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Compliance with health and safety measures among public school Computer Systems Servicing teachers in Batangas, Philippines

Michelle R. Enamac*[1], Irish Giselle C. Bautista[2]
[1, 2] Batangas State University - The National Engineering University
*Corresponding Author e-mail: *mich.elle.enamac427@gmail.com*

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Abstract

Aim: This interdisciplinary study examined compliance with health and safety measures among public school teachers who teach Computer Systems Servicing (CSS), integrating perspectives from technology education, occupational health and safety, ergonomics, and teacher well-being. Specifically, it described the respondents' profile, assessed their compliance with health and safety measures related to prolonged computer use, ergonomic issues, and stress-related concerns, determined the associations between selected profile variables and compliance with health and safety measures, and identified the challenges encountered in implementing these measures.

Methodology: The study employed a quantitative descriptive-associational research design and proportionate stratified random sampling. Data were collected from 77 public school CSS teachers across five Schools Division Offices in Batangas using a validated researcher-developed questionnaire. Frequency counts, percentages, weighted means, the Chi-square Test of Independence, and Phi coefficients were used to analyze the data.

Results: Most respondents held a bachelor's degree, had attended one to five relevant health and safety seminars, and had taught CSS for five years or less. The respondents demonstrated very high compliance with health and safety measures related to prolonged computer use and ergonomic issues and high compliance with stress-related concerns. No significant associations were found between the respondents' highest educational attainment, number of health and safety seminars attended, or years of teaching CSS and their compliance with health and safety measures. Challenges related to safety awareness, immediate health-related decision-making, training, availability of safety resources, and the implementation of health and safety guidelines were also identified.

Conclusion: CSS teachers generally demonstrated high levels of compliance with health and safety measures regardless of their selected profile characteristics. The findings highlight the need to strengthen institutional health and safety systems in technology-intensive educational environments through continuous training, ergonomic support, accessible safety resources, and standardized school-level protocols. By connecting technology education with occupational health and safety, ergonomics, and teacher well-being, the study provides practical implications for promoting safer computer-based instruction and strengthening institutional health and safety policies.

Keywords: *computer systems servicing, occupational health and safety, ergonomics, prolonged computer use, teacher well-being*

INTRODUCTION

The accelerating digital transformation of education has fundamentally changed teaching and learning, making computers, digital platforms, and technology-mediated instruction essential components of teachers' daily professional practice. As schools increasingly adopt digital technologies, teachers spend extended periods using computers for instruction, assessment, communication, laboratory management, and administrative tasks. The increasing integration of technology into education has likewise been recognized globally as a major driver of educational transformation while simultaneously presenting new challenges related to equitable, safe, and sustainable technology use in schools (UNESCO, 2023). Although these technologies enhance educational efficiency and accessibility, prolonged and intensive

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computer use may also present occupational health and safety concerns, including computer-related health problems, visual discomfort, musculoskeletal symptoms, and work-related stress (Akinbo & Omideyi, 2022; Fernández-Batanero et al., 2021; Shantakumari et al., 2014; Silva, 2021). Studies have further emphasized that computer use in school environments may expose educators to a variety of health and safety issues that require preventive interventions (Emilio, 2019). These developments have transformed teaching into a technology-intensive work environment where technology, physical workstations, organizational conditions, and human well-being interact. Therefore, understanding teachers' health and safety requires an integrated perspective that considers technology education, occupational health and safety, ergonomics, psychological well-being, and organizational practices.

This need is particularly evident in technical-vocational education, where teachers serve not only as classroom instructors but also as laboratory supervisors responsible for managing equipment, implementing safety procedures, troubleshooting technical problems, and monitoring compliance with established standards. Computer Systems Servicing (CSS), as a technical-vocational area within the Technology and Livelihood Education (TLE) and Technical-Vocational-Livelihood (TVL) context, exemplifies this environment. CSS teachers facilitate learning activities involving computer systems, laboratory equipment, technical tools, and digital technologies, thereby exposing them to prolonged computer use, repetitive tasks, equipment handling, laboratory supervision, and continuous safety monitoring. Studies have documented health concerns associated with prolonged computer use and computer-based work, including visual problems, ergonomic risks, and physical discomfort (Akinbo & Omideyi, 2022; Habibzadeh, 2018; Lin et al., 2017; Shantakumari et al., 2014; Silva, 2021). In addition, technology-intensive teaching may contribute to work-related stress and anxiety, particularly when teachers must continually adapt to technological demands and changing educational requirements (Fernández-Batanero et al., 2021). These concerns highlight the importance of addressing both physical and psychosocial dimensions of health and safety in technology-intensive teaching environments.

Health and safety measures are therefore essential for protecting teachers who work in computer-intensive educational environments. These measures encompass institutional policies, preventive strategies, ergonomic practices, laboratory management, and individual compliance with established safety procedures. They may include maintaining appropriate workstation arrangements, practicing proper posture, managing prolonged computer use, taking appropriate breaks, ensuring adequate lighting and ventilation, handling and storing equipment safely, and observing applicable occupational health and safety standards. Ergonomic considerations are particularly important because workstation design and user-selected working positions can influence physical comfort and the risk of musculoskeletal problems (Asaolu & Itsekor, 2014; Lin et al., 2017). Similarly, occupational health and safety education and workplace safety awareness are important components of promoting safe practices among workers and educators (Department of Labor and Employment, 2020; Rauscher et al., 2020; Suji & Sowmiya, 2022). Research has likewise shown that effective occupational health and safety practices contribute not only to worker protection but also to improved productivity and organizational performance. In the Philippine context, the Occupational Safety and Health Standards provide an important framework for promoting safe and healthy working conditions (Department of Labor and Employment, 2020).

Within the educational setting, CSS teachers play an important role in preparing students for technical and technology-related careers. Their responsibilities extend beyond the delivery of technical knowledge to include the demonstration and reinforcement of appropriate safety practices in laboratory and computer-based learning environments. The experiences of teachers in teaching Computer Systems Servicing further demonstrate the challenges associated with delivering CSS instruction, particularly within changing educational contexts (Sindayen & De Leon, 2023). Effective implementation of institutional policies and human resource practices has likewise been associated with improved organizational effectiveness and employee performance, emphasizing the importance of organizational support in maintaining safe educational workplaces. As technology-based instruction and laboratory activities continue to develop, ensuring the health and safety of CSS teachers becomes increasingly important because teachers serve as role models for students who are preparing for technical careers and are expected to demonstrate appropriate occupational health and safety practices.

This study focuses on CSS teachers in public secondary schools across the five Schools Division Offices in Batangas, where schools may differ in terms of laboratory facilities, technological resources, equipment availability, and implementation of safety practices. Although occupational health and safety, computer-related health concerns, ergonomic risks, and teacher stress have been examined in previous studies, these concerns have often been investigated as separate areas of inquiry. Research has addressed computer-related illnesses among library personnel (Akinbo & Omideyi, 2022), ergonomic workstation considerations (Asaolu & Itsekor, 2014), computer-related health problems among library staff (Silva, 2021), visual problems associated with computer use (Shantakumari et al., 2014), and technology-related teacher stress and anxiety (Fernández-Batanero et al., 2021). Other studies have emphasized

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occupational safety and health education, workplace safety awareness, and the importance of safety management in educational and work environments (Department of Labor and Employment, 2020; Mubita et al., 2023; Rauscher et al., 2020; Suji & Sowmiya, 2022). Studies on teacher education have also highlighted that strengthening instructional competencies and professional practice requires systematic institutional support and continuous professional development (Ramaligela et al., 2018). However, limited localized evidence is available regarding the implementation of health and safety measures specifically among CSS teachers in public secondary school computer laboratories in Batangas.

Accordingly, this study adopts an integrated perspective that considers technology education, occupational health and safety, ergonomics, psychological well-being, and organizational practices in examining health and safety measures among CSS teachers. It views health and safety compliance not merely as adherence to laboratory rules but as a multidimensional concern influenced by individual practices, work conditions, technological demands, and organizational support. By examining these dimensions within the context of public secondary school CSS instruction, the study seeks to provide a more comprehensive understanding of health and safety practices in technology-intensive educational workplaces. The findings may provide useful insights for school administrators, education leaders, occupational health practitioners, technical-vocational educators, policymakers, and researchers in developing appropriate strategies and interventions to promote safer, healthier, and more sustainable learning environments for teachers and students.

