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Demand of Design-Technology Hybrid Professionals and Competency Gaps in Urban Regeneration and Rural Revitalization: Employers and Graduate Views in Shanghai.

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Abstract: The competencies required of the spatial design professionals are changing with urban regeneration and rural revitalization, but the university curricula have been slow to respond. This paper presents a descriptive secondary analysis of an existing Shanghai research report which has 508 valid questionnaires and summaries of 15 semi-structured interviews and discusses the demand of design technology hybrid professionals in employer and graduate views. Competency attainment by employers and job-competency fit by graduates were compared on five dimensions including design creativity, technological application, interdisciplinary integration, place-based practice and international outlook. The most frequent problems that were mentioned by employers were the inability of candidates to integrate design and technological skills (83.7%), lack of interdisciplinary project experience (76.2%), and lack of knowledge about new technologies (71.4%). Both sources placed the five dimensions at equal levels where the lowest was international outlook and place-based practice whereas graduates rated practice-based courses as the most helpful (4.12 of 5).

The findings indicate that the competencies are not combined in a structural mismatch but instead, there is an absence of skill deficits and four responses to application-oriented universities: task-oriented competency standards, design-technology-driven curricula, real interdisciplinary projects, and feedback that connects demand, teaching, and assessment.

Keywords: Urban Regeneration; Rural Revitalization; Design–Technology Integration; Hybrid Professionals; Competency Gaps; Work-Integrated Learning

1. Introduction

The spatial development sector is being transformed in terms of the content of work and demand of professional talent due to urban regeneration and rural revitalization. The urban development has changed its focus on providing new space to enhancing the quality of existing space, whereas rural development is now more and more demanding coordination between ecological conservation, industrial development, and public services. Rural revitalization thus does not only involve a physical change of the built environment but reorganizes demographic, land, industrial, and governance relations and demands the joint contribution of several knowledge fields [1]. Spatial planning and landscape design are also anticipated to shift away from static plans to process design that allows adaptability, resilience, and continuous feedback under increasing environmental uncertainty [2].

The design professionals are being reorganized by digital technologies. Building Information Modeling (BIM) is not only a three-dimensional modeling tool, but it transforms the organization of information, collaboration between collaborators and delivery of projects [3]. The renewal of existing buildings and spaces also necessitates the use of digital modeling to manage incomplete baseline records, on-site data capture, and constant updating of models [4]. Digital information therefore does not simply add software tasks to an otherwise unchanged design process; it redistributes knowledge and reshapes coordination among project participants [5]. The skill to integrate aesthetic expression, technical analysis and collaborative implementation becomes a key professional requirement as a result. Urban digital twins work arrives at the same conclusion that

regeneration projects now rely on such models to test scenarios, evaluate performance and communicate with stakeholders [6].

The two projects that are taking place in Shanghai can be the real places where these changes can be seen. One is the renewal of the One River, One Creek at the banks of the Huangpu River and Suzhou Creek; another one is the creation of Chongming Ecological Island. The project of the waterfront needs to be coordinated between the public space, industrial heritage, local history, and operation and maintenance of the facility as compared to the Chongming project which has a connection between the ecological preservation and the rural industries, tourism services and the locals. The design professionals in both locations should apply spatial reasoning with the help of digital analysis and social and ecological factors on the implementation [7-9].

These general requirements of the job have not been followed by training in universities. The old fashioned curriculum has to be taught according to disciplines, and the design, technology, ecology, and social studies are all treated as different subjects, hence a student who has learned a few of them is likely to be unable to apply them to real-life situations. The literature on labor markets indicates that technical-social competencies are highly valuable and that it is impossible to cover both with a single skill in the case of complicated occupations [10]. Design-technology professionals should thus study how many software programs students can learn but whether they can use these software tools in making design decisions, communicating with other people and carrying out projects.

This paper deals with three research questions:

• RQ1: The demand of the design-technology hybrid professionals is evident in which combination of jobs and competencies?

• RQ2: What are the common weaknesses and divergent concerns that arise out of employer evaluations and graduate self-evaluations?

• RQ3: How can application-oriented universities leverage this evidence to enhance professional preparation?

The research places the competency study in the particular environment of urban regeneration and rural revitalization, and through the comparison of demand and supply sides, divides two types of dimensions: those that are rated lowly, and those that should be given priority to reform due to their applicability to core job tasks. This difference warns against identifying hybrid professionals development with simply adding technology courses.

