



PROCEEDINGS OF THE INTERNATIONAL CONFERENCE ON EDUCATIONAL TRENDS AND TECHNOLOGY (iCONETT 2025)

"Empowering Futures: Navigating the Intersection of Innovation,
Equity, and Lifelong Learning in a Globalized Eduscape"

10th AND 11th OCTOBER 2025

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6th SLIIT International Conference on Advancements in Sciences and Humanities

PROCEEDINGS OF THE
International Conference on Educational Trends and Technology
*i*CONETT 2025

“Empowering futures: Navigating the intersection of innovation, equity, and lifelong learning in globalized eduscape”

10-11 OCTOBER 2025

SRI LANKA INSTITUTE OF INFORMATION TECHNOLOGY
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Organized by
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Faculty of Social Sciences and Languages, Sabaragamuwa University of Sri Lanka

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Message from the Chancellor

With great pleasure, I warmly congratulate the organizers, participants, and contributors of the SICASH 2025 Multiconference. This significant event unites seven interdisciplinary conferences, each focusing on critical issues shaping our present and future, covering topics such as sustainability, biotechnology, education, law, psychology, language, actuarial science, and healthcare.

The themes examined this year embody a timely and ambitious agenda focused on promoting research, innovation, and collaboration across a variety of academic and professional disciplines. In a time characterized by swift change, technological progress, and intricate global challenges, the dedication to sustainability, equity, and excellence showcased by SICASH 2025 is truly commendable and inspiring.

Such gatherings transcend mere academic events; they act as incubators for innovation and change. By promoting dialogue, fostering cross-disciplinary collaborations, and disseminating evidence-based insights, SICASH 2025 emerges as a potent catalyst for generating solutions that can positively influence our societies, institutions, and the world.

These conferences serve as an essential platform for scholars, researchers, practitioners, and thought leaders to unite, engage in meaningful dialogue, and inspire one another toward innovation and shared objectives. I am confident that the knowledge generated and exchanged during this multiconference will leave a lasting impact not only within academic circles but also in shaping policies, practices, and global perspectives.

I commend the organizing committee for their commitment and foresight in creating such a thorough and progressive program. I wish all participants a productive, insightful, and enriching experience at SICASH 2025.

With sincere regards,

Prof. L. L. Ratnayake

Chairman

Sri Lanka Institute of Information Technology



Message from the Vice Chancellor

I am delighted to convey my warmest wishes as the Faculty of Humanities and Sciences hosts the sixth edition of the SLIIT International Conference on Advancements in Sciences and Humanities (SICASH 2025) Multiconference. I believe this year's theme, "Transforming Possibilities Through Research Excellence," is timely, highlighting the power of research to reshape boundaries, inspire fresh thinking, and create pathways that lead to real-world impact. In addition to the main conference, SICASH 2025 hosts seven specialized conferences, providing focused platforms for deeper exploration of specific fields, attracting experts, scholars, and practitioners, enhancing the quality of discussions, and expanding professional networks.



I am pleased to see that SICASH this year brings together a remarkable convergence of minds from Sri Lanka and beyond, including scholars from China, Australia, India, and Dubai. The wide range of disciplines represented, including biotechnology, nursing, psychology, law, linguistics, and mathematics, highlights the conference's commitment to interdisciplinary collaboration. By embracing this cross-disciplinary research approach, the conference demonstrates how every field of study is interconnected, with insights from one area reinforcing and advancing others. I am confident that this collaborative environment will drive innovative thinking and practical solutions while inspiring research capable of addressing pressing societal challenges, shaping policy, and contributing to sustainable progress on both local and global levels, demonstrating SLIIT's dedication to meaningful research.

A special welcome goes to our keynote speakers of international repute, including Dr. Patrick McNamara, Executive Director of the United States-Sri Lanka Fulbright Commission, and Dr. Usree Bhattacharya, Associate Professor at the University of Georgia. Their contributions, together with those of the other distinguished speakers across the seven specialized conferences, will bring invaluable insights to participants and set the stage for thought-provoking dialogue.

I extend my sincere appreciation to the Dean, academic reviewers, conference chairs, and organizing committees whose dedication and meticulous effort have made this multiconference possible. Their work ensures that SICASH continues to serve as a vibrant platform for advancing knowledge, building networks, and inspiring the next generation of scholars.

I am confident that SICASH 2025 will strengthen SLIIT's research profile and nurture collaborations that extend beyond academia, enabling discoveries that contribute to industry, policy, and society at large.

Prof. Lalith Gamage
Vice Chancellor
Sri Lanka Institute of Information Technology (SLIIT)

Message from the Senior Deputy Vice Chancellor & Provost

It gives me great pleasure to extend my heartfelt congratulations to the organizers and participants of SICASH 2025. This prestigious academic gathering, organized by the Faculty of Humanities and Sciences, stands as a testament to our continued commitment to excellence in academic programs and innovative research.



SICASH 2025 once again promises to be a truly multidisciplinary platform, bringing together scholars and researchers from diverse subject areas to share their findings with both national and international academic communities. It is particularly commendable that the conference has continued to grow in stature and impact over the years, reflecting its resilience and commitment to fostering academic excellence despite the many challenges that arise in today's world.

Among the many specialized tracks of this year's conference, I am delighted to recognize the International Conference on Educational Trends and Technology (*iCONETT* 2025), held under the timely theme "Empowering Futures: Navigating the Intersection of Innovation, Equity, and Lifelong Learning in a Globalized Eduscape." This focus highlights the transformative role of education and technology in shaping a sustainable, equitable, and globally connected future. *iCONETT* 2025 enriches SICASH by broadening its scope and providing a dedicated forum for dialogue, collaboration, and knowledge sharing in this vital field.

It is deeply encouraging to witness the enthusiasm and willingness of local and international academic communities to contribute to SICASH 2025. The organizing committee deserves the highest commendation for curating an engaging program of eminent keynote speakers, thought-provoking sessions, and high-quality research presentations.

I extend my sincere gratitude to the organizing committee for their tireless dedication in making this event a success, and I warmly thank all participants who have contributed their research to SICASH 2025. I wish everyone a productive, inspiring, and successful conference experience, and I look forward to the impactful outcomes that will emerge from *iCONETT* 2025 and the broader SICASH platform.

Professor N. Rajapakse
Senior Deputy Vice-Chancellor and Provost

Message from the Dean

It is with great pride that I welcome you to the SLIIT International Conference on Advancements in Sciences and Humanities (SICASH) 2025. This year marks a historic milestone, as SICASH has transformed into a multi-conference, with each track now established as an independent conference under the larger SICASH umbrella. This evolution reflects both the remarkable growth of the conference and our continued commitment to promoting research and scholarly exchange across diverse disciplines.



SICASH 2025 brings together an exceptional community of scholars, with nine distinguished resource persons from overseas joining us alongside eminent scientists and officials representing leading professional bodies. The endorsement and support of several professional associations further reinforce the credibility and impact of this conference. Their involvement demonstrates the strong alignment of SICASH with national and global academic, industrial, and professional priorities.

This year's proceedings feature more than 150 research papers, covering a breadth of fields spanning sciences, humanities, social sciences, health, and education. By granting each track its own identity as a conference, while preserving the spirit of interdisciplinary dialogue, SICASH creates a unique platform where ideas converge, collaborations emerge, and innovation thrives.

I wish to place on record my heartfelt appreciation to our keynote speakers, overseas and local experts, reviewers, and the organizing committees. In particular, I extend my warmest thanks to Conference Chair Dr. Nirosha Priyadarshani and the co-chairs, whose dedication and attention to detail have been instrumental in orchestrating this massive event.

As we embark on this new chapter in the SICASH journey, I invite you to actively participate, exchange ideas, and cultivate partnerships that will extend well beyond this event. Together, let us continue to advance knowledge, inspire innovation, and contribute to the betterment of our societies.

Dr. Malitha N. Wijesundara
Dean, Faculty of Humanities and Sciences
Sri Lanka Institute of Information Technology (SLIIT)

Message from the General Chair

As General Chair of SICASH 2025 Multiconference, it is my distinct pleasure to extend a warm welcome to all participants of the sixth annual SICASH Multiconference, hosted by the Faculty of Humanities and Sciences at SLIIT. This year's theme, Transforming Possibilities Through Research Excellence, underscores our shared commitment to advancing knowledge, fostering innovation, and promoting meaningful dialogue across disciplines.



This year, SICASH has been elevated to the level of a multiconference, a significant step in its evolution and visibility. This transformation reflects both the growth of the conference and the increasing demand for platforms that support deeper, more diverse academic engagement. By bringing together seven parallel conferences under one unified framework, SICASH 2025 provides a broader stage for scholarly exchange, interdisciplinary collaboration, and the dissemination of impactful research.

Under the shared umbrella of SICASH 2025 multiconference, bring together seven distinguished conferences:

- International Conference on Sustainable Biotechnology (ICoSBi 2025)
- International Conference on Educational Trends and Technology (*i*CONETT 2025)
- International Conference on Language, Culture, Technology, and Autonomy (ICLACTA 2025)
- International Conference on Law and Justice (ICLJ 2025)
- International Conference on Actuarial Sciences (ICActS 2025)
- International Conference on Nursing and Allied Health for Sustainability (ICoNAHS 2025)
- Psychology International Conference (PSYCIC 2025)

Each of these conferences, while maintaining a focus on its specific domain, collectively advances the mission of fostering rigorous research, promoting interdisciplinary dialogue, and translating knowledge into meaningful societal impact. Each conference publishes its own proceedings, reflecting a strong commitment to scholarly excellence.

I extend my heartfelt gratitude to all authors for their dedication and intellectual contributions, to the reviewers for upholding rigorous standards, and to our partners, sponsors, and endorsing institutions for their generous support.

Dr. S. V. G. Nirosha Priyadarshani
General Chair
SICASH 2025 Multiconference

Message from the Chair – *i*CONETT 2025

Dear Colleagues, Scholars, and Participants,

It is my great pleasure to welcome you to the International Conference on Educational Trends and Technology (*i*CONETT 2025), organized under the umbrella of the 6th SICASH International Multi-conference.

*i*CONETT serves as a vibrant platform for researchers, educators, and policymakers to engage in meaningful dialogue exploring the dynamic intersection of innovation, equity and lifelong learning that bridges the gap between educational research, classroom practice, and policy development.

In an era marked by rapid technological and therefore pedagogical transformation, this conference invites us to reimagine how innovation and evidence-based practice can advance equitable and sustainable education. The studies and reflections presented here not only enrich the scholarly discourse but also offer actionable insights to strengthen education systems in both local and global contexts.

As the School of Education of SLIIT, our commitment extends beyond academic excellence to the development of Sri Lanka's national education system and its alignment with global trends in teaching, learning, and assessment. Through *i*CONETT, we aspire to cultivate a research culture that informs practice and policy, empowering educators to lead change in the 21st-century teaching/learning landscape.

I extend my heartfelt appreciation to all contributors, reviewers, judges, chairpersons and participants for making this scholarly exchange possible. I, with my conference committee, gratefully acknowledge the Faculty of Social Sciences and Languages of the Sabaragamuwa University of Sri Lanka for their partnership and support. May your engagement at *i*CONETT 2025 inspire new collaborations and innovations that shape the future of education.

Warmest regards,

Harsha D. Wijesekera (PhD)
Conference Chair, *i*CONETT 2025
Head, School of Education, SLIIT



Keynote Speakers



Prof. Michael Mu

Enterprise Fellow and Portfolio Lead Research at the University of South Australia

Michael Mu is an Associate Professor, Enterprise Fellow, and Portfolio Lead Research at the University of South Australia. His current work grapples with resilience building for young people in (mi)migration contexts. His research has produced over 100 publications and attracted research income of over 1.5 million Australian dollars. Beyond academia, Michael is a classical pianist.



Prof. T.M. Sakunthala Yatigammana

Professor in Education, Department of Education, University of Peradeniya

T.M. Sakunthala Yatigammana Ekanayake is a Professor in Education at the University of Peradeniya, Sri Lanka, specializing in science education, educational technology, and inclusive digital transformation in higher education. She has led or collaborated on over a dozen nationally and internationally funded research projects, including multiple Erasmus+ and IDRC initiatives. Her scholarly work includes over 25 peer-reviewed journal articles, 8 book chapters, and 4 authored books. A recipient of the UGC Tier 4* Research Excellence Award (2024), she is also a journal reviewer and a passionate advocate for innovation and equity in lifelong learning and teacher development.

