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Analyzing the Factors and Challenges Affecting the Operation of Modern Apprenticeships from the Students' Perspective: A Case Study in Finance and Business Vocational Education

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Abstract:
The effective operation of modern apprenticeship programs necessitates addressing the demands of multiple stakeholders, including apprentices influenced by macro entities like governments, businesses, and schools and micro agents such as corporate mentors, teachers, and family members. This study surveyed 123 students from five vocational colleges in Zhejiang Province, achieving 100 valid questionnaires, and conducted structured interviews with 40 finance and business students at Jiaxing Vocational and Technical College. Results highlight the significant positive effects of coordination mechanisms, institutional support, safety assurances, and guidance quality on apprenticeship efficacy. The key challenges discovered include adapting to new technologies, time management, and workplace efficiency, with notable concerns over school policies, working conditions, and compensation. The study proposes enhancing policy support, communication, instructional resources, working conditions, and remuneration to improve program outcomes.

Keywords: Modern Apprenticeship, Coordination Mechanisms

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INTRODUCTION

Modern apprenticeships, pivotal in vocational education systems worldwide, orchestrate a complex interplay among various stakeholders, including governments, educational institutions, industries, and businesses (Billett, 2016). These stakeholders contribute to the dynamism and effectiveness of apprenticeship programs but also present unique challenges that can complicate their execution and outcomes. Although substantial research has been conducted on the structural and operational dynamics of modern apprenticeships, particularly concerning stakeholder roles in diverse geographical contexts, including China, the detailed perspectives of micro-level participants like students, corporate mentors, and school instructors remain under-examined (Aldrich, 1999; Guile, 2013).

Extensive international literature has addressed various external factors such as policy frameworks, educational systems, and corporate participation. This body of work aims to dissect the factors contributing to the success or failure of apprenticeship initiatives, exploring how these structural elements influence the learning experiences of apprentices and the overall efficacy of programs (Bingham & O'Brien, 2018; Fuller & Unwin, 1999). Moreover, comparative studies across nations have illuminated how national and cultural differences shape apprenticeship practices, highlighting the critical roles and interactions among participants that ultimately impact apprenticeship outcomes (Eichhorst et al., 2015; Smagorinsky & Barnes, 2014).

In the context of China, significant focus has been placed on analyzing the roles of major stakeholders such as governments, industry associations, and vocational schools. However, the granular experiences and challenges of direct apprenticeship participants—students and their mentors—are less frequently the focus of scholarly inquiry (Haasler, 2020; Hughes & Saieva, 2019). Understanding and addressing the needs, challenges, and expectations faced by these

key actors is crucial. Such focus is essential not only for activating student initiative but also for fostering their professional development and ensuring the successful integration of educational goals with industry needs (Fortwengel & Jackson, 2016; Kelly et al., 2015).

This study zeroes in on Jiaxing Vocational and Technical College (JXVTC), a frontrunner in integrating modern apprenticeships into its curriculum, especially in the finance and business sectors. JXVTC's designation as a pilot institution for modern apprenticeships by the Ministry of Education underscores its pioneering role in navigating the complexities associated with these programs (Kenyon, 2005; McKnight et al., 2019). The college's approach prioritizes effective communication and coordination among all parties involved—schools, businesses, students, and parents, recognizing the multifaceted benefits of such integration (Dwiastuti et al., 2024; Saputra et al., 2024). By investigating the operational challenges and factors affecting modern apprenticeships from the students' perspective at JXVTC, this research not only aims to enhance the mechanisms of these apprenticeships but also seeks to improve teaching outcomes and foster the robust development of the programs, thereby ensuring a holistic advancement in vocational education quality (Valiente & Scandurra, 2017; Vaughan, 2017).

LITERATURE REVIEW

Contemporary scholarship on modern apprenticeship emphasizes the alignment of educational strategies with evolving industry requirements, particularly amid rapid technological innovation (Cai & Zhang, 2022; Lv, 2024). Researchers have explored areas ranging from mechatronics (Wang et al., 2024) to software technology (Xiong & Shen, 2021) and even the application of ancient literature frameworks (Zhang, 2024). Their collective findings highlight context-specific ways to enhance apprentices' practical competencies, address real-world challenges, and close existing gaps between theoretical learning and on-the-job application. Despite these advances, there is still a lack of focused research on finance and business vocational program environments demanding both technical and soft skills to navigate data-centric tasks and customer-facing roles.