2. Literature Background and Analytical Framework

2.1 Discrete Skills to Integrated Problem-Solving Competence

We do not consider design-technology hybrids as a group of professionals who are trained in both design and technology. We consider them as the people who can use their knowledge, experience, and expertise to solve problems; they can also apply their technical skills to create something new; they can use their understanding of the context and the situation to make decisions and take actions; they can combine their knowledge and experience to come up with ideas and solutions.

The education research of sustainable development has incorporated the concepts of systems thinking, strategic thinking, normative judgment and the cooperation among people in the integrated competence models and emphasized that the solution of complex issues is determined by the interrelationships between these competences [11]. It relates to urban regeneration and rural revitalization as well, since the proposals made on the basis of spatial planning should not be too much concerned with the ecological process, but also with the local interests, cultural values and conditions of implementation. The combination of design expression and technical computation cannot fulfill such demands.

Interdisciplinary higher education studies also indicate that the mere exposure to a number of disciplines does not create interdisciplinary understanding: students need to identify, synthesize and transfer relationships between various bodies of knowledge [12]. We therefore consider interdisciplinary integration as an intermediate skill connecting design judgment, technical analysis, and practical action rather than an additional skill which is acquired automatically by taking more electives.

2.2 Place-Based Practice and Authentic Tasks

The issues of urban renewal and rural development are quite context-dependent. In various communities, in the villages and

ecosystems, the same technical problem may result in various results. The research on transdisciplinarity implies that the engagement of practitioners in knowledge making will assist the stakeholders to formulate problems together and the outcomes of the knowledge can be more useful to their environment [13].

Place-based practice is thus not limited to site surveys and documentation. It involves the determination of local needs, knowledge of competing interests, communicating design constraints, and updating designs based on feedback. The learning experience of authentic projects is less about exposure in the workplace per se but more about how learners are able to relate theoretical concepts with professional practice [14].

Based on this, we claim that the creation of hybrid professionals relies on providing students with experience in the entire project cycle, including problem identification, data acquisition, scheme generation, collaborative verification and feedback-driven revision. It is not enough to train only in tool proficiency or design outputs presentation.

2.3 A Five-Dimensional Competency Framework

Based on the questionnaire of the original report and also based on the literature reviewed in the previous section, we use five-dimensional competency model (Table 1; Figure 1). The evidence that is available is structured in the framework; it does not constitute a standard scale which has been tested with independent samples.

Table 1. A Five-Dimensional Competency Framework for Design–Technology Hybrid Professionals

Competency dimension	operational definition	representative task-level performance
Design creativity	aesthetic judgement, cultural literacy, spatial articulation and design creativity	Suggesting design solutions which respond to user requirements and site features
Application of technology	Using digital modelling, spatial analysis, parametric design and data-visualisation tools	Gathering and analysis of information to support scheme comparison and validation
Interdisciplinary integration	Integrating design, technical, ecological, and societal knowledge	Balancing between several goals and creating combined solutions
Place-based practice	Site surveying, community communication, identification of local needs and implementation feedback.	Improving and modifying design plans in certain communities or villages.
International perspective.	International cases, foreign-language sources, and intercultural communication.	Comparing practices in various contexts and determining their applicability at the local level.

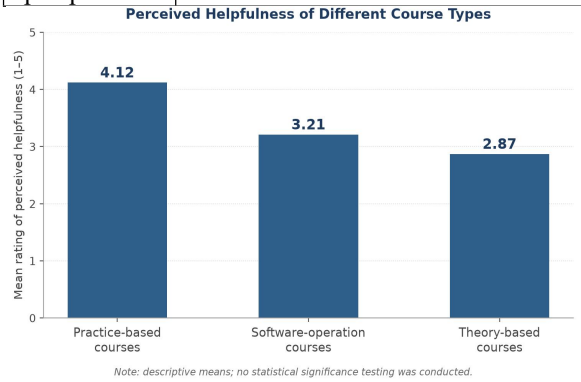


Figure 1. Competency Framework of Design-Technology Hybrid Professionals Five-Dimensional

The weight of international orientation probably differs per organisation type and project nature. We keep this dimension for coherence with the original survey construction and do not presume that all positions demand the same degree of intercultural communication competence.

Following this, the study will be based on the chain of analysis that is comprised of five links namely practice settings, job tasks, competency requirements, performance of competencies and educational responses. The place of the origin of the demands of competence are explained by the practice settings; the two-sided assessment can reveal the discrepancies; and the content of the interview can explain what occurs in the process of education.

