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Needs, Challenges, and Pathways to Solutions for Introductory Courses in Vocational Education: A Case Study of Introduction to Virtual Reality Applications

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Abstract: Introductory courses in vocational education play a foundational role in orienting first-year students to their chosen major and initiating their professional formation. Such courses help newcomers establish a cognitive map of the discipline, plan learning pathways, and cultivate identification with the profession, while also serving as a vehicle for integrating ideological-political education. In practice, however, many programs face persistent challenges in textbook development, faculty capacity, curriculum content, and alignment with industry standards, which limit the effectiveness of these courses. With the rollout of national policies such as the Implementation Plan for National Vocational Education Reform, the urgency of strengthening the construction of introductory courses has become increasingly evident. Using the textbook Introduction to Virtual Reality Applications: Cognition, Skills, and Career as a core case, this paper analyzes innovative practices in writing philosophy, course design, school-enterprise collaboration, resource integration, ideological-political infusion, and practical outcomes. Building on this analysis, the paper proposes strategies for reforming introductory courses and building coherent textbook systems in vocational education so as to improve course quality and better support students' professional development.

Keywords: Introductory courses; Vocational education; Reform strategy; Case study

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1. Introduction

As the first professional course that students encounter in higher vocational colleges, the "Introduction to Major" course is both foundational and guiding. By outlining the body of knowledge, training objectives, current state of the industry, and future trends, the course helps students answer "what to learn, why to learn, and how to learn," thereby forming a coherent, big-picture understanding of their major [1]. For many new entrants whose pre-entry understanding is limited or even mistaken, an introductory course provides the

essential “cognitive map” that prevents fragmented and aimless learning later on.

Beyond cognitive scaffolding, the course functions as vocational initiation: by showing how the major contributes to industry, what typical positions entail, and what career trajectories look like, it stimulates interest, strengthens professional identity, and fosters a sense of mission [2]. In the current era, it is also a natural vehicle for curriculum-level ideological-political education, through which educators can integrate values such as craftsmanship, integrity, and social responsibility into professional formation [3,4].

China’s vocational education is advancing into a new stage of high-quality development. The Implementation Plan for National Vocational Education Reform (“Twenty Measures for Vocational Education”) explicitly calls for aligning all courses with ideological-political education and for co-developing state-planned textbooks with enterprises, updated in step with industrial upgrading [5]. The 2021 Opinions on Promoting the High-Quality Development of Modern Vocational Education further urges deep enterprise participation in curriculum, textbooks, and teaching design. Against this policy backdrop, strengthening introductory courses is both necessary and urgent. This paper first clarifies the functional positioning and value of such courses and diagnoses current challenges; it then examines the case of Introduction to Virtual Reality Applications: Cognition, Skills, and Career, and finally, offers strategic recommendations.

2. Value analysis: Functional positioning and necessity of introductory courses

Cognitive scaffolding for professional learning: Serving as a “first organizer,” the introductory course presents the historical evolution, disciplinary foundations, core knowledge, and skill modules of the major in an integrated way, enabling students to build a coherent mental model and meaningfully situate subsequent courses and skills within that whole. When learners possess a global framework, they more easily assimilate new concepts, facilitate transfer, and integrate knowledge across topics, thereby improving learning efficiency.

Career planning and professional identity: The course is also the point of departure for career development. By introducing industry sectors, position clusters, and career pathways, it supports students in clarifying vocational goals. In the context of massified higher vocational education, many students choose majors instrumentally or with misconceptions. Exposure to the major’s societal contributions and exemplary career stories can shift students from misunderstanding to understanding, identification, and ultimately esteem for the profession, boosting motivation and engagement.

Vehicle for curriculum ideology and moral education: Aligned with the fundamental educational mission of “fostering virtue,” the course naturally integrates professional ethics and social responsibility [3,4]. Instructors can embed elements such as dedication, excellence, law-abiding conduct, teamwork, and scientific spirit through cases, narratives, and reflective discussions rather than didactic preaching, achieving a quiet yet deep influence.

Policy alignment and quality assurance: Policy documents emphasize alignment of curricula with industry needs and occupational standards. As the gateway course, the introduction clarifies training specifications and standard requirements, guiding downstream courses to “align to standards” and anchor learning outcomes. This is especially critical in emerging majors, e.g., “Virtual Reality Technology Application,” a fast-evolving field where students’ initial cognition is thin and textbooks lag, making a high-quality introduction indispensable [5,6].

3. Problem diagnosis: Current predicaments in introductory course construction

Lagging textbook development: Many majors lack dedicated, up-to-date introductory textbooks; content often

trails fast-moving industries, forcing ad-hoc lecture notes with limited systematization.

Insufficient faculty capacity: Effective instruction demands broad disciplinary vision, current industry knowledge, and the ability to integrate ideological-political education. Yet staffing is unstable; some instructors lack a panoramic understanding of the field, and experienced "dual-qualified" teachers are not always engaged.