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Improving Text Adaptation Practices among Bilingual Teachers in Sri Lanka

S. Pakeerathy^{1*}, G.H Asoka²

^{1,2}Department of Classical Languages, Foreign Languages & Bilingual Education, National Institute of Education, Maharagama, Sri Lanka

Corresponding author*: pakeera148@gmail.com

Abstract

In the context of Sri Lanka's Content and Language Integrated Learning (CLIL), the adequacy of pedagogical materials continues to be a significant challenge within bilingual education (BE). This study investigates the role of text adaptation in improving bilingual learners' academic performance, language development, and classroom engagement, based on teachers' perspectives. A total of 250 Sri Lankan bilingual teachers participated in the research, which employed an action research design implemented cluster-based (province-wise) and incorporated both quantitative and qualitative approaches. Using purposive sampling, data were gathered through a pre-test and post-test. The analysis involved descriptive statistics, thematic analysis, and paired t-tests. The study revealed a statistically significant enhancement in teachers' awareness, confidence, and capacity to implement adaptation strategies effectively. Both pre-test and post-test results indicated notable improvement, with the mean score increasing from $M = 9.65$ to $M = 113.53$ and an extremely large effect size (Cohen's $d = 12.93$). The p-value of 0.0003 confirmed the significance of this change. Teachers demonstrated improved skills in identifying content mismatches, applying techniques such as simplification, elaboration, and discursification. Post-intervention feedback further highlighted educators' recognition of the importance of adapting curriculum materials to support effective CLIL practices and to ensure that resources are both contextually appropriate and pedagogically sound. The findings emphasize the critical need for structured text adaptation strategies to address linguistic and instructional challenges in bilingual classrooms. Moreover, the study suggests that such interventions can support student learning, reduce dropout rates, provide maximum learning outcomes, and encourage greater participation in the bilingual education system. The duration of this research was one year

Key words: Adaptation, Simplification, Elaboration and Discursification, Bilingual Education, CLIL

Introduction

Problem Statement

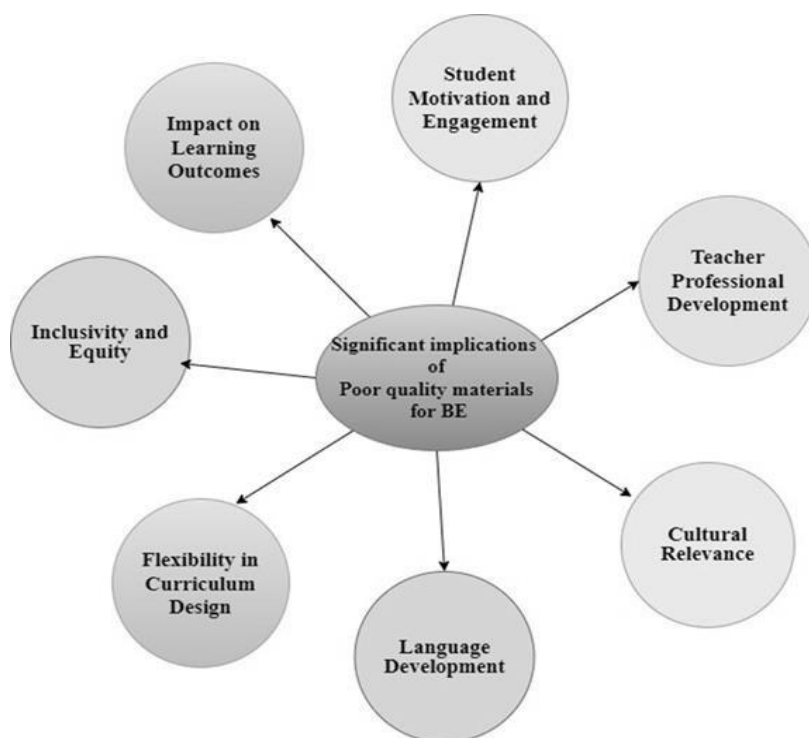
The quality of pedagogic materials for bilingual education programs is a significant issue in Sri Lanka. The absence of well-adapted materials can negatively affect the teaching-learning process and student achievement in bilingual classrooms.

Background information

The curricular materials for bilingual learners often fail to meet the needs of learners due to poor readability, comprehensibility, and inappropriate language levels, it is necessary to modify those materials. Many materials are translated from the original sources or adopted from other contexts without considering the specific needs of Sri Lankan bilingual learners. This mismatch between materials and learners' proficiency levels, learning styles, and cultural backgrounds can negatively impact their motivation, understanding, and engagement with the content. Teachers also have a lack of training programs; therefore, they are not able to scaffold the materials. (Pakeerathy, 2024). When addressing the diverse linguistic and cognitive needs of junior secondary learners, teachers should consider equity in education. Many bilingual teachers face significant challenges in adapting texts to suit learners' language proficiency levels, cultural backgrounds, and content understanding due to the lack of training programs. (Wijesekera & Nanayakkara, 2024). The lack of adaptation to local contexts and consideration for diverse learning styles further exacerbates the problem. (Iluk, 2002; Pawlak, 2010, as cited in Otwinowska-Kasztelanic, 2013).

Significance of the Problem

Inadequate materials hinder learning outcomes by failing to support language development, content comprehension, and cognitive skills, often demotivating learners and limiting participation. Poorly adapted materials disproportionately affect learners with low literacy or diverse learning styles, increasing educational inequalities (Edessa, 2017). Dependence on such materials deskills teachers, making them passive adopters rather than active facilitators, reducing their ability to meet diverse student needs (Gür, 2014). Lack of cultural adaptation disconnects learners from content, diminishing instructional effectiveness (Quispe-Mamani et al., 2024). Inappropriate language levels and insufficient support hinder students' language autonomy and overall linguistic growth. Rigid materials restrict educators' capacity to design tailored curriculum modules, limiting instructional effectiveness (Putra & Putri, 2023). Addressing these issues requires developing and adapting pedagogic materials that are linguistically and culturally appropriate, engaging, accessible, and flexible to meet diverse learner needs in bilingual contexts like Sri Lanka.



(Irambona & Chang, 2023)

Figure 1

The issues in poor quality materials for Bilingual Education

Objectives

General objectives

To enhance bilingual teachers' competencies in text adaptation and application, teacher training programs should be strengthened. These programs should encourage teachers to apply the acquired skills in the teaching–learning process, thereby ensuring the delivery of high-quality education by recommending and proposing curricular material adaptation at national level.

Specific objectives

To identify the current level of awareness of text adaptation among the selected bilingual teachers.

To design an intervention plan. (Use a moderator guide, which includes common components, Lessons, and practicum)

- a) To implement the intervention plan through the teacher education program.
- b) To assess the effectiveness of the intervention on the text adaptation practices of the teachers before and after implementing the intervention.
- c) To make suggestions and recommendations for curricular material adaptation in the CLIL context at the national level.

Methodology

The most appropriate research design for the study title is an action research design, because the study aims to address a practical issue within a specific educational setting. The need for bilingual teachers to adapt texts as a scaffolding strategy to suit the linguistic, cultural, and cognitive levels of junior secondary bilingual learners in Sri Lanka. A three-day residential moderators' training workshop was organized to implement the intervention plan on text adaptation across all provinces. In total, twenty-seven days (three days per province) were allocated for the implementation of the moderator guide. The moderator guide consists of three components: (1) a common component covering the theories and concepts of bilingual education, (2) lessons focused on text adaptation, and (3) a practicum component emphasizing application. A total of 250 moderators, comprising 30 teachers from each province, were selected as participants. Their prior knowledge and existing information related to text adaptation were first assessed. The intervention plan was implemented, using a moderator guide that had already been prepared. All participants shared the same classroom context and were provided with an identical intervention plan. Finally, participants were requested to adapt their relevant subject content. A purposive sampling technique was used. Qualitative and Quantitative approaches were used sequentially; therefore, a mixed-methods approach was used as explanatory sequential research. Data was collected through continuous observation, pretest, posttest, intervention, and discussion. Data was analyzed by using the Descriptive analysis method (mean, median), t-test, thematic analysis, and content analysis. A purposive sampling technique was employed. Both qualitative and quantitative approaches were applied sequentially, adopting a mixed-method exploratory sequential design. Data was collected through continuous observation, pre-tests, post-tests, interventions, and discussions. The analysis included descriptive statistics (mean, median), t-tests, thematic analysis, and content analysis.

Results and Findings

Table 1

Descriptive Analysis (Quantitative approach)

Statistic	Pre-Test	Post-Test	Interpretation
Mean	9.65	113.53	Indicates a sharp improvement in knowledge after the intervention.
Standard Deviation (SD)	6.36	9.42	Slight variation in scores; improvement was consistent across participants.
t-statistic (Paired t-test)	–	44.98	A high t-value shows a significant difference between pre- and post-test scores.
p-value	–	3.40 × 10 ⁻³¹	Much smaller than 0.05; confirms the result is statistically significant.
Effect Size (Cohen's d)	–	12.93	Extremely large effect shows the intervention was highly impactful.

Initially, many participants lacked knowledge of adaptation, reflected in high “Disagree” and “Need for Support” responses. Post-test responses shifted significantly toward “Totally Agree” and “Agree,” showing better understanding and confidence in adaptation strategies. Participants showed improved ability to apply techniques, reducing pedagogical mismatches. They gained awareness of CLIL-specific adaptations

and the importance of high-quality, contextually adapted materials in bilingual and diverse classrooms. The study, involving 250 Sri Lankan teachers, showed major gains in both conceptual and practical aspects of adaptation. Teachers could now define, explain, and apply adaptation principles, including CLIL strategies suitable for Sri Lankan classrooms. They understood the close connection between adaptation and pedagogical progress, acknowledged the need to integrate adaptation into CLIL syllabi, and saw adaptation as essential in all curricular materials.

The study revealed a significant improvement in teachers' competencies in text adaptation following the intervention, as reflected by the sharp increase in mean scores ($M = 9.65$ to $M = 113.53$), the statistically significant p-value (3.40×10^{-31}), and the extremely large effect size (Cohen's $d = 12.93$). Teachers moved from limited knowledge and reliance on support toward a confident ability to define, explain, and apply adaptation strategies, particularly within CLIL contexts. They recognized adaptation as a key to addressing language and cultural diversity, improving learner outcomes, and ensuring material quality. Teachers disagreed with the view that only language needs adapting, realizing that content, structure, and culture must also be considered. Post-test results show a complete transformation in teachers' knowledge, skills, and attitudes, confirming the training's success and their readiness to implement effective, inclusive curricular adaptation.

Table 2

Pre and Posttest (Quantitative)

Domain	Criteria	Pre-Test TA+A (%)	Post-Test TA+A (%)	Observation	Interpretation
1. Understanding and Defining Curricular Material Adaptation	1–6	50–60	85–90	Significant improvement in knowledge and understanding of definitions, operationalization, and appreciation	Teachers' baseline awareness and ability to define and explain adaptation were moderate. After intervention, there was substantial conceptual gain, showing effective clarification of adaptation principles.
2. Curricular Material Adaptation in Practice	7–10	40–50	85–90	Marked improvement in describing practical adaptation techniques, including CLIL-specific methods	Teachers initially had limited awareness of practical applications. Post-test indicates successful translation of theory into practice.
3. Techniques and Strategies of Adaptation	11–15	35–50	80–90	Strong gains in understanding and applying adaptation strategies	Intervention strengthened teachers' capacity to link strategies with pedagogy and CLIL contexts.

4. Importance and Benefits of Adaptation	16–22	45–55	80–95	Increased awareness of benefits for learners and teachers, including linguistic scaffolding and cultural alignment	Knowledge of the practical value of adaptation increased, reinforcing motivation to apply in classrooms.
5. Ensuring Quality in Adapted Materials	23–26	50–60	85–95	Improved understanding of producing high-quality CLIL materials	Teachers gained competence in evaluating and producing quality materials, reflecting enhanced pedagogical content knowledge (Shulman, 1987).
6. Adapting for Learner Needs and Pedagogical Alignment	27–30	45–55	85–95	Improved ability to identify mismatches and tailor materials	Demonstrates effective pedagogical adaptation and learner-centered approaches.
7. Misconceptions about Adaptation	31	40	85	Corrected the misunderstanding that adaptation is only about language	Teachers recognized adaptation includes content, pedagogy, and culture.
8. Critical Appreciation of Adaptation	32–34	45–55	85–95	Strong critical appreciation of adaptation relevance in bilingual and CLIL classrooms	Teachers developed a critical understanding of the importance of adaptation in educational practice.
Overall Analysis	All 34	~40–55	~80–95	Dramatic gains across all domains (~40–50% increase)	Teachers moved from moderate understanding to strong awareness, with improved application skills and corrected misconceptions. Supports the effectiveness of training intervention in enhancing teacher knowledge, skills, and appreciation of text and curricular material adaptation.