3. Methods

3.1 Research Design and Data Sources

This is a descriptive secondary analysis of extant material - the survey statistics, interview summaries, and contextual description in the Research Report on the demand for design-technology hybrid professionals in the context of urban regeneration and rural revitalisation.

As reported, 560 questionnaires were mailed out and 516 received back with 508 of them being valid which is 98.4 percent of the returned questionnaires. The interviewees (n=15)

comprised representatives of design companies, cultural and creative businesses, government planning offices, university administration and industry experts; each semi-structured interview was conducted within 60 to 90 minutes.

We were not able to acquire any new questionnaires and did not have access to the data of individuals or the complete interview. We hence did not do any missing-data treatment, factor analysis, regression analysis or significance testing, and our interpretation of the summary of the interviews is not a qualitative coding process in its entirety.

3.2 Sample Composition and Units of Analysis

Table 2 gives the composition of the questionnaire sample.

Table 2. Questionnaire Sample Composition

Respondent group	Distributed	Returned	Valid
Employer-side respondents	220	198	195
Recent graduates	180	168	165
Earlier graduates	160	150	148
Total	560	516	508

The original report mentions “10 employers” and 195 valid employer questionnaires, without clarifying how respondents correspond to organizations; to resolve this ambiguity, we consider the 195 questionnaires as coming from the employer side instead of being from 195 distinct organizations.

The sample of graduates is 313 responses. Since the overall competency ratings do not differentiate between recent and earlier graduates, we take pooled graduate results and make no inferences regarding differences between the two groups.

3.3 Indicators and Data-Handling Principles

We identified four categories of indicators:

•rates of recruitment difficulty;

•rates of competency attainment reported by employers;

•self-assessment of job competency fit by graduates on a 5-point scale;

•course evaluations and learning needs.

Three principles were used in handling data.

First, each indicator has its original properties. The selection rates of multiple-response items do not have to be added up to 100 percent and the percentages on the employer side are not translated into the number of independent companies.

Second, we make a distinction between the percentage of attainment and non-attainment and the difference in expectations. The 100% minus the attained amount is not necessarily the percentage of non-attainment but the percentage of non-attainment as defined in the relevant definition and the expected amount minus actual attainment is the difference between the expectation and the performance. Since the initial report has failed to record the process of deriving industry expectation values properly, we do not rank them using these gaps.

Third, we do not deduct indicators on varying scales. The attainment rates reported by employers and the 5-point ratings of graduates are applied to within-source ranking only and cross-source comparison of trends; they are not considered as a standard measure.

3.4 Integration of Materials

We matched the statistics and interview findings by competency. According to mixed methods researchers, when one uses both quantitative and qualitative data in an analysis, it will be of more benefit than the use of these two types of data separately [15]. The survey data then is used to describe how much the problems are spread and the summary of the interviews is used to explain the situation of the problem and its impact on education.

It is an interpretive complementation of the integration. It does not have independent verification on validity of scale, cause and effect relationships or representativeness of samples.

4. Results

4.1 The Job Demands are the Combination of Design, Technology and Contextual knowledge.

The initial report includes such positions as BIM-based forward design, digital twinning, parametric design, urban regeneration planning, rural planning, ecological restoration and smart operation and maintenance. The similarity in them is that work activities cross the conventional line between design and technology.

In the process of the regeneration of the waterfront, the spatial design should be associated with the collection of historical data, the acquisition of information about the site, the

study of its usage behavior, and maintenance of the facilities. The ecological design in Chongming Ecological Island work has to be incorporated with land use, environment knowledge, local industries and needs of the people living around the area. Both contexts have their own functions of digital tools, but they are both dependent on the professional judgment to transform technical results into the proof of design choices. The same condition is described in case studies of heritage renewal and site-scale twinning: only when a model can be linked with the data at the site, performance modeling, and input by stakeholders, it can be used as evidence of the design [16,17].

These materials demonstrate the composite nature of job tasks. Without a verifiable overall sampling frame, and without estimation procedures for position counts, however, this study makes no attempt to use them to estimate the total annual demand for such talent in Shanghai.

4.2 Employer Side: Competency Integration Is the Top Hiring Challenge

Table 3 ranks the recruitment difficulties reported by employer-side respondents and Figure 2 shows the same results.

