

Evaluating Information Literacy Programs in Dynamic Learning Environments: A Mixed-Methods Study of Effectiveness, Adaptability, and Sustainability in Philippine Private Universities

Dr. Dennis C. Camatog, Dr. Jacqueline G. Austria, James F. Del Valle
Paranaque City College^{1,2,3}

ORCID: <https://orcid.org/0000-0002-9221-2937>¹, <https://orcid.org/0009-0003-5070-4479>²,
<https://orcid.org/0009-0003-4889-0655>³

camatog.dennis@paranaquecitycollege.edu.ph¹, austria.jacqueline@paranaquecitycollege.edu.ph²,
delvalle.james@paranaquecitycollege.edu.ph³

ABSTRACT

Information literacy remains a critical competency in higher education, particularly in environments characterized by rapid technological change and increasing information complexity. This study examines Information Literacy Programs (ILPs) in selected Philippine private universities, focusing on their effectiveness and the roles of adaptability and sustainability in shaping outcomes. Using a convergent mixed-methods design, data were collected through surveys and supplemented by qualitative insights from interviews and group discussions. The results indicate that ILPs are generally effective at supporting student learning and skill development, particularly regarding engagement and perceived knowledge gains. However, evidence of sustained application and broader impact remains limited. Adaptability—through flexible, context-responsive instruction—and sustainability—through reinforcement and continued practice—were found to significantly influence program effectiveness. The findings underscore the importance of designing ILPs as ongoing, responsive learning processes rather than isolated instructional interventions.

Keywords: Information literacy programs; higher education; mixed-methods research; program evaluation; adaptability; sustainability; dynamic learning environments; Kirkpatrick model; Philippines

INTRODUCTION

Information literacy (IL) has become a fundamental competency in higher education, enabling students to effectively locate, evaluate, and use information in increasingly complex digital environments. As higher education institutions transition toward technology-enhanced and student-centered learning, Information Literacy Programs (ILPs) play a critical role in supporting academic success, lifelong learning, and informed decision-making. Despite widespread recognition of its importance, the implementation and evaluation of ILPs remain uneven across institutions, particularly in resource-limited contexts.

Existing research demonstrates that ILPs can improve students' cognitive and research skills across face-to-face, online, and blended formats. However, much of this evidence relies on self-reported perceptions rather than direct performance measures, limiting conclusions about the long-term impact. Moreover, studies frequently focus on short-term learning gains while overlooking whether IL competencies are sustained and transferred beyond instructional settings (Weightman et al., 2017; Erlinger, 2018). This has led to what scholars describe as a persistent "results gap," where improvements in knowledge and skills are not consistently reflected in measurable academic or institutional outcomes.

In response, recent scholarship emphasizes the need to examine ILPs beyond effectiveness alone by incorporating dimensions such as adaptability and sustainability. Adaptability refers to the extent to which ILPs respond to diverse learner needs, disciplinary contexts, and evolving technological environments. Flexible delivery modes, inclusive instructional design, and context-sensitive content have been identified as key features of adaptable programs. At the same time, sustainability highlights the importance of reinforcement, practice opportunities, and institutional integration to ensure that IL competencies are retained and applied over time (Tomar, 2025). Despite their importance, both adaptability and sustainability remain underexplored and are often treated conceptually rather than empirically.

Theoretical frameworks such as the Kirkpatrick Model of training evaluation and Behavioral Learning Theory provide useful lenses for addressing these gaps. The Kirkpatrick Model enables systematic assessment across four levels—reaction, learning, behavior, and results—while behavioral theory emphasizes reinforcement and observable outcomes as critical to sustained learning. Integrating these perspectives allows for a more comprehensive evaluation of ILPs, particularly in understanding how instructional experiences translate into long-term behavioral change.

In the Philippine context, ILP implementation in private universities presents additional challenges, including variability in institutional support, technological infrastructure, and instructional practices. While local studies have explored aspects of IL instruction, there remains limited empirical research that simultaneously examines effectiveness, adaptability, and sustainability within a unified framework. This gap is particularly significant given the growing demand for flexible and resilient learning environments in Southeast Asia.

This study addresses these limitations by evaluating ILPs in selected private universities in the Philippine National Capital Region using a convergent mixed-methods approach. Specifically, it aims to: (1) assess the effectiveness of ILPs across multiple levels of learning outcomes; (2) examine the role of adaptability in enhancing engagement and instructional relevance; and (3) evaluate the sustainability of ILPs in terms of reinforcement, practice, and long-term application. By integrating these dimensions, the study contributes to developing a more comprehensive framework for understanding and improving information literacy in dynamic learning environments.

This study is anchored in the integration of the Kirkpatrick Model of Training Evaluation and Behavioral Learning Theory, providing a multidimensional lens for assessing Information Literacy Programs (ILPs). The framework posits that ILP effectiveness is not solely determined by immediate learning outcomes but is significantly influenced by adaptability and sustainability, which shape long-term behavioral change and program impact. The Kirkpatrick Model structures effectiveness into four levels: (1) learner reaction, (2) knowledge acquisition, (3) behavioral application, and (4) results or outcomes. Meanwhile, Behavioral Learning Theory emphasizes reinforcement, practice, and repetition as essential mechanisms for sustaining learned competencies over time.