Review of Related Literature and Studies

Digital Transformation and Technology-Intensive Teaching

Technology and Livelihood Education (TLE) develops learners' practical knowledge, technical competencies, and workplace skills through experiential and authentic learning. The curriculum encompasses areas such as Industrial Arts, Home Economics, Information and Communications Technology (ICT), and Agri-Fishery, with Computer Systems Servicing (CSS) requiring teachers to continuously adapt to technological developments and integrate digital tools into instruction, assessment, and laboratory activities (Gregorio, 2016). Technology-intensive teaching extends beyond the transfer of knowledge by fostering practical skills and attitudes that learners can apply in real-life situations. Thus, CSS teachers are expected to deliver technical content while creating meaningful and engaging learning experiences that integrate technology and practical application. These responsibilities require teachers to continually develop their competencies through professional learning, relevant training, and the application of evidence-informed instructional practices that support effective teaching and learning across educational settings (Long et al., 2014; Tasnim et al., 2020; McLean, 2014; Valache et al., 2025). However, the multidimensional nature of TLE, particularly its emphasis on specialized equipment, practical activities, and laboratory-based instruction, makes the consistent implementation of health and safety measures essential.

Occupational Health and Safety in Educational Workplaces

Health and safety are fundamental components of technology-oriented learning environments, where teachers and students may be exposed to physical, electrical, and environmental hazards. In CSS laboratories, health and safety measures encompass occupational safety standards, institutional policies, and preventive practices designed to minimize workplace injuries and illnesses while promoting safe and healthy working conditions. The Occupational Safety and Health Standards provide an important framework for protecting workers and promoting safe working environments in the Philippines (Department of Labor and Employment, 2020). Effective health and safety practices also require organizational commitment, employee participation, and the development of a workplace culture that prioritizes prevention and risk reduction (Mubita et al., 2023; Rauscher et al., 2020). Because CSS teachers simultaneously serve as instructors, laboratory supervisors, and facilitators of technical activities, maintaining safe instructional environments requires compliance with relevant safety standards, institutional support, adequate resources, and continuous monitoring of laboratory conditions and practices.

Prolonged Computer Use, Ergonomics, and Digital Health Risks

The technology-intensive nature of CSS instruction exposes teachers to health concerns associated with prolonged computer use, including visual problems, musculoskeletal discomfort, physical fatigue, and other computer-related health concerns (Akinbo & Omideyi, 2022; Habibzadeh, 2018; Shantakumari et al., 2014; Silva, 2021). Technology-intensive work may also contribute to stress and anxiety among teachers, particularly when they are required to adapt continuously to technological demands and changing educational expectations (Fernández-Batanero

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et al., 2021). Poorly designed workstations and prolonged static postures may further contribute to physical discomfort and musculoskeletal problems. Ergonomic considerations, including appropriate workstation arrangements and proper working positions, are therefore important in reducing physical strain associated with computer-based activities (Asaolu & Itsekor, 2014; Lin et al., 2017). These findings highlight the close relationship among ergonomics, occupational health, and teachers' well-being in technology-intensive educational settings.

Health and Safety Training, Institutional Support, and Compliance

The effective implementation of health and safety measures depends not only on individual awareness but also on organizational commitment and institutional support. Occupational safety and health education can strengthen awareness of workplace hazards and promote safer work practices among individuals working in technical and vocational environments (Rauscher et al., 2020). Similarly, workplace safety awareness is an important factor in encouraging employees to recognize and comply with appropriate safety practices (Suji & Sowmiya, 2022). Safety management in schools also requires institutional commitment, adequate resources, and coordinated efforts to address health and safety concerns (Mubita et al., 2023). However, educational institutions may encounter challenges related to limited resources, inadequate safety equipment, insufficient training, and weaknesses in the implementation of safety programs. These challenges emphasize the need for stronger institutional policies, adequate resources, continuous training, and collaborative safety practices within technology-intensive educational workplaces.

Safety Practices in Technical-Vocational and Computer Laboratories

The implementation of health and safety measures in CSS requires structured planning and practical learning experiences that integrate safety principles, proper equipment handling, and systematic procedures. Safety-aware approaches to technical education emphasize the importance of incorporating safety considerations into practical and technology-related learning activities (Silvis-Cividjian, 2018; Konstantinou, 2020). Project-based and laboratory activities can provide opportunities for teachers and students to apply technical knowledge and safety concepts in authentic, technology-rich environments (Mishra et al., 2017). The integration of computer science, technology, and engineering concepts into practical learning activities can also support the development of technical competencies and responsible technology practices (Love & Strimel, 2016; Ozogul et al., 2019). Cybersecurity and technology-related education further demonstrate the importance of integrating safety and responsible practices into computer-based learning environments (Yue, 2016). These approaches reinforce the integration of technical knowledge and safety practices, thereby supporting safer and more effective laboratory instruction. For CSS teachers, such practices are particularly important because they must simultaneously facilitate technical learning, supervise laboratory activities, manage equipment, and model appropriate health and safety behaviors for students.

Synthesis and Interdisciplinary Research Gap

The literature indicates that health and safety in technology-intensive educational environments have been examined across various fields, including technical-vocational education, ICT, occupational health and safety, ergonomics, organizational management, and teacher well-being. Studies have identified prolonged computer use, ergonomic risks, computer-related health concerns, occupational stress, and institutional safety practices as important considerations in technology-intensive work environments (Akinbo & Omideyi, 2022; Asaolu & Itsekor, 2014; Fernández-Batanero et al., 2021; Lin et al., 2017; Silva, 2021). The literature also emphasizes occupational safety education, workplace safety awareness, organizational support, and practical laboratory instruction as important components of promoting safe practices (Mubita et al., 2023; Rauscher et al., 2020; Suji & Sowmiya, 2022). However, these areas remain largely fragmented, with limited research examining occupational health, ergonomics, teacher well-being, institutional management, and laboratory safety as interconnected dimensions of a broader health and safety framework.

Research specifically focusing on CSS teachers is also limited, despite their combined responsibilities involving prolonged computer use, laboratory supervision, technical instruction, equipment management, and safety monitoring. Existing research on teachers' experiences in teaching Computer Systems Servicing demonstrates the importance of examining the specific conditions and challenges encountered in CSS instruction (Sindayen & De Leon, 2023). This gap is particularly relevant in Philippine public secondary schools, where differences in resources, infrastructure, institutional support, laboratory conditions, and teacher characteristics may influence the implementation of health and safety measures. Accordingly, the present study adopts an interdisciplinary perspective to examine health and safety measures among CSS teachers, with particular consideration of teacher characteristics, computer-related health concerns, ergonomic practices, institutional support, and implementation challenges. By integrating perspectives from

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technology education, occupational health and safety, ergonomics, psychology, and educational management, this approach seeks to provide a more comprehensive understanding of health and safety implementation in technology-intensive educational settings.

Theoretical Framework

This study is anchored on two complementary theories: Sociotechnical Systems Theory (Trist & Bamforth, 1951) and Social Learning Theory (Bandura, 1977). Together, these theories provide an interdisciplinary framework for understanding the implementation of health and safety measures among Computer Systems Servicing (CSS) teachers from the perspectives of technology and work systems and behavioral learning. The integration of these theories recognizes that the implementation of health and safety measures is influenced by the interaction of technological conditions, organizational practices, work environments, and human behavior.

Sociotechnical Systems Theory, developed by Trist and Bamforth (1951), emphasizes the interaction between social systems, such as people, organizational practices, and institutional conditions, and technical systems, including technology, equipment, and work processes. In the context of CSS instruction, teachers' health and safety may be influenced by their interactions with computers and laboratory equipment, as well as by ergonomic conditions, workload, health and safety training, organizational support, and the physical work environment. The theory provides a basis for understanding how technological, organizational, and human factors collectively influence the implementation of health and safety measures in technology-intensive educational workplaces. From this perspective, promoting teacher safety requires consideration not only of individual practices but also of the broader work system in which CSS teachers perform their instructional and laboratory-related responsibilities.