Table 3. Recruitment Difficulties Reported by Employer-Side Respondents

Rank	recruitment difficulty	Selection rate
1	Difficulty merging design and technological capabilities	83.7%
2	Absence of interdisciplinary project experience.	76.2%
3	Lack of knowledge about new technologies like BIM, AI and digital twins	71.4%
4	lack of place-based practice and community communication skills	65.8%
5	Data illiteracy and lack of quantitative analytical skills	62.1%

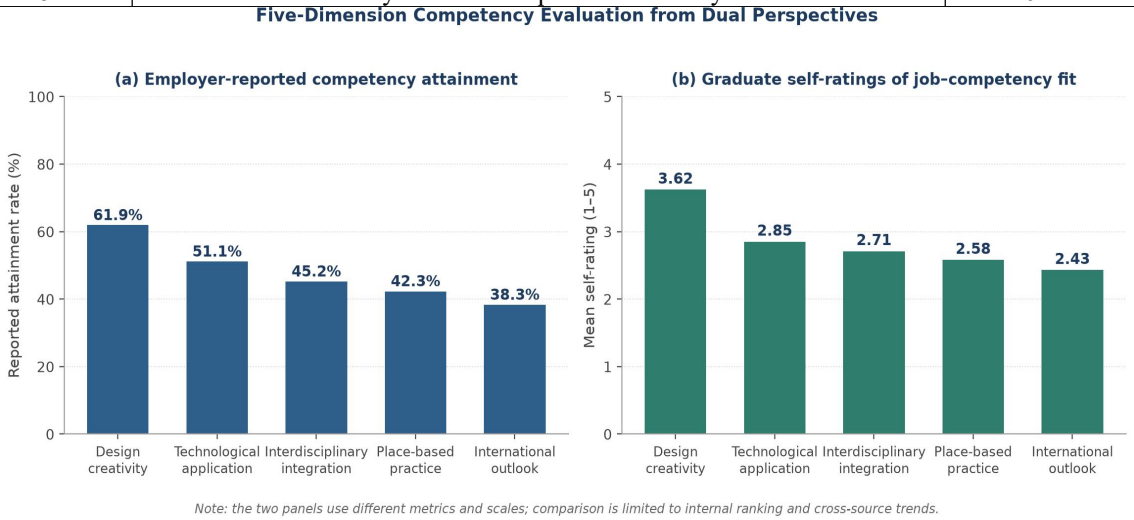


Figure 2. Top Recruiting Challenges Reported by Employers

The option of difficulty in integrating design and technological skills was chosen by 83.7% of the respondents, which is first; lack of interdisciplinary project experience and unfamiliarity with emerging technologies were chosen by 76.2% and 71.4%. The three highest items were above 70, which shows that the respondents focused their worries on design-technology integration, overall task experience and ability to keep up with the changes in technology. Place-based practice and community communication, and data literacy and quantitative analysis, were chosen by 65.8 and 62.1 respectively; they are not negligible however.

The percentage of people who have selected the difficulty of integrating design and technology was 12.3 higher than the one that has been chosen in terms of unfamiliarity with new technologies. This is an indication of the difference between descriptive and it is not about the lack of technical knowledge, but rather the ability to incorporate the technology in the process of making a decision on the design and the workflow. These data cannot be used to make assumptions on the effect of the various difficulties separately or on their interdependence since the response options are not exclusive and the co-occurrence at the individual level cannot be obtained.

4.3 Competency Orderings of Dual-Perspective Evaluations are Constant.

Figure 3 shows the five-dimensional evaluation

results.

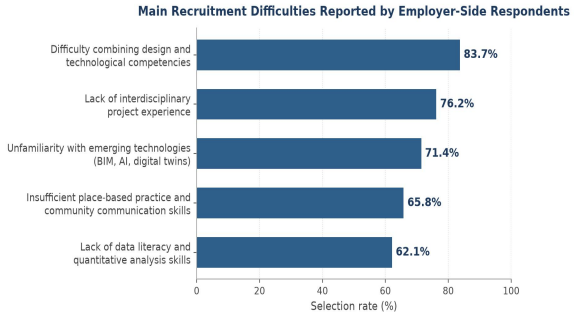


Figure 3. Five-Dimensional Competency Assessment Through Two Points of View: (a) Competency Attainment as reported by Employers; (b) Self-Ratings of Job-Competency Fit among Graduates

Employer ratings and graduate self-ratings have the same internal rank order over the five dimensions – design creativity, technological application, interdisciplinary integration, place-based practice, international outlook. The parallel provides cross-source pointers to relatively weak areas, although the two panels differ in indicator definition and scale, so one cannot infer that the two groups have the same view of absolute levels of competence.