Within this study, adaptability (e.g., flexible delivery, technological relevance, learner-centered design) and sustainability (e.g., reinforcement, integration, continuous practice) are treated as key predictor variables influencing ILP effectiveness.

Drawing on the Kirkpatrick Model and Behavioral Learning Theory, this study posits that the effectiveness of the Information Literacy Program (ILP) is influenced by adaptability

and sustainability factors. Prior literature indicates that flexible, learner-centered, and technology-integrated instruction enhances engagement and learning outcomes, while reinforcement and continuous practice support long-term skill retention.

Based on these theoretical and empirical foundations, the following hypotheses are proposed:

H1: ILPs demonstrate a significant level of effectiveness across the four Kirkpatrick levels (reaction, learning, behavior, and results).

H2: Adaptability has a significant positive relationship with ILP effectiveness.

H3: Sustainability has a significant positive relationship with ILP effectiveness.

H4: Adaptability significantly predicts ILP effectiveness.

H5: Sustainability significantly predicts ILP effectiveness.

These hypotheses collectively examine both the descriptive effectiveness of ILPs and the predictive influence of adaptability and sustainability.

Statement of the Problem

This study aimed to evaluate Information Literacy Programs (ILPs) in selected Philippine private universities within dynamic learning environments. Specifically, it sought to answer the following questions:

1. What is the level of effectiveness of ILPs in terms of:
 - a. reaction,
 - b. learning,
 - c. behavior, and
 - d. results?
2. What is the level of adaptability of ILPs in terms of:
 - a. flexibility,
 - b. technological relevance, and
 - c. learner-centeredness?
3. What is the level of sustainability of ILPs in terms of:
 - a. reinforcement,
 - b. continuous practice, and
 - c. long-term application?
4. Is there a significant relationship between:
 - a. adaptability and ILP effectiveness, and
 - b. sustainability and ILP effectiveness?
5. Do adaptability and sustainability significantly predict ILP effectiveness?

Scope and Delimitations

This study focused on evaluating Information Literacy Programs (ILPs) in selected private universities within the Philippine National Capital Region (NCR). The research examined three major dimensions of ILPs: effectiveness, adaptability, and sustainability. Effectiveness was assessed using the four levels of the Kirkpatrick Model, namely reaction, learning, behavior, and results. Adaptability encompassed instructional flexibility, technological relevance, and learner-centered approaches, while sustainability covered reinforcement, continuous practice, and the long-term application of information literacy competencies.

The study utilized a convergent mixed-methods design involving quantitative surveys and qualitative interviews and focus group discussions. Participants included students, faculty members, librarians, and academic personnel directly involved in ILP implementation and participation.

The study was limited to selected private higher education institutions in NCR and did not include public universities or institutions outside the region. The findings were based primarily on self-reported perceptions and experiences, which may be subject to response bias. Additionally, the study focused only on existing institutional ILPs and did not evaluate broader digital literacy or AI literacy programs. Due to time and resource constraints, the study did not conduct longitudinal tracking of student outcomes beyond the research period.

Review of Related Literatures

Effectiveness of Information Literacy Programs

Information Literacy Programs (ILPs) have been widely implemented in higher education to enhance students' ability to locate, evaluate, and use information effectively. A substantial body of research confirms that IL instruction positively influences students' academic performance, research skills, and critical thinking abilities. Systematic reviews indicate that ILPs are effective across various delivery modes, including face-to-face, online, and blended learning environments, with generally positive student perceptions and learning outcomes (Weightman et al., 2017).

However, despite consistent evidence of effectiveness, scholars have raised concerns about outcome measurement. Many studies rely heavily on self-reported data rather than direct assessments of student performance, limiting the ability to determine whether IL competencies are transferred to real-world contexts (Erlinger, 2018). Furthermore, evaluation efforts often focus on immediate learning gains, neglecting higher-level outcomes such as long-term retention, behavioral change, and institutional impact. This limitation contributes to what has been described as a persistent gap between instructional effectiveness and measurable results.

Adaptability in Information Literacy Instruction

Adaptability has emerged as a critical dimension in the design and delivery of ILPs, particularly in dynamic and technology-driven learning environments. It refers to the extent to which IL instruction responds to diverse learner needs, disciplinary contexts, and evolving digital tools. Research suggests that adaptable ILPs—those incorporating flexible delivery modes, personalized learning pathways, and context-specific content—enhance student engagement and learning outcomes (Chen & Zainudin, 2024).

In the context of digital and blended learning, adaptability is closely linked to integrating technology and modifying instructional approaches in response to changing conditions. Studies highlight that adaptable learning environments promote not only cognitive development but also learner autonomy and resilience (Shi et al., 2022). However, despite its recognized importance, adaptability is often treated as a conceptual attribute rather than a rigorously measured construct. This lack of operationalization limits empirical understanding of how adaptability influences ILP effectiveness.