Social Learning Theory, proposed by Bandura (1977), posits that individuals acquire and develop behaviors through observation, imitation, modeling, and reinforcement. In educational settings, CSS teachers may develop and strengthen safe work practices by observing colleagues, school administrators, laboratory personnel, and established institutional practices. Demonstrations of proper ergonomic practices, laboratory procedures, equipment handling, and occupational safety practices, when reinforced by supportive leadership and a positive safety culture, may encourage teachers to adopt and consistently practice appropriate health and safety behaviors. The theory therefore highlights the importance of social interaction, behavioral modeling, and reinforcement in promoting compliance with health and safety measures.

Collectively, these theories provide a comprehensive framework for examining the implementation of health and safety measures among CSS teachers. Sociotechnical Systems Theory highlights the interaction among people, technology, work processes, and organizational conditions, while Social Learning Theory explains how safe behaviors may be acquired, reinforced, and sustained through observation and social interaction. The integration of these theories recognizes that the health and safety of CSS teachers are shaped by the dynamic interaction of technological systems, organizational practices, work conditions, and human behavior. Thus, these theories provide a theoretical foundation for examining the implementation of health and safety measures among CSS teachers in public secondary schools.

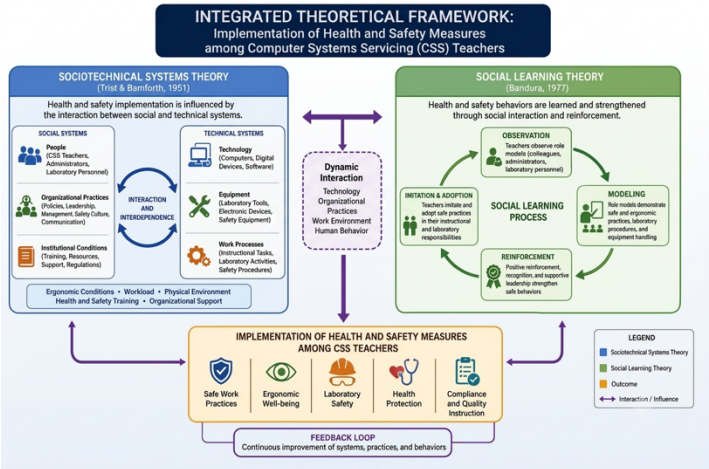

Figure 1
Theoretical Paradigm of the Study

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Figure 1 shows the integrated theoretical paradigm of the study, which is anchored on Sociotechnical Systems Theory (Trist & Bamforth, 1951) and Social Learning Theory (Bandura, 1977). The paradigm illustrates that the implementation of health and safety measures among Computer Systems Servicing (CSS) teachers is influenced by the dynamic interaction of social and technical systems, including organizational practices, institutional support, technology, laboratory equipment, work processes, ergonomic conditions, workload, and the physical work environment. It further demonstrates that safe work behaviors are developed through observation, modeling, imitation, and reinforcement within the school setting, where teachers learn and sustain appropriate health and safety practices through supportive leadership and a positive safety culture. The integration of these theories suggests that effective implementation of health and safety measures results from the combined influence of technological resources, organizational conditions, work environments, and behavioral learning, ultimately promoting safe work practices, ergonomic well-being, laboratory safety, health protection, and compliance with occupational safety standards among CSS teachers.

Statement of the Problem

The increasing integration of computer technologies into education has transformed teachers' roles in technology-intensive learning environments. In Computer Systems Servicing (CSS), teachers perform instructional, technical, and laboratory-related responsibilities that may involve prolonged computer use, repetitive tasks, sustained screen exposure, equipment handling, and demanding instructional workloads. These conditions position the health and safety of CSS teachers at the intersection of technology education, occupational health and safety, ergonomics, and teacher well-being. Although existing studies have examined computer-related health concerns, ergonomic risks, occupational safety, and technology-related stress, these dimensions are often investigated separately rather than as interconnected concerns affecting teachers in specialized technical-vocational education settings.

Research has shown that prolonged computer use, ergonomic strain, occupational stress, and workplace hazards may affect teachers' well-being and work performance. Previous studies have likewise emphasized the importance of health and safety training, institutional support, and safety-oriented practices in promoting healthier and safer work and learning environments. However, limited research has examined CSS teachers' compliance with health and safety measures across the interconnected dimensions of prolonged computer use, ergonomic issues, and stress-related concerns. There is also insufficient evidence regarding whether teachers' highest educational attainment, participation in relevant health and safety seminars, and years of teaching CSS are associated with their compliance with health and safety measures.

This research gap is particularly relevant to public secondary schools in Batangas, where CSS teachers work in technology-intensive instructional and laboratory environments. Understanding their compliance with health and safety measures and the challenges they encounter in implementing these measures may provide valuable evidence for educators, school administrators, occupational health and safety practitioners, and education policymakers. Accordingly, this study assesses CSS teachers' compliance with health and safety measures, examines its association with selected demographic and professional characteristics, identifies challenges encountered in implementation, and provides a basis for proposing a Health and Safety Enhancement Program to support safer, healthier, and more sustainable technology-intensive teaching environments.

Research Objectives

The study generally aimed to assess public school Computer Systems Servicing (CSS) teachers' compliance with health and safety measures within a technology-based educational environment.

Specifically, it aimed:

1. To describe the demographic profile of the respondents in terms of:
   1.1 highest educational attainment;
   1.2 seminars attended; and
   1.3 number of years teaching Computer Systems Servicing.
2. To assess the level of the respondents' compliance with health and safety measures in terms of:
   2.1 prolonged computer use;
   2.2 ergonomic issues; and
   2.3 stress-related concerns.

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3. To determine whether a significant association exists between the respondents' demographic profile and their level of compliance with health and safety measures.
4. To identify the challenges encountered by the respondents in implementing health and safety measures in teaching Computer Systems Servicing.
5. To propose a health and safety intervention based on the findings of the study.

Research Questions

The study sought to answer the following questions:

1. What is the demographic profile of the respondents in terms of:
   1.1 highest educational attainment;
   1.2 seminars attended; and
   1.3 number of years teaching Computer Systems Servicing?
2. What is the level of the respondents' compliance with health and safety measures in terms of:
   2.1 prolonged computer use;
   2.2 ergonomic issues; and
   2.3 stress-related concerns?
3. Is there a significant association between the respondents' demographic profile and their level of compliance with health and safety measures?
4. What challenges are encountered by the respondents in implementing health and safety measures in teaching Computer Systems Servicing?
5. What health and safety intervention may be proposed based on the findings of the study?

Hypothesis

H_0: There is no significant association between the respondents' demographic profile in terms of highest educational attainment, seminars attended, and number of years teaching Computer Systems Servicing and their level of compliance with health and safety measures related to prolonged computer use, ergonomic issues, and stress-related concerns.

METHODOLOGY

Research Design

This study employed a quantitative descriptive-associational research design to examine the implementation of health and safety measures among public secondary school teachers who teach Computer Systems Servicing (CSS). The descriptive component was appropriate for describing the respondents' profiles in terms of highest educational attainment, number of health and safety seminars attended, and years of teaching CSS. It was also used to determine the respondents' level of compliance with health and safety measures related to prolonged computer use, ergonomic issues, and stress-related concerns, as well as to identify the challenges encountered in implementing health and safety measures within the CSS learning environment.

The associational component of the research design was used to determine whether significant associations existed between the respondents' profile characteristics and their compliance with health and safety measures. Specifically, the study examined the associations between teachers' highest educational attainment, number of health and safety seminars attended, and years of teaching CSS and their level of compliance with health and safety measures using the Chi-square Test of Independence. The Phi coefficient was also employed to determine the strength of significant associations identified through the Chi-square analysis.

Descriptive research provides a systematic framework for collecting quantitative data and describing the characteristics, conditions, and patterns of a particular population without manipulating the study environment. According to Miksza and Elpus (2018), descriptive research is concerned with exploring what is, what exists, and the status of a topic of interest. In the present study, descriptive statistical techniques, including frequency counts, percentages, and weighted means, were used to summarize the respondents' profiles, level of compliance with health and safety measures, and challenges encountered in implementation. Inferential statistical analyses, particularly the Chi-square Test of Independence and Phi coefficient, were employed to examine the associations between selected profile variables and the respondents' compliance with health and safety measures. The integration of descriptive and associational analyses enabled the study to provide a comprehensive description of the implementation of health and

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safety measures among CSS teachers and to determine whether selected profile characteristics were associated with their level of compliance.