Table 3

Thematic Analysis (Qualitative approach)

Theme	Category	Code	Description
and Identifying Addressing Issues in Curricular Materials	Curriculum Analysis & Awareness	CA1	Teachers identify mismatches in curricular content that fail to meet bilingual learners' needs, ensuring

			adaptation for better comprehension.
Understanding Pedagogical Challenges in Adaptation and Adoption	Pedagogical Understanding	PU1	Teachers differentiate between adaptation and adoption, recognizing adaptation's importance in bilingual contexts.
Expressing Views on the Necessity of Adaptation	Pedagogical Understanding	PU2	Teachers articulate and justify the importance of adaptation using academic reasoning and classroom experience.
Enhancing Comprehensibility through Simplification and Elaboration	Adaptation Strategies	AS1	Teachers use simplification and elaboration to enhance content clarity for bilingual learners.
Ensuring High-Quality CLIL Materials	CLIL Application	CL1	Teachers ensure that adapted CLIL materials maintain content integrity while enhancing accessibility.
Collaborative Learning and Peer Engagement	Professional Collaboration	PC1	Teachers engage in peer discussions to refine adaptation practices and grow professionally.
Mastering Academic Communication and Presentation Skills	Professional Competence	PC2	Teachers improve academic language use and structured presentation of adaptation practices.
Developing Analytical Tools for Adaptation	Curriculum Analysis & Awareness	CA2	Teachers use tools like concept maps and checklists to evaluate and plan curricular adaptations.
Appreciating Adaptation as a Pedagogical Tool	Pedagogical Understanding	PU3	Teachers view adaptation as essential in bridging curricular aims with learner needs.
Differentiating Adaptation from Translation	Pedagogical Understanding	PU4	Teachers understand adaptation preserves pedagogical intent, unlike translation, which is language-only focused.
Applying Specific Adaptation Techniques	Adaptation Strategies	AS2	Teachers practice techniques like simplification, elaboration, and discursification to support learning.
Justifying Adaptation over Adoption	Pedagogical Understanding	PU5	Teachers argue about the advantages of adaptation in engaging learners and enhancing outcomes.
Strengthening Classroom Communication and Non-Verbal Interaction	Instructional Communication	IC1	Teachers incorporate visual and non-verbal tools to aid understanding during adapted instruction.

Building Confidence in Curriculum Adaptation	Professional Competence	PC3	Teachers gain confidence in selecting and modifying materials to meet diverse learner needs.
Professional Growth through Curricular Adaptation	Professional Development	PD1	Teachers view ongoing adaptation practice as a means of professional development and improving outcomes.

Based on teachers' perspectives, 15 themes were identified and grouped under six major categories, reflecting a comprehensive understanding of curricular material adaptation in bilingual education. Curriculum Analysis & Awareness highlights the importance teachers place on identifying content mismatches and evaluating curricular materials using structured tools, which guide the adaptation process to meet bilingual learners' linguistic and cognitive needs. In terms of Pedagogical Understanding, teachers showed a clear grasp of the difference between adaptation and adoption, the theoretical basis for adaptation, and its crucial role in bilingual pedagogy, emphasizing that adaptation goes beyond translation by preserving both meaning and instructional purpose. Under Adaptation Strategies, teachers employed techniques such as simplification, elaboration, and discursification to make content more accessible, helping learners overcome language barriers while maintaining academic integrity. The category of CLIL Application & Instructional Communication revealed that teachers ensured adapted materials adhered to CLIL principles by balancing subject content and language learning while supporting student comprehension through visual and non-verbal communication tools. In the area of Professional Competence & Collaboration, teachers engaged in collaborative learning, enhancing their use of academic language and their ability to present adaptation practices effectively. It is fostering mutual professional growth and building confidence in implementing curricular changes. The Professional Development category showed that teachers view the continual refinement of adaptation skills as integral to their professional advancement, committing to educational best practices to deliver inclusive, high-quality, and contextually relevant learning materials.

Discussion

Adapting texts and tests to suit learners' language needs had a strong positive influence on both their learning outcomes (such as grades and subject understanding) and their classroom participation (including interest, motivation, and involvement) within Sri Lanka's bilingual education system. This study highlights the significant impact of text and test adaptation on bilingual learners' academic performance and engagement in Sri Lanka's bilingual education system. Adapted materials notably enhance comprehension, language acquisition, and subject understanding. Pre- and post-test data confirm a substantial improvement.

Teachers were aware of the mismatch between existing curricular materials and bilingual learners' needs but lacked knowledge of text adaptation—a key strategy to address this gap. This finding resonates with Cummins' (1979, 2000) distinction between Basic Interpersonal Communicative Skills (BICS) and Cognitive Academic Language Proficiency (CALP), which emphasizes the importance of adapting language to support learners in moving from everyday communication to academic proficiency.

Adapted materials offer essential linguistic support, promoting proficiency in both first and second languages through simplified language, visual aids, and glossaries. This aligns with Vygotsky's Sociocultural Theory (1978), particularly the concept of the Zone of Proximal Development (ZPD), which highlights the role of scaffolding in helping learners perform tasks beyond their independent ability. The

use of visual aids and glossaries also reflects principles of Krashen's Input Hypothesis (1985), which stresses the need for comprehensible input slightly above learners' current level ($i+1$).

This approach can reduce dropout rates from bilingual to monolingual education and increase student retention in bilingual programs. Teachers now demonstrate strong understanding of adaptation principles, including defining and applying concepts, using CLIL techniques, and tailoring materials to learners' linguistic and cultural needs. They recognize that adaptation goes beyond language, encompassing content, pedagogy, and cultural relevance—an idea consistent with Coyle, Hood, and Marsh's (2010) CLIL framework, which integrates content, communication, cognition, and culture.

Adapted materials also boost student motivation and classroom participation, while improving teachers' instructional practices. However, national-level curriculum adaptation remains outside teachers' authority. Although they can adapt materials at the lesson level, this is challenging due to time constraints and workload. This echoes Shulman's (1987) concept of Pedagogical Content Knowledge (PCK), which emphasizes that effective teaching requires adapting content to the context and needs of learners.

Finally, the lack of training and professional development programs focused on text adaptation in bilingual education underscores the need for comprehensive teacher training in this area. This connects to Fullan's (2007) theory of educational change, which stresses capacity building and professional learning as central to sustainable reform.

Conclusion

The findings of this study clearly demonstrate the intervention's strong impact on enhancing teachers' knowledge, skills, and attitudes toward curricular material adaptation in bilingual education. The significant increase in mean scores from the pre-test ($M = 9.65$) to the post-test ($M = 113.53$), along with a statistically significant p-value ($p = 3.40 \times 10^{-31}$) and an exceptionally large effect size (Cohen's $d = 12.93$), confirms that the improvement was both statistically and practically meaningful. Before the training, teachers showed limited understanding of text adaptation, low confidence, and a high need for support. Post-intervention results reveal notable growth in conceptual understanding, practical application, and the contextual use of adaptation strategies in bilingual, culturally diverse classrooms. Teachers gained confidence in applying adaptation techniques, addressing textbook limitations. But it is not practicable due to time restrictions. The training effectively bridged theoretical gaps and enhanced classroom practices, fostering inclusive and high-quality bilingual education. It laid a strong foundation for further professional development, highlighting the importance of continued support and targeted training. Ultimately, text adaptation is essential for bilingual learners to achieve optimal learning outcomes.

Recommendations and suggestions

Curriculum Development and Material Adaptation at the National Level

Establish standardized text adaptation guidelines to ensure consistency in BE. Develop materials tailored to Sri Lankan learners' linguistic and cultural contexts. Promote collaboration among educators, linguists, and subject experts to produce high-quality adapted resources.

Teacher Training and Professional Development

Implement professional development to train teachers in adaptation techniques. Offer workshops on scaffolding and differentiated instruction in CLIL settings. Create a resource-sharing network for exchanging best practices and adapted materials.

Assessment Reforms

Design assessments that support diverse linguistic and cognitive needs by including glossaries and visual aids. Align tests with students' language proficiency levels to ensure accessibility and fairness. Give importance to formative assessment.

Policy Implications

Educational policymakers should integrate adaptation strategies into the national curriculum framework. Allocate funding for the development of quality-adapted materials. Promote research initiatives on the long-term impact of adapted materials on bilingual education.

Future Research Directions

Conduct longitudinal studies on the long-term impact of adapted materials. Investigate digital tools' role in text adaptation and how adaptation strategies affect subjects within CLIL.

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Enhancing English Language Learning through Teaching Aids

Pasangie Mahaarachchi ^{1*}, Srianthie Salgado², Virajith Gamage³

^{1,2} *The Open University of Sri Lanka*

³ *Sri Lanka Institute of Information Technology*

Corresponding author*: pasangie92@gmail.com

Abstract

Language teaching has often been criticized as theoretical, boring, and uninteresting. To counteract this, teachers employ diverse approaches, including the use of teaching aids—tools that engage students' auditory and visual senses. This study explores the impact of teaching aids on English language learning in secondary classrooms. It emphasizes the significance of visual aids, assesses their effectiveness, and identifies challenges in their usage. The study uses a mixed-methods approach, including a questionnaire and pre-/post-test comparisons, to demonstrate how beneficial teaching aids are for student motivation, engagement, and the lesson's expected learning outcomes.

Keywords: Teaching Aids; English Language Learning; Visual Aids; Second Language Acquisition; Vocabulary Acquisition

Introduction

English language teaching has been criticized for its monotonous and theoretical nature. In response, educators have adopted various methods to enhance student engagement, among which teaching aids play a critical role. According to Good's Dictionary of Education, as cited in Kundu (2017), a teaching aid is "anything by means of which the learning process may be encouraged or carried out through the senses of hearing or sight". According to Chen (2025), Teaching aids include traditional tools such as blackboards, flashcards, charts, and pictures, and modern media like radio, television, and projectors. As Patesan, Balagiu, and Alibec (2018) observe, students no longer accept passive learning; they demand active involvement. Yunus, Salehi, & John (2013) further assert that visual aids promote authentic interaction with literary texts, enhancing communication and comprehension. Teachers of Grade 11 English Language Teaching (ELT) at the first author's school highlighted challenges in successfully guiding pupils in expanding their vocabulary. Students' overall language proficiency was shown to be hindered by limited vocabulary, particularly in understanding and expression. The first author of this study started to look at methods for improving vocabulary instruction after realizing this difficulty. The study specifically examined the use of both conventional and contemporary teaching aids to encourage vocabulary acquisition, raise student interest, and boost retention.

This study's focus on the function of teaching aids in language acquisition is shaped by several research questions and objectives. Discovering if teaching aids are helpful for vocabulary acquisition, how they encourage students to interact with the English language, and whether their use results in noticeable improvements in students' competence levels are the goals of the research topics. According to these

inquiries, the study's goals are to highlight the value of teaching aids in the classroom, optimise the advantages of various visual aids, and pinpoint the issues and difficulties related to their application in instruction. Therefore, this study investigates the effectiveness of teaching aids in improving language learning among Grade 11 students, particularly in the context of post-pandemic disengagement. By comparing two student groups—one taught with teaching aids and the other without—the research assesses academic performance and student attitudes toward the teaching aids used.

Materials and Methods

The study was conducted at a government national school in the Southern Province of Sri Lanka. Twenty Grade 11 students (10 per class, balanced by gender) with Sinhala as their mother tongue and English as a second language were selected. For practical and methodological reasons, a sample of 10 students was chosen from each class (A and B) of about 40 for this study. Firstly, the first author/researcher was able to give each student more individualized help and closer attention by working with a smaller group than she could have with the full class. Second, it was easier to monitor, assess, and document the progress of ten students in detail due to the study's time and resource limitations. Third, purposive sampling was used to select the ten participants who had special difficulty in vocabulary acquisition. This made it possible to observe the efficacy of teaching aids more clearly and guaranteed that the study would concentrate on the people who would gain the most from the intervention. As a result, the study was more focused, practical, and trustworthy for its intended scope due to the smaller sample size.

Data Collection Tools and Methods

Students were taught vocabulary over five consecutive 40-minute lessons within two weeks. Class A was taught using teaching aids, which were designed based on Alduais' (2012) recommendations, while Class B was taught the same words written on the blackboard, and their meanings were presented orally. Both the pre-test and the post-test were designed in the same way to evaluate specific vocabulary items such as gender nouns, baby animals, classroom items, household items, synonyms, and antonyms. Pre- and post-tests were administered to both groups, which provided quantitative data. A student questionnaire was designed in students' L1 to assess the attitudes towards visual aids using a 5-point Likert scale. Part A of the questionnaire was related to the students' personal data, and Part B of the questionnaire was based on the 5 statements related to my study. The responses were tabulated in Table 1 and visualized using pie charts for analysis.

Results

Questionnaire Analysis

Table 1

Analysis of the responses given for the questionnaire.

Comment	The use of teaching aids gets my attention	The use of teaching aids activates participation	The use of teaching aids helps understanding	The use of teaching aids makes lessons memorable	The use of teaching aids is necessary
Strongly agree	8	12	17	5	7
Agree	10	8	3	15	10
Disagree	2	0	0	0	3

Strongly disagree	0	0	0	0	0
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Graphical representation of the responses given for the questionnaire

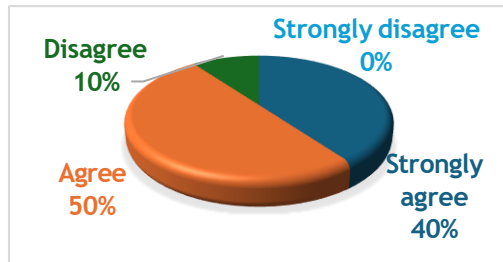


Figure 1

The use of teaching aids gets my attention.