Outdated, monolithic content and pedagogy: Some courses mimic undergraduate models, overemphasizing theory and offering little vocational specificity. Teaching may devolve into simple introductions to training schemes and syllabi, with limited cases, practice, or student participation.

Weak alignment with standards and shallow school-enterprise collaboration: Content often under-connects with occupational standards, 1+X certificates, and concrete position competencies. Mechanisms for joint course development with enterprises are underdeveloped, limiting freshness, practicality, and forward-looking alignment with real jobs.

4. Case study: Introduction to Virtual Reality Applications: Cognition, Skills, and Career (course development practice)

4.1. Writing philosophy: Integrating vocational characteristics with "Sanquan education"

Anchored in vocational goals, the textbook unifies cognition, skills, and career. Complex theories are made accessible without sacrificing rigor, balancing "useful" with "usable." Ideological-political elements are woven throughout via industry pioneers, enterprise cases, and ethical reflections—embodying "all-staff, whole-process, and all-round education" and the vocational ideal of "integrating knowledge and action, virtue and skill."

4.2. Course design: Modular structure across cognition, skills, and career

A three-part structure links a cognition module (history, principles, terminology), a skills module (entry-level content creation—e.g., basic 3D modeling and simple interaction tools), and a career module (industry chain, position profiles, competency requirements, alumni sharing, and hiring standards). A term-long project (case investigation and presentation) connects modules and raises participation and relevance.

4.3. School-enterprise collaboration: Deep enterprise participation

The textbook was co-authored by college faculty (e.g., He Hanwu; Zhang Po) and enterprise engineers, ensuring currency and case richness. Teaching incorporates enterprise lectures, lab co-construction, and site visits, bringing students closer to real development workflows and strengthening motivation and aspiration. This "dual-system" approach aligns with national calls for joint textbook development [7].

4.4. Resource integration: Diversified resources for innovative teaching

Beyond the print textbook, the course provides digital resources (slides, micro-videos, animations) on the publisher's online platform and designs selected content as immersive VR learning experiences (e.g., virtual labs and safety simulations). MOOCs and maker-space hardware extend learning beyond class, supporting differentiated, interest-driven study.

4.5. Ideological-political infusion: Quietly cultivating professional spirit

A curated list of ideological-political elements and integration points guides instructors to highlight domestic innovation stories, social value in education and safety applications, and the fusion of core socialist values with craftsmanship—implemented through narrative cases, guided discussion, and reflective writing. Students report

strengthened mission and responsibility alongside technical understanding.

4.6. Practical outcomes: Enhanced cognition and demonstrative impact

Surveys indicate that over 90% of students gained a comprehensive understanding of the major and clarified learning goals; more than 85% reported stronger motivation for subsequent skill development. Engagement increased, attrition declined, and participation in clubs and competitions rose. The course was recognized as a model for curriculum ideology, and the textbook was recommended within provincial higher vocational institutions and submitted for national textbook planning, filling a gap in VR introductory textbooks for higher vocational programs.

5. Reform pathways: Strategies and insights

Embed in programs and strengthen top-level design. Make the introductory course a required component in the first semester across majors, with clear credits, outcomes, and assessment standards; include it in quality assurance and program evaluation.

Prioritize textbook R&D and periodic updating. Encourage faculty-led school-based textbook development while organizing expert consortia to produce high-quality, nationally shareable texts that reflect frontier technologies, occupational standards, and 1+X requirements; revise on a ~3-year cycle and provide companion digital resources.

Build "dual-qualified" teams and upgrade pedagogy. Engage senior instructors and enterprise experts as co-teachers; provide training in project-based and discussion-based methods and opportunities for industry practice; create incentives that recognize contributions to the introductory course.

Deepen industry-education integration and co-construction. Co-design syllabi and content with leading enterprises; use enterprise projects and cases; organize practicums and observations; leverage enterprise platforms and co-built labs to strengthen practical conditions.

Systematically integrate ideological-political education. Specify moral-education objectives; build a shared repository of cases (role models, ethics, laws, red heritage); adopt a "case + discussion + reflection" pattern; assess growth in professional qualities through reflective essays and career plans.

Emphasize feedback and continuous improvement. Institutionalize multi-source feedback (students, employers, alumni), conduct teaching-learning research on identity development and learning outcomes, and share across institutions via alliances and workshops to scale effective practices.

6. Conclusion

Introductory courses occupy a small yet pivotal position in vocational talent cultivation. The case of Introduction to Virtual Reality Applications demonstrates that scientifically designed, industry-integrated, resource-rich, and value-infused introductory courses can open the door to the profession and ignite students' vocational aspirations. As policies to "improve quality and excellence" advance, institutions should elevate the strategic importance of the introductory course and use it as a lever for enhancing students' comprehensive qualities and learning effectiveness. With coherent textbook systems, strengthened teaching teams, innovative pedagogies, and robust quality assurance, these courses can better serve the cultivation of high-caliber, technically skilled talent.

Disclosure statement

The author declares no conflict of interest.

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