Sustainability of Information Literacy Programs

Sustainability in ILPs refers to the capacity of programs to maintain their relevance, effectiveness, and impact over time. Sustainable ILPs are typically characterized by strong institutional support, integration into academic curricula, and ongoing assessment and improvement processes. Research emphasizes the importance of reinforcement and repeated practice in ensuring that information literacy skills are retained and applied beyond initial instruction (Tomar, 2025).

Despite these insights, many ILPs remain episodic or isolated, often delivered as one-time sessions without sufficient follow-up or integration. This limits students' opportunities to practice and internalize IL competencies, thereby undermining long-term outcomes. Additionally, the absence of systematic evaluation frameworks further constrains the ability to assess sustainability meaningfully. As a result, there is a growing call for more comprehensive approaches that link instructional design, assessment, and institutional strategy.

Theoretical Framework

The evaluation of ILPs has increasingly drawn on established frameworks from education and training. The Kirkpatrick Model provides a structured approach for assessing program effectiveness across four levels: reaction, learning, behavior, and results. While widely used, the model has been critiqued for its linear structure and limited attention to contextual factors.

Complementing this, Behavioral Learning Theory emphasizes the role of reinforcement, practice, and observable outcomes in sustaining learning. From this perspective, the effectiveness of ILPs depends not only on knowledge acquisition but also on the extent to which learners are given opportunities to apply and reinforce skills over time. Integrating these frameworks enables a more comprehensive evaluation of ILPs, particularly in understanding the transition from learning to long-term behavioral change.

Although extensive research has examined the effectiveness of ILPs, significant gaps remain. First, there is a lack of studies that simultaneously evaluate effectiveness, adaptability, and sustainability within a single framework. Second, adaptability is rarely operationalized as a measurable construct, limiting its empirical examination. Third, sustainability is often discussed conceptually without sufficient attention to reinforcement mechanisms and long-term outcomes.

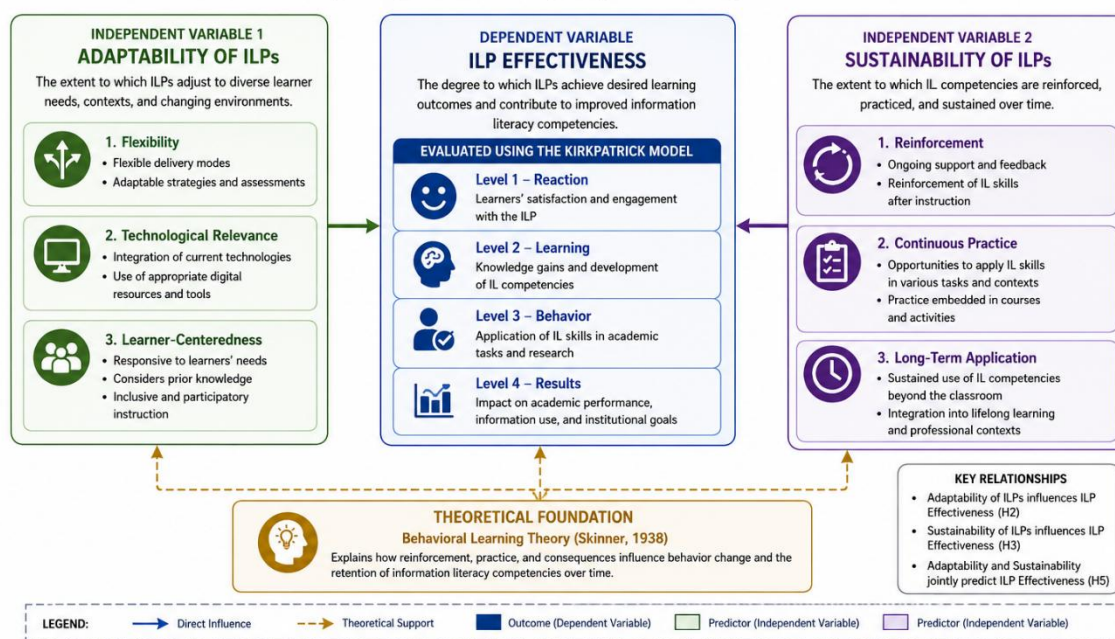
These gaps are particularly evident in developing contexts, including the Philippines, where institutional variability and resource constraints influence ILP implementation.

Addressing these limitations requires a multi-dimensional approach that integrates theoretical frameworks with mixed-methods evaluation.

This study addresses these gaps by providing a comprehensive evaluation of ILPs that integrates effectiveness, adaptability, and sustainability into a unified framework. By applying a mixed-methods design grounded in the Kirkpatrick Model and Behavioral Learning Theory, the study provides both empirical evidence and practical insights into developing dynamic and sustainable information literacy programs in higher education.

THEORETICAL FRAMEWORK FOR ILP EVALUATION

An Integrated Model of Information Literacy Program (ILP) Effectiveness, Adaptability, and Sustainability in Dynamic Learning Environments



Note: The Kirkpatrick Model (1994) provides the evaluation framework for measuring effectiveness, while Behavioral Learning Theory (Skinner, 1938) underpins the mechanisms of reinforcement and sustained behavior change.

