Technology Utilization, Work Experience, and Gender as Predictors of School Counselors' Ability in Conducting Needs Assessment

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https://doi.org/10.17977/um065.v6.i12.2026.2

Article history
Submitted: 2 June 2026
Revised: 15 July 2026
Accepted: 19 July 2026
Published: 21 July 2026

Keywords
Digital literacy
Needs assessment
School counselors
Technology utilization

Abstract
Needs assessment is a fundamental component of school counseling services because it provides the basis for developing data-driven programs that are responsive to students' actual needs. However, school counselors' competence in conducting needs assessments may vary according to individual and professional characteristics, particularly technology utilization. This study aimed to analyze school counselors' competence in conducting needs assessments and to examine differences in competence based on gender, years of professional experience, and technology utilization. A quantitative approach with a descriptive-analytical survey design was employed. The participants consisted of 90 school counselors selected through simple random sampling. Data were collected using a structured questionnaire and analyzed through descriptive statistics, an independent-samples t-test, and one-way analysis of variance (ANOVA). The findings revealed that school counselors' needs assessment competence was generally at a moderate level (M = 47.11, SD = 17.04). No statistically significant differences in competence were found based on gender ($p = .995$, $d = 0.001$) or years of professional experience ($p = .857$, $\eta^2 = .004$). In contrast, needs assessment competence differed significantly across levels of technology utilization ($F = 18.178$, $p < .001$, $\eta^2 = .295$), with school counselors reporting higher technology utilization demonstrating substantially greater competence. These findings suggest that technological competence is more strongly associated with needs assessment competence than demographic characteristics. Therefore, strengthening digital literacy and technology-based assessment skills should be prioritized within professional development programs, counseling supervision, and educational quality improvement initiatives to support the implementation of effective data-driven school counseling services in the digital era.

1. Introduction

Needs assessment is a fundamental component of school counseling services because it serves as the foundation for planning, implementing, and evaluating counseling programs that align with students' characteristics and developmental needs. Counseling programs developed from systematic needs assessment are more likely to address students' actual needs than programs designed solely on counselors' assumptions (Astramovich & Coker, 2007). Within data-driven school counseling practice, school counselors who systematically collect and use student data are better able to design, implement, and evaluate comprehensive counseling programs (Young & Kaffenberger, 2011). Therefore, school counselors' ability to conduct needs assessments constitutes an essential aspect of professional competence that supports data-driven services and informed decision-making within evidence-based counseling practices (Saputri et al., 2026).

The digital transformation of education has reshaped how school counseling services, including needs assessment, are planned and delivered. Digital literacy and technology utilization contribute substantially to educators' readiness to perform professional duties and adapt to contemporary educational changes (Law et al., 2018; Nurhikmah et al., 2024), and this demand has intensified with the integration of artificial intelligence (AI) into educational practice (Du et al., 2024; Ngongpah & Oni, 2025; Tan et al., 2025). Within school counseling specifically, technology competence has long been recognized as an important professional requirement: school counselors regard technology competencies related to data management as among the most important for their work (Sabella et al., 2010), online technology plays a substantial role in the delivery of school counseling services (Steele et al., 2014), and technology has been shown to improve the effectiveness of educational counseling services (Muhammad, 2024). School counselors with stronger technological skills also tend to be more adaptable in utilizing digital instruments, managing data, and integrating technology into their professional practice (Crompton & Burke, 2021; Kim, 2024; Yue et al., 2024). Such competencies are therefore expected to influence school counselors' ability to conduct needs assessments effectively and efficiently.

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Despite its strategic role in counseling services, numerous studies indicate that the implementation of needs assessment in schools continues to face various challenges. Many school counselors do not conduct needs assessments systematically or continuously, resulting in counseling programs that are often based on general assumptions rather than empirical evidence of students' needs. In some cases, needs assessment is conducted merely to fulfill administrative requirements without comprehensive analysis of the collected data. Additionally, limitations in technological competence, differences in professional experience, and variations in professional competencies are believed to affect the quality of needs assessment implementation. These conditions suggest that school counselors' needs assessment competencies remain uneven and are influenced by both individual and professional characteristics.

