narrative

Reflexive narrative has been increasingly and widely used for educational research in recent years. It takes the form of presenting lived stories and experiences, observations and reflexivity on the part of stakeholders involved (Conle, 2000). It is "a spoken or written text giving account of an event/action or series of events/actions" (Czarniawska, 2013). Narrative-based reflexivity is a process of self-assessment and self-awareness (Beck et al., 1994), and using narrative-based reflexivity helps explore and understand "something that I am acting out as I live my life" (Rudd, 2009). In this paper, reflexive narrative is used to investigate observations and study the work experiences of dozens of Masters' degree holders in authentic workplaces, which is also a process of deeply exploring and interpreting how people experience various events, moments, and the world in which they live (Connelly & Clandinin 1990). When interpreting experiences and stories, it is critical to consider interactions between individuals,

contexts, and temporal and spatial changes, as these factors may influence people's lived experiences (Clandinin & Connelly 2004).

As a result, in this study, research notes are collected and analyzed to investigate how people interact differently with newly hired employees with Master's degrees on campus who have also worked front-line in the author's company. Much emphasis was placed in this paper on the data relating to the gap between the research objects' learning experiences, program expectations, and actual work performances. Individual observations and interactions with relevant academic and professional Master's degree holders are examined in a reflexive manner. The authors can "take the opportunity to evaluate their actions in relation to their intentions and thus write a further part of their histories" using this method (Goodson & Gill 2014, 33). Through dialogue with ourselves and our research objects, such a process allows the authors to potentially gain insights from their experiences. It is worth noting that in this process, we are both outsiders who objectively explore and analyze the stories of relevant research objects and insiders who can recall and review the yardsticks against which their performance should be measured. These various roles contribute to the authors' motivation to investigate the topic in a critical and reflexive manner.

4. Findings

Question 1: What are the differences between Masters' programs in university context and the job requirements in the industry of urban and rural planning.

When the professional Master's program was initially introduced, the number of its applicants was far less than that of the academic Master's program. The admission score of the professional Master's program was lower than the academic one as well. In recent years, in comparison with the academic Master's program, the professional Master's program

has witnessed a larger number of applicants and a higher enrollment rate. Even so, the academic and professional Master's programs at universities remain immature, as represented by the random copy of the evaluation standards for research-oriented talents and application-oriented talents. The following findings include several important aspects: where the difference lies between the academic Master's programs and the professional Master's programs; and the increase in workplace requirements.

The Deviation of Professionalized Academic Master's Program from the Academic-oriented Ones

Currently, China is witnessing an increasing demand for high-level research-oriented and innovative talents, and universities, in order to meet the demand of this development, have gradually expanded the enrollment of Master's students. In the meantime, pursuing a Master's degree has become a solution in the eyes of both students and parents for improving job market competitiveness. Such a mentality has allowed the students to obtain more opportunities to practice and adapt quickly to the positions while disregarding the fundamental goal of academic research. Furthermore, tutors are more willing to involve students in project planning and design as well as relevant subject research, rather than viewing the publication of high-quality papers as the only way to achieve scientific research outcomes.

The Academicization of Professional Master's Program

In recent years, the number of students applying for the professional Master's program has surpassed the number of students applying for the academic Master's program. Nonetheless, given the professional Master's program's short history, the deviation from the fundamental cultivation goal of combining professionalism development with knowledge accumulation, the similar curriculum design to academic-oriented ones, and the crippled deployment

and development of faculty, the realization of cultivation objectives under the professional Master's program is bound to be subdued. These factors will have an impact on the achievement of the training goal of professional Master's programs.

Capabilities of the Professionals Required by the Industry of Urban and Rural Planning

With the restructuring of the Ministry of Natural Resources, land spatial planning has emerged. Compared to traditional urban planning, land-spatial planning involves comprehensive and interdisciplinary knowledge of asset evaluation, land management, urban and rural planning, management, implementation, and guarantee of legal systems. It has raised higher requirements for talent cultivation under the program of urban and rural planning. It requires the students to leverage their traditional advantages of strong learning capabilities to quickly bridge the knowledge gap in forestry, agriculture, oceanic sciences, water, and ecological environments, and thus, make full technical preparations for their expansion into the fields of watershed planning, marine spatial planning, forest planning, and land consolidation, rehabilitation, and planning.

As a result, design firms are in desperate need of talent who understand comprehensive urban and rural planning, land planning, urban management, and land resources, as well as proficiency in applying theoretical knowledge and methods to solve specific problems in planning projects.