Conceptual Framework

This study is anchored in a conceptual framework examining the influence of adaptability and sustainability on the effectiveness of Information Literacy Programs (ILPs) in selected Philippine private universities operating in dynamic learning environments. The framework identifies adaptability and sustainability as the independent variables, while ILP effectiveness serves as the dependent variable.

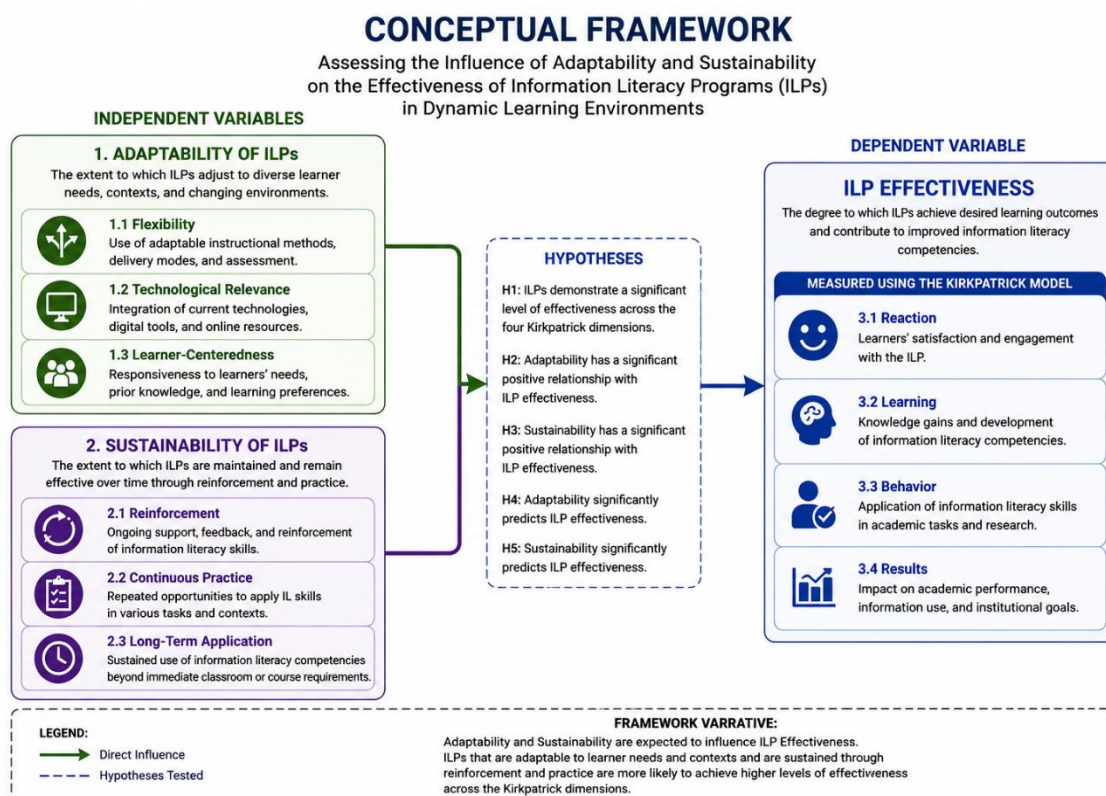
Adaptability refers to the extent to which ILPs respond to diverse learner needs, evolving technological environments, and changing instructional contexts. In this study, adaptability is operationalized through three dimensions: flexibility, technological relevance, and learner-centeredness. Flexibility pertains to the use of adaptable instructional methods and delivery modes; technological relevance refers to the integration of current digital tools and resources; and learner-centeredness emphasizes responsiveness to students' needs, prior knowledge, and learning preferences.

Sustainability refers to the capacity of ILPs to maintain their effectiveness and relevance over time through reinforcement and continued application of information literacy competencies. It is measured through reinforcement, continuous practice, and long-term application. Reinforcement involves ongoing support and strengthening of learned competencies; continuous practice refers to repeated opportunities for skill application across learning activities; and long-term application pertains to the sustained use of information literacy skills beyond immediate instructional settings.

The dependent variable, ILP effectiveness, is evaluated using the four levels of the Kirkpatrick Model: reaction, learning, behavior, and results. Reaction refers to learners'

satisfaction and engagement with ILPs; learning pertains to knowledge acquisition and skill development; behavior involves the application of information literacy competencies in academic contexts; and results refer to broader educational outcomes and institutional impact.

The framework assumes that higher levels of adaptability and sustainability contribute positively to ILP effectiveness. Specifically, adaptable and sustainable ILPs are expected to enhance learner engagement, strengthen knowledge acquisition, encourage behavioral application of information literacy skills, and improve long-term educational outcomes. Thus, the conceptual framework serves as the basis for examining the relationships and predictive influence of adaptability and sustainability on ILP effectiveness.