The difference between the two dimensions of design creativity and international outlook in the employer side assessment is 23.6 percent, and the difference between the two dimensions of self-assessment by graduates is 1.19 percent. The differences are not convertible to one another as they are the differences that exist within the system of evaluation and it is not possible to convert them into each other. There are some intermediate stages of technological application and interdisciplinary integration in both tests but there is high salience on the difficulty of recruitment and learning requirements which demonstrates that the dimension being rated lowest at present and the most important competency that requires immediate attention does not necessarily equate. Talent development should thus not merely assign courses by ascending scores. Offerings should be stratified by target job duties: technology utilization and interdisciplinary synthesis are common development emphases, situated practice is infused into authentic context-based projects, and international competence demands are stratified by career direction.

4.4 Value of Practice-Based Courses and Transferable Technological Competencies for Graduates

Figure 4 shows the ratings of course helpfulness by graduates.

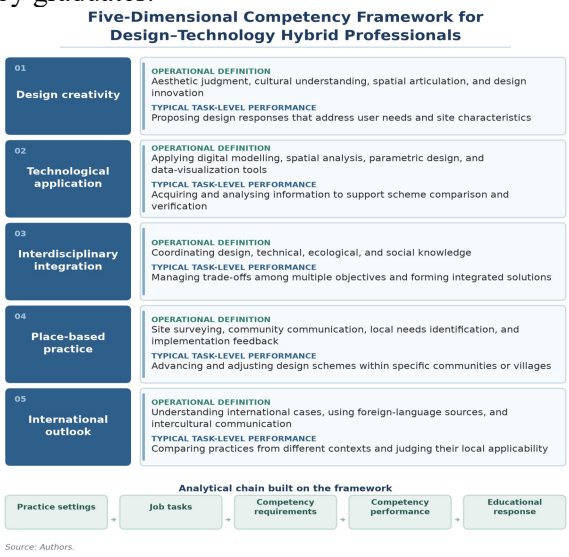


Figure 4. Helpfulness of Various Course Types (Mean Ratings, 15)

Practice-based, software-operation and theory-based courses were rated at 4.12, 3.21, and 2.87 out of 5 respectively by graduates. The rating of the practice-based course was higher than that of the software-operation courses by 0.91 points and that of the theory-based courses by 1.25 points. These variations are subjective impressions of job relevance among graduates instead of quantified variations in teaching effectiveness.

Practice courses could have been rated very well as they are all the problem identification, application of tools, group work and feedback on results at once. It is not possible to interpret this result as an argument to take the place of theory courses by practice courses. The better way to do it is to enhance the relations between the courses in such a way that the interpretation of problems will be served by the theory, verification of schemes will be served by the technical training, and practical activities will be used as means of integration and reflection of knowledge. The future studies ought to incorporate the history of course attendance, the real performance of tasks, and longitudinal studies of how the organization of the courses relates to the development of competency.

The skills that the graduates were most interested in mastering included the use of new technologies like BIM and digital twins, 79.6 percent, project experience on an interdisciplinary basis, 73.4 percent, and programming with the visualization of data,

66.8 percent. Such demands are in line with the employer side recommendation to train technology and practice cross-disciplinary.

The helpfulness of the course is not a measurement of its teaching, but rather a judgment on how useful the course would be to work in the future. The fact that the practice-based courses are rated high does not necessarily mean that theory-based courses will be cut down; this can only suggest that the relationship between the theory and the real-life activities has not been established yet.

4.5 The Interview Summaries are the Separation of Curriculum and Lack of Real Tasks

The interview summaries in the original report offer three general explanations.

To begin with, the technological practice is being applied to the design process. The report also says that BIM-based forward design has become an aspect of the project as a necessity in the design institute and the informants in landscape practice have emphasized on the GIS-based ecological analysis and sensor based monitoring. Digital technologies are therefore not just tools of the outcome; they are also producing evidence for designing.

Second, the juxtaposition of design and technology in curricula is not a competency. According to one of the interviewees, who works as an architect, it is possible to train an architect on the basis of traditional training and then learn BIM on a short term basis, which results in a superficial knowledge about the subject but not in the ability to solve problems.

