

Influence of Teachers Webinars to Professional Development

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Abstract:

This study investigated the influence of webinars to public high school teachers in terms of the domains of the Philippine Professional Standards for Teachers (PPST). Variables namely age, sex, highest educational attainment, teaching experience, and number of webinars attended were considered in the study. Comparative data analysis was used to determine the significance of the differences in the categories of the variables. Results revealed that public high school teachers were highly influenced by webinars in domains (1) content knowledge and pedagogy, (3) diversity of learners, (4) curriculum planning (5) assessment and reporting, and (8) plus factor. Additionally, public high school teachers were very highly influenced by webinars in domains (2) learning environment, (6) community linkages & professional engagement, (7) professional growth & professional development. Some of the differences in the influence of webinars to public school teachers were found to be statistically significant in all domains when grouped according to the variables.

Keywords: Influence, professional development, teachers, webinars

Introduction:

Nature of the Problem

The role of teachers in cultivating an educated citizenry is vital, and their professional development is crucial for enhancing skills and improving student outcomes. According to Kampen (2019), professional development encompasses continuing education efforts for educators. Sekar (2020) highlights that teacher professional learning is essential for equipping students with complex 21st-century skills. Effective professional development helps teachers refine instructional methods to foster these abilities (Darling-Hammond et al., 2017).

The COVID-19 pandemic hindered teachers' professional growth, limiting their ability to attend in-person seminars and conferences. Despite this, teachers adapted by leveraging opportunities for growth through webinars, which allowed them to learn from renowned speakers while remaining at home or in their institutions. Webinars, as described by Sekar (2020), are web-based seminars enabling participants and facilitators to connect in real time through voice-over IP and web cameras, providing a new realm of learning opportunities.

Even up to this day, teachers and other educators can interface online from all things considered. Webinars are a great way of sufficing the knowledge and skills needed by the teacher to gain professional development. This was confirmed by Tenebro (2020) in her study on webinars for professional development where the influence of webinars on the professional development of teachers is high which means that attending webinars can help teachers grow professionally especially in instructional materials development. Likewise, Magallanes (2021) in her study revealed that the professional development of science teachers during the pandemic was great which also reflects good impact of webinars on the professional development of teachers.

However, these are few studies conducted during the onset of the Covid-19 pandemic and rare are the studies conducted after more than two years of Covid-19 pandemic where normal face-to-face classes are coming back. It is for these reason that the researcher wanted to conduct an investigation on the influence of teachers' webinars to professional development as basis for the upskilling of teachers.

Current State of Knowledge

Teacher professional learning is essential for equipping students with 21st-century skills such as critical thinking, problem-solving, communication, and collaboration. Effective professional development (PD) supports teachers in refining instructional strategies to foster these competencies (Darling-Hammond et al., 2017). PD is ongoing, incorporating training, practice, feedback, and follow-up support. Successful programs mirror the learning activities

teachers use with students and promote collaborative learning communities. There is increasing interest in schools as learning organizations where teachers systematically share expertise and experiences.

Rao (2019) emphasized that webinars are cost-effective, accessible tools for enhancing knowledge and skills, initially popular in business but now widely adopted in education. They support teachers' professional development by introducing innovative techniques and methods, particularly in teaching English as a foreign language, where they help improve vocabulary, grammar, and pronunciation. Similarly, Beckmann (2019) highlighted webinars as powerful tools in mathematics education, promoting subject-specific skills while providing valuable digital learning experiences for students.

Moreover, Tenebro (2021) highlighted the growing use of digital learning environments, particularly webinars and web conferencing, in higher education. These tools enable real-time interaction between participants and facilitators across geographical distances using virtual platforms, voice-over IP, and webcams. Toquero (2020) emphasized the importance of adequate teacher training, supported by educational apps, for effective online course delivery. This training enhances student learning and aligns with institutional goals. Tenebro's research also revealed that webinars had a significant impact on teachers' professional development across various demographic factors such as sex, age, civil status, educational attainment, teaching experience, and webinar participation. Notably, female teachers showed greater improvements in instructional materials development, while single teachers excelled in ICT teaching skills, subject mastery, and assessment. Less experienced teachers benefited more in ICT skills, and the overall influence of webinars was consistent across educational attainment and webinar attendance. This study aims to explore teachers' and students' perspectives on online teaching, focusing on identifying their key needs and expectations.

Gegenfurtner and Ebner (2019) found mixed evidence regarding the effectiveness of webinars in enhancing student achievement, with webinars showing slightly better outcomes compared to asynchronous online platforms and face-to-face instruction, though the differences were minimal. These findings offer valuable insights for educators, trainers, and technologists in designing and assessing webinar-based learning environments. Similarly, Magallanes (2021) explored the professional development of public-school teachers during the pandemic, revealing that while the overall development of science teachers was moderate, it varied across demographic factors such as sex, age, educational attainment, and teaching experience.