Population and Sampling

The study involved Computer Systems Servicing (CSS) teachers from public junior and senior high schools under five Schools Division Offices (SDOs) in Batangas, Philippines, namely Batangas City, Batangas Province, Lipa City, Tanauan City, and Sto. Tomas City. Schools Division Offices (SDOs) are local administrative units of the Philippine Department of Education (DepEd) responsible for administering and supervising public basic education within their respective geographical jurisdictions. The target population consisted of 95 CSS teachers assigned to schools under the five participating SDOs. Table 1 presents the distribution of the target population and corresponding sample of CSS teachers across the five participating Schools Division Offices.

The required sample size was determined using the Raosoft sample size calculator with a 5% margin of error. Based on the calculated sample size, a total of 77 CSS teachers were selected through proportionate stratified random sampling, with each Schools Division Office serving as a stratum. This sampling technique ensured that teachers from each participating SDO were represented proportionately according to the number of CSS teachers within their respective divisions. The approach strengthened the representativeness of the sample and helped minimize potential sampling bias. As shown in Table 1, the sample allocation for each Schools Division Office was proportionate to its corresponding population, ensuring adequate representation of all participating divisions in the study.

The inclusion criteria required participants to: (1) be currently teaching Computer Systems Servicing (CSS) in a public junior or senior high school under one of the five participating Schools Division Offices during the data collection period; and (2) voluntarily agree to participate in the study by providing informed consent. Teachers who were not assigned to teach CSS during the conduct of the study, those employed in private schools, and those who declined to participate were excluded from the study.

The use of proportionate stratified random sampling was appropriate because the target population was distributed across multiple Schools Division Offices with varying numbers of CSS teachers. By proportionately selecting participants from each division, the sampling procedure ensured that eligible CSS teachers across the five participating SDOs were adequately represented in the sample. This approach also provided each eligible teacher within the respective strata with an appropriate opportunity for selection while maintaining proportional representation of the target population. Consequently, the sampling procedure strengthened the representativeness of the sample and supported the validity and applicability of the study findings to the target population of CSS teachers within the five participating Schools Division Offices.

Table 1

Distribution of the Population and Sample of CSS Teachers

Schools Division Office (SDO)	**Population *(N)***	**Sample *(n)***
Batangas City	18	15
Batangas Province	30	24
Lipa City	17	14
Tanauan City	15	12
Sto. Tomas City	15	12
Total	95	77

Research Instrument

Data were collected using a researcher-developed questionnaire specifically designed to assess the compliance of Computer Systems Servicing (CSS) teachers with health and safety measures and the challenges they encountered in implementing these measures. The instrument was developed based on an extensive review of related literature, occupational health and safety guidelines, ergonomic standards, and empirical studies addressing computer use, workplace ergonomics, occupational stress, and school health and safety practices. Specifically, the indicators related to prolonged computer use were developed from recommendations concerning digital eye strain, screen-time management, and computer workstation safety published by the World Health Organization (2022) and the Department of Labor and Employment (2020), as well as related studies on computer-related health risks (Habibzadeh, 2018; Shantakumari et al., 2014; Silva, 2021). The ergonomic indicators were constructed based on internationally recognized

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ergonomic principles and workstation design standards (Lin et al., 2017; Akinbo & Omideyi, 2022; Zelik et al., 2022), while the stress-related indicators were developed from literature on occupational stress management, teacher well-being, and workplace mental health (American Psychological Association, 2024; Fernández-Batanero et al., 2021; Souto et al., 2019). The items assessing implementation challenges were derived from previous studies identifying barriers to the implementation of occupational health and safety measures among educators, including inadequate training, limited resources, insufficient institutional support, and difficulties in maintaining workplace safety compliance (Mubita et al., 2023; Suji & Sowmiya, 2022; International Labour Organization, 2022).

The questionnaire consisted of three major parts. Part I gathered the respondents' profile, including their highest educational attainment, number of health and safety-related seminars attended, and years of teaching Computer Systems Servicing (CSS). Part II assessed the respondents' compliance with health and safety measures in teaching CSS and comprised 30 items distributed across three dimensions: prolonged computer use (10 items), ergonomic issues (10 items), and stress-related concerns (10 items). Part III consisted of 10 items measuring the challenges encountered by CSS teachers in implementing health and safety measures in their instructional and laboratory environments. All items were written in clear and concise language appropriate for the respondents and were aligned with the objectives of the study.

To establish content validity, the instrument was evaluated by five experts with relevant backgrounds in research methodology, educational research, occupational health and safety, ergonomics, and Computer Systems Servicing (CSS) education. The validators assessed the questionnaire in terms of content relevance, clarity, representativeness, organization, language appropriateness, and alignment with the objectives of the study. Their comments and recommendations focused on improving item wording, eliminating ambiguous statements, ensuring adequate coverage of the constructs, and strengthening the alignment of the indicators with the dimensions being measured. Based on their recommendations, revisions were incorporated before pilot testing to enhance the validity, clarity, and comprehensiveness of the instrument.

The revised questionnaire underwent pilot testing among 30 Computer Systems Servicing (CSS) teachers from private secondary schools who possessed characteristics similar to those of the target respondents but were not included in the actual study. The pilot testing was conducted to assess the clarity, comprehensibility, feasibility, and internal consistency of the instrument. Feedback from the pilot respondents resulted in minor revisions to item wording and questionnaire formatting to improve readability and ease of administration.

The reliability of the instrument was determined using Cronbach's alpha (α) coefficient. The reliability analysis yielded satisfactory internal consistency across all subscales. The Prolonged Computer Use dimension obtained a Cronbach's α of 0.929, the Ergonomic Issues dimension yielded an α of 0.901, the Stress-Related Concerns dimension obtained an α of 0.874, and the Challenges Encountered dimension produced an α of 0.824. These coefficients indicate acceptable to excellent internal consistency, demonstrating that the questionnaire had satisfactory reliability for measuring the constructs included in the study.

The questionnaire employed a four-point Likert scale. For Part II, which assessed compliance with health and safety measures, the response options were 4 – Very High Compliance, 3 – High Compliance, 2 – Low Compliance, and 1 – Very Low Compliance. Composite mean scores were interpreted using the following intervals: 3.25–4.00 = Very High Compliance; 2.50–3.24 = High Compliance; 1.75–2.49 = Low Compliance; and 1.00–1.74 = Very Low Compliance. For Part III, which assessed the challenges encountered, respondents rated each statement using 4 – Strongly Agree, 3 – Agree, 2 – Disagree, and 1 – Strongly Disagree. The corresponding weighted mean interpretations were as follows: 3.25–4.00 = Strongly Agree; 2.50–3.24 = Agree; 1.75–2.49 = Disagree; and 1.00–1.74 = Strongly Disagree. The use of standardized response scales facilitated the consistent measurement and interpretation of respondents' compliance with health and safety measures and the challenges encountered in teaching Computer Systems Servicing (CSS).

Data Collection Procedure

Prior to the conduct of the study, the researcher secured the necessary approvals from the appropriate university authorities and the Department of Education (DepEd) through the respective Schools Division Offices (SDOs) of Batangas City, Batangas Province, Lipa City, Tanauan City, and Sto. Tomas City. Upon obtaining the required permissions, the researcher coordinated with the school heads and CSS coordinators of the participating public junior and senior high schools to facilitate the identification of eligible Computer Systems Servicing (CSS) teachers based on the established inclusion criteria.

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Data were collected from April 16, 2024, to July 11, 2024. After the eligible participants were identified through the approved sampling procedure, they were invited to participate in the study and were informed of its purpose, voluntary nature, confidentiality of their responses, and right to withdraw from the study at any stage without consequences. Those who agreed to participate provided informed consent before completing the questionnaire. The collection, handling, and storage of participants' information were conducted in accordance with the provisions of the Data Privacy Act of 2012 (Republic Act No. 10173).

The questionnaire was administered using a mixed-mode approach consisting of Google Forms and printed questionnaires to maximize participation and accommodate differences in respondents' accessibility to digital resources. Participants with stable internet access were provided with the Google Forms link through their respective school or division coordinators, while printed questionnaires were distributed to respondents with limited internet connectivity or those who preferred a paper-based format. Each participant completed the questionnaire using only one mode of administration. Respondent monitoring was conducted using the participant lists coordinated with the Schools Division Offices and school coordinators to prevent duplicate responses.