Third, interdisciplinary development is limited by organizational and practical factors simultaneously. The administrators of the universities mentioned departmental barriers and issues of teaching structure, industry informants stressed on real experience in projects. Reform thus entails new course material as well as reorganized forms of faculty interaction, project structuring and evaluation of learning.

These summaries reflect the main issues raised in the questionnaire. Frequencies of themes, saturation, and inter-coder reliability cannot be reported due to unavailable full texts and coding logs.

5. Discussion

5.1 The Essence of Talent Mismatch is Combinations of Competencies, Not Discrete Skill Shortages

The most frequently mentioned challenge was the inability to integrate design and technological competencies as opposed to lack of any particular software which means that the critical issue in the supply of hybrid professionals occurs at the intersections between competencies.

The fact that one can build a model does not imply the ability to determine what information about the field is needed by the model; the ability to create data charts does not imply the ability to interpret what the data suggest about a spatial proposal; and the ability to come up with a design concept does not imply the ability to control costs of implementation, ecological limitations, and community responses. Technology only turns into professional competence when it becomes involved in the identification processes of problems, comparison of schemes and justification of decisions.

This reading is in line with the studies of digitalized projects, in which digital information enhances efficiency and also restructures collaborative relations and project delivery processes [5]. Unless universities continue to evaluate design courses and technology courses independently, they will continue to churn out graduates who are good at isolated skills but poor at integrated task performance.

5.2 The Weakness of the Descriptive Job Should not be confused with the Competence of the Core Job

This article modifies the description of technological application and interdisciplinary integration as “the two weakest competencies”. Of the available options, international outlook and place-based practice were rated lower, however issues with recruitment and additional learning needs indicate the significance of technological application and interdisciplinary integration.

The two outcomes are not in conflict with one another, as they are the answers to different questions. The assessment of competency is a question about how well the performance is at this time and recruitment problems are a question about what the most important shortcomings are in terms of job matching.

Three factors should be considered when considering the reform of cultivation: the level of insufficiency or the weakness that has been determined by the existing assessments; the level of relevance of the job or the significance of the competency in relation to the target activities; and the possibility of intervention, i.e. whether the universities can change it through training and education.

Technology and the integration of the interdisciplinary is the most suitable to be applied in the basic reform, place-based practice should be enhanced with setting projects, and the international perspective needs to be provided on a different level, not on the same level as it is done by all students.

5.3 Place-Based Practice Is the Key Link between Technical Outputs and Social Needs

The assessment of the place-based practice is low and it means that it is impossible to simplify the hybrid professional problem to a combination of design and digital tools. The interest of the various user groups in the waterfront regeneration, as well as the production and daily life in the rural projects are also taken into account. Technical analysis does not by itself make an accurate judgment on whether or not the proposal is suitable.

The transdisciplinary research has stressed the need to engage the practitioners in the process of problem definition and knowledge synthesis [13]. The community interviews, needs confirmation, and feedback revision should become part of the project-based teaching instead of being ceremonial presentations after a design is finalized. It can be seen that the work on the digital twinning at the scale of the site leads to the same direction: people are interested in the model, and citizens provide information about their data [18].

The practice of place-based can also be used to learn technology. As an example, students could construct a list of spatial problems by watching the usage behavior and then compare proposals with GIS analysis and digital modeling. The process of learning technical skills and social understanding stops being two different tasks but rather serve the same problem-solving process.

5.4 The Benefit of Practice-Based Courses is Integration, not Substitution

The comparatively good rating of practice-based courses is in line with the studies on learning by work experience, where learners only gain transferable competence when there is a connection between work tasks and educational support [14]. Authentic projects do not necessarily result in high quality learning though. When students are given documentation, rendering or repetitive modeling only, practice can strengthen localized operations without enhancing integrated competence.

The learning should therefore be translated into experience and the results of this experience by courses that have a clear goal of learning, gradual tasks, and reflective process. According to constructive alignment theory, the objectives of the learning process, teaching process, and assessment are supposed to be in mutual agreement [15] and studies on work-integrated learning indicate that the value of practice is not only determined by the amount of exposure but also the preparation and guidance provided to students as well as the way they were taught [19]. The evidence concerning generative AI in design education has made an argument that is similar to this one: it can only increase the achievement level when the teaching will focus on the verification, ethical issues, and the boundaries of automated production [20].