Further, Fajardo (2021) explored how the Philippine educational system is adapting to provide quality education amid the pandemic, with a focus on teachers' professional development. As schools evolve, many teachers continue attending training, particularly in Information and Communications Technology (ICT), to enhance their skills. The study identified key competencies teachers and students believe are essential, with tech-savviness ranked lowest, and qualities like knowledgeability, empathy, creativity, humor, and discipline as top priorities. The study also addressed challenges faced by teachers in the VUCA (Volatile, Uncertain, Complex, and Ambiguous) environment, offering recommendations for improvement through the L-U-V (Learning, Understanding, Visualizing) approach and the 3R's (Rechecking, Revisiting, and Aligning).

Theoretical Underpinnings

The study was anchored on the socio-cultural theory which states that all human activity, including the learning of teachers, is historically, socially, culturally and temporally situated (Mansour 2013; Vygotsky 1978). This suggests that the experiences and contexts of teachers will have a major influence on their learning to teach and implies a need to pay attention not only to the challenges, opportunities and context of aspects of learning (in this case initiatives of continuing professional development), but also to the voices and perspectives of the individuals taking part in professional development.

Likewise, Kendra (2022) underscore that sociocultural theory is an emerging theory in psychology that looks at the important contributions that society makes to individual development. This theory stresses the interaction between developing people and the culture in which they live. Sociocultural theory also suggests that human learning is largely a social process. Thus, this theory focuses not only how adults and peers influence individual learning, but also on how cultural beliefs and attitudes affect how learning takes place.

This research therefore argues that teachers should grow professionally even during those times of Covid-19 pandemic, and researchers should consider the socio-cultural-political contexts when interpreting teachers' professional development.

Objectives

This study aimed to determine the influence of webinars on the professional development of public high school teachers among national high schools in one of the cities school's divisions of Negros Occidental after more than two years of the Covid-19 pandemic during the school year 2023-2024. Specifically, the study sought to answer the following questions: 1) the extent of the influence of the webinars on the professional development of public high

school teachers in terms of the following domains as content knowledge and pedagogy, learning environment, and Diversity of learners, curriculum and planning, assessment and reporting, community linkages and professional engagement and personal growth and development, and plus factor; and 2) the significant difference in the level of influence of webinars on the professional development of teachers when grouped and compared according to the aforementioned variables.

Methodology

This section presents the discussion of the research methodology used, the subjects and respondents of the study, the research instruments used, the validity and reliability of the instruments, the procedure for data gathering, and the statistical tools and procedure for data analysis.

Research Design

This study aimed to determine the influence of webinars on the professional development of public high school teachers in one of the schools in division of Negros Occidental; hence quantitative research is used, more specifically the descriptive research design. According to Creswell (2014), descriptive research provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population. Investigators using this method do not manipulate variables or make things happen. Likewise, Castillo (2007) cited in Lapid (2019) describes descriptive research as a method that defines the nature of existing conditions or determines the relationship that exists between variables.

Study Respondents

The respondents of the study were the public school teachers in one of the schools in a medium-sized division, specifically in District X. The total population of Junior High School and Senior High School teachers is 214. Since the number of respondents is quite large to handle, the researcher decided to use total enumeration. This means that the population of one of the mega schools were considered as actual respondents of the study.

Instruments

A self-designed questionnaire, based on the 2021 Individual Performance Commitment and Review Form (IPCRF), was developed to collect the necessary data for this study. The instrument underwent validation by a jury for accuracy and relevance. It consists of two parts: Part I captures respondent profile information, including age, sex, civil status, highest educational attainment, and the number of webinars attended. Part II assesses the influence of webinars on the professional development of public-school teachers across five areas: (1) content knowledge and pedagogy, (2) learning environments, (3) diversity of learners, curriculum planning, and assessment/reporting, (4) community linkages and professional engagement, and (5) personal growth and development. Each domain contains a varied number of items, which are rated on a scale from 1 to 5, where 5 represents "very high," 4 "high," 3 "average," 2 "low," and 1 "very low." The instrument underwent both validity and reliability testing. Using the Lawshe validity index, a result of 0.91 indicated a very high degree of validity, confirming the instrument's appropriateness for the study. Reliability testing yielded a score of 0.980, which was interpreted as "Excellent."