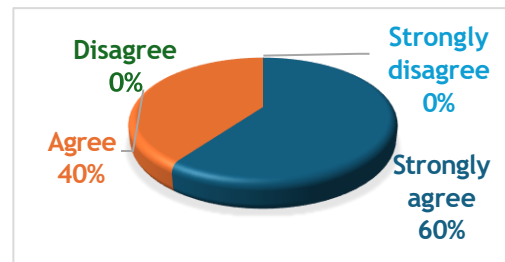


Figure 2

The use of teaching aids activates participation.

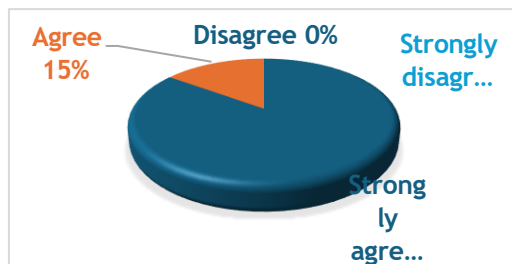


Figure 3

The use of teaching aids helps understanding

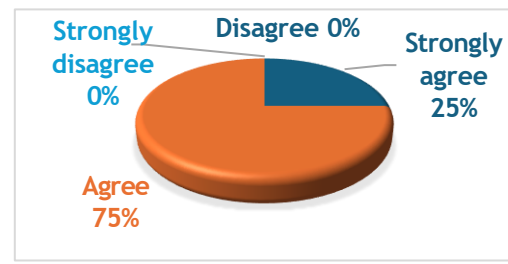


Figure 4

The use of teaching aids makes lessons memorable

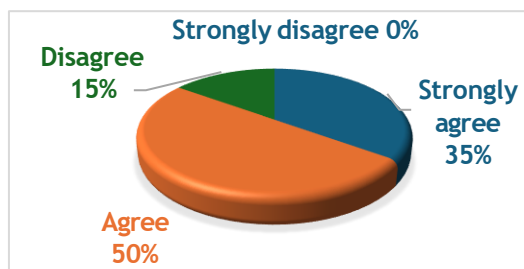


Figure 5

The use of teaching aids is necessary.

The results of the questionnaire demonstrate that students have favorable opinions on visual aids for learning. There was universal approval among respondents, with 85% strongly agreeing and 15% agreeing that teaching aids improve understanding. With 40% agreeing and 60% strongly agreeing, teaching aids were also found to increase participation, suggesting that they promote active engagement in the classroom. Similarly, only 10% of students disagreed with the 90% who agreed or strongly agreed that teaching aids capture their attention. All the students agreed or strongly agreed that using teaching aids made the lessons more memorable. Lastly, although 15% disagreed with the majority of answers (85%), the data shows that students generally value visual aids for engagement, comprehension, and retention.

Graphical representation of the test scores

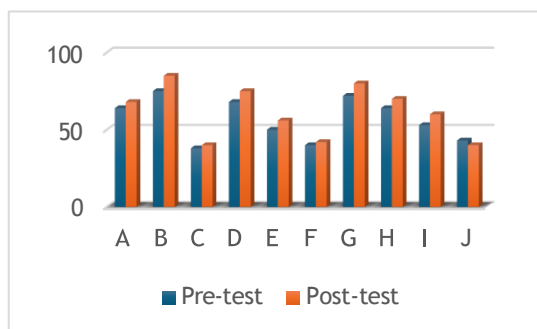


Figure 6

Test scores of Class A (With Visual Aids)

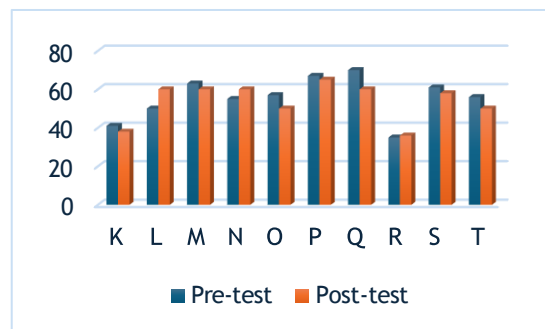


Figure 7

Test scores of Class B (Without Visual Aids)

The majority of students have improved according to the pre-test to the post-test data in Table 2 (Class A with teaching aids), with significant advances made by Students B (75 to 85) and G (72 to 80). The general trend in Class A is upward, indicating the beneficial impacts of teaching aids, even though a small number of pupils only displayed minor increases. Table 3 (Class B without teaching aids), on the other hand, displays a range of outcomes. While some students, like Student L (50 to 60), show little improvement, others, like Student O (57 to 50) and Student Q (70 to 60), show a decline. Compared to Class A, Class B's performance generally seems less stable and exhibits more instances of lack of progress or decreased performance.

Discussion

The findings of this study offer valuable insights into the effectiveness of teaching aids in learning vocabulary among Grade 11 ESL students at a Sri Lankan government national school. The comparison of pre- and post-test scores between Class A (with teaching aids) and Class B (without teaching aids) demonstrates that students who received teaching aids improved their vocabulary test results more consistently and significantly. Almost all students in Class A improved to some extent, with gains ranging from minor (e.g., Student C: 38 to 40) to large (e.g., Student B: 75 to 85, Student G: 72 to 80). Student J was the only exception, and his score was slightly decreased. In contrast, Class B (without teaching aids) produced more variable outcomes. Some students, such as L and N, improved their scores, while others, such as K, O, Q, S, and T, showed declines. These inconsistent findings indicate that typical teaching methods alone may not be sufficient to support uniform vocabulary development among students. The average score improvement in Class A was higher and more consistent than in Class B, supporting the conclusion that teaching aids improve the efficacy of vocabulary learning. These findings support Alduais' (2012) argument that teaching aids help contextualize and reinforce new language, boosting retention and comprehension.

The questionnaire data support the positive impact of teaching aids. A considerable number of students strongly agreed or agreed with statements emphasizing the benefits of teaching aids in attracting attention (90%), encouraging participation (100%), boosting knowledge (100%), and making lessons memorable (100%). Notably, 85% of students agreed or strongly agreed that teaching aids are useful for learning. These attitudes indicate that teaching aids do more than only help cognitive processes; they also increase students' emotional and motivational involvement with the topic. When students find lectures more interesting and

memorable, they are more inclined to invest in their education, which can lead to improved academic achievements.

Integration of Quantitative and Qualitative Results

Together, the test score comparisons and responses to the questionnaire make a persuasive case for using teaching aids in second language training. The observed increase in test results, when combined with favourable student attitudes, emphasizes the cognitive and affective benefits of teaching aids in the classroom. While this study's scope was limited to only 20 students from one school, it provides a solid foundation for suggesting the use of visual aids in English language teaching in similar educational environments. Future research might increase the sample size, investigate long-term effects, and analyze teachers' opinions to provide a more complete picture of teaching aids' usefulness in language instruction. Finally, as proposed by Chung (2023), the results of this study also prove that the use of teaching aids improves vocabulary acquisition and student engagement, making them an effective tool in language classrooms.

Limitations

Limitations of this study include the small and context-specific sample size, the use of short-term pretest-posttest measures, and the students' unfamiliarity with modern teaching aids. Furthermore, there is no triangulation of teacher feedback or long-term observation; instead, the conclusions are mostly reliant on student impressions. Finally, the study lacks a systematic comparison across several teaching aid categories, which limits the data's generalizability.

Conclusion

This study investigated the way teaching aids impact vocabulary acquisition in Grade 11 pupils at a government national school in Sri Lanka. The results clearly show that the usage of teaching aids improves students' learning outcomes and attitudes toward English language learning.

Quantitative data revealed that students in Class A who were taught with teaching aids experienced greater and more consistent improvements in vocabulary test scores than those in Class B who were taught without them. The qualitative data supported these findings, demonstrating substantial student support for teaching aids as a means of improving attention, involvement, understanding, and cause memorability.

Overall, the findings demonstrate the efficacy of teaching aids as a pedagogical tool in second language learning. They not only help with language recall but also make studying more engaging and enjoyable. To improve both academic achievement and student motivation, educators should integrate teaching aids into English language teaching approaches more systematically, particularly in the Sri Lankan ESL classroom.

Recommendations

Promoting the use of contemporary technological teaching aids and encouraging students to create their own teaching aids as part of the learning process are crucial for improving the efficacy of language instruction. Incorporating these tools into teaching practices is essential for promoting learning. Teachers also need to receive sufficient training on modern instructional technology. In order to improve teaching quality and student engagement, more institutional support is also needed to enable the continuous and meaningful use of teaching aids in the classroom.

Suggestions for Future Research

Although this study clarifies the role of teaching aids in language learning, there are still many areas that need more research. Future studies could look at how teaching aids affect a broader range of language skills, such as reading comprehension, writing, speaking, and listening, in addition to vocabulary development. These studies could also take into account the opinions and experiences of teachers to offer useful insights into implementation challenges and best practices. Furthermore, determining if gender or individual learning preferences—such as kinesthetic, visual, or auditory—have an impact on how well teaching aids work could help educators adapt their methods to meet the demands of a wide range of students. The research of technologically enhanced teaching aids, such as interactive whiteboards, augmented reality, and multimedia presentations, is another exciting avenue that could provide novel methods for teaching languages. A more comprehensive understanding of the function of teaching aids in promoting language acquisition in a variety of circumstances would be possible if these aspects were addressed.

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Bridging Policy and Practice: Investigating Non-Compliance with School-Based Professional Teacher Development Guidelines in Sri Lankan Schools

Sureka Fernando*¹

¹*Professional Development Center for Teachers, Bolawalana, Negombo*

Corresponding Author*: surekafernando@gmail.com

Abstract

School-Based Professional Teacher Development (SBPTD) plays a crucial role in improving instructional quality and promoting the continuous professional growth of educators. When implemented systematically, SBPTD fosters a culture of reflective practice, collaboration, and ongoing learning, ensuring that teachers consistently refine their skills to meet evolving educational needs. In Sri Lanka, despite comprehensive national-level planning and the introduction of a mandatory SBPTD handbook, school-level implementation has remained inconsistent, with only 8% adherence recorded within a selected Education Zone. This study investigates the reasons behind such non-compliance and proposes structured, context-responsive interventions to bridge the gap between policy and practice. Guided by three core research questions: what factors contribute to non-compliance, how schools deviate from official guidelines, and what interventions can enhance compliance. A mixed-methods approach was adopted; quantitative data from 117 schools were analyzed alongside qualitative insights from semi-structured interviews (SSI) and Focus Group Discussions (FGD) with education administrators and In-Service Advisors (ISA). The study revealed critical performance gaps in three SBPTD components: need-based topic selection, annual scheduling, and implementation of follow-up mechanisms. Interventions included standardized needs analysis tools, planning templates, real-time reporting systems, and digital supervision platforms. The findings suggest that structured support, accountability mechanisms, and digital integration significantly enhance compliance with SBPTD processes. The study concludes that improving compliance requires both systemic policy reinforcement and school-level operational reforms. This research contributes practical strategies for strengthening teacher development frameworks in decentralized education systems.

Keywords: School-Based Professional Teacher Development; compliance; school-based management; teacher development; implementation gaps

Introduction

School-Based Teacher Development has become a key strategy in global education reform, promoting localized, teacher-driven growth to enhance teaching quality (Pillay et al., 2017). Countries like Finland show that structured, teacher-led development could significantly boost student achievement and teacher satisfaction (Barrera, 2016). Sri Lanka adopted this model in 2012 as School-Based Teacher Development (SBTD), later formalized as SBPTD in 2019 under the key guidance documents 'Our Strength for Our School' and Circular No. 26/2018, which support school-level implementation. SBPTD emphasizes decentralization

and school autonomy to foster continuous, collaborative improvement in Sri Lanka (National Education Commission, 2016). Although the initiative focuses on improving classroom practices and institutionalizing peer collaboration, schools reveal a stark gap between policy and practice (Wijekoon & Kumari, 2021). Compliance is widely seen as central to the effectiveness of a program, and strong compliance with handbook guidance can improve the performance, retention, and engagement of programmes (Kjøbli et al., 2012). Poor compliance due to inadequate training, unclear roles, and misaligned resources leads to inconsistent and ineffective outcomes (2020, Smith & Gillespie, 2023). Although other countries have implemented SBPTD programs with structured planning, digital tracking, and rigorous monitoring over the adherence to guidelines (Bunting & Klerk, 2022), Sri Lanka's SBPTD monitoring system remains inconsistent (Wehella, 2014). Therefore, this study addresses a key knowledge gap: why Sri Lankan schools fail to comply with SBPTD guidelines?

This study aims to:

1. Analyze deviations from the official SBPTD guidelines.
2. Identify key factors behind school-level non-compliance.
3. Propose evidence-based strategies to improve compliance.