Universities must therefore not make a mere trade-off between theory and practice. Theory is to explain problems, technology verify judgments and practice give feedback.

6. Practical Implications for Talent Development

6.1. Translation of Job Tasks into Measurable Learning Outcomes

The standards of competency must be transformed in the direction of knowing a technology or mastering a software to being able to do a task. The technological application can be evidenced through the processing of the information on the site, expressing the limitations of data and interdisciplinary approach by the comparison of the conflict between ecological, cultural, economic, and use needs and place-based practice by the generation of traceable records of the requirements of the community as well as clear explanation of the changes in the scheme.

These task-based standards will ensure that software certificates, number of courses or the visual appeal of deliverables do not replace the

overall competency evaluation.

6.2 Co-Construction of Curriculum Modules Driven by Design and Technology

Under the circumstances of application-based universities, modules like Spatial Problem Identification and Data Articulation, BIM and Regeneration Design, GIS and Ecological Spatial Analysis, Parametric Scheme Comparison, and AI-Assisted Design and Result Verification can be created.

The course structure ought to be based on the problems and not on the tool menus. The same tasks must be designed, supervised and evaluated by both technology faculty and design faculty so that the students can know how they relate with each other in terms of selection of tools, setting parameters and interpreting results. In addition to teaching AI tools, it is also important to teach the students about sources tracing, checking the results and limits of using them as without this knowledge, the students are likely to take the generated results at face value [20].

6.3 Enhancing Integrated Competence by Dual-Setting Projects

Waterfront projects can be differentiated into the ones that are based on the regeneration of the waterfront and those that focus on the rural areas. The former would need to highlight the use of the public space, collecting data of historical nature, as well as the integration of digital models with operation and maintenance; the latter would need to highlight the ecological spatial analysis, the needs of the local population, industrial conditions, and the communication among the people.

Field investigation, problem definition, comparison of schemes, multi-party feedback and reflective reports should be part of both types of project. Project quality assessment should not only focus on the final drawings but also on data basis, design process and rationale behind revisions.

6.4 Creating a Continuous Feedback Loop between Demand, Cultivation, and Assessment

Competency standards can be revised at intervals by the universities, in which the curriculum committee, industry mentors, graduate tracking and feedback of the project will be used. The employer side reviews and self-assessment of graduates might remain as well as portfolio evaluation and testing based on tasks and documentation of the processes of projects so that it does not rely solely on subjective assessment.

Table 4 summarises how each competency gap maps on to the improvement measures proposed above.

Table 4. Match between Gaps in Competencies and Improvement Measures

Improvement focus	Recommended educational actions	Observable evidence of achievement
Application of technology	Digital tools embedded in the entire design work.	Data processing, model validation, and result interpretation
Interdisciplinary integration.	Cross-disciplinary teaming, joint supervision, and integrated tasks	multi-objective comparison, documentation of knowledge integration, and collaboration history
Place-based practice.	Community surveys, site visits, and scheme iteration	Requirements documentation, stakeholder analysis and justification of revisions.
International perspective	Comparative study of foreign cases; reading foreign-language sources.	Source credibility, case relevance, and arguments by comparison
Design creativity	Keeping design principles and enhancing evidential support	Creativity quality, culture sensitivity and logic of design.

Micro-programs like “Digital design of waterfront space” can be complementary mechanisms for scarce competencies, although they cannot be relied upon to carry the full burden of hybrid competency development. Short-cycle learning is more appropriate for reinforcing particular mixes of competency and its efficacy still has to be proven via performance in real tasks.

7. Conclusion

Based on the aggregated data of questionnaires and summaries of interviews in Shanghai, this paper examined the demand of design-technology hybrid professionals in urban regeneration and rural revitalization through the dual prism of employers and graduates.

The mismatch is primarily seen as the lack of integration between design judgment, technological application and practical action. The recruitment problems on the employer side and the additional learning requirements of graduates all indicate the use of technology and interdisciplinary project experience, but the

five-dimension assessments indicate a weaker descriptive performance in terms of international outlook and place-based practice. The numerical ranking of the weaknesses of competencies and the order of priority of educational reform should thus be discussed separately.

The application universities need to shift the focus of their activities to the process of building a collection of skills in real-life tasks, which can be done by means of task-oriented approach, integration of talents and competencies, as well as feedback. The evidence presented above is not enough to argue that these directions are sufficient to determine the magnitude of the talent gap or the impact of the measures taken.

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