Data Gathering Procedure

The researcher asked permission from the Public-School District Supervisor and the Schools Division Superintendent. When the permit was granted, the survey questionnaire was then reproduced and distributed to the respondents of the study. The respondents were asked to answer the questionnaire during one of the meetings facilitated by the researcher. Further, questionnaires were gathered, checked, and encoded right after the administration of the questionnaire. The scores were treated accordingly and were subjected to the SPSS software.

Data Analysis and Statistical Treatment

Objective No.1 used a descriptive-analytical scheme and mean to determine the extent of the influence of the webinars on the professional development of public high school teachers in terms of content knowledge and pedagogy, learning environment, diversity of learners, curriculum and planning, and assessment and reporting, community linkages and professional engagement and personal growth and development, and plus factor.

Objective No. 2 used a comparative analytical scheme and Mann-Whitney U Test to determine whether or not a significant difference exists in the extent of the influence of the webinars on the professional development of public high school teachers when they are grouped and compared according to age, sex, civil status, highest educational attainment, and the number of webinars attended.

Ethical Consideration

Participants’ personal demographic information results were collected and were noted in the data capturing sheet. Informed consent via verbal communication was elicited with the respondents. They read and understood the provided information and can ask questions. Moreover, their participation was voluntary, and they were free to withdraw without giving any reasons. The respondents were assured that there would be no risks of harm will experience before, during, or after participating in the research. The data and information used in the study were treated with strict confidentiality. No statement regarding the participant’s identity was disclosed unnecessarily in this study. After the data gathering, since there was no need, debriefing was not done by the researcher anymore, as cited in the Data Privacy Act.

Results and Discussion

This section deals with the presentation, analysis and interpretation of data gathered to carry out the objectives of this study. All these were made possible by following certain appropriate procedures so as to give the exact data and solution to each specific problem.

Table 1

Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Content Knowledge and Pedagogy

Area	Mean	Interpretation
A. Content Knowledge and Pedagogy		
<i>To what extent does the webinar influence your professional development in...</i>		
1. applying the knowledge of content within and across curriculum teaching areas?	4.45	Great Extent
2. using research-based knowledge and principles of teaching and learning to enhance professional practice.	4.43	Great Extent
3. displaying proficient use of Mother Tongue, Filipino, and English to facilitate teaching and learning?	4.46	Great Extent
4. applying effective verbal and nonverbal classroom communication to support learner understanding, participation, engagement, and achievement?	4.47	Great Extent
5. adapting a range of teaching strategies to develop critical and creative thinking as well as other higher order thinking skills?	4.38	Great Extent
Overall Mean	4.44	Great Extent

Table 1 presents the findings of a survey conducted to evaluate the extent of influence of webinars on the professional development of public high school teachers, specifically in the areas of content knowledge and pedagogy. The data showcases the mean scores of 4.47 interpreted as great extent and 4.38 as great extent.

Overall, the aggregated mean score of 4.44 indicates a great extent of influence across all areas of content knowledge and pedagogy. These results emphasize the significant contribution of webinars to the continuous professional development of public high school teachers, fostering improvements in their instructional practices and ultimately benefiting student learning outcomes.

Table 2

Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Learning Environment

Area	Mean	Interpretation
B. Learning Environment		
<i>To what level does the webinar influence your professional development in...</i>		
1. sustaining a learning environment that promotes fairness, respect, and care to encourage learning?	4.66	Very Great Extent
2. supporting a learning environment that nurtures and inspires learners to participate, cooperate and collaborate in continued learning?	4.57	Very Great Extent
3. integrating a range of successful strategies that maintain learning environments that motivate learners to work productively by assuming responsibility for their own learning?	4.56	Very Great Extent
4. establishing safe and secure learning environments to enhance learning through the consistent implementation of policies, guidelines, and procedures?	4.50	Very Great Extent

5. managing learner behavior constructively by applying positive and non-violent discipline to ensure learning-focused environment?	4.54	Very Great Extent
Overall Mean	4.57	Very Great Extent

The results presented in Table 2 highlight the significant influence of webinars on the professional development of public high school teachers in the context of the learning environment. The data showcases the mean scores of 4.66 interpreted as very great extent and 4.50 as very great extent. The overall mean score of 4.57 underscores the comprehensive impact of webinars on enhancing teachers' professional development in creating conducive learning environments. These findings align with the notion that effective learning environments are pivotal for student success and are significantly influenced by teachers' pedagogical skills and classroom management strategies (Brophy & Good, 1986).

The consistently high mean scores across all dimensions affirm the importance of continuous training and support for educators to optimize their teaching practices and positively impact student learning outcomes.

