Application of Cubit Estimating PRO in Cost Estimation for Undergraduate Quantity Surveyors: Implication for Developing Cost Estimation Skills

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Abstract

In this research paper, we explore the utilization of Cubit Estimating PRO, a construction estimating and takeoff software, within the context of undergraduate quantity surveying education. The present study explored the role of Cubit Estimating Pro in cost estimation for undergraduate quantity surveyors at the National Institute of Construction Technology and Management, Uromi, Edo State, Nigeria. The results indicate that only 9% of respondents reported low competence. Approximately 27% of respondents demonstrated moderate competence. A significant majority (64%) exhibited high competence in utilizing Cubit Estimating PRO. These favorable outcomes suggest that the software positively contributes to developing cost estimation skills among quantity surveyors. By examining the practical application of Cubit Estimating PRO, the study aims to provide insights into how this tool enhances accuracy, efficiency, and proficiency in cost estimation.

Keywords: cubit estimating pro, quantity surveyors, cost estimation, undergraduate

Introduction

Cost estimation is crucial in project planning and management (Al-Asheeri & Hammad, 2020; Younus, 2021). It involves predicting the financial resources required for various aspects of a construction project. Accurate cost estimates are essential for budgeting, bidding, and decision-making. Quantity surveyors, engineers, and project managers rely on cost estimation to allocate funds efficiently, assess feasibility, and ensure successful execution. Cost estimates are the foundation for project budgets (Alshammari, 2022). Accurate estimates ensure sufficient funds are allocated for materials, labor, equipment, and other project-related expenses. Projects may face cost overruns or shortages without precise estimates, impacting financial stability. Contractors rely on accurate estimates to submit competitive bids. A wellprepared estimate allows contractors to price their services appropriately, win contracts, and secure profitable projects. Inaccurate estimates can lead to lost opportunities or unprofitable ventures. Project managers use cost estimates to allocate resources effectively. Accurate estimates guide resource allocation decisions, whether scheduling labor, ordering materials, or planning equipment usage. Poor estimates can disrupt project timelines and hinder progress. Estimating costs involves considering various risks, such as market fluctuations, unforeseen conditions, and regulatory changes. Accurate estimates account for these risks, allowing project teams to develop contingency plans and mitigate potential issues. Clients expect projects to be completed within budget. Accurate cost estimates build trust with clients by demonstrating transparency and professionalism. Conversely, inaccurate estimates can strain client relationships and harm a contractor's reputation.

Quantity surveyors are pivotal in ensuring that cost estimates are reliable and well-founded. Several authors have emphasized the relevance of cost estimation in quantity surveying (Akinsiku, 2016; Benge, 2014; Ismail et al., 2019, 2021). Moreover, the introduction of simulation modeling in the field has encouraged it (Moawad et al., 2021; Smith, 2014). Cubit Estimating PRO is a powerful software solution specifically tailored for professionals in the construction industry. Cubit Estimating PRO streamlines the process of quantifying materials and labor required for construction projects. Contractors can perform digital takeoffs directly from project plans, reducing manual effort and minimizing errors. Contractors can create precise cost estimates for bidding purposes. The software allows them to factor in material costs, labor rates, equipment expenses, and other project-specific details. Accurate bids enhance competitiveness and increase the chances of winning contracts. Estimators can expedite their work by leveraging Cubit Estimating PRO's intuitive interface. The software automates repetitive tasks, such as counting items and calculating quantities, allowing estimators to focus on value-added analysis.