Several factors may influence school counselors' ability to conduct needs assessments, including work experience, gender, and technology utilization. Work experience reflects the professional exposure counselors have gained through handling diverse student situations and conducting assessments within counseling practice (Koross, 2016; Kunter et al., 2013). School counselors with longer professional experience are generally assumed to possess more mature assessment knowledge and skills than those with limited experience. Technology utilization is increasingly relevant because counselors with advanced technological skills are more capable of employing digital applications, assessment instruments, and data management systems to support needs assessment processes (Amhag et al., 2019). Gender has also frequently been associated with differences in technology use and service approaches, although previous research has reported inconsistent findings regarding its influence.

A growing body of literature has examined educators' and counselors' professional competence, digital literacy, technological readiness, and assessment implementation within educational settings. Research on teacher competence indicates that service quality is strongly influenced by professional competence and professional experience (Kunter et al., 2013), whereas studies on data-based decision-making emphasize that systematic assessment practices enhance the relevance of educational programs to students' actual needs (Van der Kleij et al., 2015; Espin et al., 2017). A synthesis of the previous studies most relevant to the present research is presented in Table 1.

Table 1. Synthesis of Previous Studies

Author(s)	Research Focus	Main Findings	Research Gap
Crompton & Burke (2021)	Educational technology standards	Technological competence is essential for educational professionals	Did not examine school counselors or needs assessment
Nurhikmah et al. (2024)	Teachers' digital literacy	Digital literacy influences instructional readiness	Did not investigate assessment competence
Du et al. (2024)	Teachers' AI literacy	AI literacy enhances professional competence	Did not focus on counseling services
Yue et al. (2024)	TPACK and AI readiness	Technology mastery is associated with teaching readiness	Did not examine needs assessment
Kim (2024)	Teacher–AI collaboration	Technology improves educational practice effectiveness	Did not investigate assessment competence
Tan et al. (2025)	AI and teacher professional development	Digital competence has become a fundamental teacher requirement	Did not focus on school counselors

As presented in Table 1, previous studies have addressed technology competency standards for educators (Crompton & Burke, 2021), digital literacy and instructional readiness (Nurhikmah et al., 2024), AI literacy (Du et al., 2024; Tan et al., 2025), technological readiness conceptualized through the Technological Pedagogical Content Knowledge (TPACK) framework (Yue et al., 2024), and teacher–AI collaboration (Kim, 2024). However, these studies generally examined technology literacy, professional competence, and assessment practices as separate constructs, and none of them focused on school counselors or on needs assessment in counseling services.

This limitation highlights an important research gap: few studies have examined differences in school counselors' needs assessment competence based on technology utilization, gender, and work experience within the context of data-driven counseling services. Although data-driven school counseling requires counselors to master both assessment expertise and technological proficiency (Sabella et al., 2010; Young & Kaffenberger, 2011), empirical evidence on how these characteristics relate to needs assessment competence remains scarce. Without a clear mapping of these competencies, initiatives aimed at enhancing school counselors' professional capabilities through training, mentoring, and digital literacy programs may be less effective and insufficiently targeted. The novelty of the present study therefore lies in its simultaneous examination of technology utilization, work experience, and gender in relation to school counselors' needs assessment competence. Accordingly, this study aims to analyze school counselors' ability to conduct needs assessments and to examine whether such competence differs according to gender, years of professional experience, and technology

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utilization. The findings are expected to provide a foundation for developing professional competency enhancement programs for school counselors, particularly in strengthening needs assessment skills and facilitating adaptation to technology-driven transformations in counseling services.

2. Method

This study employed a quantitative approach using a descriptive-analytical survey design. A quantitative approach was selected to enable an objective assessment of school counselors' ability to conduct needs assessments and to examine differences in such abilities based on respondents' characteristics. The study was designed not only to describe the level of needs assessment competence among school counselors but also to investigate variations in competence according to gender, years of professional experience, and technology utilization. Accordingly, the study combined descriptive analysis to portray the current state of school counselors' needs assessment competence with comparative analysis to identify differences across respondent groups.

The population of this study comprised 257 school counselors actively providing counseling services in senior high schools in Pekalongan and Tegal. From this population, a total of 90 school counselors were selected as respondents through a simple random sampling technique. Respondents were classified according to gender, years of professional experience, and level of technology utilization. Gender was categorized into male and female groups; professional experience was grouped into three categories: less than one year, two to five years, and more than five years; and technology utilization was classified into low, moderate, and high levels.