Table 3

Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Diversity of Learners, Curriculum and Planning, and Assessment and Reporting

Area	Mean	Interpretation
C. Diversity of Learners, Curriculum, and Planning, and Assessment and Reporting		
<i>To what level does the webinar influence your professional development in...</i>		
1. designing, adapting, and implementing teaching strategies that are responsive to learners with disabilities, giftedness, and talents?	4.36	Great Extent
2. redesigning culturally appropriate teaching strategies to address the needs of learners from indigenous groups?	4.15	Great Extent
3. modifying and implementing learning programs that ensure relevance and responsiveness to the needs of all learners?	4.45	Great Extent
4. Conducting assessments appropriate to the different subject matter.	4.44	Great Extent
5. utilizing assessment data to inform the modification of teaching and learning practices and programs?	4.45	Great Extent
Overall Mean	4.37	Great Extent

Table 3 provides insight into the influence of webinars on the professional development of public high school teachers, particularly in the realms of diversity of learners, curriculum and planning, and assessment and reporting. The data showcases the mean scores of 4.45 interpreted as great extent and 4.15 as great extent.

The overall mean score of 4.37 indicates a great extent of influence across these dimensions. These findings underscore the importance of continuous professional development for teachers to effectively cater to diverse learners' needs, create culturally inclusive classrooms, and employ assessment practices that support learning outcomes. However, there is still a potential for further enhancement in addressing the needs of indigenous learners, which calls for targeted training and resources in this domain.

This implies that webinars have a notable impact on the professional development of public high school teachers in addressing diversity, curriculum planning, and assessment practices. The high mean scores reflect the valuable role of webinars in helping teachers adapt their strategies and practices to create an inclusive, engaging, and effective learning environment for all students.

Table 4

Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Community Linkages and Professional Engagement and Personal Growth and Development

Area	Mean	Interpretation
D. Community Linkages and Professional Engagement and Professional Growth and Professional Development		
<i>To what level does the webinar influence your professional development in...</i>		
1. maintaining learning environments that are responsive to community contexts?	4.49	Very Great Extent
2. reviewing regular personal teaching practices using existing laws and regulations that apply to the teaching profession and the responsibilities specified in the code of Ethics for Professional teacher?	4.43	Great Extent
3. establishing harmonious relationships with learners, parents, and other stakeholders through partnership in any school activities?	4.60	Very Great Extent

4. building relationship with parents/guardians and the wider school community to facilitate involvement in the educative process?	4.50	Very Great Extent
5. setting professional development goals based on the Philippine Professional Standards for Teachers?	4.60	Very Great Extent
Overall Mean	4.53	Very Great Extent

The findings presented in Table 4 shed light on the considerable influence of webinars on the professional development of public high school teachers within the spheres of community linkages, professional engagement, and personal growth and development. The data showcases the mean scores of 4.60 interpreted as very great extent and 4.43 as great extent.

The overall mean score of 4.53 further underscores the webinars' transformative impact on teachers' professional development across community linkages, professional engagement, and personal growth. This aligns with the understanding that effective education involves not only teaching within the classroom but also engaging with the community and fostering continuous self-improvement (Fullan, 2007).

Results underscores the critical role of webinars in enhancing the professional development of public high school teachers in areas encompassing community engagement, professional conduct, and personal growth. The consistently high mean scores across these dimensions reinforce the importance of webinars in shaping well-rounded educators who are not only skilled in their teaching but also deeply engaged with their communities and committed to ongoing improvement.

Table 5

Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Plus Factor

Area	Mean	Interpretation
D. Plus Factor		
<i>To what level does the webinar influence your professional development in...</i>		
1. performing various related works/activities that contribute to the teaching-learning process?	4.39	Great Extent
2. conducting echo seminars among other teachers through in-service training/LAC sessions?	4.03	Great Extent
3. participating in professional networks to share knowledge and to enhance practice?	4.21	Great Extent
4. applying a personal philosophy of teaching that is learner-centered after attending seminars/LAC sessions?	4.20	Great Extent
5. developing a personal professional improvement plan based on reflection of one's practice and ongoing professional learning?	4.24	Great Extent
Overall Mean	4.21	Great Extent

Table 5 provides valuable insights into the extent to which webinars influence the professional development of public high school teachers, particularly in the "Plus Factor" domain. The data showcases the mean scores of 4.39 interpreted as great extent and 4.03 as great extent.

The overall mean score of 4.21 reinforces the notion that webinars significantly contribute to the "Plus Factor" of teachers' professional development. This encompasses a multifaceted approach that extends beyond classroom teaching, encompassing collaborative activities, knowledge sharing, and self-directed growth (Hargreaves & Fullan, 2012).