METHODOLOGY

Research Design

This study employed a convergent mixed-methods research design, integrating both quantitative and qualitative approaches to provide a comprehensive evaluation of Information Literacy Programs (ILPs). This design enables the simultaneous collection and analysis of numerical and narrative data, allowing for triangulation and deeper interpretation of findings. The approach is particularly suitable for capturing both measurable outcomes (effectiveness) and contextual factors (adaptability and sustainability).

Research Setting and Participants

The study was conducted in selected private universities in the Philippine National Capital Region (NCR). These institutions were chosen for having established ILPs and for engaging in blended or technology-enhanced learning environments.

Participants included students, faculty members, librarians, and academic staff who have direct experience with ILPs. Approximately 72 respondents participated in the quantitative phase, selected through purposive sampling to ensure representation of key stakeholder groups. For the qualitative phase, participants were selected through criterion-based sampling, focusing on individuals with relevant experience in IL program implementation and participation.

Data Collection Methods

Quantitative data were gathered through a structured survey questionnaire designed to measure three primary constructs:

- (1) Effectiveness, based on the four levels of the Kirkpatrick Model (reaction, learning, behavior, results);
- (2) Adaptability, including flexibility, technological relevance, and learner-centeredness; and
- (3) Sustainability, focusing on reinforcement, practice, and long-term application.

Responses were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument was adapted from existing validated frameworks and modified to align with the study context.

Qualitative data were gathered through semi-structured interviews and focus group discussions (FGDs). These methods allowed for in-depth exploration of participants' experiences, perceptions, and insights regarding ILP implementation. Interview guides were developed based on the study variables and theoretical framework.

Data Analysis

Quantitative data were analyzed using descriptive and inferential statistics. Descriptive statistics (mean, standard deviation) were used to assess the overall levels of effectiveness, adaptability, and sustainability.

To examine relationships among variables, correlation analysis was conducted, followed by multiple regression analysis to determine the predictive influence of adaptability and sustainability on ILP effectiveness. Statistical significance was set at $p < 0.05$.

Qualitative data were analyzed using thematic analysis, following coding, categorization, and theme development. This process enabled the identification of recurring patterns related to program strengths, limitations, and contextual factors influencing ILP outcomes.

Validity and Reliability

To ensure content validity, the survey instrument was reviewed by experts in information literacy and educational research. A pilot test was conducted to refine the instrument and improve clarity.

Reliability was assessed using Cronbach's alpha, with values above 0.70 considered acceptable. For qualitative data, credibility and trustworthiness were ensured through triangulation, member checking, and peer debriefing.

Ethical Considerations

Ethical standards were strictly observed throughout the study. Participants were informed of the study's purpose and provided informed consent prior to participation. Confidentiality and anonymity were maintained, and all data were used solely for research purposes.

Limitations of the Methodology

This study is subject to certain limitations. First, the use of self-reported data may introduce response bias. Second, the relatively small sample size limits generalizability. Third, adaptability and sustainability were measured using proxy indicators, which may not fully capture their complexity.

RESULTS

Descriptive Results

The findings indicate that Information Literacy Programs (ILPs) demonstrate moderate to high levels of effectiveness across the four Kirkpatrick dimensions. Participants reported high levels of satisfaction (reaction) and perceived improvement in knowledge and skills (learning). Behavioral application of IL competencies (behavior) was also evident, although to a slightly lesser extent. However, results-level outcomes, such as measurable academic or institutional impact, were comparatively lower.

Variable	Mean	SD	Interpretation
Effectiveness	3.85	0.62	High
Adaptability	3.78	0.65	High
Sustainability	3.60	0.70	Moderate

These findings align with previous studies showing that ILPs are generally well-received and effective in enhancing immediate learning outcomes but often fall short in demonstrating long-term or institutional-level impact (Weightman et al., 2017; Sparks et al., 2016).

Correlation Analysis

Correlation analysis revealed significant positive relationships among the key variables. Adaptability was moderately to strongly correlated with ILP effectiveness, indicating that flexible and learner-centered program designs are associated with improved outcomes. Similarly, sustainability demonstrated a significant positive relationship with effectiveness, suggesting that reinforcement and continuous practice contribute to better program performance.

Variables	1	2	3
1. Effectiveness	—		
2. Adaptability	.62*	—	
3. Sustainability	.58*	.55*	—

Note: $p < .05$

These results support existing literature emphasizing the importance of adaptive learning environments and sustained engagement in promoting meaningful learning experiences (Chen & Zainudin, 2024; Shi et al., 2022).

Regression Analysis

Multiple regression analysis was conducted to examine the predictive influence of adaptability and sustainability on ILP effectiveness. The results indicate that both variables are statistically significant predictors of effectiveness ($p < 0.05$).

Adaptability emerged as a strong predictor, highlighting the importance of aligning ILPs with learner needs, technological advancements, and flexible delivery methods. Sustainability also showed a significant positive effect, reinforcing the role of ongoing practice, curricular integration, and reinforcement mechanisms in enhancing long-term outcomes.

Predictor	B	SE	β	p-value
Adaptability	0.45	0.08	0.48	< .001
Sustainability	0.32	0.09	0.34	< .01

$R^2 = 0.52$

These findings suggest that ILPs are more effective when they move beyond static instructional models and incorporate dynamic and sustained learning strategies. The results are consistent with recent research advocating for adaptive and sustainability-oriented approaches in higher education (Tomar, 2025; Gao et al., 2025).