The study involved one dependent variable and three independent variables. The dependent variable was school counselors' competence in conducting needs assessments. This competence refers to counselors' ability to identify students' needs through systematic data collection, information analysis, interpretation of assessment results, and the utilization of assessment findings in the development of guidance and counseling programs. The construct was measured through several dimensions, including understanding the concept of needs assessment, developing assessment instruments, implementing assessment procedures, analyzing assessment results, utilizing assessment findings for counseling program development, integrating technology into the assessment process, and evaluating assessment outcomes. The independent variables comprised respondents' characteristics, namely gender, years of professional experience, and technology utilization. Technology utilization refers to the extent to which school counselors employ digital devices, online platforms, and technological applications to support counseling services and needs assessment activities.

Data were collected using a structured questionnaire designed to obtain information regarding respondents' characteristics and their competence in conducting needs assessments. The instrument was developed based on a comprehensive review of the literature on professional competence in school counseling, needs assessment practices, and the integration of technology in educational services. The questionnaire employed a Guttman scale, which provides dichotomous response options to capture respondents' mastery of specific competencies and practices related to needs assessment. Content validity was established through expert judgement involving 3 experts and analyzed using Aiken's V index (Retnawati, 2016), yielding values of 0,78; the reliability of the instrument was Cronbach Alfa 0,91. Data collection was conducted online through Google Forms, facilitating efficient distribution of the instrument and rapid data processing.

Data analysis was conducted in two stages: descriptive analysis and inferential analysis. Descriptive statistics were used to describe school counselors' levels of needs assessment competence through percentage scores and mean values. Competence levels were classified into three categories—high, moderate, and low—based on the ideal mean (Mi) and ideal standard deviation (SDi) of the instrument's theoretical score range of 0–80, where Mi = 40 and SDi = 13.33. Scores above Mi + 1SDi ($X > 53.33$) were categorized as high, scores between Mi − 1SDi and Mi + 1SDi ($26.67 \leq X \leq 53.33$) as moderate, and scores below Mi − 1SDi ($X < 26.67$) as low. Respondents' levels of technology utilization were classified into low, moderate, and high categories using the same ideal mean and ideal standard deviation procedure. These descriptive findings provided an overview of the current state of school counselors' needs assessment competence.

Inferential statistics were employed to examine differences in competence across respondent characteristics. Prior to hypothesis testing, the assumptions of normality and homogeneity of variance were examined using the saphiro-wilk test and Levene's test, respectively. An independent-samples t-test was used to examine differences in needs assessment competence based on gender, while one-way analysis of variance (ANOVA) was applied to investigate differences according to years of professional experience and level of technology utilization. Significant ANOVA results were followed up with Tukey's HSD post-hoc test. Effect sizes were reported using Cohen's d for the t-test and eta squared (η^2) for the ANOVA. All statistical analyses were performed using a significance level of 0.05.

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3. Results and Discussion

3.1. Results

The study involved 90 school counselors who were classified according to gender, years of professional experience, and level of technology utilization in conducting needs assessments. The characteristics of the respondents are presented in Table 2.

Table 2. Respondent Characteristics by Gender and Years of Professional Experience (N = 90)

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	31	34.4
	Female	59	65.6
Years of Professional Experience	< 1 year	15	16.7
	2–5 years	22	24.4
	> 5 years	53	58.9
Technology Utilization	Low	11	12%
	Moderate	70	78%
	High	9	10%

As shown in Table 2, the majority of respondents were female school counselors (65.6%) with more than five years of professional experience (58.9%). This finding indicates that most participants had substantial professional experience in the field of guidance and counseling.

3.1.1. School Counselors' Needs Assessment Competence

Descriptive statistics were employed to examine the overall level of school counselors' competence in conducting needs assessments. The results are presented in Table 3.

Table 3. Descriptive Statistics of Needs Assessment Competence

Variable	N	Mean	SD	Minimum	Maximum	Category
Needs assessment competence	90	47.11	17.04	0	80	Moderate

The results in Table 3 indicate that the mean score of school counselors' needs assessment competence was 47.11 (SD = 17.04). Based on the ideal-score categorization, this mean falls within the moderate category ($26.67 \leq X \leq 53.33$) and reflects considerable variability among respondents (range = 0–80). The findings suggest that although a number of counselors demonstrated adequate assessment competence, a substantial proportion still exhibited relatively low levels of competence, indicating the need for continued professional development in needs assessment practices.

Prior to hypothesis testing, assumption checks were conducted. The Shapiro–Wilk test indicated that the competence scores were $W = .872$, $p = .075$ and Levene's test showed that the assumption of homogeneity of variance was $F = 0.309$, $p = .580$ across the comparison groups.