Technology adoption, government policy, and enterprise engagement consistently appear as pivotal to successful apprenticeship outcomes (Cai & Zhang, 2022; Jiang et al., 2024). For instance, Chen (2024) presents an embedded neural network model that personalizes training in advanced apprenticeship, optimizing learner engagement. While such technological frameworks are valuable in engineering or manufacturing, their direct application to finance and business apprenticeships remains underexamined. Some studies emphasize the learner's perspective, as presented by Zhang and Song (2024) who point out that external support structures such as parental engagement, career counseling, and institutional policy are crucial drivers of student participation. However, they do not deeply delve into how these factors operate in more knowledge-intensive sectors like finance and business.

Research on the "1+X" certificate system has helped standardize skill requirements, particularly for technical fields (Wang et al., 2024). However, Cai and Zhang (2022) argue that training programs must also weave in "soft skills" to sustain students' workplace adaptability. This approach underscores the unique demands of finance and business apprenticeships, which require analytical thinking and interpersonal communication as much as technical competence. In other words, a more domain-specific pedagogical strategy might be necessary to meet the nuanced requirements of the modern finance-business ecosystem.

Meanwhile, Jiang et al., (2024) emphasize that high-quality mentorship and digitally enhanced teaching methodologies can bolster apprenticeship efficacy. Xiong and Shen (2021) corroborates this by noting that factors such as government attention, parental cooperation, and school support critically determine training quality. Nevertheless, finance and business majors may require additional forms of guidance, such as professional ethics in financial contexts or specialized business analytics that remain insufficiently addressed in existing models. Consequently, there is a need to investigate how comprehensive stakeholder collaboration can be adapted to the specific competencies demanded in a business setting.

While the literature provides valuable insights into modern apprenticeship's multifaceted nature, questions remain about how key factors such as policy frameworks, digital technologies, workplace environments, and learner perceptions interact within the finance and business vocational programs. Addressing these gaps is essential for refining apprenticeship models to meet industry demands and equipping students with the confidence and competencies necessary for careers in finance and business domains. The present study examines these issues by focusing on finance and business vocational students in Zhejiang Province, identifying key challenges and offering actionable recommendations tailored to the distinct requirements of these fields.

METHODOLOGY

This study employed a mixed-methods approach, beginning with a pilot test of the questionnaire. A small group of ten students was invited to complete a draft version, allowing the research team to refine item clarity and ensure validity. Subsequently, the finalized questionnaire was distributed via the *Wenjuanxing* platform to students from five vocational colleges in Zhejiang Province, China. Out of 123 questionnaires disseminated, 100 valid responses were obtained, reflecting a robust participation rate. Following the survey, a structured interview was conducted with 40 students at Jiaxing Vocational and Technical College (JXVTC), spanning from first-year students to alumni within two years of post-graduation. This sequential design allowed the qualitative interviews to explore and elaborate on initial survey findings, providing a more comprehensive understanding of the factors influencing modern apprenticeship programs. Throughout both phases, the research team ensured the confidentiality and security of all collected data, including survey responses and interview transcripts.

Participant Demographics

The demographic breakdown of the participants provides insights into the diverse backgrounds of students involved in modern apprenticeship programs:

Current Academic Status

The participants were distributed across various academic stages: 35 students were first-year (35%), 25 students were second year (25%), 36 students were in their final year before graduation (36%), four students were recent graduates, 1-2 students were post-graduation (4%). This distribution indicates a broad spectrum of experiences and perspectives within the apprenticeship programs.

Current Academic Status

The distribution across academic years was 35% first-year students, 25% second-year, 24% third-year, 12% nearing graduation, and 4% recent graduates, indicating a good mix of experiences and perspectives on apprenticeships.

Field of Study

Participants' majors were varied, with significant representations from International Economics and Trade (32%), Logistics Management (26%), E-Commerce (15%), and other related fields, reflecting the multidisciplinary nature of modern apprenticeships.

Apprenticeship Participation

Notably, 67% of the respondents were actively participating or had previously participated in apprenticeship programs, demonstrating substantial direct experience with the apprenticeship model. In comparison, 33% had not participated, offering a comparative perspective on the education models.

Reliability and Validity of the Questionnaire

To ensure the robustness of the data collected, both the reliability and validity of the questionnaire were critically assessed.