Hypothesis Testing Results

The study tested five hypotheses examining the effectiveness of Information Literacy Programs (ILPs) and the influence of adaptability and sustainability.

H1 proposed that ILPs demonstrate significant effectiveness across the four Kirkpatrick dimensions. Descriptive results indicate moderate to high mean scores across reaction, learning,

and behavior, with relatively lower scores at the results level. Overall, these findings confirm that ILPs are effective in achieving immediate learning outcomes. Thus, H1 is supported.

H2 examined the relationship between adaptability and ILP effectiveness. Correlation analysis revealed a statistically significant positive association between the two variables ($r \approx .62$, $p < .05$), indicating that higher levels of adaptability are associated with greater effectiveness. Therefore, H2 is supported.

H3 tested the relationship between sustainability and ILP effectiveness. The results also show a significant positive correlation ($r \approx .58$, $p < .05$), suggesting that reinforcement and continued engagement contribute to improved program outcomes. H3 is supported.

H4 proposed that adaptability significantly predicts ILP effectiveness. Regression analysis indicates that adaptability has a strong and statistically significant effect ($\beta \approx .48$, $p < .001$), making it one of the primary contributors to effectiveness. Thus, H4 is supported.

H5 examined whether sustainability significantly predicts ILP effectiveness. The findings confirm a significant positive effect ($\beta \approx .34$, $p < .01$), indicating that sustainability also plays an important role, although to a lesser extent than adaptability. Therefore, H5 is supported.

Overall, the results demonstrate that both adaptability and sustainability are significant determinants of ILP effectiveness, with adaptability showing a relatively stronger influence.

DISCUSSION

Effectiveness of Information Literacy Programs

The findings indicate that Information Literacy Programs (ILPs) in selected Philippine private universities are generally effective in enhancing learner satisfaction, knowledge acquisition, and information literacy competencies. High ratings in the reaction and learning dimensions suggest that participants perceive ILPs as relevant, engaging, and beneficial to their academic development. These findings support the Kirkpatrick Model, particularly the first two levels, which emphasize learner response and knowledge acquisition as indicators of instructional effectiveness.

However, lower outcomes in the behavior and results dimensions imply that while learners acquire information literacy knowledge and skills, the long-term transfer and consistent application of these competencies remain limited. This suggests that instructional gains may not automatically translate into sustained behavioral change or broader institutional outcomes. Similar studies have emphasized that information literacy instruction becomes more effective when integrated continuously into academic coursework and authentic learning tasks rather than delivered as isolated interventions.

Adaptability of Information Literacy Programs

The study further revealed that adaptability significantly influences ILP effectiveness. Flexible instructional delivery, technological relevance, and learner-centered approaches contributed positively to learner engagement and perceived instructional value. These findings

indicate that ILPs become more effective when they respond to diverse learner needs, evolving technologies, and changing educational environments.

The results reflect the growing importance of adaptive learning environments in higher education, particularly in digitally mediated contexts where students require accessible, responsive, and context-sensitive instruction. Programs that integrate updated digital resources, interactive learning strategies, and differentiated instructional methods are more likely to sustain learner participation and improve learning outcomes.

Sustainability and Long-Term Learning

Sustainability also emerged as a significant predictor of ILP effectiveness. Reinforcement, continuous practice, and opportunities for long-term application were found to strengthen the retention and transfer of information literacy competencies. This finding aligns with Behavioral Learning Theory, which emphasizes that repeated practice and reinforcement are necessary for sustained behavioral change and skill retention.

The findings suggest that ILPs should not be limited to one-time orientations or standalone instructional sessions. Instead, institutions should embed information literacy competencies across curricula, research activities, and collaborative learning experiences to ensure continuous exposure and application. Sustainable ILPs foster deeper engagement and encourage learners to apply information literacy skills beyond immediate classroom requirements.

Implications for Higher Education Institutions

The study highlights the need for higher education institutions to redesign ILPs as integrated and sustainable components of the academic ecosystem. Universities should strengthen collaboration among librarians, faculty members, and academic administrators to ensure that ILPs remain adaptable to technological developments and responsive to learner needs.

Furthermore, institutional support for continuous assessment, curricular integration, and digital innovation may enhance the long-term effectiveness of ILPs. The study also contributes to the growing body of literature on information literacy by proposing a multidimensional framework that integrates effectiveness, adaptability, and sustainability for evaluating ILPs in dynamic learning environments.

SUMMARY

This study examined the effectiveness, adaptability, and sustainability of Information Literacy Programs (ILPs) in selected private universities in the Philippines operating in dynamic learning environments. Guided by the Kirkpatrick Model and supported by Behavioral Learning Theory, the study aimed to determine how adaptability and sustainability influence the overall effectiveness of ILPs in higher education institutions.

Using a convergent mixed-methods research design, quantitative and qualitative data were collected from students, faculty members, librarians, and academic personnel involved in implementing ILPs. Quantitative data were analyzed using descriptive statistics, correlation, and regression analyses, while qualitative data from interviews and focus group discussions provided supporting insights and contextual interpretations of the findings.

