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MODULAR GUIDE FOR SIMULATION-BASED NETWORKING INSTRUCTION USING CISCO PACKET TRACER

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ABSTRACT

Cisco Packet Tracer is widely used as a simulation tool in networking education to enhance students' understanding and practical skills. This study examined the perception and level of acceptability of Cisco Packet Tracer among second-year BIT–CT students at Cebu Technological University–San Francisco Campus. Guided by the Technology Acceptance Model (TAM), the study focused on system features, system design, usability, functionality, perceived usefulness, perceived ease of use, attitude toward use, and behavioral intention to use.

A descriptive-quantitative research design was employed, involving 344 respondents (171 males and 173 females). Data were collected through survey questionnaires and analyzed using descriptive statistics and inferential tools such as ANOVA and t-test.

The findings revealed that respondents generally have positive perceptions and a high level of acceptability toward Cisco Packet Tracer. Moreover, age, gender, and frequency of use were found to have no significant effect on perception and acceptability. The study concludes that Cisco Packet Tracer is an effective and inclusive tool for networking education and supports the development of practical skills.

KEYWORDS: *Acceptability, Cisco Packet Tracer, Networking Education, Perceived Ease of Use, Perceived Usefulness, Perception, Technology Acceptance Model*

INTRODUCTION

The integration of technology in education has significantly improved the way students learn complex concepts, particularly in the field of networking. Simulation tools such as Cisco Packet Tracer provide learners with a virtual environment where they can design, configure, and troubleshoot networks without the need for expensive physical equipment.

In higher education, especially in Information Technology programs, there is a growing need to bridge the gap between theory and practice. Traditional teaching methods often limit students' ability to fully understand networking concepts due to a lack of hands-on experience. As a result, simulation-based tools have become essential in enhancing both conceptual understanding and practical skills.

This study is anchored on the **Technology Acceptance Model (TAM)**, which explains how users come to accept and use a technology based on perceived usefulness and perceived ease of use. Understanding students' perception and acceptability of Cisco Packet Tracer is important in determining its effectiveness as a teaching tool.

Thus, this study aims to evaluate the perception and level of acceptability of Cisco Packet Tracer among students, and to determine whether demographic variables such as age, gender, and frequency of use influence these factors.

METHOD

This study employed a **descriptive-quantitative research design** to assess the perception and level of acceptability of Cisco Packet Tracer. The respondents consisted of **344 second-year BIT–CT students** from Cebu Technological University–San Francisco Campus, composed of **171 males and 173 females**, selected through total enumeration.

Data were gathered using a structured survey questionnaire adapted from previous studies and aligned with TAM constructs. The instrument measured system features, system design, usability, functionality, perceived usefulness, perceived ease of use, attitude toward use, and behavioral intention.

Descriptive statistics such as frequency, percentage, mean, and standard deviation were used to summarize the data. Inferential statistics, including **One-Way ANOVA** and **independent samples t-test**, were applied to determine significant differences in perception and acceptability when grouped according to age, gender, and frequency of use.

All responses were treated with strict confidentiality and used solely for academic purposes.

RESULTS

The findings showed that respondents generally have positive perceptions of Cisco Packet Tracer across all evaluated dimensions. The system was rated as user-friendly, functional, and effective in supporting networking tasks such as creating topologies and troubleshooting.

In terms of usage, most students reported using the software once or twice a week, indicating that it is regularly integrated into laboratory and course-related activities.

The results also revealed that the level of acceptability of Cisco Packet Tracer is moderately high, particularly in terms of perceived usefulness and ease of use. Respondents recognized its value in improving their understanding, productivity, and practical skills in networking.

Furthermore, statistical analysis showed that age, gender, and frequency of use do not significantly influence the respondents' perception and level of acceptability, indicating that the tool is effective and accessible across different groups of students.

DISCUSSION

The results suggest that Cisco Packet Tracer is an effective tool for enhancing both theoretical understanding and practical skills in networking education. The positive perception of students may be attributed to its user-friendly interface, realistic simulation features, and ability to replicate real-world networking scenarios.

The finding that demographic variables do not significantly affect perception and acceptability supports the idea that the software is

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inclusive and adaptable to different types of learners. This aligns with the principles of the Technology Acceptance Model, which emphasizes the importance of perceived usefulness and ease of use in technology adoption.

Although the results indicate overall acceptability, some respondents reported minor challenges in using the system for more complex tasks. This suggests the need for additional instructional support or training to further enhance user experience.

Overall, the study highlights the importance of integrating simulation tools like Cisco Packet Tracer in networking education to improve student engagement, learning outcomes, and skill development.

CONCLUSION

Cisco Packet Tracer is a reliable, effective, and acceptable tool for networking instruction. It enhances students' understanding, supports practical learning, and can be effectively integrated into Information Technology curricula regardless of demographic differences.

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The author is a graduating student of the Master of Science in Industrial Technology (MSIT) at Cebu Technological University – San Francisco Campus. His research interests include networking education, simulation-based learning, and educational technology. He is actively involved in teaching and research focused on improving student learning through innovative instructional tools.