Results highlights the considerable impact of webinars on enhancing the "Plus Factor" of public high school teachers' professional development. While maintaining high mean scores, there is potential for further strengthening certain dimensions, such as conducting echo seminars and deepening participation in professional networks. This data underscores the importance of webinars as a versatile tool in equipping teachers to become well-rounded educators who contribute not only to their classrooms but also to the broader educational community.

Table 6

Difference in the Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Content Knowledge and Pedagogy when grouped and compared according to the aforementioned variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	123	116.26	4519.500	0.015	0.05	Significant

	Older	91	95.66			
Sex	Male	96	104.39	5365.500	0.502	Not Significant
	Female	118	110.03			
Highest Educational Attainment	Lower	117	98.06	4570.000	0.013	Significant
	Higher	97	118.89			
Teaching Experience in Years	Shorter	124	117.69	4317.000	0.004	Significant
	Longer	90	93.47			
Number of Seminars Attended	Few	87	86.03	3656.500	0.000	Significant
	Many	127	122.21			

Table 6 presents a comprehensive analysis of the extent to which webinars influence the professional development of public high school teachers concerning content knowledge and pedagogy. The table categorizes and compares the influence according to several variables, such as age, sex, highest educational attainment, teaching experience, and the number of seminars attended. The findings reveal varying levels of significance in the influence of webinars on different professional development aspects based on these variables.

When considering age as a variable, the table indicates a statistically significant difference in the influence of webinars on content knowledge and pedagogy for younger and older teachers ($p = 0.015$). Younger teachers (Mean Rank = 116.26) appear to experience a higher extent of influence compared to their older counterparts (Mean Rank = 95.66). This suggests that webinars may be particularly effective in enhancing the professional development of younger teachers, potentially due to their greater familiarity and comfort with digital learning platforms.

The variable of sex, however, does not yield a statistically significant difference in the influence of webinars on professional development ($p = 0.502$). Male teachers (Mean Rank = 104.39) and female teachers (Mean Rank = 110.03) exhibit relatively similar extents of influence. This result implies that webinars are equally effective for both male and female teachers in terms of content knowledge and pedagogy enhancement.

The highest educational attainment variable presents a significant disparity in the influence of webinars ($p = 0.013$). Teachers with higher educational attainment (Mean Rank = 118.89) report a greater extent of influence compared to those with lower educational attainment (Mean Rank = 98.06). This finding implies that teachers with advanced degrees or qualifications might extract more value from webinars concerning content knowledge and pedagogical development.

Teaching experience also emerges as a significant factor influencing the impact of webinars on professional development ($p = 0.004$). Teachers with shorter teaching experience (Mean Rank = 117.69) indicate a higher extent of influence than those with longer teaching experience (Mean Rank = 93.47). This result suggests that webinars might be particularly valuable for early-career teachers in terms of enhancing their content knowledge and pedagogical practices.

The number of seminars attended stands out as a crucial variable influencing the impact of webinars on professional development ($p < 0.001$). Teachers who have attended many seminars (Mean Rank = 122.21) exhibit a significantly higher extent of influence compared to those who have attended few seminars (Mean Rank = 86.03). This outcome underscores the cumulative effect of engaging in multiple webinars, highlighting the importance of continued professional development through such online learning opportunities.

Table 6 underscores the varying influence of webinars on the professional development of public high school teachers in terms of content knowledge and pedagogy, based on different variables. While factors such as age, educational attainment, teaching experience, and the number of seminars attended demonstrate significant differences, the variable of sex does not appear to be a significant determinant. These findings provide valuable insights for education policymakers, institutions, and educators themselves to tailor professional development initiatives effectively, accounting for teachers' individual characteristics and needs.

Table 7

Difference in the Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Learning Environment when grouped and compared according to the aforementioned variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	123	110.49	5228.500	0.399	0.05	Not Significant

	Older	91	103.46			
Sex	Male	96	97.44	4698.500	0.028	Significant
	Female	118	115.68			
Highest Educational Attainment	Lower	117	99.38	4725.000	0.031	Significant
	Higher	97	117.29			
Teaching Experience Years	Shorter	124	110.18	5248.000	0.446	Not Significant
	Longer	90	103.81			
Number of Seminars Attended	Few	87	82.82	3377.500	0.000	Significant
	Many	127	124.41			

Table 7 presents an insightful analysis of the extent to which webinars influence the professional development of public high school teachers in the context of the learning environment. The table classifies and compares this influence across several variables including age, sex, highest educational attainment, teaching experience, and the number of seminars attended. The findings highlight varying degrees of significance in the impact of webinars on different dimensions of professional development in relation to the learning environment.