The study revealed that ILPs demonstrated significant effectiveness across the four Kirkpatrick dimensions: reaction, learning, behavior, and results. Participants generally perceived ILPs as beneficial in enhancing information literacy competencies, improving engagement with academic resources, and supporting research-related learning outcomes. The findings also indicated that adaptability and sustainability were evident in the implementation of ILPs through flexible instructional strategies, technological integration, learner-centered approaches, reinforcement mechanisms, continuous practice, and long-term application of information literacy skills.

Correlation and regression analyses further showed that adaptability and sustainability were significantly and positively related to ILP effectiveness. Adaptability significantly predicted ILP effectiveness by enabling programs to respond effectively to changing learner needs and evolving educational environments. Similarly, sustainability contributed to the continued reinforcement and application of information literacy competencies beyond immediate instructional activities. The combined influence of adaptability and sustainability strengthened the overall effectiveness and long-term impact of ILPs.

Qualitative findings supported the quantitative results by emphasizing the importance of responsive instructional delivery, institutional support, technological relevance, and sustained opportunities for practice and application. Participants highlighted that ILPs are more effective when continuously updated, integrated into academic activities, and aligned with the evolving demands of digital and information-rich learning environments.

Overall, the study underscored the importance of developing adaptable and sustainable Information Literacy Programs that not only improve immediate learning outcomes but also promote long-term information literacy competencies among learners in higher education institutions.

CONCLUSION

This study evaluated Information Literacy Programs (ILPs) in selected Philippine private universities in terms of effectiveness, adaptability, and sustainability within dynamic learning environments. The findings revealed that ILPs are generally effective in promoting learner satisfaction, knowledge acquisition, and the development of information literacy competencies. However, the impact of ILPs at the behavioral and results levels was comparatively limited, suggesting a gap between immediate learning outcomes and the sustained application of information literacy skills in academic and real-world contexts.

The study further established that adaptability and sustainability are significant determinants of ILP effectiveness. Adaptable programs characterized by flexible delivery methods, technological relevance, and learner-centered approaches were found to enhance learner engagement and improve instructional outcomes. Similarly, sustainability through

reinforcement, curricular integration, and continuous opportunities for practice contributed significantly to the retention and long-term application of information literacy competencies.

Anchored on the Kirkpatrick Model and Behavioral Learning Theory, the study provides a comprehensive framework for evaluating ILPs in higher education institutions. The findings underscore that effective Information Literacy Programs should extend beyond isolated instructional interventions and instead function as dynamic, integrated, and sustainable learning systems that continuously respond to evolving educational and technological demands.

RECOMMENDATIONS

Based on the findings, the following recommendations are proposed:

1. Integrating Information Literacy into the Curriculum

Embedding information literacy within the curriculum represents a shift from peripheral instruction to a core academic practice. Research indicates that information literacy competencies are more effectively developed when contextualized within disciplinary learning rather than delivered through isolated workshops or standalone orientations (Wang, 2010; Johnston & Webber, 2003).

Curricular integration allows students to engage with information literacy through authentic academic tasks such as research projects, case analyses, reflective activities, and problem-based learning. This supports constructivist learning principles, which emphasize that knowledge acquisition becomes more meaningful when situated within relevant learning contexts. Furthermore, integration enables the progressive development of competencies across year levels, beginning with foundational search and retrieval skills and advancing toward critical evaluation, synthesis, and ethical use of information.

Without systematic curricular integration, Information Literacy Programs (ILPs) may be perceived as supplementary rather than essential, thereby limiting their long-term educational impact.

2. Strengthening Adaptability through Flexible and Technology-Enhanced Approaches

Adaptability should remain a central feature of ILPs in dynamic learning environments. Programs must continuously respond to diverse learner needs, emerging digital tools, and evolving academic practices. Flexible instructional approaches such as blended learning, modular content delivery, asynchronous learning resources, and self-paced instructional materials may improve accessibility and learner engagement (Chen & Zainudin, 2024).

Technological integration also plays a critical role in improving instructional responsiveness. Digital platforms, interactive learning tools, and adaptive learning systems may enhance learner participation by providing personalized pathways, immediate feedback, and varied learning experiences. However, adaptability should extend beyond instructional delivery and include regular program evaluation and revision based on student feedback, institutional priorities, and technological developments.

Programs that continuously adapt to changing educational environments are more likely to remain relevant, effective, and responsive to learners' information literacy needs.

3. Enhancing Sustainability through Reinforcement and Continuous Practice

The sustainability of ILPs may be strengthened through continuous reinforcement and repeated opportunities for practice and application. Consistent with principles of Behavioral Learning Theory, sustained engagement and repeated exposure contribute to the retention and long-term application of acquired competencies.

Institutions may reinforce information literacy skills by embedding IL-related activities across multiple courses and academic levels. Successive assignments, scaffolded learning activities, and interdisciplinary applications can provide learners with opportunities to apply competencies in increasingly complex contexts. Feedback mechanisms such as instructor guidance, peer evaluation, and reflective assessment may further strengthen learning retention.