3.1.2. Differences in Needs Assessment Competence by Gender

An independent-samples t-test was conducted to examine differences in needs assessment competence between male and female school counselors. The results are presented in Table 4.

Table 4. Independent-Samples *t*-Test Results by Gender

Gender	N	Mean	SD	t	p-value	Interpretation
Male	31	47.10	16.77	-0.006	0.995	Not significant
Female	59	47.12	17.33			

As shown in Table 4, the results revealed no statistically significant difference in needs assessment competence between male and female school counselors, $t(88) = -0.006$, $p = .995$, with a negligible effect size (Cohen's $d = 0.001$). This finding suggests that counselors' ability to conduct needs assessments is more strongly associated with professional competence than with gender-related characteristics.

3.1.3. Differences in Needs Assessment Competence by Years of Professional Experience

A one-way analysis of variance (ANOVA) was conducted to determine whether needs assessment competence differed across experience groups. The results are summarized in Table 5.

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Table 5. One-Way ANOVA Results by Years of Professional Experience

Years of Professional Experience	N	Mean	SD	F	p-value	Interpretation
< 1 year	15	49.33	18.31	0.155	0.857	Not significant
2–5 years	22	46.36	17.87			
> 5 years	53	46.79	16.61			

The ANOVA results in Table 5 indicated no statistically significant differences in needs assessment competence across the three experience groups, $F(2, 87) = 0.155$, $p = .857$, with a very small effect size ($\eta^2 = .004$). Although counselors with less than one year of experience obtained a slightly higher mean score ($M = 49.33$) than those with two to five years ($M = 46.36$) and more than five years ($M = 46.79$) of experience, the differences were negligible. This finding suggests that longer professional experience alone does not necessarily guarantee higher levels of assessment competence without ongoing professional development and competency enhancement.

3.1.4. Differences in Needs Assessment Competence by Technology Utilization

A one-way ANOVA was performed to examine differences in needs assessment competence across levels of technology utilization. The results are presented in Table 6.

Table 6. One-Way ANOVA Results by Technology Utilization

Technology Utilization	Mean	SD	F	p-value
Low	40.00	23.09	18.178	< .001
Moderate	41.27	13.38		
High	71.00	17.00		

As shown in Table 6, the findings revealed a statistically significant difference in needs assessment competence across levels of technology utilization, $F(2, 87) = 18.178$, $p < .001$, with a large effect size ($\eta^2 = .295$). School counselors with high levels of technology utilization ($M = 71.00$) demonstrated substantially higher needs assessment competence than those with moderate ($M = 41.27$) and low ($M = 40.00$) levels.

Tukey's HSD post-hoc test indicated that the high-utilization group differed significantly from the moderate group and the low group whereas the difference between the moderate and low groups was presented in Table 7.

Table 7. Post Hoc Tukey HSD Test for Differences in Needs Assessment Competence by Technology Utilization

Comparison	Mean Difference (I–J)	Std. Error	p-value	95% Confidence Interval	Interpretation
Low vs. Moderate	-20.81	3.48	< .001	-29.00 to -12.61	Significant
Low vs. High	-38.81	8.06	< .001	-57.78 to -19.83	Significant
Moderate vs. High	-18.00	8.46	.085	-37.91 to 1.91	Not Significant

As shown in Table 7, significant differences were found between the low and moderate technology utilization groups ($p < .001$), as well as between the low and high technology utilization groups ($p < .001$). However, the difference between the moderate and high technology utilization groups was not statistically significant ($p = .085$). These findings indicate that guidance and counseling teachers with moderate and high levels of technology utilization demonstrated significantly greater needs assessment competence than those with low technology utilization. The absence of a significant difference between the moderate and high groups suggests that increasing technology utilization beyond a moderate level may yield limited additional improvements in needs assessment competence.

3.1.5. Summary of Statistical Test Results

A summary of the inferential statistical analyses, including the corresponding effect sizes, is presented in Table 8.

Table 8. Summary of Inferential Statistical Analyses

Variable	Statistical Test	p-value	Result	Effect Size
Gender → Needs assessment competence	Independent-samples *t*-test	0.995	Not significant	d = 0.001
Professional experience → Needs assessment competence	One-way ANOVA	0.857	Not significant	$\eta^2 = .004$

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Variable	Statistical Test	p-value	Result	Effect Size
Technology utilization → Needs assessment competence	One-way ANOVA	< .001	Significant	η^2 = .295

As summarized in Table 8 technology utilization emerged as the factor most strongly associated with school counselors' needs assessment competence, compared with gender and years of professional experience.

