

**Effectiveness of automated Phil-IRI templates
in streamlining division-level data consolidation**

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ABSTRACT

This descriptive quantitative study evaluated the effectiveness of a locally developed Automated PHIL-IRI Template in streamlining data consolidation within the DepEd Toledo City Division, addressing the delays and inconsistencies inherent in traditional manual methods. Through a survey of 116 public elementary educators and administrators guided by the Unified Theory of Acceptance and Use of Technology (UTAUT), the research found the template to be "Very Effective" (Grand Mean = 3.48), with 86.2% of participants adopting it as their primary tool for significantly reducing workload and accelerating report generation. While personal demographics such as age and sex played no role in the tool's perceived effectiveness, contextual factors—including school size, type, and previous training—were statistically significant influencers ($p < 0.05$). Ultimately, the study concludes that the automated template is a highly accepted innovation for improving data accuracy and efficiency, recommending intensified formal training and tailored technical support to ensure universal adoption across the division.

Keywords: Administration and supervision, reading comprehension, quasi-experimental research, Toledo City, Cebu, Philippines

Date Submitted: January 13, 2026
Date Accepted: January 26, 2026
Date Published: February 11, 2026

INTRODUCTION

Timely and accurate data collection is essential to informed decision-making in education, particularly when addressing learners' reading proficiency at scale. The Philippine Informal Reading Inventory (PHIL-IRI), developed by the Department of Education (DepEd) and formalized through DepEd Order No. 14, s. 2018, serves as the national standard tool for assessing and monitoring reading proficiency levels across public elementary schools. While the instrument has proven effective in identifying learners' reading levels, the process of manually consolidating results at both the school and division levels has consistently generated delays, inconsistencies, and significant additional workload for teachers and school heads. These challenges are particularly pronounced in large divisions where hundreds of schools

DOI: <http://doi.org/10.69651/PIJHSS0501797>

Recommended citation:

Allosa, J. R. (2026). Effectiveness of automated Phil-IRI templates in streamlining division-level data consolidation. *Pantao (The International Journal of the Humanities and Social Sciences)* 5 (1), 8891-8899.
<http://doi.org/10.69651/PIJHSS0501797>

submit data in varied formats, hindering the timely formulation of reading interventions and compromising the reliability of reports submitted to higher offices (Department of Education, 2018).

In response to these persistent inefficiencies, the researcher developed an Automated PHIL-IRI Template, a Microsoft Excel spreadsheet-based system designed to simplify and standardize the consolidation of reading data across the Toledo City Division. The template incorporates embedded formulas, pre-set validation checks, and a streamlined interface that not only automates computations but also generates summary tables essential for instructional planning and division-level analysis. This innovation aligns with DepEd's strategic thrust toward digital transformation and data-driven governance, as articulated through the DepEd Digital Rise Program, the Revised Guidelines on the DepEd Computerization Program (DepEd Order No. 16, s. 2023), and Secretary Angara's emphasis on developing data dashboards and digital systems to enable effective information-driven action at local and division levels (Philippine News Agency, 2025). By leveraging basic automation tools, the initiative allows school-level personnel to redirect their attention from manual data encoding toward data analysis and targeted reading interventions.

The theoretical foundation of this study is anchored in the Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Venkatesh et al. (2003), which provides a comprehensive model for explaining user intentions to adopt and use technology through four key constructs: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. In the context of the PHIL-IRI automated template, Performance Expectancy is reflected in the tool's capacity to improve data accuracy and efficiency; Effort Expectancy is addressed through its user-friendly design; Social Influence is manifested through school leader and peer advocacy for its use; and Facilitating Conditions are operationalized through available ICT infrastructure and technical support. Complementing UTAUT is Rogers' Diffusion of Innovations Theory (2003), which frames adoption as a function of relative advantage, compatibility, ease of use, trialability, and observability, characteristics that the PHIL-IRI template demonstrably possesses. Additional theoretical support is drawn from Mishra and Koehler's (2006) Technological Pedagogical Content Knowledge framework, Von Bertalanffy's (1968) Systems Theory, Sweller's (1988) Cognitive Load Theory, and Vygotsky's (1978) constructivist principles of collaborative professional problem-solving, collectively establishing that the automated template addresses cognitive, organizational, and social dimensions of technology integration in educational management.