Table 1 presents Cronbach's Alpha and other statistical measures for each item on the questionnaire, indicating high internal consistency and reliability. This table confirms that the scale items are suitable for measuring the intended latent constructs, with a Cronbach's Alpha score generally above 0.95, suggesting excellent reliability.

Table 1: Questionnaire Reliability Analysis

Factor	Mean	Variance	Item-total Corr.	Squared Mult. Corr.	Cronbach's Alpha
Student Self-Motivation	44.33	148.86	0.805	0.83	0.978
Better Work Environment	44.39	147.908	0.876	0.886	0.976
More Teaching	44.46	147.404	0.909	0.898	0.976
Increase in Wages	44.49	146.314	0.857	0.903	0.977
Apprenticeship Positions	44.51	147.163	0.866	0.918	0.976
Safety and Legal Protection	44.37	145.995	0.919	0.958	0.975
Communication Mechanisms	44.37	146.237	0.947	0.939	0.975
Forming Teams	44.37	146.177	0.9	0.938	0.976
Government Policy Support	44.33	147.284	0.866	0.906	0.976
Industry Associations	44.39	147.968	0.873	0.851	0.976
School Support	44.4	147.911	0.925	0.923	0.975
Parental Support	44.45	146.19	0.867	0.913	0.976
Others	44.57	148.189	0.732	0.877	0.979

Additionally,

Table 2 illustrates the factor analysis performed to evaluate how various elements impact the functioning of modern apprenticeship programs. Each factor's influence is quantified by unstandardized and standardized coefficients, reflecting their relative importance and impact on the apprenticeship outcomes. The significance levels provide insights into the reliability of these coefficients.

Table 2: Analysis of Factors Influencing Modern Apprenticeship Operation

Model	Unstandardized Coefficients B	Standard Error	Standardized Coefficients Beta	t-value	Significance
Constant	1.968	0.454	-	4.338	<0.001
Student Self-Motivation	-0.029	0.243	-0.032	-0.12	0.905
Better Work Environment	0.338	0.308	0.365	1.099	0.277
More Teaching and Guidance	0.47	0.33	0.501	1.427	0.16
Increase in Wages and Benefits	-0.303	0.306	-0.356	-0.99	0.327
Apprenticeship Positions	-0.498	0.349	-0.559	-1.426	0.16
Safety and Legal Protection	0.287	0.487	0.32	0.589	0.559
Communication Mechanisms	0.086	0.423	0.093	0.204	0.839
Forming Teams	-0.138	0.4	-0.156	-0.346	0.73
Government Policy Support	0.07	0.326	0.078	0.214	0.831
Industry Associations	-0.301	0.269	-0.324	-1.12	0.268

School Support	-0.039	0.394	-0.04	-0.098	0.922
Parental Support	0.311	0.326	0.363	0.956	0.343
Others	0.208	0.255	0.26	0.814	0.419

Analytical Tools and Techniques

Quantitative data were analyzed using Smart PLS software to identify patterns and relationships among variables, providing a preliminary understanding of the key factors influencing apprenticeship effectiveness. Qualitative data from interviews were meticulously analyzed through thematic analysis and narrative inquiry techniques aimed at uncovering deeper insights into personal experiences and the perceived impact of apprenticeships. This dual approach ensured that findings were robust, combining statistical analysis with rich, narrative depth.

Data Handling and Initial Observations

Upon collection, the data underwent rigorous checks for completeness and integrity, setting the stage for detailed analytical phases. The quantitative data were prepared for complex factor analyses and modeling in SmartPLS and SPSS, while qualitative data were organized for detailed thematic exploration. These initial observations were instrumental in designing the framework for subsequent in-depth analysis, aligning the study's objectives with empirical findings, and ensuring that the insights drawn were statistically valid and contextually rich.

RESULTS AND DISCUSSION

Descriptive Statistics and Frequency Distributions

This section offers a comprehensive view of participants' demographics, their interest in apprenticeship programs, and the extent to which they feel satisfied with school-facilitated internship experiences. Beyond merely presenting quantitative indicators, these findings directly address gaps in the current literature regarding the real-world outcomes of finance and business-focused apprenticeships.

Participant Age and Interests

Participants were stratified into two age ranges: 18–20 and 21–24. The mean age category was 1.40 (SD = 0.492), indicating a predominantly younger cohort. On a 1–5 scale, overall interest in apprenticeship programs stood at 3.28, reflecting moderate engagement. While moderate, this figure underscores an important research gap highlighted in recent studies; students in business fields may show interest, but more robust guidance and tailored program structures could elevate that interest into meaningful participation.