This study is significant because it sheds light on the persistent implementation gap within Sri Lanka's SBPTD framework. By exposing the barriers in systemic issues such as limited needs assessment, poor integration into planning processes, and the absence of monitoring mechanisms, the study provides timely evidence for policymakers, zonal authorities, and school leaders to rethink how professional development is operationalized at the school level. Beyond identifying challenges, the study also proposes a set of practical, scalable solutions that can transform SBPTD from a compliance-driven activity into a purposeful and sustainable development process. The suggested interventions are not only relevant to Sri Lanka's decentralized education system but also provide transferable lessons for other contexts where teacher development is hindered by weak process management.

Research Design

This study employed a mixed-methods research design to diagnose root causes, develop target interventions, and evaluate their effectiveness in improving adherence to MOE standards. The study used a combined sampling strategy for comprehensive data collection. Purposive sampling targeted ISAs and administrative officers for qualitative insights in SBPTD implementation. For the quantitative phase, census sampling included all 117 schools in NEZ, ensuring full representation and eliminating sampling error.

Data Collection Tools and Techniques

Qualitative – The study used multiple data collection tools to gain a comprehensive view of non-compliance with SBPTD guidelines. Semi-structured interviews with administrative officers provided insights into systemic and school-level barriers. A document review of policy circulars, the SBPTD handbook, school plans, SBPTD sub-committee reports, and attendance records further enriched the analysis. Focus Group Discussions (FGDs) with ISAs helped to triangulate findings and capture collective perspectives.

Quantitative – Surveys and questionnaires were distributed across all 117 schools in the NEZ to collect quantitative data on planning, topic selection, scheduling, and follow-up.

Data Analysis

Qualitative – Data from interviews, document reviews, and FGDs were transcribed and analyzed using thematic coding. FGD data were coded alongside individual interview data to identify converging and diverging themes, ensuring collective perspectives were integrated into the final thematic framework. Triangulation across these sources strengthened the validity of findings.

Quantitative – Survey data were subjected to performance gap analysis to measure deviations in SBPTD implementation. Pareto analysis was applied to prioritize the most critical causes of non-compliance, while Ishikawa (fishbone) diagrams were used to map root causes systematically. The integrated analytical framework was structured around the three selected components.

Procedure

1) Need Analysis of Identifying Key Factors Behind School-level Non-compliance

Adherence to SBPTD Handbook- Despite the mandatory nature of the SBPTD handbook, only a small number of schools demonstrated adherence to SBPTD guidelines, as shown in Figure 1. This result supports the need for targeted interventions to bridge policy and practice, validating the main objective of increasing adherence from a baseline of 8% to at least 30%.

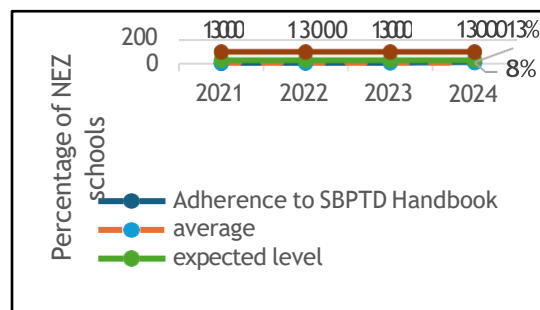


Figure 1

Performance Gap in Expected Adherence to SBPTD Handbook (2021–2024)

Topic Selection in SBPTD Programs - The study found that the majority of schools do not conduct proper need analyses for selecting SBPTD topics, as shown in Figure 2. Interviews and focus group discussions confirmed that schools often select topics arbitrarily or based on School Evaluation Quality Indicator (SEQI) evaluation priorities rather than staff development needs. This finding directly aligns with the objective of improving systematic topic selection processes.

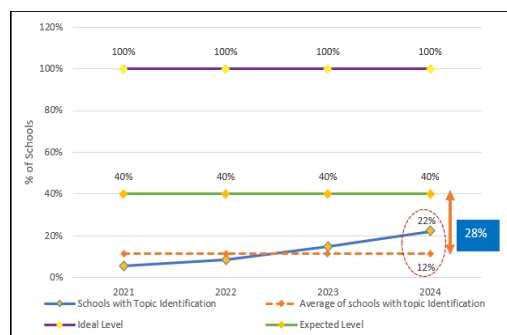


Figure 2

Performance Gap in Needs-Based Topic Selection (2020–2024)

SBPTD Date Scheduling Practices- Another critical shortcoming identified was the absence of date scheduling within annual school plans, as shown in Figure 3. The findings indicate reactive, last-minute planning in most schools, undermining the effectiveness of SBPTD activities. The proposed planning framework directly addresses this issue.

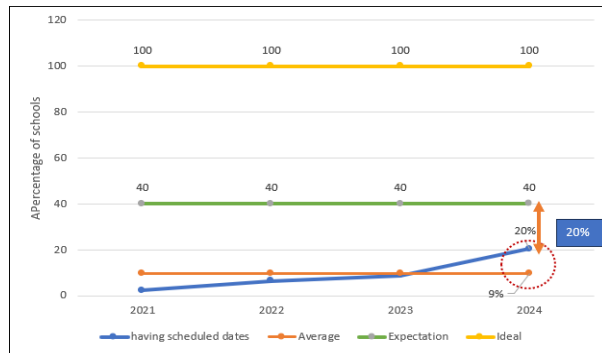


Figure 3

Performance Gap in Scheduling SBPTD Dates (2021–2024)

Follow-Up Mechanisms in SBPTD- Follow-up processes were identified as the most underdeveloped area, as shown in Figure 4. Qualitative responses highlighted that many schools conduct SBPTD sessions without any subsequent evaluation or feedback, limiting long-term impact. This aligns with the objective of increasing follow-up practices and justifies the introduction of new digital tracking and supervision tools.

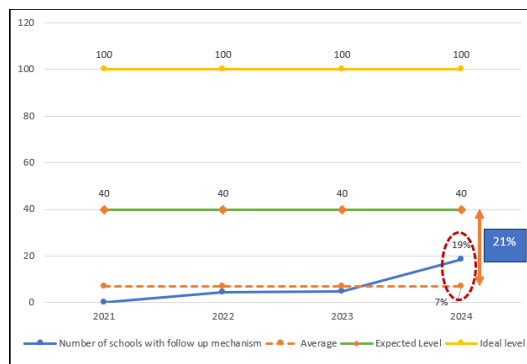


Figure 4

Performance Gap in SBPTD Follow-Up Mechanisms (2021–2024)

The results underscore systemic inconsistencies in SBPTD implementation. These insights validate the design and necessity of the proposed interventions and support their broader scalability.

2) Implementation of Strategies

The study adopted a component-based intervention strategy to address each of the identified weaknesses. For Data Collection and Needs Analysis, structured workshops were conducted using Standard Operating Procedures (SOPs), accompanied by training timetables and feedback forms to ensure consistency and quality. Under Process Management, a planning framework was introduced, supplemented by customizable Google templates, Key Performance Indicators (KPIs), and process flowcharts to support efficient planning and documentation. To improve Monitoring and Evaluation, several tools were deployed, including digital follow-up systems using WhatsApp groups, a centralized Learning Management System (LMS) platform, and school-level bulletin boards for transparency and communication. These interventions were initially tested in a selected group of schools to assess feasibility and make necessary adjustments before wider implementation.

3) Evaluation and Validation of Intervention Effectiveness

Intervention effectiveness was evaluated using feedback forms, structured checklists, and supervision visits to ensure implementation fidelity. Standardized digital templates enabled real-time reporting and progress tracking. These measures ensured reliability, scalability, and supported continuous improvement within the SBPTD framework.

Discussion

Despite the mandatory nature of the SBPTD handbook, compliance among schools remains critically low, averaging just 8% over four years. This aligns with previous literature suggesting that low compliance with educational frameworks is often linked to insufficient training, ambiguous accountability structures, and the absence of continuous supervision (Smith & Gillespie, 2023). The findings reveal persistent non-compliance across three critical areas: topic selection, date scheduling, and follow-up mechanisms; each of which has significant implications for the effectiveness of teacher development programs in Sri Lanka. This demonstrates that many schools are treating SBPTD as a “nice to have activity” rather than a structured, data-driven process.

The finding that only 22% of schools selected SBPTD topics based on actual needs underscores the limited use of needs assessment tools. This reinforces the argument that whether the professional development, not grounded in systematic needs analysis, can improve instructional quality (Taherdoost, 2021). The absence of scheduled SBPTD activities in school annual plans further indicates a lack of process management and planning culture, reflecting Lovanella’s (2024) view that process inefficiencies in education often stem from weak leadership accountability and inadequate stakeholder alignment.

Moreover, the near absence of structured follow-up mechanisms calls into question the sustainability and effectiveness of existing teacher development sessions. As noted by Naik et al. (2020), monitoring and evaluation systems are essential for ensuring training relevance and impact. Without these, SBPTD sessions risk becoming isolated, one-time events with no long-term benefits, as also emphasized by Rosenberg and Kotschy (2020).

To strengthen Compliance, schools should move beyond a compliance mindset toward purpose-driven professional development. Embedding SBPTD into School Development Plans (SDPs), supported by structured SOPs and clear timelines, can facilitate this shift (Garcia & Lee, 2020). The positive uptake of digital tools—such as Google templates, real-time feedback systems, and LMS platforms—highlights technology’s potential to reduce administrative inefficiencies and improve monitoring (Costa et al., 2020). Sustained implementation also requires coordinated support at both zonal and national levels, with localized initiatives reinforced by adaptable central policies (Bunting & de Klerk, 2022). Additionally, applying a Value-Added Model (Hansen, 2013) could offer a data-driven approach to measure the long-term impact of teacher development. The study underscores that weak

compliance with SBPTD guidelines is primarily due to implementation barriers rather than deficiencies in policy. While the MOE provides directives, schools often fail to operationalize key elements.

Practical interventions—such as SOPs, KPI frameworks, Google templates, and digital platforms—can enhance clarity, accountability, and consistency in execution. Aligning CPD with real-time reporting systems further strengthens stakeholder engagement and continuous evaluation.

Overall, this research proposes a scalable framework for improving CPD within decentralized education systems. By addressing implementation gaps, it contributes to improved teaching quality, greater equity in learning opportunities, and the long-term development of human capital, aligning with Sri Lanka’s vision for inclusive and sustainable education reform.

Conclusion

The study revealed that while SBPTD is a critical mechanism for enhancing teacher development, its implementation in Sri Lanka faces significant challenges due to weak needs analysis, poor process management, and inadequate monitoring. By combining survey data with qualitative insights, the research identified systemic and school-level barriers that hinder compliance. The proposed interventions—standardized planning tools, digital reporting systems, and stronger accountability measures—highlight practical ways to bridge the policy–practice gap. Strengthening these areas can foster more consistent compliance with SBPTD guidelines.

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The Role of Content and Language Integrated Learning (Soft CLIL) in Developing Academic Language Functions in Tertiary Education

G.A.R.C. Jayarathna ^{1*}, Harsha Dulari Wijesekera²

¹*University of Ruhuna*

²*Sri Lanka Institute of Information Technology*

Corresponding author* : rishinij@eltu.ruh.ac.lk

Abstract

This paper explores the role of Soft Content and Language Integrated Learning (Soft CLIL) in developing academic language functions (ALFs) among tertiary level learners, focusing on speaking skills. Soft CLIL integrates language with subject-related content, prioritizing language development while introducing subject concepts lightly. ALFs refer to the specific language required for academic tasks such as describing, explaining, comparing, and arguing. This qualitative action research was conducted in a Sri Lankan state university, involving fourth-year students following the Bachelor of Arts (Honors) degree in Pali and Buddhist Studies, and their English language teachers. It employed a single-cycle action research design of planning, acting, observing, and reflecting, to examine learner and teacher perceptions of Soft CLIL and its impact on developing ALFs. Multiple data sets were gathered for corroboration. To probe into learner perceptions, focus group discussions, reflective diary entries, and guided essays were utilized. Teacher perceptions were elicited through self-reflections and peer classroom observations. The analysis followed a deductive approach, and the interpretation was supported by Krashen's Theory of Second Language Acquisition. Though more demanding to plan than general English for Academic Purposes (EAP) lessons, the approach proved effective. The findings show that Soft CLIL positively impacted learner comprehension, interaction, confidence, and the development of ALFs. Learners showed progress in using key ALFs needed for their degree. Thus, this study highlights the need to promote Soft CLIL among curriculum developers and English Language Teaching (ELT) practitioners. The findings offer insights for stakeholders, advocating for the wider adoption of the approach within the faculty and beyond to enhance ALFs among tertiary-level learners.