The completed printed questionnaires were personally retrieved by the researcher or designated school coordinators, while responses submitted through Google Forms were automatically recorded in a secure database. All completed questionnaires were reviewed for completeness and consistency before data encoding. The encoded data were subsequently organized, cleaned, and prepared for statistical analysis using appropriate descriptive and inferential statistical techniques to address the objectives of the study.

Data Analysis

The collected data were coded, tabulated, and analyzed using appropriate descriptive and inferential statistical techniques. Frequency counts and percentage distributions were used to describe the respondents' profiles in terms of highest educational attainment, number of health and safety seminars attended, and years of teaching Computer Systems Servicing (CSS).

The weighted mean was used to determine the respondents' level of compliance with health and safety measures related to prolonged computer use, ergonomic issues, and stress-related concerns. It was also used to assess the challenges encountered by CSS teachers in implementing health and safety measures. Composite weighted means were computed for each dimension and interpreted using the established four-point Likert scale.

To examine the associations between the respondents' profile variables and their compliance with health and safety measures, the Chi-square Test of Independence was employed. Specifically, the test was used to determine whether significant associations existed between the respondents' highest educational attainment, number of health and safety seminars attended, and years of teaching CSS and the three dimensions of health and safety compliance, namely prolonged computer use, ergonomic issues, and stress-related concerns. Prior to the analysis, respondents' composite compliance scores for each dimension were categorized into two groups, namely High Compliance and Very High Compliance, based on the interpretation ranges of the four-point Likert scale to meet the categorical data requirements of the Chi-square Test of Independence. The assumptions of the Chi-square test, particularly the adequacy of expected cell frequencies, were examined before conducting the analysis.

The Phi coefficient (φ) was computed to determine the strength of association for statistically significant Chi-square results involving 2 × 2 contingency tables. The magnitude of the association was interpreted using the following criteria: 0.00–0.19 = Very Weak; 0.20–0.39 = Weak; 0.40–0.59 = Moderate; 0.60–0.79 = Strong; and 0.80–1.00 = Very Strong. All statistical analyses were conducted at a 0.05 level of significance ($\alpha = .05$). The null hypothesis (H_0) was rejected when the computed *p*-value was less than .05 and was not rejected when the *p*-value was greater than or equal to .05.

Ethical Considerations

Prior to the conduct of the study, the researcher secured the necessary administrative approvals from the appropriate university authorities, the Department of Education (DepEd), and the participating Schools Division Offices (SDOs) before commencing data collection. Before administering the questionnaire, the respondents were provided with a comprehensive orientation regarding the nature, objectives, significance, procedures, potential benefits, and minimal risks associated with the study. They were informed that participation was entirely voluntary and that they had the right to decline participation or withdraw from the study at any stage without penalty or adverse consequences. Written informed consent was obtained from all participants before the administration of the questionnaire.

The researcher ensured the confidentiality of the respondents' information throughout the conduct of the study. No names or other personally identifiable information were included in the final dataset used for analysis.

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Participants who completed the questionnaire through Google Forms were instructed not to provide identifying information, and the online form was configured not to collect email addresses or other personally identifiable information. Similarly, the printed questionnaires did not require respondents to provide their names and were coded solely for data organization and retrieval. Access to the collected data was restricted exclusively to the researcher.

All electronic files were stored in password-protected digital storage, while printed questionnaires were kept in a secure location accessible only to the researcher. The collected data were used solely for academic and research purposes and were not disclosed to unauthorized individuals. In compliance with Republic Act No. 10173, otherwise known as the Data Privacy Act of 2012, all research records will be retained for the period required by institutional policy and will thereafter be permanently deleted from electronic storage. Printed questionnaires will be securely shredded or otherwise destroyed after the prescribed retention period to protect the privacy and confidentiality of the participants.

AI-Assisted Writing Disclosure

Grammarly AI was used solely to assist with grammar, spelling, punctuation, clarity, sentence construction, and readability during the preparation of the manuscript. The AI tool was not used to generate research data, conduct statistical analyses, interpret findings, or formulate conclusions. The researcher independently reviewed, verified, and approved all content and assumes full responsibility for the accuracy, originality, integrity, and final content of the manuscript.

RESULTS AND DISCUSSION

1. Demographic Profile of the Respondents

To understand the characteristics of the study participants and their potential influence on the research findings, a demographic profile of the respondents was developed. This section outlines the respondents' demographic profiles, including their highest educational attainment, seminars attended, and number of years in teaching CSS.

1.1 Highest educational attainment. This section presents the distribution of educational levels among the respondents, including the percentage of the respondents with various degrees and certifications.

Table 2

Respondents' Highest Educational Attainment

	Frequency	Percent
Bachelor's Degree	55	71.4
Advanced Degree	22	28.6
Total	**77**	**100**

As shown in Table 2, most respondents held a bachelor's degree as their highest educational attainment, while a smaller proportion had completed advanced degrees. This indicates that bachelor's degree holders comprised the largest educational attainment group among the respondents. Educational attainment was included as one of the respondents' profile variables and was subsequently examined in relation to their compliance with health and safety measures in teaching Computer Systems Servicing (CSS). Educational preparation may contribute to the development of professional competencies that support teachers in performing their instructional responsibilities and applying appropriate practices in the workplace (Long et al., 2014). However, the present study does not assume that educational attainment alone determines teachers' compliance with health and safety measures. Rather, the potential association between these variables was examined empirically through the statistical analyses conducted in the study.

1.2 Seminars attended. In order to gain insights into the professional development activities of the respondents, the number of seminars they attended was examined. Below is the tabulated frequency of the number of seminars they attended in relation to health and safety measures.

Table 3

Respondents' Number of Seminars Attended

	Frequency	Percent
1 - 5 Seminars	52	67.5
6 Seminars and More	25	32.5
Total	**77**	**100**

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Table 3 shows that most respondents had attended one to five seminars, while approximately one-third had attended six or more seminars. This finding describes the respondents' participation in professional development activities based on the number of seminars they had attended. Participation in professional development activities provides educators with opportunities to strengthen their competencies and improve instructional practices (Tasnim et al., 2020). Likewise, occupational safety and health education and training can enhance educators' knowledge and preparedness for implementing workplace safety practices (Rauscher et al., 2020). Nevertheless, the present findings describe only the respondents' reported seminar attendance and do not establish a causal relationship between participation in seminars and compliance with health and safety measures.

1.3 Number of years teaching CSS. Years of service in a particular field offer numerous benefits that include an increase in expertise, enhanced reputation, greater confidence, and financial security. Accordingly, assessing the years spent teaching CSS provides insight into how instructional expertise relates to the implementation of occupational health and safety protocols.

Table 4

Respondents' Number of Years in Teaching CSS

	Frequency	Percent
5 years and below	45	58.4
6 years and above	32	41.6
Total	**77**	**100**

Table 4 shows that most respondents had been teaching Computer Systems Servicing (CSS) for five years or less, while a smaller proportion had more than five years of teaching experience. This indicates that teachers with five years or less of CSS teaching experience constituted the majority of the study sample. Years of teaching experience were included as one of the respondents' profile variables and were subsequently examined in relation to their compliance with health and safety measures concerning prolonged computer use, ergonomic issues, and stress-related concerns. Professional competencies developed through teaching practice may support educators in carrying out their instructional responsibilities effectively (Long et al., 2014). However, the present study does not assume that years of teaching experience determine compliance with health and safety measures. Rather, the potential association between teaching experience and compliance was examined empirically through the statistical analyses conducted in the study.

2. Health and Safety Measures in Teaching Computer Systems Servicing (CSS)

Teaching Computer Systems Servicing (CSS) involves unique health and safety considerations because of prolonged computer use, laboratory-based activities, and the operation of technical equipment. This section explores the essential health and safety measures that need to be implemented in the classroom by teachers. By understanding and addressing potential hazards, educators can create a safe and conducive learning environment for CSS.

2.1 Prolonged Computer Use. In today's digital age, computers have become an integral part of daily life. The increase in screen time has also raised concerns about prolonged exposure to computer screens. This section investigates the practices educators employ to mitigate the effects of prolonged computer exposure.