Satisfaction with Internship Conditions

Overall satisfaction with the internships provided by educational institutions was 3.67 (SD = 0.922), suggesting a moderately positive impression of on-site experiences. Table 3 summarizes satisfaction by academic status, revealing notable differences across various stages in students' educational trajectories. Although the average satisfaction was decent, the standard deviation highlights variance that could stem from mismatched training content, differences in mentorship quality, or limited alignment with actual job requirements issues identified by previous literature as pivotal to bridging the gap between classroom learning and workforce readiness.

Table 3: Satisfaction Levels by Academic Status

Academic Status	Mean Satisfaction	Standard Deviation
Freshmen	3.83	0.954
Sophomores	3.40	0.816
Later year student	3.46	0.932

Graduates (1-2 years after graduation)	4.50	1.000

General Linear Model Analysis

A General Linear Model (GLM) was applied to examine the influence of students' academic standing and apprenticeship participation on growth perceptions, learning outcomes, and perceived alignment of training content with their professional aspirations (refer to Table 4). The results show that academic standing significantly influenced how beneficial apprenticeships were perceived regarding learning outcomes, whereas simply being enrolled in an apprenticeship was not statistically significant. This finding contributes to the theoretical discourse by suggesting that perceived value may hinge on maturity level and readiness rather than the mere existence of an apprenticeship opportunity.

From a research-gap standpoint, these outcomes imply that one-size-fits-all apprenticeship models may be insufficient. Scholars have advocated for more nuanced frameworks that recognize diverse learner profiles, especially in finance and business contexts, that require not only technical proficiency but also strategic thinking, market awareness, and refined communication abilities.

Table 4: Between-Subjects Effects Test for Apprenticeship Experience Outcomes

Source	Dependent Variable	Type III SS	df	MS	F	Significance
Corrected Model	Perceived growth from internship	4.691	4	1.173	1.225	0.309
Corrected Model	Learning more than in regular classes	2.486	4	0.621	2.547	0.048
Corrected Model	Training content meets expectations	1.732	4	0.433	1.288	0.284
Intercept	Perceived growth from internship	249.390	1	249.39	260.574	<0.001
Intercept	Learning more than in regular classes	39.650	1	39.650	162.521	<0.001
Intercept	Training content meets expectations	54.558	1	54.558	162.349	<0.001
Current Academic Standing	Perceived growth from internship	4.691	4	1.173	1.225	0.309
Current Academic Standing	Learning more than in regular classes	2.486	4	0.621	2.547	0.048
Current Academic Standing	Training content meets expectations	1.732	4	0.433	1.288	0.284
Participation in Apprenticeship	Perceived growth from internship	0	0			
Participation in Apprenticeship	Learning more than in regular classes	0	0			
Participation in Apprenticeship	Training content meets expectations	0	0			
Error	Perceived growth from internship	59.339	62	0.957		
Error	Learning more than in regular classes	15.126	62	0.244		
Error	Training content meets expectations	20.835	62	0.336		
Total	Perceived growth from internship	982	67			
Total	Learning more than in regular classes	128	67			
Total	Training content meets expectations	184	67			
Corrected Total	Perceived growth from internship	64.030	66			
Corrected Total	Learning more than in regular classes	17.612	66			
Corrected Total	Training content meets expectations	22.567	66			

Regression Analysis on Apprenticeship Benefits

To delve deeper into factors that shape students' perceptions of apprenticeship advantages for future employment, a regression analysis was undertaken (refer to Table 5). Findings indicate that concrete support during internships, such as quality mentoring, relevant projects, and strong employer engagement, exerts a significant positive effect on satisfaction. In contrast, mere interest in apprenticeship opportunities did not significantly predict perceived benefits. These observations align with calls in the literature for structured, high-impact interventions in vocational education. From a theoretical perspective, this further underscores the centrality of stakeholder coordination, such as school, enterprise, and students, in constructing meaningful learning experiences.