Institutional support is likewise necessary to sustain ILPs over time. Sustainable implementation requires alignment with curricular structures, collaboration among faculty and librarians, and continuous resource allocation. Institutionally embedded programs are more likely to maintain continuity and effectiveness despite organizational or personnel changes.

4. Improving Assessment Strategies for Long-Term Impact

The study highlights the need for more comprehensive assessment approaches in evaluating ILP effectiveness. While perception-based measures provide useful insights into learner experiences, they may not fully capture actual competence or long-term behavioral application.

Higher education institutions are encouraged to adopt performance-based and longitudinal assessment methods. Performance-based assessments such as research portfolios, annotated bibliographies, reflective outputs, and project-based tasks can provide direct evidence of students' ability to apply information literacy competencies. Longitudinal assessments may also help determine whether competencies are retained and transferred across academic and professional contexts over time.

Aligning assessment practices with the Kirkpatrick Model may further strengthen evaluation by measuring outcomes beyond immediate learner reactions and knowledge acquisition, including behavioral change and broader institutional impact.

5. Strengthening Institutional Support and Policy Alignment

The effectiveness and sustainability of ILPs are strongly influenced by institutional structures, leadership support, and policy alignment. Programs with limited administrative support may encounter challenges related to inconsistent implementation, inadequate resources, and fragmented instructional delivery.

Institutions are encouraged to formally integrate information literacy within curriculum standards and institutional policies. Administrative support may include dedicated funding,

faculty and librarian professional development, technology infrastructure enhancement, and support for cross-departmental collaboration.

Collaborative partnerships between faculty members, librarians, and academic administrators are likewise essential to ensure that ILPs remain aligned with disciplinary goals and institutional learning outcomes. Recognizing information literacy as a core graduate competency may further encourage systematic and sustained implementation across academic programs.

6. Expanding Directions for Future Research

Future studies may further strengthen the body of knowledge on ILPs by using larger, more diverse samples across different institutional contexts. Comparative studies involving public and private universities or regional and international settings may provide deeper insights into contextual variations in ILP implementation and effectiveness.

There is also a need for future research that utilizes objective, analytics-based measures of information literacy competence, including standardized assessments, digital learning analytics, and behavioral tracking methods. These approaches may complement perception-based data and provide more comprehensive evidence of competency development and long-term application.

Emerging areas such as AI literacy, data literacy, digital citizenship, and digital resilience also present important directions for expanding contemporary information literacy frameworks. As educational and technological environments continue to evolve, future research should explore how ILPs can remain adaptive, sustainable, and responsive to increasingly complex information ecosystems.

Overall, these recommendations emphasize the need for Information Literacy Programs to evolve into adaptive, sustainable, and institutionally integrated learning systems that support learners in rapidly changing digital and academic environments.

REFERENCES

- Bury, S. (2016). Learning from faculty voices on information literacy: Opportunities and challenges for undergraduate information literacy education. *Reference Services Review*, 44(3), 237–252. <https://doi.org/10.1108/RSR-11-2015-0047>
- Chen, Z., & Zainudin, Z. (2024). Systematic review on developing digital literacy approaches in higher education institutions. *Uniglobal Journal of Social Sciences and Humanities*. <https://ujssh.com/index.php/ujssh/article/view/131>
- Erlinger, A. (2018). Outcomes assessment in undergraduate information literacy instruction: A systematic review. *College & Research Libraries*, 79(4), 442–479. <https://doi.org/10.5860/crl.79.4.442>

-
- Johnston, B., & Webber, S. (2003). Information literacy in higher education: A review and case study. *Studies in Higher Education*, 28(3), 335–352. <https://doi.org/10.1080/0307507032000122266>
- Shi, Y., Peng, F., & Sun, F. (2022). A blended learning model to improve college students' information literacy. *IEEE Access*, 10, 1–12. <https://doi.org/10.1109/ACCESS.2022.3140000>
- Sparks, J. R., Katz, I. R., & Beile, P. M. (2016). Assessing digital information literacy in higher education: A review of existing frameworks and assessments. *ETS Research Report Series*, 2016(2), 1–33. <https://doi.org/10.1002/ets2.12118>
- Tomar, M. (2025). Assessing information literacy programs in academic libraries: A comprehensive review. *International Journal of Information Studies*. <https://dline.info/ojs/index.php/ijis/article/view/421>
- Wang, L. (2011). An information literacy integration model and its application in higher education. *Reference Services Review*, 39(4), 703–720. <https://doi.org/10.1108/00907321111186703>
- Wang, X. (2010). *Integrating information literacy into higher education curricula: An information literacy curricular integration model* (Doctoral dissertation, Queensland University of Technology). <https://eprints.qut.edu.au/41747/>
- Weightman, A. L., Farnell, D. J. J., Morris, D., Strange, H., & Hallam, G. (2017). A systematic review of information literacy programs in higher education. *Evidence Based Library and Information Practice*, 12(3), 111–177. <https://doi.org/10.18438/B86W90>