Since no prior evaluation of the PHIL-IRI automated template's effectiveness had been conducted, this study was designed to assess whether the tool meets its intended purpose of improving the speed, accuracy, and usability of the reading data consolidation process, and to identify the contextual factors that moderate its adoption. The findings are intended to inform the improvement of the current system and to provide a replicable model for similar automated solutions applicable to other DepEd assessments such as the Comprehensive Rapid Literacy Assessment and the Quarterly Reading Assessment.

Statement of the problem

This study determined the effectiveness of the automated PHIL-IRI template in streamlining division-level data consolidation at DepEd Toledo City Division during the School Year 2025-2026, as a basis for a school PHIL-IRI Action Plan. Specifically, it sought to answer the following questions:

1. What is the profile of the respondents in terms of age, sex, educational background, current position, length of service, size of school, type of school, and trainings attended related to ICT?
2. What is the extent of awareness of the respondents regarding the use of the automated PHIL-IRI template?
3. How does the extent of effectiveness of the automated PHIL-IRI template affect the workload of respondents in terms of performance expectancy, effort expectancy, social influence, and facilitation conditions?
4. What is the extent of satisfaction of respondents in using the automated PHIL-IRI template?
5. Is there a significant relationship between the respondents' profile and the extent of effectiveness of the automated PHIL-IRI template?
6. What is the most commonly utilized process for administering the PHIL-IRI in schools: the manual method or the automated method?
7. Based on the findings, what recommendations may be proposed?

METHODOLOGY

This study employed a descriptive-comparative research design to assess the effectiveness of the automated PHIL-IRI template in streamlining data consolidation across the DepEd Toledo City Division. The UTAUT framework guided the assessment of the template's effectiveness across four key constructs: Performance Expectancy, Effort Expectancy, Social Influence, and Facilitating Conditions. The descriptive component characterized respondents' levels of awareness, effectiveness perceptions, and satisfaction, while the comparative component examined differences in perceived effectiveness across demographic and contextual subgroups.

The study was conducted exclusively within the DepEd Toledo City Division, which served as both the organizational unit and the geographical area where the automated PHIL-IRI template was introduced and implemented. This locale was intentionally selected because it is the actual site of the innovation's development and deployment, enabling the researcher to access primary users with direct, sustained experience in both traditional manual reporting and the newly introduced automated system.

The respondents comprised a minimum of 116 participants drawn from public elementary schools: at least 104 classroom teachers and at least 12 school heads or principals. Teachers were prioritized as primary respondents given their direct responsibility for encoding, consolidating, and submitting initial PHIL-IRI data, while school heads were included for their administrative oversight role in reviewing and certifying the accuracy of submitted reports. All selected participants were required to have been actively and directly involved in the submission or review of PHIL-IRI data during the preceding two academic years, ensuring that feedback was grounded in current and sustained practical experience. Schools were selected through purposive sampling to guarantee inclusion of both automated-template users and manual-method users, while a stratified sampling technique was applied across districts to ensure representativeness with respect to school size, geographical location, and general resource level.

The primary research instrument was a structured survey questionnaire composed of five parts. Part I gathered respondents' demographic and professional profiles. Part II measured awareness of the automated template using a four-point Likert scale ranging from Not Aware (1) to Very Aware (4). Part III assessed the extent of effectiveness across the four UTAUT constructs using a four-point scale from Strongly Disagree (1) to Strongly Agree (4). Part IV measured satisfaction using a scale from Not Satisfied (1) to Very Satisfied (4). Part V

identified the most commonly utilized PHIL-IRI administration process. Open-ended questions were also included to capture qualitative elaborations. The instrument was pilot-tested for reliability and validity prior to full implementation, and the survey was administered digitally via Microsoft Forms.