Table 5

Assessment on the Compliance of CSS Teachers on Health and Safety Measures Relative to Prolonged Computer Use

		WM	VI
1.	Maintain proper ventilation and lighting while using the computer every day.	3.64	VHC
2.	Maintain a comfortable workplace during prolonged computer use.	3.57	VHC
3.	Frequently look away from the screen and focus on far away objects.	3.55	VHC
4.	Balance computer use by setting time limits and breaks.	3.55	VHC
5.	Usually wear prescription glasses to reduce eye strain and eye discomfort.	3.53	VHC
6.	Keep the screen clean and use a desk lamp to make it easier to see.	3.52	VHC
7.	Ensure the screen covers are easy to look at and that the characters are sharp and legible.	3.52	VHC
8.	Frequently take a break from using the computer to rest the eyes.	3.48	HC
9.	Adjust the brightness of the computer screen depending on the learners' needs.	3.43	HC
10.	Set blue light colors when using a computer to reduce eye strain.	3.36	HC

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COMPOSITE MEAN	**3.51**	**VHC**

Note: *VHC - Very High Compliance HC - High Compliance*

Table 5 shows that the respondents demonstrated a very high level of self-reported compliance with health and safety measures related to prolonged computer use, as indicated by the composite mean of 3.51. Among the indicators, maintaining proper ventilation and adequate lighting while using computers obtained the highest weighted mean, whereas setting blue-light colors to reduce eye strain received the lowest weighted mean. Nevertheless, the latter indicator remained within the high compliance category. This pattern suggests that respondents reported stronger adherence to environmental and workspace-related practices than to certain screen-related protective measures. Similar preventive and ergonomic practices have been emphasized in previous studies addressing computer-related health risks, workstation conditions, visual problems, and ergonomic considerations (Akinbo & Omideyi, 2022; Asaolu & Itsekor, 2014; Habibzadeh, 2018; Lin et al., 2017; Shantakumari et al., 2014). However, the present study measured only the respondents' self-reported compliance with these health and safety measures and did not directly assess their effects on health, productivity, or other work-related outcomes.

2.2 Ergonomic issues. Prolonged exposure to computers can lead to health problems including eye strain, physical fatigue, and mental health issues. As computer usage becomes increasingly prevalent, especially among educators of computer-related subjects who spend the majority of their time exposed to computers and possible radiation, it is imperative to address the ergonomic issues and concerns associated with prolonged exposure to computers and possible radiation emitted by the device, which will be discussed in this section.

Table 6

Assessment of CSS Teachers' Compliance with Health and Safety Measures Relative to Ergonomic Issues

		WM	***VI***
1.	Alternate tasks and change positions to avoid prolonged sitting.	3.62	VHC
2.	Ensure that the computer screen and the eyes are positioned at the same level.	3.60	VHC
3.	Position the computer in the center to straighten the neck position.	3.58	VHC
4.	Follow the prescribed guidelines by the institutions in maintaining proper ergonomics in the working station.	3.56	VHC
5.	Keep shoulders relaxed with elbows close to the body.	3.52	VHC
6.	Utilize the ergonomic workshops for managing issues offered by the institutions.	3.51	VHC
7.	Maintain good posture when working at the keyboard.	3.48	HC
8.	Incorporate physical activities into the daily routine to reduce ergonomic issues.	3.48	HC
9.	Maintain proper posture when working at the computer table.	3.39	HC
10.	Keep your feet supported on the floor or on a footrest when you work to reduce pressure on the lower back.	3.38	HC
	COMPOSITE MEAN	**3.51**	**VHC**

Note: *VHC - Very High Compliance HC - High Compliance*

Table 6 shows that the respondents demonstrated a very high level of self-reported compliance with health and safety measures related to ergonomic issues, as indicated by the composite mean of 3.51. Among the indicators, alternating tasks and changing positions to avoid prolonged sitting obtained the highest weighted mean, followed by maintaining the computer screen at eye level and positioning the computer centrally to support proper neck alignment. In contrast, maintaining proper posture while working at the computer table and keeping the feet supported on the floor or a footrest received comparatively lower weighted means, although both remained within the high compliance category. This pattern suggests stronger reported adherence to workstation positioning and task-variation practices than to certain sustained postural practices. These findings are consistent with ergonomic literature emphasizing the importance of appropriate workstation design, proper posture, and regular movement in computer-based work environments (Akinbo & Omideyi, 2022; Asaolu & Itsekor, 2014; Lin et al., 2017; Silva, 2021; Zelik et al., 2022). However, the present study assessed only the respondents' self-reported compliance with ergonomic health and safety measures and did not directly measure musculoskeletal disorders, circulation, productivity, or other health-related outcomes.

2.3 Stress-related. An increase in screen time, particularly among CSS teachers who rely heavily on computers, has been linked to a myriad of health issues such as physical ailments. Beyond its physical effects, prolonged computer

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use may also contribute to psychological stress and other stress-related concerns. This section presents the respondents' assessment of their compliance with health and safety measures related to stress management.

Table 7
Assessment on the Compliance of CSS Teacher on Health and Safety Measures Relative to Stress-Related Issues

		WM	VI
1.	Get enough time to relax and rest the mind from work.	3.53	VHC
2.	Manage workloads and activities effectively and efficiently.	3.53	VHC
3.	Adopt teaching setups that reduce physical and mental exhaustion.	3.51	VHC
4.	Establish mind relaxation when stressed.	3.49	HC
5.	Increase social interactions to reduce stress from work.	3.45	HC
6.	Create proper stress management in a flexible way.	3.44	HC
7.	Attend several stress management training and awareness classes at school.	3.39	HC
8.	Take regular check-ups and professional consultation.	3.34	HC
9.	Take regular breaks, such as having a hot beverage or light refreshments.	3.27	HC
10.	Take stress-related leave when necessary.	3.26	HC
	COMPOSITE MEAN	**3.42**	**HC**

Note: VHC - Very High Compliance HC - High Compliance

Table 7 shows that the respondents demonstrated a high level of self-reported compliance with health and safety measures related to stress, as indicated by the composite mean of 3.42. This composite mean was comparatively lower than those obtained for prolonged computer use (3.51, Very High Compliance) and ergonomic issues (3.51, Very High Compliance), suggesting that respondents reported relatively lower compliance with stress-related health and safety measures than with the other two dimensions. Among the indicators, having sufficient time to relax and rest from work and managing workloads and activities effectively and efficiently obtained the highest weighted means, followed by practicing teaching setups that reduce physical and mental strain. In contrast, attending regular medical check-ups, taking regular breaks such as drinking a cup of tea, and taking time off from work due to stress-related concerns received comparatively lower weighted means, although all remained within the high compliance category. This pattern suggests that respondents reported stronger adherence to workload management and rest-related practices than to certain stress-management and recovery practices. Previous studies have emphasized the importance of promoting employee well-being, managing occupational stress, and implementing organizational and preventive practices to support a healthy work environment (American Psychological Association, 2024; Fernández-Batanero et al., 2021; Souto et al., 2019). However, the present study assessed only the respondents' self-reported compliance with stress-related health and safety measures and did not directly measure stress levels, mental health outcomes, productivity, or the effectiveness of these practices.

3. Association Between Respondents' Profile and Their Compliance to Health and Safety Measures in Teaching Computer Systems Servicing (CSS)

In teaching CSS, educators must maintain health and safety measures regardless of their demographic profile. This section will discuss the association of the respondent's profile and their assessment of compliance with health and safety measures relative to prolonged computer use, ergonomic issues, and stress-related concerns.

Table 8
Association Between Respondents' Profile and their Compliance with the Health and Safety Measures Relative to Prolonged Computer Use

Prolonged Computer Use					
	χ^2 value	**φ-coefficient**	***p*-value**	**Decision on H_0**	**Interpretation**
HEA	0.462	-0.077	0.336	Failed to Reject	Not Significant
SA	1.298	-0.13	0.188	Failed to Reject	Not Significant
NYT CSS	1.814	-0.153	0.135	Failed to Reject	Not Significant

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Note: HEA = Highest Educational Attainment; SA = Seminars Attended; NYT CSS=Number of Years Teaching CSS; Degree of Association; ±.80-±1.00 (Very Strong); ±.60-±.79 (Strong); ±.40-±.59 (Moderate); ±.20-±.39 (Weak); .00-±.19 (Very Weak)

Table 8 shows that the study found no statistically significant associations between the respondents' profile variables, namely highest educational attainment, number of health and safety seminars attended, and years of teaching Computer Systems Servicing (CSS), and their self-reported compliance with health and safety measures related to prolonged computer use. For highest educational attainment, the analysis yielded χ^2 (1, N = 77) = 0.462, p = .336, with a very weak negative association (φ = −.077). Similarly, the number of health and safety seminars attended was not significantly associated with compliance, χ^2 (1, N = 77) = 1.298, p = .188, with a very weak negative association (φ = −.130). Likewise, years of teaching CSS was not significantly associated with compliance, χ^2 (1, N = 77) = 1.814, p = .135, and demonstrated a very weak negative association (φ = −.153). The use of quantitative statistical procedures to examine associations among variables provides an empirical basis for describing and interpreting relationships observed in quantitative research (Miksza & Elpus,2018).