Keywords: Content and Language Integrated Learning; Academic language functions; Tertiary education; Sri Lanka; Action research

Introduction

This study investigates the role of Soft Content and Language Integrated Learning (Soft CLIL) in developing academic language functions (ALFs) among tertiary-level learners at a Sri Lankan state university. The study responds to a pressing issue in the local context: despite the presence of compulsory English courses, many learners continue to struggle with ALFs, which are specific language skills required for academic tasks such as analyzing, evaluating, describing, explaining, defending, inferring and arguing skills essential for academic success in university programs. This single-cycle intervention study was implemented as a supplementary class series

integrating content from the learners' discipline of Pali and Buddhist Studies into English language instruction, with a specific focus on speaking skills. This approach was grounded in the principles of Soft CLIL, which prioritizes language development while using familiar, discipline-specific content to facilitate learning. In our teaching experience, final-year undergraduates struggled to apply ALFs in academic subjects. Additionally, the implementation of soft CLIL, specifically in a tertiary-level EAP classroom, remains an under researched area. This gap highlights the need for teaching that supports both language development and disciplinary relevance. The purpose of this study, therefore, is to explore how Soft CLIL can foster the development of ALFs. The following research questions guide the inquiry:

RQ1: How do learners perceive the use of Soft CLIL in supporting the development of ALFs in English?

RQ2: What do teaching practitioners observe and experience regarding learners' use of ALFs in a Soft CLIL classroom?

As elaborated by scholars such as Coyle, Hood, and Marsh, CLIL is a "dual-focused educational approach; and in the teaching and learning process, content and language are 'interwoven', even if the emphasis is greater on one or the other at a given time" (2010, p.1). CLIL can be implemented in two ways: Hard CLIL and Soft CLIL. In the content-language continuum, Soft CLIL leans towards language where language development is prioritized (Banegas, 2016). Soft CLIL integrates cross-curricular content into language teaching, enhancing both instruction and learners' cognitive development (Bentley, 2010; Esteban, 2015).

ALFs are the diverse roles that language plays in scholarly communication, with core tasks including explaining, arguing, analyzing, and evaluating. They support content learning, especially for English learners. ALFs are rooted in Halliday's functional linguistics and Cummins' Cognitive Academic Language Proficiency (CALP) concept. CALP, more cognitively demanding than Basic Interpersonal Communicative Skills (BICS), refers to the academic language proficiency, which is "the extent to which an individual has access to and command of the oral and written academic registers of schooling" (Cummins, 2008, p. 67). Extending Halliday's ideas, Gibbons (2009) emphasizes the explicit teaching of ALFs to scaffold academic literacy across disciplines. According to Schlepppegrell (2004), these functions facilitate the communication of complex ideas, constructing arguments, evaluating evidence, and other skills essential for undergraduate success. Several studies highlight CLIL's potential in supporting these functions. Esteban (2015) observed that integrating thematic content into English instruction for Spanish BA students enhanced both language learning and cognitive-communicative skills. Mencarelli (2016) observed that Italian secondary-level students improved in micro ALFs like hypothesizing when English was taught through scientific subjects. Mohan and Beckett (2003), in a Canadian tertiary English as a Second Language (ESL) context, applied a functional CLIL approach focused on Chinese socioeconomic content and highlighted how communicative tasks and causal explanations linked content with advanced language use. Similarly, Mårtensson and Östrand (2023) emphasize that CLIL and content-based instruction (CBI) boost learner motivation by linking content to interests, supporting sustained engagement. These findings informed the present study, which used a task-based framework to develop ALFs among final-year Pali and Buddhist Studies undergraduates.

Theoretical Underpinnings

Krashen's Theory of Second Language Acquisition, which explains how learners acquire a second language, aligns well with the context of this tertiary-level classroom. His five hypotheses: Acquisition-Learning, Natural Order, Monitor, Comprehensible Input, and Affective Filter, form a coherent framework in analyzing the study's findings (Krashen, 1981). Both Krashen's theory and the CLIL framework promote language learning through natural, meaningful communication rather than explicit grammar instruction, forming the theoretical basis of this study. In designing the lessons, Krashen's emphasis on comprehensible input and lowering the affective filters guided the selection of soft content and communicative activities that encouraged authentic use of academic language in an encouraging and relaxed atmosphere. CLIL, particularly in its 'soft' form, prioritizes language development while

introducing subject content in an accessible way, making it especially suitable for EAP contexts. Central to CLIL is the development of CALP conceptualized by Cummins, which refers to the ability to understand and use academic language that is cognitively demanding. This study draws on both the CLIL framework and the concept of CALP to support the development of ALFs. Additionally, it contributes to the limited research on Soft CLIL in Sri Lankan tertiary EAP classrooms by integrating a religious philosophy into English instruction.

Materials and Methods

This is a “reactive action research”, where the first author, as the teaching practitioner, reacted to a problem encountered in her professional teaching setting (Craig, 2009, p.248). Reactive action research addresses a practical problem and improves professional practice, and the participants are actively involved in the study from beginning to end to solve this practical problem (Craig, 2009). The following figure illustrates the action research design adopted for this study, which was modeled by Kemmis and McTaggart (1988).

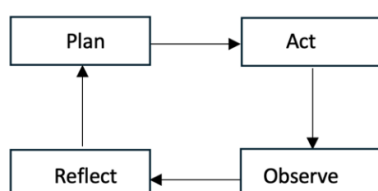


Figure 1

Kemmis and McTaggart's (1988) Action Research Design

This action research follows one cycle of planning, acting, observing, and reflecting to examine the impact of content integration. A single cycle was chosen due to time constraints- a 15-week semester with two lecture hours per week. Reflections from this cycle provide a foundation for future multi-cycle research. Content selection was guided by the course coordinator's input and the researcher's background in Buddhism. Various qualitative data were collected, as detailed in the table below.

Table 1

Summary of Data Collection Tools and Data Sets

Research question	Tool	Data set
RQ1: How do learners perceive the use of Soft CLIL in supporting the development of ALFs in English?	Reflective diary entries of the learner participants	Written diary entries
	Focus group discussions with the learner participants	Audio recordings, transcripts and translations
	Guided essays of the learner participants	Written guided essays
RQ 2: What do teaching practitioners observe and experience regarding learners' use of ALFs in a Soft CLIL classroom?	Self-reflections of the class teacher/me	Written self-reflections
	Classroom observations done by peer teaching practitioners	Classroom observation protocols filled by peer teaching practitioners

Content included themes such as Right Endurance, Contemplation of Emotions, the Five Hindrances, the Senses, and the Middle Way, providing a strong basis for integrating subject content into language teaching. Activities, including speeches, discussions, debates, and presentations, targeted speaking-related ALFs and were supported by textual and audiovisual materials. Lesson plans incorporated both content and language objectives. The action was observed throughout. In the final reflection, the first author analyzed how effectively she supported ALF development through Soft CLIL and identified feasible remedial steps.

Researcher reflexivity was maintained by critically examining the dual insider-outsider roles, acknowledging how personal and institutional positioning influenced interpretations, and incorporating participant perspectives to challenge biases, to provide a transparent, ethically responsible, and contextually grounded account of the research.

Participants

The participants were all final-year students (Students A–G) from the Department of Pali and Buddhist Studies, i.e., four monks, two lay males, and one lay female, aged 22–26. All were Sri Lankan Buddhists, Sinhala-medium educated, with limited English exposure. Most are from lower-middle-class, semi-urban, or rural backgrounds. Informed consent was obtained from all participants, and anonymity, confidentiality, and the right to refrain from answering or withdraw were assured.

Procedure of data analysis

Before analysis, the first author manually transcribed and translated all Sinhala audio recordings, diary entries, and essays into English for accuracy, while English texts were presented verbatim. Data were thematically coded and analyzed based on the two research questions. Guided by Krashen's Second Language Acquisition Theory, the analysis used a deductive approach that applied theory to the data to test it (Bingham & Witkowsky, 2022). It examined how Soft CLIL influenced the development of ALFs, focusing on language and content objectives, teaching and learning processes, activities and resources used, evaluation, and overall classroom management.

Results and Discussion

Learner perceptions of the use of Soft CLIL in supporting the development of ALFs in English

Throughout the data collection, the participants demonstrated a positive attitude towards the innovative Soft CLIL classroom experience and emphasized the value of developing ALFs. In a focus group discussion (FGD), Student A remarked, "I am a communicator. I need to reach my audience through an international language. For that, I improved my dhamma preaching skills through this lecture series. I value the impromptu speaking opportunities I received during the program," while Student B added, "I like this updated method of teaching. I wish this program had been conducted from the first year onwards."

When participants were asked whether the repetition of discipline-related content in English materials caused disengagement, their responses suggested the contrary. Student A wrote in a guided essay, "Familiar content in these materials was the reason I developed an interest in attending this lecture." Student D noted that "prior knowledge in (their) subject area" helped them connect with the lesson. Student C said, "I'm not sure if Madam deliberately linked the materials to our subject, but it was very relevant to us; for example, the text on 'Ignorance' introduced us to different interpretations of it." In a reflective diary entry (RDE), the same student noted, "'The Right Endurance' lesson related to my subject. We learned new topic words, discussed ideas, and argued respectfully." Regarding materials, Student A said, "I will never forget the lesson on 'Sammuthi.' I could present my own interpretation and analysis of this Buddhist text in English, which I hadn't done in any previous English courses." Thus, integrating discipline-specific content helped learners engage in developing ALFs. These reflections

support Krashen's (1982) 'comprehensible input' hypothesis (i+1), where familiar content ('i') combined with English elements ('+1') facilitated language development beyond learners' current level. Materials such as articles, stories, dhamma talks, meditations, and dialogues provided meaningful, natural input supporting second language acquisition.

Krashen's (1982) affective filter hypothesis explains how anxiety or low confidence can hinder learning. In this study, the filter was lowered by allowing code-switching, encouraging risk-taking, and creating a supportive environment that facilitated ALF development. Student F noted in an RDE: "We read the text, then learned how to disagree, agree, interrupt, etc. We had a fruitful discussion on 'Contemplation of Anger', with confidence and no fear of mistakes. Learners shared that content-integrated activities were key to developing ALFs. In a guided essay, Student E remarked, "Some dislike speaking, some are shy, but these activities enabled us to speak, at least with the little English we knew." Student C added, "Activities were fruitful; they developed speaking, presentation, and communication skills." These responses highlight how the choice of activities also promoted the development of ALFs.

Some learners showed conscious learning and self-monitoring during speaking tasks. Krashen's 'monitor hypothesis' states that fluency comes from acquired language, while learned knowledge aids accuracy (1981, p. 2). Student A noted in an RDE: "When I spoke about 'Pride, Conceit and Humility,' I stumbled on linking words. I took my time to choose correctly and talk about my subject." This reflects how learned knowledge supported editing in cognitively demanding tasks. Overall, learner perceptions suggest that Soft CLIL effectively supported ALF development in English.

Teacher perceptions of the use of Soft CLIL in supporting the development of ALFs in English

The data revealed that teaching practitioners observed significant development in ALFs in the Soft CLIL classroom. The first author, as the main researcher, also maintained journal entries. She noted that planning a Soft CLIL lesson required more time and effort than a general EAP lesson, yet this is a skill that language practitioners can master with experience. Early on, she noted, "I had to spend more time aligning content and language objectives," but in the final reflection, she remarked, "In planning the lesson 'The Middle Way,' I successfully aligned content objectives with language objectives and learner proficiency." These entries reflect progress in content-language integration.

Peer observation protocols rated both planning and implementation as "excellent" or "very good." Lesson planning is also aligned with Krashen's 'natural order' hypothesis, providing input suited for second language acquirers rather than learners. As Patrick (2019, p. 40) notes, learners acquire language only when ready, and the teacher's role is to offer understandable input. The researcher aimed to observe this order and provide appropriate input accordingly.

The development of learner participants' ALFs, such as predicting, inferring, and expressing opinions, was evident during concept-checking questions posed before lessons. For instance, to set the context, when they were asked, "What is 'endurance'? How do you react to deeply felt emotions (e.g., worry, elation, anger)? What do you do when a negative thought arises? Do you indulge it or act out of it?" These questions prompted learners to describe and analyze their personalities, leading to deep discussions on emotions. This growth was also reflected in self-reflections: "A learner participant conducted a guided meditation during class, while others followed attentively. He did it with clarity and accuracy." This highlighted improved speaking skills and the ability to explain complex concepts in English. During lessons, learners supported their arguments with examples, details, and anecdotes. One reflection noted: "Learners used their prior knowledge, quoting Pali shlokās and Jātaka stories," showing how disciplinary content enriched language use; and another noted: "Learners paraphrased a story effortlessly," demonstrating their ability to comprehend and express complex ideas in English. These examples show how

content familiarity fosters deeper engagement and stronger academic communication. In the debate, the proposition and opposition teams collaborated closely, gathering evidence, preparing rebuttals, and learning from peers. The data also reveals how affective filters like confidence, fear, and anxiety influence language acquisition (Krashen, 1982). While the negative filters cannot be eliminated, they can be managed. Patrick (2019) notes that tasks promoting natural acquisition reduce stress, whereas explicit instruction may heighten it, linking affective filters to Krashen's acquisition-learning and comprehensible input hypotheses.

The first author's reflections indicated that learners met both content and language objectives, with new language effectively applied in activities. For example, "they used discussion functions of expressing opinions, giving reasons, seeking clarification, and connectors for addition, contrast, cause-effect, and summarizing during tasks like paraphrasing texts and quoting *Nikāyas* in presentations." These instances showed meaningful integration of content and language. Peer observation protocols confirmed teaching effectiveness, rating areas such as concept clarity, adaptability, classroom management, intellectual humility, and time allocation as "excellent," affirming the professionalism and success of the Soft CLIL approach.