Data were analyzed using descriptive statistics including mean, standard deviation, and frequency distribution to summarize respondent profiles and measure awareness, effectiveness, and satisfaction. Inferential statistics were employed to test the null hypothesis: an independent samples t-test was applied when comparing two groups, Analysis of Variance was used for three or more groups, and Pearson Product-Moment Correlation Coefficient examined relationships between continuous profile variables and effectiveness ratings. All inferential tests were set at a 0.05 level of significance. Composite means were interpreted using the established Likert scale ranges: 3.25-4.00 as Very Effective or Very Aware or Very Satisfied, 2.50-3.24 as Effective or Aware or Satisfied, 1.75-2.49 as Less Effective or Slightly Aware or Slightly Satisfied, and 1.00-1.74 as Not Effective, Not Aware, or Not Satisfied.

RESULTS AND DISCUSSION

This section presents and discusses findings derived from 116 respondents comprising public elementary school teachers and school heads within the DepEd Toledo City Division. Data were gathered through a structured survey questionnaire and analyzed using descriptive and inferential statistics. Results are organized according to the research questions.

Profile of the respondents

The demographic and professional profile of the 116 respondents establishes the contextual framework within which the UTAUT constructs are interpreted. In terms of age, the largest group was aged 30-39 (37.07%), with a combined 62.93% falling between 30 and 49 years. This mid-career majority possesses sufficient experience to recognize manual tasks as burdensome while retaining enough digital literacy to adopt new tools, a profile consistent with high Performance Expectancy as identified by Venkatesh et al. (2003) and confirmed by Bayu et al. (2021), who found that mid-career professionals are highly likely to adopt technology offering clear workload solutions.

Regarding sex, 85.34% of respondents were female and 14.66% were male, accurately reflecting the gender composition of the Philippine public elementary school system, where over 80% of teachers are women (DepEd national data). This composition suggests that Social Influence and Effort Expectancy are particularly salient adoption drivers, as female-dominated educational environments tend to value peer support and user-friendly interfaces (Venkatesh et al., 2003). Concerning educational background, 58.62% held Master's Degree units or full degrees and 35.34% held a Bachelor's Degree. This high level of academic qualification implies that respondents possess the analytical capacity to evaluate the template's technical merits, a finding supported by Ngampornchai and Adams (2016), who identified higher educational attainment as a significant predictor of technology readiness and acceptance.

With respect to current position, 82.76% were classroom teachers, 10.34% were school principals, 5.17% were master teachers, and 1.72% were head teachers. The predominance of frontline teacher perspectives grounds the study's effectiveness findings in the direct experiences of those most affected by manual data consolidation burdens, reinforcing the validity of Performance Expectancy ratings (Venkatesh et al., 2003; Bayu et al., 2021). In terms of length of service, a bimodal distribution was observed, with the largest groups being early-

career teachers with 0-5 years (30.17%) and seasoned educators with 16 or more years of service (29.31%), suggesting that the template's positive reception spans both digital natives and veteran educators accustomed to traditional methods. As Venkatesh et al. (2003) note, experience is a key moderator of Effort Expectancy, while Ngampornchai and Adams (2016) and Bayu et al. (2021) affirm that veteran teachers are reliable judges of long-term effectiveness by virtue of their capacity to compare the tool against years of experience with less efficient manual systems.

Regarding school size, most respondents came from medium (38.79%) and small (30.17%) schools, with 31.03% representing large and extra-large institutions. The positive reception across all school sizes suggests that the template is scalable and addresses the universal need for data accuracy regardless of institutional volume, consistent with the principle that effective digital tools must be flexible enough to function in both resource-limited and high-volume environments (Lari et al., 2020). In terms of school type, 62.93% of respondents were from rural schools and 36.21% from urban areas. The predominantly rural sample implies that if the template is perceived as effective by this majority, the tool demonstrates robustness even in settings challenged by connectivity and technical support limitations, consistent with Facilitating Conditions as a significant UTAUT moderator (Venkatesh et al., 2003). Finally, 56.90% had attended only one to two ICT-related trainings and 30.17% had attended none, meaning 87.07% had minimal formal training. This underscores the template's user-friendly design, as Dioquino and Paglinawan (2024) and Clarin (2021) both observed that basic competency in spreadsheet software allows Filipino teachers to adapt to automated templates rapidly even without extensive professional development.