When considering age as a variable, the analysis shows that the extent of influence of webinars on the learning environment does not exhibit a statistically significant difference between younger and older teachers ($p = 0.399$). Both younger teachers (Mean Rank = 110.49) and older teachers (Mean Rank = 103.46) seem to experience a relatively similar impact on their professional development in terms of the learning environment. This suggests that the influence of webinars on creating conducive learning environments is consistent across different age groups of teachers.

The variable of sex, however, presents a statistically significant difference in the influence of webinars on professional development ($p = 0.028$). Male teachers (Mean Rank = 97.44) and female teachers (Mean Rank = 115.68) exhibit a discernible difference in the extent of influence on the learning environment. This outcome suggests that webinars might have a more pronounced impact on the professional development of female teachers when it comes to enhancing the learning environment within their classrooms.

Similarly, the highest educational attainment variable reveals a significant disparity in the influence of webinars ($p = 0.031$). Teachers with higher educational attainment (Mean Rank = 117.29) report a substantially higher extent of influence on the learning environment compared to those with lower educational attainment (Mean Rank = 99.38). This finding indicates that teachers with advanced degrees or qualifications might derive greater benefits from webinars in terms of shaping an effective learning environment.

Teaching experience, on the other hand, does not seem to play a significant role in influencing the impact of webinars on the learning environment ($p = 0.446$). Teachers with shorter teaching experience (Mean Rank = 110.18) and those with longer teaching experience (Mean Rank = 103.81) exhibit comparable extents of influence. This suggests that webinars are equally effective in aiding both early-career and experienced teachers in cultivating a positive learning environment.

The number of seminars attended emerges as a significant determinant of the influence of webinars on the learning environment ($p < 0.001$). Teachers who have attended many seminars (Mean Rank = 124.41) experience a significantly higher extent of influence on the learning environment compared to those who have attended few seminars (Mean Rank = 82.82). This underscores the importance of ongoing professional development through webinars in creating and maintaining effective learning environments.

Table 7 underscores the varying influence of webinars on the professional development of public high school teachers in relation to the learning environment, considering different variables. While factors such as sex, highest educational attainment, and the number of seminars attended exhibit significant differences, age and teaching experience do not appear to be significant determinants. These findings provide valuable insights for educational practitioners and policymakers aiming to design tailored professional development initiatives that enhance the learning environment within classrooms.

Table 8

Difference in the Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Diversity of Learners, Curriculum and Planning, and Assessment and Reporting when grouped and compared according to the aforementioned variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	123	116.51	4488.500	0.012		Significant
	Older	91	95.32				
Sex	Male	96	100.17	4960.000	0.112		Significant
	Female	118	113.47				
Highest Educational Attainment	Lower	117	97.79	4539.000	0.011	0.05	Significant
	Higher	97	119.21				
Teaching Experience Years	Shorter	124	112.13	5005.500	0.192		Not Significant
	Longer	90	101.12				
Number of Seminars Attended	Few	87	79.03	3048.000	0.000		Significant
	Many	127	127.00				

Table 8 presents a comprehensive analysis of the extent to which webinars influence the professional development of public high school teachers across different dimensions: diversity of learners, curriculum and planning, and assessment and reporting. The table categorizes and compares this influence based on variables including age, sex, highest educational attainment, teaching experience, and the number of seminars attended. The results reveal varying degrees of significance in the impact of webinars on professional development within these aspects.

Starting with age as a variable, the analysis indicates a statistically significant difference in the extent of influence of webinars on teachers' professional development regarding diversity of learners, curriculum and planning, and assessment and reporting ($p = 0.012$). Younger teachers (Mean Rank = 116.51) experience a higher extent of influence compared to their older counterparts (Mean Rank = 95.32). This suggests that webinars might be particularly effective for younger teachers in enhancing their skills and strategies related to these dimensions of education.

In terms of sex as a variable, a notable distinction arises in the influence of webinars on professional development ($p = 0.112$). Male teachers (Mean Rank = 100.17) and female teachers (Mean Rank = 113.47) exhibit differing extents of influence. This result suggests that webinars may have a more pronounced impact on the professional development of female teachers in terms of diversity of learners, curriculum planning, and assessment techniques.

The highest educational attainment variable shows a significant contrast in the influence of webinars ($p = 0.011$). Teachers with higher educational attainment (Mean Rank = 119.21) report a higher extent of influence compared to those with lower educational attainment (Mean Rank = 97.79). This underscores the potential of webinars to address and support the professional development needs of teachers with advanced qualifications, particularly in relation to catering to diverse learners, curriculum design, and assessment practices.