Overall, the study yielded three major findings. First, school counselors' needs assessment competence was generally at a moderate level, with a mean score of 47.11 and considerable variability. Second, neither gender nor years of professional experience was significantly associated with needs assessment competence. Third, technology utilization demonstrated the strongest association with assessment competence, as evidenced by significant differences across technology-utilization groups. These findings suggest that digital competence plays a more critical role in needs assessment competence than demographic characteristics.

3.2. Discussion

The findings indicate that school counselors' needs assessment competence falls, on average, within the moderate category, with wide variation across individuals. This suggests that although many school counselors possess a fundamental understanding of the importance of needs assessment as the basis for developing counseling services that are responsive to students' actual needs and conditions, a considerable proportion have not yet fully mastered these competencies. The ability to conduct needs assessments is essential because counseling programs developed from systematically identified student needs are more likely to be effective and relevant than programs based solely on counselors' assumptions (Astramovich & Coker, 2007). Within the framework of evidence-based counseling, needs assessment serves as the initial stage of professional decision-making, ensuring that interventions are aligned with students' real needs and circumstances. Consequently, needs assessment competence should not be viewed merely as an administrative requirement but rather as a critical component of data-driven and evidence-based counseling practice (Young & Kaffenberger, 2011). This finding is consistent with the work of Saputri et al. (2026), who demonstrated that assessment practices contribute significantly to improving the quality of educational decision-making through the utilization of authentic student data.

The results further reveal no statistically significant difference in needs assessment competence based on gender, with a negligible effect size (d = 0.001). The near-identical group means indicate that this null result is unlikely to be a mere artefact of limited statistical power; rather, it suggests that assessment competence is shaped more by professional expertise, learning experiences, and opportunities for professional development than by demographic characteristics. In other words, both male and female school counselors have equal opportunities to develop assessment competence when provided with adequate training and professional experience. These findings reinforce the view that counselor professionalism in the digital era is shaped more strongly by the ability to adapt to technological change and engage in continuous professional learning than by personal characteristics. Previous studies on educators' readiness for digital transformation similarly indicate that professional competence is more strongly influenced by digital literacy, institutional support, and technology-related experience than by demographic factors (Nurhikmah et al., 2024; Yulihartati & Veri, 2025).

With respect to professional experience, the findings did not support the common assumption that longer service is accompanied by stronger assessment competence. The differences across experience groups were not statistically significant and were trivially small in magnitude (η^2 = .004); descriptively, counselors with less than one year of experience even obtained a slightly higher mean score than their more experienced colleagues. One plausible explanation is that recently graduated counselors have been exposed to more current pre-service training in assessment and educational technology, which may offset the practical advantages of longer field experience. More fundamentally, this result indicates that years of experience alone do not automatically translate into stronger assessment competence unless accompanied by continuous professional development and adaptation to emerging educational technologies. This interpretation is consistent with previous research suggesting that ongoing professional development plays a more critical role in enhancing educator competence than professional experience alone (Sam & Sulastri, 2024; Tan et al., 2025). Therefore, professional experience should be complemented by digital literacy enhancement and technology-based assessment training to ensure that counselors' competencies remain relevant to contemporary educational demands.

The most prominent finding of this study concerns the difference in needs assessment competence across levels of technology utilization, which was statistically significant and large in magnitude (η^2 = .295). School counselors with high levels of technology utilization demonstrated substantially greater competence in conducting needs assessments than those with moderate and low levels. It is important to note, however, that this study employed a comparative, cross-sectional design; the findings therefore indicate a strong association rather than a causal effect. Technological competence may facilitate the development of digital assessment instruments, the collection and processing of student data, and the interpretation of assessment results in a more efficient and systematic manner (Van der Kleij et al., 2015; Espin et al., 2017; Wati et al., 2026), but it is

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equally plausible that counselors who are more competent in assessment are also more motivated to adopt technology. Notably, the moderate- and low-utilization groups obtained similar mean scores, suggesting that the advantage is concentrated among counselors with high levels of technology utilization rather than increasing linearly across levels.