Extent of awareness of the automated PHIL-IRI template

The aggregate mean for awareness was 3.33, placing respondents in the Very Aware category. Respondents were most confident in understanding the template's functions (WM = 3.36) and in their familiarity with the tool (WM = 3.35), while confidence in actually operating it correctly was slightly lower (WM = 3.27), though still within the Very Aware range. This pattern suggests the template is easy to conceptualize, which reduces hesitation toward adoption. According to the UTAUT framework, awareness of a system's purpose reduces perceived ease-of-use barriers, making adoption more likely (Venkatesh et al., 2003). Ahmad and Jalil (2021) similarly noted that knowing a tool's purpose significantly lowers the psychological resistance to adoption, while Magsambol (2024) emphasized that awareness of automated systems is the critical first step in reducing administrative paperwork burdens among Filipino teachers, provided adequate operational support is available.

Extent of effectiveness across UTAUT constructs

All four UTAUT constructs were rated Very Effective, yielding a Grand Mean of 3.48 with a standard deviation of 0.57. Performance Expectancy received the highest aggregate mean of 3.53, with respondents most strongly agreeing that the template helped them complete tasks faster (WM = 3.56), enhanced work quality (WM = 3.53), and improved report accuracy (WM = 3.51). These ratings confirm that the template effectively addresses the primary administrative burden motivating its adoption, namely the time and accuracy costs of manual data consolidation. Castro (2023) and Magsambol (2024) similarly argue that automation allows teachers to redirect effort from administrative desk work toward instructional priorities, while Cabansag (2025) identifies speed and precision as the principal drivers of Filipino teachers' satisfaction with technological tools.

Effort Expectancy received an aggregate mean of 3.47, with respondents identifying time savings relative to manual consolidation as the highest-rated indicator (WM = 3.51), followed by ease of use and simplicity of functions (WM = 3.46 each). These ratings confirm that the template's user-friendly design effectively removes technological apprehension, consistent with Venkatesh et al.'s (2003) finding that ease of use is a primary driver of rapid adoption. Al-Mashaqbeh (2021) and Espinosa (2023) emphasize that simplicity is essential for teachers operating across varied digital skill levels, and Tan and Tan (2024) confirm that time-saving features are among the strongest predictors of sustained long-term tool use.

Social Influence registered an aggregate mean of 3.49, with school head support receiving the highest rating (WM = 3.51) and colleague encouragement closely behind (WM = 3.49). These results indicate that a supportive organizational culture actively promotes template adoption, creating a positive ripple effect across the school community. Bacolod (2022) found that Filipino teachers are highly social adopters who follow the lead of their school heads, and Sarmiento and Prudente (2021) identified peer coaching as one of the most effective mechanisms for supporting software adoption, as witnessing colleagues successfully using a tool makes the transition feel more accessible.

Facilitation Conditions yielded an aggregate mean of 3.42, with access to necessary hardware and software receiving the highest rating (WM = 3.47) and availability of training opportunities rated slightly lower (WM = 3.35), though still Very Effective. This suggests that basic technological infrastructure is satisfactorily in place, though formal training provision represents the greatest remaining area for improvement. Reyes (2024) notes that Philippine schools increasingly succeed when digital tools are designed for offline efficiency and do not require expensive hardware upgrades, while Tindowen et al. (2021) emphasize that perceived availability of technical support is a backbone condition for sustained digital transformation in education.