The software integrates with Computer-Aided Design (CAD) and Building Information Modeling (BIM) files. Estimators can import drawings and models directly, ensuring consistency between takeoffs and project documentation. Estimators can create reusable templates for common project types. These templates include predefined measurement rules, cost codes, and item libraries, saving time and maintaining consistency. Quantity surveyors rely on accurate measurements to determine quantities of materials, labor, and other project components. Cubit Estimating PRO's measurement tools facilitate precise takeoffs, reducing the risk of overestimation or underestimation. The software provides detailed cost

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breakdowns, allowing quantity surveyors to analyze project expenses at a granular level. This information is essential for budgeting, cost control, and value engineering. Quantity surveyors can collaborate with other team members by sharing project data within the software. Whether reviewing takeoffs, adjusting quantities, or validating cost estimates, Cubit Estimating PRO enhances communication and teamwork. The software minimizes human error by automating calculations and ensuring consistency across estimates. It also guarantees faster takeoffs and streamlined workflows, which lead to significant time savings.

Cubit Estimating PRO integrates seamlessly with other construction software tools, enhancing overall project efficiency. The software typically offers training resources and customer support to assist users in maximizing its capabilities. Cubit Estimating PRO empowers professionals in the construction industry to create precise cost estimates, improve project planning, and enhance collaboration. Its user-friendly interface and robust features make it an asset for contractors, estimators, and quantity surveyors. Hasan et al. (2023) emphasize the importance of accurate SCE for project planning and decision-making. This systematic literature review focuses on software cost estimation (SCE) in software development projects. Niazi et al. (2006) provide a detailed review of the state of the art in product cost estimation, covering various techniques and methodologies developed over the years. Tayefeh et al. (2020) investigated various cost estimation methods in construction projects. The study identifies trends and gaps, suggesting that deep-learning techniques deserve attention for future research.

Classroom learning provides theoretical knowledge, but practical exposure is essential for mastering cost estimation. While specialized software like Cubit Estimating PRO enhances efficiency, students must learn to use these tools effectively. Overcoming the learning curve and understanding software features can be daunting. Estimators must account for uncertainties like market fluctuations, unforeseen site conditions, and regulatory changes. Balancing risk and estimate accuracy require skill and judgment. Undergraduate quantity surveyors face theoretical, practical, and industry-specific challenges. Integrating classroom learning with practical exposure, staying updated, and mastering software tools are key steps toward overcoming these hurdles(Ismail et al., 2019) emphasize the general usage of BIM by quantity surveyors and examine BIM capabilities, especially in the use of software to achieve more dependable results in cost-estimating practices. They are improving quantity surveying education through continually updating curriculum digitalization to meet industry requirements. Ebekozien and Aigbavboa (2023) advocate continually updating QS education curricula to meet industry requirements. Stakeholders emphasize the importance of integrating digital technology into QS education. These studies highlight the evolving landscape of quantity surveying education, emphasizing the need to embrace digital tools and stay abreast of industry advancements.

Method

The study aims to explore the Application of Cubit Estimating PRO in Cost Estimation for Undergraduate Quantity Surveyors. 33 Undergraduate students conveniently selected from the National Institute of Construction Technology and Management, Uromi, Edo State, received training sessions on using Cubit Estimating PRO. These sessions covered software features, navigation, and basic functionalities. Using the software, they learned how to

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perform quantity takeoffs (measurement) directly from digital drawings. Importantly, they were assigned practical exercises related to cost estimation tasks. They used Cubit Estimating PRO to quantify materials, labor, and other project components based on architectural plans and specifications. The exercises included estimating quantities for various construction elements (e.g., walls, floors, ceilings, doors, windows). Students applied Cubit Estimating PRO to real-world scenarios. For instance, I estimate the concrete volume for a foundation slab, calculate the number of tiles required for a bathroom floor, and determine the steel reinforcement quantity for a column. These scenarios mirrored actual construction projects, allowing students to practice cost estimation in context.

Result

After completing the exercises, students reflected on their experiences using the software. They provided feedback on usability, accuracy, and any challenges encountered. The researcher facilitated discussions to address queries and clarify doubts. Students applied software skills to coursework assignments, reinforcing their understanding of cost estimation principles. Students' performance using Cubit Estimating PRO was assessed. Evaluation criteria included accuracy of estimates, efficient use of software features, and adherence to industry standards.

Table 1 shows the descriptive results of the study.