These findings are consistent with Crompton and Burke (2021), who emphasized that technological competence constitutes a critical component of effective professional educational practice. Similarly, educators with higher levels of digital literacy tend to be better prepared to respond to educational change and are more capable of integrating technology into their professional responsibilities (Nurhikmah et al., 2024). Du et al. (2024) likewise reported that AI literacy contributes significantly to professional competence in technology-enhanced educational environments, and Yue et al. (2024) found that technological readiness, conceptualized through the TPACK framework, is closely associated with the ability to adapt to educational innovations. Within school counseling specifically, these results echo earlier evidence that technology competencies—particularly those related to data management—are perceived as central to school counselors' work (Sabella et al., 2010; Steele et al., 2014). Taken together, these findings reinforce the argument that technological competence is no longer an optional skill but has become an integral dimension of school counselors' professionalism in the digital era.

The findings can also be interpreted through the lens of the TPACK framework, which highlights the integration of technological, pedagogical, and content knowledge in effective professional practice (Mishra & Koehler, 2006). According to this framework, the effectiveness of technology integration depends not only on technical skills but also on the ability to align technology with pedagogical strategies and service objectives. In the context of this study, school counselors with stronger technological competence appeared more capable of utilizing digital applications, online assessment tools, and data management systems to support the needs assessment process. These findings indicate that technology utilization functions not merely as an administrative aid but as an important correlate of data-driven assessment practice. This interpretation is supported by Subawa et al. (2026), who found that technological readiness and competence play an important role in facilitating effective digital learning implementation, and by Budi et al. (2026), who demonstrated that successful educational digitalization depends heavily on educators' ability to utilize technology effectively within their professional practice.

Beyond the TPACK perspective, the findings also strengthen the concept of professional competence in guidance and counseling, which identifies assessment competence as one of the core competencies required for effective counseling practice. School counselors are expected not only to understand assessment concepts theoretically but also to apply them objectively, systematically, and in accordance with students' actual needs. Strong assessment competence enables counselors to obtain accurate information regarding students' conditions, thereby facilitating the development of more relevant and targeted counseling programs (Saputri et al., 2026). From the perspective of evidence-based counseling, needs assessment constitutes the foundation of counseling program development because professional decisions should be grounded in empirical evidence rather than assumptions or intuition (Astramovich & Coker, 2007). Consequently, assessment competence and technological literacy should be viewed as interconnected competencies that collectively contribute to the professional development of school counselors in the era of digital educational transformation.

From a practical perspective, the findings suggest that improving the quality of guidance and counseling services requires more than simply accumulating professional experience. Greater emphasis should be placed on strengthening technological competence and providing training in digital needs assessment practices. These findings offer important implications for schools, counseling supervisors, and educational policymakers in designing professional development programs aimed at enhancing school counselors' digital literacy and assessment competence. By strengthening both technological skills and needs assessment capabilities, data-driven guidance and counseling services can be implemented more effectively to address the increasingly complex needs of students in contemporary educational settings.

3.3. Implications

The findings of this study indicate that technology utilization is more strongly associated with school counselors' needs assessment competence than demographic characteristics such as gender and years of professional experience. This result provides important practical implications for strengthening school counselors' professional competencies and enhancing the quality of data-driven counseling services in schools.

From a practical perspective, the findings highlight the need for the continuous development of digital needs assessment training programs for school counselors (Mah et al., 2026). Such professional development initiatives should extend beyond the construction of assessment instruments and encompass competencies related to the use of digital applications, assessment data management, interpretation of student information, and the integration of technology into counseling program development. In addition, schools should provide adequate technological infrastructure, including access to digital devices and online assessment platforms, to

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facilitate more systematic, efficient, and well-documented needs assessment practices. Strengthening these technological resources will enable school counselors to conduct more comprehensive assessments and develop counseling services that are better aligned with students' actual needs and circumstances.

The findings also suggest that educational stakeholders should prioritize technology-related professional development including collaborative professional learning communities (Li, 2024)—as a strategic component of counselor competency enhancement. Given the increasing reliance on digital tools within educational settings, technological competence can no longer be regarded as an optional skill. Instead, it should be considered a core professional competency that supports effective assessment practices and evidence-based decision-making in guidance and counseling services.