These findings suggest that respondents' reported compliance was relatively similar across the profile categories examined in the study. The absence of statistically significant associations indicates that differences in highest educational attainment, number of health and safety seminars attended, and years of CSS teaching experience were not sufficiently associated with variations in reported compliance with health and safety measures related to prolonged computer use within the sample. Although occupational health and safety education and training are recognized as important components of workplace safety, the present findings suggest that participation in seminars alone may not necessarily correspond to statistically significant differences in self-reported compliance within the study population (Rauscher et al., 2020). These results should be interpreted within the context of the present study and should not be generalized beyond the target population without considering the study's research design, sampling procedure, measurement approach, and contextual limitations.

Table 9

Association Between Respondents' Profile and their Compliance with the Health and Safety Measures Relative to Ergonomic Issues

Ergonomic Issues					
	χ^2 value	**φ-coefficient**	**p-value**	**Decision on H_0**	**Interpretation**
HEA	0.048	0.025	0.517	Failed to Reject	Not Significant
SA	0.711	0.096	0.276	Failed to Reject	Not Significant
NYT CSS	0.018	-0.015	0.539	Failed to Reject	Not Significant

Note: HEA = Highest Educational Attainment; SA = Seminars Attended; NYT CSS=Number of Years Teaching CSS; Degree of Association; ±.80-±1.00 (Very Strong); ±.60-±.79 (Strong); ±.40-±.59 (Moderate); ±.20-±.39 (Weak); .00-±.19 (Very Weak)

Table 9 shows that the study found no statistically significant associations between the respondents' profile variables and their self-reported compliance with health and safety measures related to ergonomic issues. Specifically, highest educational attainment was not significantly associated with ergonomic compliance, χ^2(1, N = 77) = 0.048, p = .517, with a very weak positive association (φ = .025). Similarly, the number of health and safety seminars attended was not significantly associated with ergonomic compliance, χ^2(1, N = 77) = 0.711, p = .276, with a very weak positive association (φ = .096). Likewise, years of teaching Computer Systems Servicing (CSS) was not significantly associated with ergonomic compliance, χ^2(1, N = 77) = 0.018, p = .539, with a very weak negative association (φ = −.015).

These findings suggest that respondents' self-reported ergonomic compliance was relatively similar across the profile categories examined in the study. The results indicate that differences in highest educational attainment, number of health and safety seminars attended, and years of teaching CSS were not significantly associated with variations in compliance with ergonomic health and safety measures within the sample. Although ergonomic practices may also be influenced by contextual factors such as workstation design, environmental conditions, and organizational practices, these factors were not directly examined in the present study. Previous studies have highlighted the importance of proper computer workstation design, ergonomic principles, and appropriate work practices in promoting safer and healthier computer-based work environments (Akinbo & Omideyi, 2022; Asaolu & Itsekor, 2014; Lin et al., 2017). Therefore, the present findings should be interpreted within the scope of the variables examined and should not be

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taken to establish the influence of other contextual factors, such as institutional support, availability of ergonomic resources, or workplace practices, on teachers' compliance with health and safety measures.

Table 10

Association Between Respondents' Profile and their Compliance with the Health and Safety Measures Relative to Stress-Related Issues

Stress-Related Issues					
	χ^2 value	φ-coefficient	p-value	Decision on H_0	Interpretation
HEA	0.257	-0.058	0.399	Failed to Reject	Not Significant
SA	0.444	0.076	0.338	Failed to Reject	Not Significant
NYT CSS	0.045	-0.024	0.508	Failed to Reject	Not Significant

Note: HEA = Highest Educational Attainment; SA = Seminars Attended; NYT CSS=Number of Years Teaching CSS; Degree of Association; ±.80-±1.00 (Very Strong); ±.60-±.79 (Strong); ±.40-±.59 (Moderate); ±.20-±.39 (Weak); .00-±.19 (Very Weak)

Table 10 shows that the study found no statistically significant associations between the respondents' profile variables and their self-reported compliance with health and safety measures related to stress-related concerns. Specifically, highest educational attainment was not significantly associated with compliance with stress-related health and safety measures, χ^2 (1, N = 77) = 0.257, p = .399, with a very weak negative association (φ = −.058). Similarly, the number of health and safety seminars attended was not significantly associated with compliance, χ^2 (1, N = 77) = 0.444, p = .338, with a very weak positive association (φ = .076). Likewise, years of teaching Computer Systems Servicing (CSS) was not significantly associated with compliance with stress-related health and safety measures, χ^2 (1, N = 77) = 0.045, p = .508, demonstrating a very weak negative association (φ = −.024).

These findings suggest that respondents' reported compliance with stress-related health and safety measures was relatively similar across the profile categories examined in the study. Previous studies have emphasized that occupational stress and well-being in educational settings may be influenced by multiple interacting factors, including technology-related demands, working conditions, organizational support, and psychosocial factors, rather than by individual characteristics alone (Fernández-Batanero et al., 2021; Souto et al., 2019). Thus, the absence of statistically significant associations in the present study indicates that the respondents' highest educational attainment, number of health and safety seminars attended, and years of CSS teaching experience were not significantly associated with variations in their reported compliance with stress-related health and safety measures within the study population.

Across the three dimensions examined—prolonged computer use, ergonomic issues, and stress-related concerns-the study consistently found no statistically significant associations between the respondents' profile variables and their reported compliance with health and safety measures. This overall pattern suggests that compliance may be associated with organizational, environmental, technological, and behavioral factors that were not directly measured in the present study. Consequently, future research may consider examining factors such as institutional support, workload, availability of health and safety resources, workplace conditions, safety culture, and other contextual variables that may be associated with teachers' implementation of health and safety measures.

4. Challenges Met in Health and Safety Measures in Teaching Computer Systems Servicing (CSS)

The increasing integration of technology into education has expanded the use of computers and other digital resources in teaching and learning. Consequently, Computer Systems Servicing (CSS) teachers encounter various challenges associated with technology-intensive instruction. Common challenges encountered by CSS teachers include limited resources, inadequate professional training, and the need to adapt to evolving technological and instructional requirements.

Table 11

Challenges Met in Health and Safety Measure of CSS Teachers

		WM	VI
1.	Awareness of safety guidelines in teaching Computer Systems Servicing.	3.57	SA
2.	Enhancing the capability to make instant decisions related to health situations.	3.55	SA
3.	Access to adequate training for health and safety purposes.	3.52	SA

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4.	Ability to manage difficult working conditions.	3.48	A
5.	Accessible safety standards at the working office.	3.47	A
6.	Experienced adequate training and quality resources.	3.45	A
7.	Efficient guidance on following the health and safety guidelines.	3.44	A
8.	Capacity to manage emotional stress during daily activities.	3.44	A
9.	Adequate knowledge about health and safety measures.	3.40	A
10.	Availability of safety equipment for managing the workplace environment.	3.34	A
	COMPOSITE MEAN	**3.47**	**A**

Note: *SA – Strongly Agree* *A - Agree*

Table 11 presents the respondents' level of agreement with statements related to health and safety measures in teaching Computer Systems Servicing (CSS), with an overall weighted mean of 3.47, interpreted as Agree. The highest-rated statements concerned awareness of safety guidelines in teaching CSS (WM = 3.57), the capability to make immediate decisions in health-related situations (WM = 3.55), and having adequate training for health and safety purposes (WM = 3.52), all of which were interpreted as Strongly Agree. The remaining indicators, including the ability to manage difficult working conditions, accessibility of safety standards, adequacy of training and quality resources, guidance on health and safety guidelines, capacity to manage emotional stress, knowledge of health and safety measures, and availability of safety equipment, were all rated Agree.