Variables	frequency	percentage	
Low	4	9%	
Moderate	10	27%	
High	19	64%	

The table above shows the distribution of respondents based on their competence in using cubit estimating PRO. Responses to the open-ended question assessing the level of knowledge, exposure, confidence, and ease of using cubit estimating PRO software in quantity surveying showed that only 9% of the respondents have low competence. In comparison, 27% of the respondents showed moderate competence, while 64% showed high competence in cubit estimating PRO. Thus, the data indicates favorable outcomes regarding cubit estimating PRO competence in developing cost estimation skills. The participants shared insights, discussed best practices, and learned from each other's experiences. They actively engaged with Cubit Estimating PRO through training, practical exercises, real-world scenarios, and coursework integration. Their experiences contributed to developing their cost estimation skills and familiarity with specialized software.

Discussion

The present study explored the application of cubit estimating PRO in cost estimation for undergraduate quantity surveyors. The students explored various cost elements (materials, labor, overheads) within the software. The participants actively engaging with Cubit Estimating PRO develop a keen eye for detail. The software encourages precise quantity takeoffs, minimizing errors in measurements. Accurate takeoffs lead to more reliable cost

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estimates, a critical skill for quantity surveyors. Cubit Estimating PRO streamlines the estimation process. Students learn to navigate the software efficiently, reducing the time spent on manual calculations. Efficient workflows allow quantity surveyors to handle larger projects effectively. The software seamlessly integrates quantity takeoff (measurement) with cost estimation. Students grasp the importance of linking these two aspects. Understanding how measurements translate into cost components enhances their holistic understanding of project costs. Quantity surveyors often encounter specialized software in their professional careers. Exposure to Cubit Estimating PRO prepares students for industry expectations. Familiarity with industry-standard tools gives them a competitive edge. In summary, Cubit Estimating PRO positively impacts students' accuracy, efficiency, decision-making abilities, and overall readiness for the quantity surveying profession.

Implications for Developing Cost Estimation Skills

Specialized software allows students to break down construction projects into individual components (items). They learn to quantify materials, labor, and other resources accurately. For instance, when estimating the cost of constructing a wall, students can itemize bricks, mortar, reinforcement, and labor hours. This granularity fosters a deeper understanding of cost elements. The participants associate quantities with unit rates (e.g., cost per square meter, cost per linear meter). The software facilitates automatic calculations based on these rates and explores how different pricing affects overall project costs. Cubit estimating PRO bridges theory and practice, allowing students to explore cost components dynamically and interactively. It equips them with essential skills for their future roles as quantity surveyors. Some participants struggled to connect theoretical concepts from lectures with practical software usage. Inputting data (quantities, rates, dimensions) and errors led to inaccurate estimates. Few participants rush through takeoffs or estimations, compromising accuracy, while some solely rely on software outputs without understanding underlying principles. Addressing these challenges involves training, practice, patience, and continuous learning. By acknowledging these hurdles, students can navigate them effectively and develop robust costestimation skills.

Conclusion

Students using Cubit Estimating PRO demonstrated improved accuracy in quantity takeoffs and subsequent cost estimates. The software streamlined workflows, allowing students to work more efficiently. The participants quickly grasped the importance of linking quantity takeoff (measurement) with cost estimation. The present study concludes that Cubit Estimating PRO positively impacted students' accuracy, efficiency, and readiness for their future role as quantity surveyors. Integrating practical tools into quantity surveying education is crucial for preparing students effectively. It bridges the gap between theory and practice. Students gain hands-on experience, making their learning more relevant and applicable. Exposure to tools like Cubit Estimating PRO ensures that students are well-prepared for the challenges they will face in their professional careers. Quantity surveyors must stay updated with industry advancements by integrating practical tools to ensure that quantity surveying education is dynamic, relevant, and aligned with industry demands. Educators and practitioners play complementary roles in shaping the future of quantity surveying.

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Combining theoretical knowledge with practical skills prepares students to excel in their careers.

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