Conclusion

The results and discussion led to the conclusion that the implementation of Soft CLIL in this tertiary-level English language classroom had a positive impact on learner comprehension, interaction, confidence, and, most importantly, the development of ALFs. Although teaching practitioners acknowledged that planning a Soft CLIL lesson was more demanding than preparing a general EAP class, they noted that the overall effectiveness of the teaching and learning process, along with the course's high productivity and practical value, outweighed these challenges. As the teaching practitioner who conducted the lecture series, the first author observed significant improvement in the learners' ALFs. Through the task-based English language lessons covered throughout the semester, the learners mastered their language functions of analyzing, describing, explaining, expressing opinions, comparing, contrasting, arguing, defending, predicting, inferring, etc. These cognitively demanding ALFs were required for the learner participants' degrees, and as a result, the mastery of these functions was an investment for their overall academic performance as well. The implications of the study highlight the measures that should be taken by curriculum developers and English language teaching practitioners in tertiary education to implement similar programs in other contexts and emphasize the necessity of promoting the soft CLIL approach, especially in tertiary education.

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The Effect of the Curriculum of the English Access Micro-Scholarship Program on the Improvement of 21st-Century Skills of Its Students in Sri Lanka

Y. M. N. N. Yatiagalagama^{1*}, H. M. S. Priyanath²

¹*Candidate in MA in English and Education, Faculty of Graduate Studies, Sabaragamuwa University of Sri Lanka*

²*Department of Economics and Statistics, Faculty of Social Sciences and Languages, Sabaragamuwa University of Sri Lanka.*

Corresponding author*: niroshanishanthi1980@gmail.com

Abstract

This paper examines the impact of the English Access Micro-scholarship program curriculum on improving the 21st-century skills of its students in Sri Lanka. The study utilizes a quantitative method for data collection. The sample consists of 92 access students; the data were collected through a structured questionnaire and analyzed with the Partial Least Squares-Structural Equation Model (PLS-SEM), supported by SmartPLS. The results show that English knowledge encompassing the four skills targeted through the access micro-scholarship program positively impacts the improvement of 21st-century skills of its students. Communication ability, which is expected to be developed through the access curriculum, has a favorable influence on the enhancement of 21st-century skills of access to students. Additionally, confidence and self-esteem fostered through the access curriculum positively influence the improvement of 21st-century skills of students. Cultural awareness taught through the Access Curriculum also positively impacts this improvement. Finally, English knowledge and time management imparted through the access curriculum significantly enhance the development of 21st-century skills of access students.

Keywords: 21st-Century Skills; Curriculum; English Access Micro-Scholarship Program.

Introduction

In modern society, learning a second or third language has become a common practice, particularly among young learners. Countries invest substantial resources in second-language education, including policies, curriculum development, teacher training, technology integration, and evaluation. Fluency in an international language such as English is crucial, making curriculum design a key factor in the learning process (Burns & Richards, 2018). A well-designed curriculum prepares students for the evolving job market and equips them with 21st-century skills such as critical thinking, problem-solving, and collaboration (Alismail & McGuire, 2015). Curriculum designers aim to ensure that students acquire knowledge, technological literacy, and practical experience to meet the demands of the contemporary workforce. Despite the growing emphasis on skills-based education, many students in Sri Lanka face challenges to achieve success (Ariyawansa, 2008).

The English Access Micro Scholarship Program (Access) provides economically disadvantaged youth aged 13 to 20 with the opportunity to learn English through intense after-school sessions and other activities specially tailored for community service and leadership development. (Al-Soufi, 2021). The United States Embassy funds the Access program, which is implemented in numerous Asian, South Asian, and African nations. According to the authorities,

the main purpose of this program is to improve computer-related skills and English-language skills. More than 90 nations and almost 200,000 students have taken part in the Access Program since it began in 2004. These students have graduated from the USA (Al-Soufi, 2021).

A significant number of students have completed the course in Sri Lanka as well. This study focuses on the Access students who finished the program in Sri Lanka and examines the impact of the curriculum on achieving the expected 21st-century skills, as well as any differences between the school curriculum and the Access curriculum based on student performance during and after the course. The ACCESS program operates in numerous countries across Asia, South Asia, and Africa. This program's primary goal, according to the authorities, is to enhance English language and computer-related skills. Since its inception in 2004, the Access Program has enrolled nearly 200,000 students across more than 90 countries. They are graduates of the United States. There are few studies conducted about the Access program in other South Asian Countries. (Al-Soufi, 2021).

According to the limited research available, it is clear that the new curriculum designers pay attention to including 21st-century skills in their novel work, recognizing their importance. Through empirical literature, there aren't any theories to discuss the relationship between curriculum and 21st-century skills. Although there is some research conducted in other countries regarding the English Access Micro-Scholarship Program, according to the literature survey of this research, none of the research was found regarding the relationship between the curriculum and 21st-century skills in Sri Lanka. This gap highlights the need for conducting this research. Therefore, the primary objective of this study is to analyze the effect of the curriculum of the English Access Micro-Scholarship Program on the 21st-century skills of its Students in Sri Lanka.

Materials and Methods

The present study examines the effectiveness of the Access curriculum and fostering 21st-century skills, with a focus on prior concepts covered in the literature review. A deductive approach is employed to develop the relationship between independent and dependent variables. Given that, this research applies the existing theories to a practical context. Hence, the philosophy of this research is positivism. Therefore, the adopted methodological approach used in this research is the quantitative method, which involves collecting data using a structured questionnaire and a survey.

Sample: In this research, the unit of analysis consists of Access students. These students are participants in the English Access Micro-Scholarship Program. There are four centers in operation in Ampara, Puttalam, Kaluthara, and Aluthgama. The approximate number of access students in a center is 30, and therefore, the population size is 120. According to the sample size calculator (calculater.net), the required sample size was identified as 92 to maintain a 95% confidence level in the research. The first 92 responses received were used as data for analysis using the random sampling method.

Data collection: Access curriculum was assessed using its Intended Learning Outcomes (ILOs); English Knowledge and four language skills, Communication ability in different contexts, cultural awareness, confidence and self-esteem, and time management. 21st Century skills were measured using 37 items (See Table 1) developed by the Organization for Economic Co-operation and Development (OECD) in 2019, representing all the aspects adopted. Self-report structural questionnaire items are used to collect data using a seven-point Likert scale. Responses ranged from 'strongly disagree' to 'strongly agree'. Data was gathered for the questionnaire through face-to-face interviews with respondents.

Data analysis: A PLS-SEM is used as the main analysis technique to test hypothetical relationships. The analysis was conducted in two steps: first measurement of variables, and second, evaluating the structural model.. The study first assessed the reliability and validity of the variables. Each of the outer loadings was used to calculate the indicator reliability value, which should be 0.7 or higher. For each indicator, the t-statistic should be more than 1.96, and the path coefficient should be significant. For a construct's internal consistency reliability, Cronbach's (CA) alpha and composite reliability (CR) should be 0.7 or higher. The convergent validity was tested using the average

variance extracted (AVE), and each latent variable should have an AVE value greater than 0.5 (Hair et al., 2014). The structural model evaluated the multicollinearity, significance of path coefficients, coefficients of determination (R^2), and effect size.

Results

First, the study calculated measurements of variables to ensure their reliability and validity. Indicator reliability was identified using factor loadings of items and their t-statistics. The factor loading for all items related to variables lies above the threshold value of 0.7. This indicates a high degree of indicator reliability. A strong connection with their respective items was suggested by the t-statistics, which also showed that all factor loadings were statistically significant at a 95% confidence level. Internal consistency reliability was satisfactory with CA values ranging from 0.928 to 0.972, well above the recommended threshold of 0.7. To further support the accuracy of the evaluations, the CR scores for all 21st talents ranged from 0.933 to 0.975. All variables had AVE values between 0.659 and 0.771, indicating that each construction accounted for a significant portion of the variance in each skill. A requirement for the discriminant validity of first-order constructions was met when there were no inter-construct correlation values over the square root of the AVE. The next step of the study tested hypotheses. Based on the PLS-SEM results as indicated in Table 1, each path coefficient is statistically significant. The essential t-value was established to be 1.96 at a significance level of 0.05 (Hair et al., 2014). Therefore, all hypotheses except one are accepted. To assess the association between the two variables, R^2 has been used in the study. Accordingly, R^2 was 0.865. The model demonstrates the significant impact of the predictive variables.

Table 1

Path Coefficients and Significance of Hypotheses

Hypotheses	Path coefficient	T statistics	P values	Decision
H:1 Communicate ability -> 21st-century skills	0.077	1.305	0.194	Not accepted
H2: Confidence and self-esteem -> 21st-century skills	0.291	4.133	0.000	Accepted
H3: Cultural awareness -> 21st-century skills	0.271	3.783	0.000	Accepted
H4: English Knowledge and four skills -> 21st-century skills	0.166	2.534	0.012	Accepted
H5: Time management -> 21st-century skills	0.216	3.414	0.001	Accepted

Discussion

H1 suggests that the communication ability improved through the Access curriculum, positively impacting the upgrading of 21st-century skills among Access students. The path coefficient of 0.077 indicates a positive relationship between communication ability and 21st-century skills among Access students. However, results suggest that communication ability, an intended learning outcome of the Access curriculum, has a positive impact on the improvement of 21st-century skills of Access students. Through their ability to solve problems and master the material, students who were exposed to these 4Cs have demonstrated their effectiveness (Chiruguru, 2020).

H2 suggests that Confidence and self-esteem, focused through the Access curriculum, positively impact the improvement of 21st-century skills in Access students. The path coefficient of 0.291 indicates a positive relationship between confidence and self-esteem to improve 21st-century skills among Access students. The T statistics of 3.783 suggest that the positive responses to this relationship are higher than the negative ones. This data provides strong evidence to accept hypothesis 2. Self-esteem is a crucial component of an individual's presence in the classroom. Schools can play an important part in fostering self-esteem among students (Nuryana, Xu & Lu, 2023). The creation

of a curriculum that helps to improve the students' self-esteem is an initiative that can be undertaken. A curriculum is a set of segments created for students to follow instructions from educational institutions. The content of the curriculum can be either static or dynamic and includes the necessary competencies. (Nuryana, Xu & Lu, 2023).

H3 suggests that cultural awareness taught through the Access curriculum positively contributes to the development of 21st-century skills of Access students. The path coefficient of 0.271 indicates a positive relationship between cultural awareness and 21st-century skills among Access students. The t-statistic 3.783 indicates that the number of positive responses to accept this relationship is higher than the negative responses. This evidence provides strong evidence to accept hypothesis 3. Thus, it can be determined that cultural awareness, which is targeted through the Access program, impacts the improvement of 21st-century skills among Access students. In today's globalized world, intercultural communication competence (ICC) is essential for human survival, particularly in contemporary education and worldwide business (Sarwari et al., 2024).

H4 suggests that English knowledge and the four skills influence the improvement of 21st-century skills of Access students. The path coefficient of 0.166 indicates a positive relationship between English knowledge and the four skills and 21st-century skills. The t-statistics of 2.534 suggests that the responses on this relationship are statistically significant, and it provides highly significant evidence to accept hypothesis 4. The 21st-century language classroom encompasses more than just teaching and studying language skills and vocabulary. In addition to mastering language, one must also acquire other talents that are thought to be essential in 21st-century skills, to meet the demands and overcome the obstacles of the modern world (Idrizi, 2023).

H5 suggests that time management, emphasized in the Access curriculum, positively influences improvement of 21st-century skills of Access students. The path coefficient of 0.216 indicates a positive relationship between time management and 21st-century skills among Access students. The t-statistic of 3.414 indicates that the positive responses on this relationship are greater than the negative responses. This data provides strong evidence to accept hypothesis 5. Effective time management significantly influences overall performance and accomplishments. For students to succeed, effective time management is essential. Nevertheless, some students struggle with time management, which has a detrimental impact on both their academic performance and their personal well-being (Nasrullah & Khan, 2015).

Conclusion

Research findings indicate that the Access program effectively enhances students' 21st-century skills through its curriculum. The results show that English language knowledge with the four skills targeted through the access micro-scholarship program, positively impacts the improvement of 21st-century skills of its students. Communication ability, which is expected to be developed through the access curriculum, has a favorable influence on the enhancement of 21st-century skills of Access students. Additionally, confidence and self-esteem fostered through the access curriculum positively influence the improvement of 21st-century skills. Cultural awareness taught through the access curriculum also positively impacts this improvement. Finally, English knowledge and time management imparted through the access curriculum significantly enhance the development of 21st-century skills among students.