Teaching experience, however, does not emerge as a significant factor in determining the impact of webinars on professional development in these dimensions ($p = 0.192$). Both teachers with shorter teaching experience (Mean Rank = 112.13) and those with longer teaching experience (Mean Rank = 101.12) exhibit similar extents of influence. This result implies that webinars are equally effective in supporting the professional development of teachers across different experience levels in terms of diversity of learners, curriculum and planning, and assessment and reporting.

The number of seminars attended proves to be a crucial determinant of the influence of webinars on professional development ($p < 0.001$). Teachers who have attended many seminars (Mean Rank = 127.00) experience a significantly higher extent of influence in these areas compared to those who have attended few seminars (Mean Rank = 79.03). This highlights the cumulative effect of engaging in multiple webinars, emphasizing the importance of continued professional development for effectively addressing diverse learners, curriculum design, and assessment strategies.

Table 8 highlights the varying influence of webinars on the professional development of public high school teachers, focusing on diversity of learners, curriculum and planning, and assessment and reporting. The impact varies based on age, sex, highest educational attainment, and the number of seminars attended. These findings provide valuable insights for education stakeholders to design targeted professional development programs that address the specific needs of teachers in these crucial aspects of education.

Table 9

Difference in the Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Community Linkages and Professional Engagement and Personal Growth and Development when grouped and compared according to the aforementioned variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	123	108.79	5437.500	0.717		Not Significant
	Older	91	105.75				
Sex	Male	96	99.26	4872.500	0.073		Not Significant
	Female	118	114.21				
Highest Educational Attainment	Lower	117	99.94	4789.500	0.045	0.05	Significant
	Higher	97	116.62				
Teaching Experience Years	Shorter	124	105.58	5341.500	0.586		Not Significant
	Longer	90	110.15				
Number of Seminars Attended	Few	87	87.33	3769.500	0.000		Significant
	Many	127	121.32				

Table 9 presents a comprehensive analysis of the extent to which webinars influence the professional development of public high school teachers concerning community linkages, professional engagement, personal growth, and development. The table classifies and compares this influence based on variables including age, sex, highest educational attainment, teaching experience, and the number of seminars attended. The results reveal varying degrees of significance in the impact of webinars on different dimensions of professional development within these areas.

Starting with age as a variable, the analysis indicates that the extent of influence of webinars on teachers' professional development in terms of community linkages, professional engagement, and personal growth and development does not exhibit a statistically significant difference between younger and older teachers ($p = 0.717$). Both younger teachers (Mean Rank = 108.79) and older teachers (Mean Rank = 105.75) experience a relatively similar impact. This suggests that webinars have a consistent influence on enhancing these dimensions of professional development across different age groups of teachers.

Regarding sex as a variable, the results indicate a noticeable difference in the influence of webinars on professional development ($p = 0.073$). While not statistically significant, male teachers (Mean Rank = 99.26) and female teachers (Mean Rank = 114.21) exhibit somewhat different extents of influence. This outcome implies a potential trend where webinars might have a slightly more substantial impact on the professional development of female teachers in relation to community linkages, professional engagement, and personal growth and development.

The variable of highest educational attainment presents a significant contrast in the influence of webinars ($p = 0.045$). Teachers with higher educational attainment (Mean Rank = 116.62) report a higher extent of influence compared to those with lower educational attainment (Mean Rank = 99.94) in terms of community linkages, professional engagement, and personal growth and development. This suggests that webinars might have a more pronounced impact on these dimensions of professional development for teachers with advanced degrees or qualifications.

Teaching experience, however, does not emerge as a significant determinant of the influence of webinars on professional development within these areas ($p = 0.586$). Both teachers with shorter teaching experience (Mean Rank = 105.58) and those with longer teaching experience (Mean Rank = 110.15) exhibit similar extents of influence. This result suggests that webinars are equally effective in supporting the professional development of teachers across different experience levels in terms of community linkages, professional engagement, and personal growth and development.

The number of seminars attended stands out as a crucial determinant of the influence of webinars on professional development ($p < 0.001$). Teachers who have attended many seminars (Mean Rank = 121.32) experience a significantly higher extent of influence on community linkages, professional engagement, and personal growth and development compared to those who have attended few seminars (Mean Rank = 87.33). This emphasizes the cumulative effect of engaging in multiple webinars and highlights the importance of continued professional development for fostering community connections, enhancing professional engagement, and personal growth.

Table 36 underscores the varying influence of webinars on the professional development of public high school teachers, focusing on community linkages, professional engagement, and personal growth and development. The impact varies based on highest educational attainment and the number of seminars attended, while age, sex, and teaching experience do not appear to significantly influence this impact. These findings provide valuable insights for education stakeholders to design targeted professional development initiatives that effectively foster community engagement, professional growth, and personal development among teachers.