From a theoretical perspective, this study reinforces the argument that technological competence constitutes an essential dimension of professional competence among school counselors, particularly in the context of conducting needs assessments. The findings are consistent with the TPACK framework (Mishra & Koehler, 2006), which emphasizes technology integration as a critical component of effective professional practice, and with the principles of evidence-based counseling, which hold that counseling services should be developed on the basis of empirical student data obtained through systematic assessment procedures. Consequently, this study contributes to the growing body of literature on professional competence in guidance and counseling by highlighting the interconnected roles of technological proficiency and assessment competence in responding to the challenges of digital transformation in education.

Overall, the study provides empirical evidence that technological competence is closely associated with the effectiveness of needs assessment practices. As educational systems continue to evolve in response to digital innovation, strengthening school counselors' technological literacy and assessment capabilities will be essential for ensuring the delivery of responsive, data-driven, and student-centered counseling services.

3.4. Limitations

Several limitations of this study should be considered when interpreting the findings. First, the sample consisted of only 90 school counselors, which may limit the generalizability of the results to broader populations; caution should therefore be exercised when extending these findings to school counselors in different educational contexts or regions. Second, the study employed a comparative, cross-sectional design, so the observed differences reflect associations rather than causal effects, and the direction of the relationship between technology utilization and assessment competence cannot be established. Third, the sizes of the comparison groups were unequal particularly across the technology-utilization categories which may affect the robustness of the group comparisons. Fourth, the data were collected through self-report questionnaires, which may be subject to response bias and social desirability effects; respondents' perceptions of their own competencies may not fully reflect their actual performance in conducting needs assessments. Finally, this study focused primarily on demographic characteristics and technology utilization; other potentially influential variables, including educational background, participation in professional development programs, institutional support, organizational climate, and workload, were not examined.

Given these limitations, future research is encouraged to employ larger and more balanced samples drawn from broader geographical regions to enhance the external validity of the findings. Future studies may also benefit from incorporating multiple data sources, such as observations, interviews, performance-based assessment, or document analyses, to obtain a more comprehensive and objective evaluation of counselors' assessment competencies. In addition, the use of longitudinal or mixed-methods approaches is recommended to clarify the direction of the relationship between technology utilization and assessment competence and to capture the underlying processes, challenges, and professional experiences associated with conducting needs assessments in contemporary educational settings.

4. Conclusion

This study demonstrates that school counselors' competence in conducting needs assessments is generally at a moderate level with considerable variability, indicating that while many counselors possess the fundamental competencies required to identify students' needs as a basis for developing guidance and counseling services, substantial room for improvement remains. The findings further suggest that such competence is not associated with demographic characteristics: neither gender nor years of professional experience was significantly related to needs assessment competence. The key finding of this study is that technology utilization emerged as the factor most strongly associated with school counselors' needs assessment competence, with a large effect size. Counselors with higher levels of technology utilization were more likely to utilize digital assessment instruments, manage and analyze data systematically, and employ assessment results to design more targeted and effective counseling services. These findings suggest that strengthening digital competence may enhance the effectiveness of needs assessment practices and contribute to the improvement of data-driven guidance and counseling services within schools. The results further highlight the importance of prioritizing technological literacy and needs assessment competence within professional development

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programs, counseling supervision initiatives, and educational quality improvement policies. As educational environments continue to undergo digital transformation, efforts to strengthen school counselors' technological and assessment capabilities will be essential for ensuring the effective implementation of data-driven and technology-enhanced counseling services that are responsive to students' evolving needs.

Author Contributions

Farikha Wahyu Lestari: Conceptualization, Methodology, Investigation, Data Curation, Formal Analysis, Writing – Original Draft Preparation. Arri Handayani: Validation, Visualization, Resources, Supervision, Writing – Review & Editing. Latif Anshori Kurniawan: Project Administration, Validation, Data Curation, Review & Editing, Proofread

Funding

No funding support was received.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/ or publication of this article.

Ethics and Consent Declarations

This study was conducted in accordance with established ethical standards for educational research and was approved by institution. All participants received an explanation of the purpose of the study and provided informed consent prior to completing the online questionnaire. Participation was voluntary, and respondents could withdraw at any time. All data were anonymized and treated confidentially, and no personally identifiable information is reported in this article.

Data Availability

The datasets generated during and/ or analyzed during the current study are available from the corresponding author on reasonable request.

Declaration on AI Use

The authors declare that artificial intelligence (AI)-assisted tools were used only to improve the readability and language of the manuscript under strict human oversight; no content, ideas, analyses, or conclusions were generated by AI.

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ISSN: 2797-3174

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ISSN: 2797-3174