Extent of satisfaction and most utilized process

The overall satisfaction with the automated PHIL-IRI template was rated Very Satisfied with an aggregate mean of 3.51. The highest satisfaction scores were recorded for the speed of generating reports (WM = 3.53) and significant workload reduction (WM = 3.51), with general usefulness rated at 3.49. These results affirm that the template successfully delivers on its core promise of efficiency. According to Bhattacharjee's (2001) Expectation-Confirmation Model, sustained use of a tool is most reliably predicted when users perceive that it delivers the benefits they anticipated. Vergel de Dios (2024) confirmed that Filipino teachers demonstrate higher satisfaction with digital tools providing immediate, visible results compared to labor-intensive manual tallying, while Al-Adwan et al. (2022) identified satisfaction as the strongest predictor of long-term adoption.

Regarding the most commonly utilized PHIL-IRI administration process, 86.2% (100 respondents) reported using the automated method as their primary tool, while only 13.8% (16 respondents) continued relying on manual procedures. This high adoption rate indicates that the template has successfully transitioned from an innovation to a normalized operational standard within the division, consistent with Rogers' (2003) Diffusion of Innovations Theory, which explains that rapid widespread adoption follows when the advantages of a new tool are clear, observable, and socially normalized. Buabeng-Andoh (2021) further noted that majority adoption creates an organizational environment where digital tools become the default mode of work, while Durban and Catalina (2022) emphasized that this shift toward digital record-keeping is a critical bridge toward a more data-driven Philippine educational system.

Relationship between respondent profile and effectiveness

Hypothesis testing revealed that personal and professional characteristics including age, sex, and current position did not yield statistically significant relationships with perceived effectiveness at the $p < 0.05$ level, indicating that the template's effectiveness is broadly perceived regardless of individual demographics. However, contextual factors including school size, school type, and the number of ICT-related trainings attended were found to be statistically significant influencers ($p < 0.05$), affirming that institutional environment and capacity-building opportunities meaningfully shape how educators experience and evaluate the tool. These findings suggest that while the template's core design is accessible to users across demographic profiles, targeted structural investments in training and technical support, particularly for rural and small-school contexts, are essential for optimizing perceived effectiveness and ensuring equitable adoption across the division.

CONCLUSION

The findings of this study lead to the conclusion that the locally developed Automated PHIL-IRI Template is a highly effective and widely accepted innovation for streamlining division-level data consolidation within the DepEd Toledo City Division. Across all four UTAUT constructs, the template was rated Very Effective, with a Grand Mean of 3.48, with Performance Expectancy emerging as the most valued dimension, reflecting educators' strong appreciation for the tool's capacity to accelerate task completion and enhance reporting accuracy. Respondents expressed Very Satisfied overall satisfaction ($WM = 3.51$), and an overwhelming 86.2% have adopted the automated method as their primary PHIL-IRI administration process, demonstrating a clear organizational shift away from manual consolidation.

The absence of statistically significant relationships between personal demographics and perceived effectiveness confirms that the template's practical value is universally recognized across age groups, sexes, educational backgrounds, positions, and years of service. Conversely, the significance of school size, school type, and ICT training history as moderating factors underscores that contextual and institutional conditions continue to shape how effectively the tool is experienced and utilized. The 13.8% of respondents still using manual methods signals persistent adoption gaps attributable to training deficiencies and technical infrastructure constraints that require deliberate institutional response.

To ensure universal and sustained adoption, it is recommended that the DepEd Toledo City Division formally institutionalize the automated template as the official standard for all literacy data reporting, develop and schedule regular hands-on ICT training programs with particular attention to rural and small-school contexts, and designate technical support personnel to assist schools with software compatibility and troubleshooting. School heads should foster a culture of social support by formally recognizing teachers who demonstrate proficiency in the template and by incorporating its use into structured in-service training sessions. The automated PHIL-IRI template further presents a scalable model for developing comparable tools for other DepEd assessment instruments, including the Comprehensive Rapid Literacy Assessment and the Quarterly Reading Assessment, thereby broadening the impact of this locally driven innovation across the division's data management ecosystem.

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