Furthermore, thanks to the rediscovery of land value in the downtown city, the function enhancement of the built-up areas and the improvement of the spatial environment, the planning of land development and stock land have become important trends for future development. The subjects of planning have gradually switched from newly built areas in cities to built-up areas and old towns in cities, and the planning is more focused on difficult issues such as small-scale and negotiable stock planning and community

planning.

According to the Beijing City Overall Plan (2016–2035), the development model of city construction has shifted from reliance on land development to upgrading of stock land. Priority projects for organic upgrade will include the updating of blocks in the capital's core area; the improvement of public spaces in cities; and the renovation of old urban communities, old industrial factories, traditional commercial buildings, and traditional business districts. To begin, plant greeneries on underutilized land. The government is attempting to reduce land use by utilizing inefficient collective industrial land outside of the concentrated building zone as the primary method. It focuses on reducing land use, improving land quality, and increasing greenery through planning. Second, strictly control land use. The government has specified the percentage of stock land for construction in the annual supply plan, as well as researched and developed guiding recommendations for the activation and use of state-owned stock land for construction. There has been progress in the implementation of secondary market measures for the transfer, lease, and mortgage of the right to use construction land. As a result, design firms are in desperate need of professional talents with problem analysis and problem-solving skills, negotiation strategies, and integrated competence (comprehensive capabilities) to solve coordination problems in stock land planning.

Question 2: The compatibility among graduates with an academic Master's degree, graduates with a professional Master's degree and the job positions of design companies

There is no significant difference in overall capabilities between students with an academic Master's degree and students with a professional Master's degree. Students with an academic Master's degree demonstrate slightly stronger learning abilities than students with a professional Master's degree

due to the different cultivation objectives of different universities. Both types of Master's students need more work-related experience in terms of practical and innovative skills, planning and decision-making, communication, and coordination. Based on the characteristics of the discipline of study in urban and rural planning, the paper analyzes their work performance in design firms from the following perspectives in the hope of providing corresponding suggestions and measures to address the problems.

Learning Capabilities

Because urban and rural planning are closely related to the development strategies and policies of the country, their practitioners are required to constantly learn new knowledge and skills and focus on the development of learning capabilities. Unlike traditional urban and rural building, the new land-spatial planning is more complicated in that it involves the knowledge and professional abilities of urban and rural planning, construction, transportation engineering, and landscape architecture, thus requiring the practitioners to bridge the knowledge gap between related fields.

The cultivation objectives of the academic and professional Master's programs make it clear that students with an academic Master's degree have slightly stronger learning capabilities than others. When design firms take on new types of planning business in which they are unfamiliar, practitioners must learn and summarize the main points of new knowledge in a short period of time in order to come up with ideas to address the priorities and challenges of new projects and explore countermeasures. Students with an academic Master's degree outperform their peers in this regard. However, the main scope of business of design firms in reality is doing projects in which they have expertise, so the difference in learning abilities between the two types of students is not visibly felt by routine work.

Professional Competency

The evaluation of a planner's professional competency can be conducted from the aspects of innovation capability, reasonability of goals and orientations, and self-adjustment ability, depending on the state of the urban and rural planning industry and the actual demands of design firms.

Innovation serves as the soul of planning and design. A planner should apply the theories and methodologies of planning and design to the process of urban and rural planning and design in a creative way. Nonetheless, the difference in practical and innovative capability between the two types of students is insignificant in the projects.

Another important factor in determining professional competency is whether the planners have established reasonable career goals and orientations. A planner's career path begins as an assistant planner upon graduation, progresses to a planner with years of experience, and finally to a general planner who oversees projects throughout the process. It entails the individual demonstrating exceptional overall qualities as well as professional abilities. The appointment of a general planner can be viewed as both an acknowledgement and a major test. Those who wish to pursue the path should aim to become general planners. New graduates who make clear career plans are more likely to succeed. As a matter of fact, most of the Master's students are making their efforts based on this path.

When the study of urban and rural planning was upgraded to a first-grade discipline, its development theories shifted as well. Traditional planning and design rely mostly on the emotional awareness of planners, so the new forward-thinking thoughts and theories often face doubt and failure, which is the necessary development process of new things. A planner should be able to make self-adjustments and persevere regardless of failures. Since the new land spatial planning requires the learning of new expertise, students with either an academic or professional

Master's degree, faced with the pressure from learning and unfamiliarity with the work procedure, should enhance their self-adjustment ability to be competent for the job.

Planning and Decision-making

Urban and rural planning and decision-making refers to a process of decision-making that involves the formulation and selection of optimal plans to guide and regulate city building in the course of urban development, and the plans center around the development direction, scale, speed, and specific building activities based on the rules of urban development and distinctiveness of the cities. As a result, practitioners in urban and rural planning must develop the ability to analyze and solve problems in a scientific way to formulate more reasonable plans and make more rational decisions, which play a vital role in urban and rural planning.