Table 10

Difference in the Extent of Influence of the Webinars on the Professional Development of Public High School Teachers in the Area Plus Factor when grouped and compared according to the aforementioned variables

Variable	Category	N	Mean Rank	Mann Whitney U	p-value	Sig. level	Interpretation
Age	Younger	123	102.24	4949.000	0.141		Not Significant
	Older	91	114.62				
Sex	Male	96	108.31	5586.000	0.860		Not Significant
	Female	118	106.84				
Highest Educational Attainment	Lower	117	93.75	4065.500	0.000	0.05	Significant
	Higher	97	124.09				
Teaching Experience in	Shorter	124	98.18	4424.000	0.009		Significant
	Longer	90	120.34				
Number of Seminars Attended	Few	87	87.50	3784.500	0.000		Significant
	Many	127	121.20				

Table 10 presents a comprehensive analysis of the extent to which webinars influence the professional development of public high school teachers concerning the "Plus Factor." The table categorizes and compares this influence based on variables including age, sex, highest educational attainment, teaching experience, and the number of seminars attended. The results reveal varying degrees of significance in the impact of webinars on the "Plus Factor," which encompasses several dimensions of professional development.

Starting with age as a variable, the analysis indicates that the extent of influence of webinars on the "Plus Factor" does not exhibit a statistically significant difference between younger and older teachers ($p = 0.141$). Both younger teachers (Mean Rank = 102.24) and older teachers (Mean Rank = 114.62) experience a relatively similar impact. This suggests that webinars have a consistent influence on enhancing the various dimensions of professional development encompassed by the "Plus Factor" across different age groups of teachers.

Considering sex as a variable, the results indicate that the influence of webinars on professional development does not significantly differ between male and female teachers ($p = 0.860$). Both male teachers (Mean Rank = 108.31) and female teachers (Mean Rank = 106.84) exhibit similar extents of influence. This outcome suggests that webinars have a similar impact on enhancing the "Plus Factor" for both male and female teachers.

The highest educational attainment variable presents a significant disparity in the influence of webinars ($p < 0.001$). Teachers with higher educational attainment (Mean Rank = 124.09) report a higher extent of influence compared to those with lower educational attainment (Mean Rank = 93.75) in terms of the "Plus Factor." This result indicates that webinars might have a more pronounced impact on professional development for teachers with advanced degrees or qualifications.

Teaching experience emerges as a significant determinant of the influence of webinars on the "Plus Factor" ($p = 0.009$). Teachers with shorter teaching experience (Mean Rank = 98.18) indicate a higher extent of influence compared to those with longer teaching experience (Mean Rank = 120.34). This implies that webinars are particularly effective for early-career teachers in enhancing their professional development across the dimensions of the "Plus Factor."

The number of seminars attended is a crucial factor in determining the influence of webinars on the "Plus Factor" ($p < 0.001$). Teachers who have attended many seminars (Mean Rank = 121.20) experience a significantly higher extent of influence compared to those who have attended few seminars (Mean Rank = 87.50). This underscores the cumulative effect of engaging in multiple webinars, highlighting the importance of ongoing professional development for enhancing various dimensions of the "Plus Factor."

Table 10 underscores the varying influence of webinars on the professional development of public high school teachers in terms of the "Plus Factor." The impact varies based on highest educational attainment, teaching

experience, and the number of seminars attended, while age and sex do not significantly influence this impact. These findings provide valuable insights for education stakeholders to design targeted professional development initiatives that effectively enhance the dimensions encompassed by the "Plus Factor" among teachers.

Conclusions

The study highlights the importance of demographic factors such as age, sex, educational qualifications, teaching experience, and webinar engagement in shaping teachers' professional development. Webinars were found to positively impact areas like content knowledge, pedagogy, diversity of learners, curriculum planning, assessment, and overall development, with variations across different teacher profiles. Younger and older teachers alike benefit from improved content knowledge, while female teachers show greater improvements in learning environments, and male teachers excel in community engagement. Teachers with higher educational attainment experience more significant gains across all areas, and those with less experience gain more in pedagogy and content knowledge. Teachers who attended more webinars reported greater benefits, especially in learning environments. Based on these findings, recommendations include tailoring webinar content to meet the diverse needs of teachers, offering specialized webinars for younger and more experienced teachers, incorporating gender-responsive designs, and ensuring content accessibility for teachers with varying educational backgrounds. Peer-to-peer learning should be encouraged, and webinars should cater to varying participation levels while integrating interactive elements to boost engagement. By continuously refining webinars based on feedback, educational institutions can enhance teachers' professional development and build a more skilled, motivated workforce.

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