The pattern of responses indicates that respondents generally agreed with positive statements describing their health and safety practices and workplace conditions. The highest levels of agreement were observed in relation to awareness of safety guidelines, decision-making capability in health-related situations, and health and safety training, whereas comparatively lower levels of agreement were reported regarding the availability of safety equipment and knowledge of health and safety measures. These findings are consistent with previous studies emphasizing the importance of occupational health and safety education, organizational commitment, safety training, and access to appropriate resources in promoting effective health and safety practices (Department of Labor and Employment, 2020; International Labour Organization, 2022; Mubita et al., 2023; Rauscher et al., 2020). However, the present study measured only the respondents' level of agreement with the presented statements and did not directly assess organizational deficiencies, coping strategies, resilience, or the effectiveness of institutional health and safety programs.

5. Health and Safety Intervention for Computer Systems Servicing (CSS) Teachers

Table 12
Health and Safety Intervention for CSS Teachers

Objectives	Intervention Activities	Responsible Office	Expected Outcome
Enhance health and safety practices related to prolonged computer use.	Conduct seminars on digital wellness, proper screen time, eye care, and healthy computer work habits.	School Heads, ICT Coordinator, CSS Coordinator	Improved awareness and sustained compliance with safe computer use.
Strengthen ergonomic practices in CSS laboratories.	Provide ergonomic training, workstation assessments, and promote proper posture and stretching exercises.	School Administration, CSS Coordinator	Improved ergonomic practices and reduced ergonomic risks.
Promote teachers' stress management and well-being.	Organize stress management seminars, wellness activities, and mental health awareness programs.	Guidance Office, School Head	Improved stress management and teacher well-being.

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Improve awareness of health and safety guidelines.	Conduct orientation on laboratory safety policies, emergency procedures, and occupational health standards.	School Head, Safety Officer	Increased awareness of health and safety policies.
Enhance emergency preparedness.	Conduct first aid training and emergency response drills.	DRRM Coordinator, School Nurse	Increased preparedness during health and safety emergencies.
Strengthen continuous professional development.	Provide regular health, safety, and CSS-related training and workshops.	Schools Division Office, School Administration	Increased participation in professional development programs.
Sustain monitoring of health and safety compliance.	Conduct regular monitoring, classroom observations, and periodic safety evaluations.	School Head, CSS Coordinator	Continuous improvement in health and safety compliance.

The proposed Health and Safety Enhancement Program was developed based on the findings of the study, which revealed very high compliance with health and safety measures related to prolonged computer use and ergonomic issues and high compliance with stress-related health and safety measures among Computer Systems Servicing (CSS) teachers. Although the respondents generally demonstrated favorable levels of compliance across all three dimensions, the findings underscore the importance of sustaining and further strengthening existing health and safety practices through continuous institutional support. Accordingly, the proposed program focuses on continuous professional development, ergonomic workplace improvement, wellness and stress-management initiatives, health and safety orientation, emergency preparedness, and regular compliance monitoring to reinforce safe teaching practices in CSS instructional and laboratory environments. These interventions are consistent with the literature emphasizing that effective occupational health and safety management requires not only individual compliance but also organizational commitment, continuous training, and supportive workplace policies (Department of Labor and Employment, 2020; International Labour Organization, 2022; Mubita et al., 2023).

Considering the technology-intensive nature of Computer Systems Servicing instruction, teachers are regularly engaged in prolonged computer use, repetitive tasks, and extended screen exposure, which may be associated with visual discomfort, musculoskeletal strain, and other work-related health concerns when appropriate preventive measures are not consistently practiced (Habibzadeh, 2018; Shantakumari et al., 2014). Maintaining ergonomically appropriate workstations, practicing proper posture, and ensuring suitable workstation arrangements are therefore important components of occupational health and safety in computer-based work environments (Akinbo & Omideyi, 2022; Asaolu & Itsekor, 2014; Lin et al., 2017; Silva, 2021). In addition, wellness programs and stress-management activities may support teachers' psychological well-being, particularly given the potential for work-related stress in technology-intensive teaching environments (American Psychological Association, 2024; Fernández-Batanero et al., 2021; Souto et al., 2019).

Furthermore, continuous professional development through seminars, workshops, and health and safety orientations can reinforce teachers' awareness of occupational health and safety standards and support the consistent application of safe practices within CSS instructional and laboratory environments (Department of Labor and Employment, 2020; Isaev & Astashova, 2018; Rauscher et al., 2020). Regular monitoring and evaluation of compliance with health and safety measures may also assist school administrators in identifying areas requiring additional support and improvement while promoting a culture of safety within educational institutions (García-Herrero et al., 2012; Mubita et al., 2023; Rahanu et al., 2018). The proposed Health and Safety Enhancement Program provides a practical framework for sustaining and strengthening occupational health and safety, ergonomic practices, psychosocial well-being, and safe instructional practices, thereby supporting a safer and healthier teaching environment for Computer Systems Servicing teachers.

Conclusions

The study showed that most respondents held bachelor's degrees, had attended one to five health and safety seminars, and had been teaching Computer Systems Servicing (CSS) for five years or less. These findings describe the predominant educational attainment, professional development participation, and teaching experience of the CSS teachers included in the study.

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The respondents reported very high compliance with health and safety measures related to prolonged computer use and ergonomic issues and high compliance with stress-related health and safety measures. The comparatively lower composite mean for stress-related concerns indicates that psychosocial health and safety practices were relatively less highly rated than practices related to prolonged computer use and ergonomic issues. Taken together, these findings demonstrate that health and safety in technology-intensive teaching encompasses interconnected physical, ergonomic, and psychosocial dimensions.

Based on the inferential analyses, no statistically significant associations were found between the selected profile variables and compliance with health and safety measures related to prolonged computer use, ergonomic issues, and stress-related concerns. Thus, the study did not provide sufficient statistical evidence that highest educational attainment, number of health and safety seminars attended, or years of teaching CSS were associated with differences in compliance within the sample. These findings should be interpreted within the scope of the variables examined and do not establish that other individual, institutional, or workplace factors determine teachers' compliance with health and safety measures.

The study contributes context-specific evidence to the interdisciplinary understanding of health and safety in Computer Systems Servicing education by integrating technology-intensive teaching, occupational health and safety, ergonomics, and psychosocial well-being within a single empirical investigation. The findings underscore the value of examining teachers' health and safety as a multidimensional concern in technology-intensive educational environments and highlight the importance of sustaining institutional support and strengthening health and safety practices in CSS instructional and laboratory settings.

Recommendations

Based on the study's findings, school heads and educational administrators should sustain existing health and safety practices related to prolonged computer use and ergonomic issues while giving additional attention to stress-related health and safety measures, which obtained a comparatively lower composite mean than the other dimensions examined. Teacher support initiatives may include evidence-informed activities related to adequate rest, workload management, stress awareness, and access to appropriate professional support.

Computer Systems Servicing (CSS) teachers may be provided with continuing opportunities to review and apply health and safety measures relevant to technology-intensive teaching. Professional development activities may integrate occupational health and safety, ergonomics, responsible computer use, and psychosocial well-being to reflect the multidimensional nature of teachers' work in CSS instructional and laboratory environments.

Schools and Schools Division Offices may implement structured health and safety monitoring mechanisms to periodically assess practices related to prolonged computer use, workstation ergonomics, and stress-related concerns. The results of such monitoring may provide a basis for developing context-specific support and improvement initiatives rather than assuming that teachers' educational attainment, seminar attendance, or teaching experience alone explain differences in compliance with health and safety measures.

Researchers may further examine organizational, technological, psychosocial, and workplace factors that were not measured in the present study. Future research may investigate institutional health and safety support, workload conditions, safety climate, access to ergonomic resources, technostress, and other potential factors using larger samples, multiple educational settings, and research designs capable of examining factors associated with health and safety compliance.

The proposed Health and Safety Toolkit may be retained as a study output only if its components are explicitly grounded in the verified empirical findings and formally presented in the manuscript. Its proposed content may be mapped to specific indicators that received comparatively lower ratings or to verified challenges identified through the original research instrument. This approach would ensure that the toolkit is directly aligned with the evidence generated by the study and addresses identified areas for sustaining or strengthening health and safety practices among CSS teachers.

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