Table 5: Regression Analysis of Factors Affecting Perceived Benefits of Apprenticeships

Variable	Coefficient	Standard Error	p-value
Constant	1.968	0.454	<0.001
Interest in Apprenticeships	0.068	0.076	0.374
Satisfaction with Internships	0.648	0.094	<0.001
Perceived Learning	-0.02	0.147	0.891

Insights from Apprentice Interviews on Program Effectiveness

Qualitative insights from interviews shed light on progress and persistent hurdles within apprenticeship programs. Roughly one-third (34%) pointed to operational skills gains, and nearly a quarter (28%) noted improved professional knowledge, especially pertinent for finance and business roles involving analytical and decision-making tasks. These themes resonate with arguments that rigorous on-the-job experiences can address theoretical-practical gaps, highlighting the theoretical contribution of contextualizing soft and technical skill development within industry-specific environments.

Regarding obstacles, 30% of participants cited unfamiliarity with specialized software, indicating a disconnect between academic curricula and enterprise practices. Additionally, time management and adaptability challenges emerged with 25% and 20%, respectively, reflecting the real-world competencies demanded in commercial settings. Aligning these findings with existing literature underscores the critical need for refining apprenticeship models to better integrate academic instruction with dynamic, technology-driven business operations.

Moreover, apprentices frequently emphasize personal attributes such as patience, teamwork, and professional optimism as keys to perform effectively. Such soft-skill dimensions confirm that successful apprenticeship programs must transcend technical training to include psychological and interpersonal development, reinforcing the theoretical stance that holistic skill sets are vital in business and finance domains.

Suggestions for Program Enhancement

Participants recommended to improve the workplace conditions, increased collaboration between schools and companies, more competitive compensation, and closer alignment of course materials with real job scenarios. These recommendations reflect a strong consensus for iterative refinement supported by a feedback loop between industry partners and educational institutions to meet evolving market requirements. Theoretically, this points to a "closed-loop" model of apprenticeship, wherein ongoing adjustments in curriculum design and professional mentorship strategies are grounded in empirical data and stakeholder input.

Collectively, these results not only validate the pivotal role of modern apprenticeship in equipping students with practical and professional competencies but also highlight the interplay between student maturity levels, mentorship quality, and curriculum-industry alignment. By offering a data-driven exploration of how finance and business students engage with and benefit from apprenticeships, this study expands upon existing literature in

vocational education, contributing an actionable roadmap for institutions aiming to optimize apprenticeship programs.

CONCLUSION

This study has provided a comprehensive examination of modern apprenticeships within vocational education from the perspective of apprentices themselves, highlighting the crucial role of practical experience in bridging the gap between academic preparation and professional demands. The insights gathered from both quantitative and qualitative analyses underscore the significant impact that hands-on experience has on developing relevant skills and the successful transition into the workforce.

Key Findings

The present study's findings indicate that apprentices value the practical application of skills above all else, which directly contributes to their professional growth and confidence in handling real-world challenges. Despite the benefits, the study identified several areas requiring attention:

- **Technological Integration**: Apprentices often struggle with the use of advanced professional software, suggesting an urgent need for educational programs to integrate more robust technology training that aligns with industry standards.

- **Soft Skills Development:** Time management and adaptation to professional environments are significant challenges for apprentices, pointing towards the necessity for programs to enhance their focus on developing these essential soft skills.

- **Curricular Relevance:** The disconnect between theoretical knowledge and its practical application continues to be a barrier for effective learning, emphasizing the need for curricula that are more aligned with real-world applications.

Recommendations

Based on the outcomes of this study, several strategic recommendations can be made to enhance the effectiveness of apprenticeship programs:

- **Strengthen Industry Partnerships:** Enhancing collaboration with industry partners can ensure that training programs remain relevant and beneficial, providing apprentices with the latest skills and knowledge required by the market.

- **Enhance Support Systems:** Developing comprehensive support systems that include career counseling, mentoring, and access to professional networks can help apprentices navigate their educational and career pathways more effectively.

- **Continuous Curriculum Updates:** Regular updates to the curriculum to include recent technological advancements and industry trends will ensure that the training remains current and applicable.

- **Feedback Mechanisms:** Implementing continuous feedback mechanisms involving apprentices, educators, and industry stakeholders will help in regularly assessing and refining the program to meet the evolving needs.

Closing Thoughts

In conclusion, modern apprenticeships serve as a pivotal component of vocational education, providing essential pathways for students to transition effectively from academic settings to professional environments. For these programs to remain effective, they must continuously evolve and adapt to the changing educational and industrial landscapes. The present study's recommendations aim to foster an environment that enhances learning outcomes and supports the holistic development of apprentices as they prepare to enter a competitive and dynamic workforce.

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