It takes time for graduates to adjust to their new work environment. Only by gaining work experience, learning theoretical knowledge, honing professional skills, and becoming mentally and technically prepared can graduates analyze and solve problems in a targeted and organized manner. All of these are skills that new graduates must develop.

Communication and Coordination

When urban development shifts its focus from land development to the adjustment of stock land, the role of planners has also gradually changed. Apart from serving the government, they will also visit communities, interact with various interest groups such as the general public, societies, and businesses, and solve a variety of practical and difficult problems. Consequently, the planners are compelled to find a way out amid compromises and negotiations. They may fail to adhere to professional ethics and agreed-upon ultimate goals if they lack communication and coordination skills, as well as their own judgment in the process of convincing and explaining.

Largely explained by a lack of work experience,

it is no surprise that new graduates with either a professional or academic Master's degree are weak in communication and coordination as new entrants to the workplace, so they should enhance their gaming skills, professional ethics, and expression abilities, which constitute the basic requirements for planners to undertake social responsibilities.

5. Discussion

In order to better serve society, universities should enhance cooperation with enterprises based on the demands of the urban and rural planning industry and develop high-level application-oriented Master's graduates who demonstrate strong professional capabilities, competency, and innovative performance.

Enterprises, on the other hand, can establish exchange and cooperation platforms with universities to introduce more qualified talents. The joint cultivation of universities and enterprises can establish a community of shared interests through the promotion of mutual exchanges and the combination of production, learning, scientific research and practice in a systematic way. In fact, these reflect the demands of enterprises for technology and talents, as well as the demands of universities for the expansion of cultivation channels for talents. As such, as carried out as an internationally recognized practice, a university-enterprise joint cultivation model is suggested for win-win outcomes for both universities and industrial companies (Beregal-Mirabent et al., 2020; Sherwood et al., 2004).

A Clear Teaching System of "Double Tutor"

Through a preliminary mutual assessment system between tutors and students, universities can help both sides reach an initial consensus on research direction and cultivation plan. Furthermore, universities shall assign two tutors for each student, one full-time from the university and the other from a (design) company, by leveraging faculty resources both on and off campus to facilitate on-campus theoretical studies and

on-the-job experience accumulation. The former shall focus on providing guidance on the study of theoretic knowledge and scientific and research methods, and the latter shall guide project practices and engage in curriculum development and paper guidance.

In the mid-to-late stage of the Master's program, universities can organize students to seek internships in enterprises and institutions that they are in cooperation with, and the tutors from the enterprises shall evaluate and guide the practices. By guiding the master's students in the participation of engineering projects, the tutors can help students accumulate practical experience, improve design skills, and narrow the gap between theories and practices.

Incorporation of Practice Assessment into the Evaluation System

In the traditional teaching courses of the discipline for the study of urban and rural planning, the student's performance is marked primarily by their drawings. Considering the demands of the development of the urban and rural planning industry, universities are suggested to incorporate presentation ability and application of comprehensive knowledge into the evaluation system, among which the former stands for a comprehensive evaluation of the students' logical thinking and expression ability, and the latter stands for the assessment of the students' ability to analyze and solve problems through specific design plans.

Better Articulations of Recruitment Demands by Enterprises

In the workplace, design companies, more often than not, suffer from a shortage of talents, which undoubtedly constrains the development of enterprises and businesses. The golden standard of talent recruitment should be that the talents meet the requirements of the roles and help solve problems encountered by enterprises. However, design companies are plagued by challenges in talent recruitment, without considering talent reserves for

the comprehensive development of the companies but rather recruiting employees frequently for temporary or urgent tasks, which will affect their healthy development. As a result, they shall devise reasonable plans of talent recruitment and inform university partners timely of the demand to satisfy the needs of both companies and students.

As different roles have different requirements, departments of the design companies should specify the details. In general, provided that the design company needs to recruit a limited number of talents for scientific research, they can define the job requirements as being able to independently complete topic research, demonstrate strong writing skills, and recruit graduates with an academic Master's degree.

While providing that the design company needs a large number of talents for project design and especially engineering practices as a must, they are suggested to recruit graduates with a professional Master's degree.

Faced with the changes in the urban and rural planning industry brought by the change of times, universities shall enhance cooperation and seek joint cultivation with enterprises, delivering teaching reform, distinctiveness, and innovation in an all-round way; it is necessary to formulate a distinctive cultivation system and teaching plan for the professional Master's program, and it is only in this way that they can achieve a win-win outcome for universities and enterprises.

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