This study highlights the impact of the English Access Micro-Scholarship Program on Sri Lankan students, addressing a research gap in this context. The researcher identified Intended Learning Outcomes (ILOs) from the Access Curriculum, adding new knowledge since the program lacked predefined outcomes. The findings show that small class sizes, well-trained teachers, and interactive activities enhance students' English proficiency. The curriculum fosters confidence, creativity, IT literacy, leadership, and 21st-century skills. Access students develop digital literacy, cross-cultural communication, and self-direction. Ultimately, this research confirms that the Access curriculum effectively enhances students' 21st-century skills in Sri Lanka, providing a basis for future studies.

This research study highlights key policy recommendations to enhance English language curriculum development, aiming to improve education quality and prepare students for global success. The curriculum should focus on all

four language skills, with particular emphasis on speaking, as it is essential for communication. Students should be exposed to diverse accents and cultural interactions beyond their immediate communities to enhance linguistic competence and cultural awareness. Collaboration with different groups fosters understanding, peaceful coexistence, and expanded job opportunities. Additionally, the curriculum should incorporate leadership training, personality development, and teamwork through well-designed activities. In a developing country like Sri Lanka, early emphasis on time management is crucial for individual and societal progress. Furthermore, integrating 21st-century skills into English education will ensure that students are equipped for the evolving job market. Overall, a modernized curriculum will produce globally competent individuals capable of achieving personal and professional success.

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The Effect of TPACK on ESL Learners' Performance: An Investigation of Teacher Competency in Technology Integration in the Colombo District

L.U. Colombage^{1*}, K.R.W. K.H. Abeywickrama²

¹Department of Surveying and Geodesy, Sabaragamuwa University of Sri Lanka

²Department of Languages, Sabaragamuwa University of Sri Lanka

Corresponding author*: lakshani.upeksha99@gmail.com

Abstract

Given the growing use of technology in education, it is essential to comprehend how Technological Pedagogical Content Knowledge (TPACK) contributes to teachers' successful learning. This study investigates how the TPACK of secondary-level English as a Second Language (ESL) teachers affects the performance of ESL students by analysing data gathered from secondary-level ESL teachers in seven schools in the Colombo District using a mixed-method approach. A closed-ended questionnaire was distributed among 52 teachers, and 10 teachers were selected randomly to participate in a semi-structured interview. The results show that teachers' TPACK and ESL learners' performance are significantly correlated, particularly when technology is incorporated into ESL instruction; the learners showed increased motivation, engagement, and language proficiency. Moreover, incorporating TPACK into instruction improved teacher agency, quality, and professional capital while decreasing teacher burnout and stagnation. These findings address Sri Lanka's educational needs, improve language learning outcomes, and highlight the value of professional development initiatives aimed at advancing ESL teachers' TPACK. By equipping teachers with the necessary skills to integrate technology effectively and by equipping the schools with the necessary technological devices, schools can improve ESL learner performance, thereby fostering better academic performance and language learning.

Key Words: ESL, Engagement, Motivation, Performance, Secondary Level, TPACK

Introduction

English language proficiency is increasingly recognized as essential for global communication and participation in the modern workforce. In Sri Lanka, English is taught as a Second Language, and proficiency in English is often linked with better educational and employment opportunities (Abeywickrama, 2021a; Abeywickrama, 2021b; Abeywickrama, 2020; Liyanage, 2021). However, effective ESL instruction requires more than just linguistic proficiency. It necessitates the integration of technology, pedagogy, and content knowledge (Ersanli, 2016; Harris, Mishra, & Koehler, 2009). The Technological Pedagogical Content Knowledge (TPACK) framework, which was proposed by Mishra and Koehler (2006), offers a comprehensive approach to understanding how teachers can effectively integrate technology into their teaching practices to enhance the language proficiency of English as a Second Language (ESL) learners. The introduction of technology has led many 21st-century students to become less engaged with conventional teaching methods. As Sahin (2011) claims, a teacher must grow personally in a

variety of ways in order to succeed in their role. The TPACK framework created by Mishra and Koehler (2006) emphasizes the importance of teachers possessing technological knowledge, knowing how to successfully integrate

relevant technologies to improve student learning, in addition to content knowledge, what to teach) and pedagogical knowledge (how to teach). In addition to promoting better learning outcomes, this integration helps teachers grow personally. According to Tondeur et al. (2012), this kind of development is essential for improving teacher agency, instructional quality, and overall professional capital while lowering teacher burnout and stagnation.

In the context of Sri Lanka, traditional methods of ESL instruction are increasingly being supplemented or replaced by technology-enhanced approaches (Alles, 2023). However, for such integration to be effective, teachers must possess a well-developed understanding of how to combine technological tools with pedagogical strategies and content expertise, even though incorporating technology into the curriculum remains to be a complex task for educators (Garofalo et al., 2000; Hosseini & Kamal, 2013). This necessity is underscored by the fact that 21st-century learners are digital natives, the students who have grown up in a technologically saturated environment and therefore respond better to digitally mediated instruction (Gallardo-Echenique et al., 2015). ESL teachers must be able to adapt to these learners' preferences by incorporating educational software, multimedia resources, online platforms, and digital communication tools into their classroom practices (Lim, Din, NikMohamed, & Swanto, 2021).

Despite the increasing importance of technology in language learning, limited research has been done on how ESL teachers in Sri Lanka view and apply the TPACK framework in their lessons, particularly at the secondary level. By investigating how secondary-level ESL teachers' TPACK affects ESL students' performance, this study aims to address that gap by examining the dimensions of Technological Knowledge (TK), Pedagogical Knowledge (PK), and Content Knowledge (CK), as well as their intersections in forms such as Technological Pedagogical Knowledge (TPK), Pedagogical Content Knowledge (PCK), and Technological Content Knowledge (TCK). This research aims to understand how these integrated domains affect teaching effectiveness and student outcomes. Finally, the current study will shed light on how teacher proficiency in the TPACK domains can improve the performance and engagement of ESL students. It is anticipated that the results will influence instructional design techniques and professional development programs that help ESL teachers successfully meet the demands of contemporary language instruction. By doing this, the study adds to the larger conversation about enhancing language learning results.

Methodology

Research Design

A mixed-methods approach was used to investigate how secondary-level ESL teachers perceive the influence of the TPACK framework on student performance. A comprehensive analysis, balancing statistical rigor with a deep comprehension of teachers' real-world experiences, was facilitated by the integration of qualitative and quantitative methods. Data were anonymized, and no identifying information was included in any part of the analysis or reporting.

Population and Sampling

Secondary-level ESL instructors working in government, semi-government, and international schools in the Colombo district, Sri Lanka, comprised the target population. To ensure representation across different school contexts, including urban, suburban, and rural areas, a purposive sampling technique was used. The purposive sampling method can be used to gain an in-depth understanding of participants and the context to which they belong (Savenye & Robinson, 2005; Patton, 2002). As such, the sampling method facilitated the researcher to gain a

holistic understanding of Colombo District ESL teacher competency in technology integration. This means that the nature of the investigation and the degree to which the study examines “the complex in-depth phenomena” (Lichtman, 2013, p. 22) determine the validity of the study. Ten teachers participated in in-depth interviews lasting between thirty and forty-five minutes, and fifty-two out of sixty teachers answered the structured questionnaire. Participants were chosen based on their use of digital tools in their teaching practices and their current involvement in ESL instruction.

Data Collection

Data was gathered over three weeks. Digital data was gathered and distributed through the WhatsApp channel. Participants in the virtual interviews were chosen from the questionnaire pool. Teachers' self-assessed competencies in the three main TPACK domains TPK, PCK, and TCK were measured using a structured Likert scale questionnaire. The questionnaire also included demographic questions and items related to perceived impacts on student performance.

Among the 52 teachers, to supplement quantitative data, 10 secondary-level ESL teachers were selected to conduct a semi-structured interview. These interviews aimed at exploring participants' understanding and application of TPACK as well as their perceptions of how these technological integrations influence student engagement and academic performance.

Analysis

SmartPLS 4 software was used to analyze the quantitative data from the survey. To determine the connection between the important variables, TPACK domains, and ESL learner performance, hypothesis testing was done. Microsoft Excel was used to generate charts and summaries. Additionally, the interview transcripts were analyzed using Thematic Analysis (TA) using manual coding techniques. Three categories that aligned with the TPACK framework had recurring themes. To strengthen the validity of interpretations, these thematic findings were integrated with quantitative findings.

Results and Discussion

ESL Practitioners' Awareness of TPACK

Although the secondary level ESL teachers integrated technology into language teaching and learning, it was assumed that they lacked an adequate understanding of the TPACK framework. As such, prior to gathering data, the researcher sought to identify ESL teachers' awareness of TPACK. The results showed that although most respondents are familiar with the term, the majority of those who demonstrated a satisfactory understanding were inexperienced teachers, as verified through interviews. Nine respondents reported that their awareness of the TPACK framework ranged from fair to poor, whereas 43 respondents mentioned that their awareness was satisfactory.

The Use of TPACK in ESL Classrooms

The results indicated how teaching and learning have changed due to the technology integration in the classroom, particularly in ESL settings. The TPACK framework provides a comprehensive model for understanding and implementing this integration effectively. Three fundamental elements, technology, pedagogy, content knowledge, intersect in TPACK. As reported, this framework is essential for developing dynamic, interesting, and successful learning experiences in the context of ESL instruction.

The Use of Technological Pedagogical Knowledge (TPK) on ESL Learner Performance

Approximately 80% of secondary-level ESL teachers reported using tools such as multimedia and instructional software in their classes, indicating that the most of them were confident in incorporating technology into their

pedagogy. For instance, the interviewee 3 stated, “We started integrating technology into teaching often only after the COVID-19 pandemic. We had no option then. Since the students’ engagement was higher when using technology, I sometimes use my smartphone at least to play music when I teach at school, too.” However, hypothesis testing did not provide statistical support for this perception. The lack of adequate school resources, especially in rural areas, was a major issue that forced teachers to rely on their personal devices, like laptops and smartphones, to help with technology integration. While TPK was widely acknowledged in practice, some teachers still lacked confidence, particularly in troubleshooting and adapting digital tools independently. Data gathered through interviews confirmed that novice teachers were more comfortable with technology, often learning independently or receiving support at home. Commonly cited examples of technology use included audio-visual learning, online games, and digital storytelling, especially in the post-pandemic period. Teachers observed improved student engagement when lessons incorporated technological elements, reinforcing the idea that TPK supports ESL performance, despite infrastructure gaps and varying levels of teacher readiness. The idea that TPK is essential to promoting ESL learning outcomes is supported by the teachers’ consistent observations of higher student engagement when technology was used in the classroom. Nevertheless, the consistent and effective integration of technology in ESL classrooms remains constrained by challenges in infrastructure and teacher preparedness.

The Use of Technological Content Knowledge on ESL Learner Performance

Results showed that to improve lesson delivery and student engagement, ESL teachers frequently combine technology with subject-matter expertise. Most participants reported that they use digital resources designed specifically for ESL instruction and expressed confidence using technology to improve their vocabulary and grammatical competence. Teachers also utilized educational websites, multimedia content, and personal devices to enhance classroom instruction, as confirmed through interviews. The number of respondents (42) who agreed with the statement “I often engage ESL students in collaborative projects or activities using digital platforms such as Google Classroom, Zoom, and WhatsApp groups” is comparatively high. As reported, students were engaged beyond conventional approaches using collaborative tools such as Zoom and WhatsApp. When technology was incorporated into the delivery of content, particularly in digital labs or multimedia-supported lessons, teachers observed increased student interaction. These findings demonstrate that high TCK enhances engagement and comprehension, thereby improving ESL learner performance.

The Use of Pedagogical Content Knowledge on ESL Learner Performance

To improve learner outcomes, secondary-level ESL teachers successfully combined pedagogical strategies with subject knowledge, according to the analysis of Pedagogical Content Knowledge (PCK). Most respondents revealed that they frequently employ active learning techniques such as group discussions and cooperative projects, integrate real-world and cultural contexts into lessons, and use differentiated instruction to accommodate a range of language proficiency levels. These findings were validated by qualitative data, which highlighted innovative strategies such as incorporating familiar topics to increase vocabulary or employing role-playing to teach grammar. For instance, one participant explained how to reinforce the past tense by having students act out past events. One of the main components of PCK is the integration of teaching methodology and content mastery, which is demonstrated by such practices. With educators emphasizing engagement and participation through a variety of instructional strategies, the transition from traditional teacher-centered to learner-centered approaches was clear. Overall, the findings demonstrated that teachers possess and apply strong PCK, which has a major impact on the performance of ESL students.

Furthermore, the findings reinforced that teachers in the Colombo District effectively use TPACK, particularly the intersection of pedagogy and content, with technology to boost student comprehension and engagement. These practices underscore the need for sustained professional development to support continued innovation in ESL education.

The Impact of TPACK on ESL Learner Performance

The overarching aim of the study is to explore the impact of TPACK on ESL learner performance based on the secondary level ESL teachers' perceptions in Sri Lanka. Most ESL practitioners firmly confirmed that TPACK improves student performance. 79% of respondents agreed with the statement (as shown in Figure 1) that teachers' TPACK has a positive perceived impact on the outcomes of ESL students.

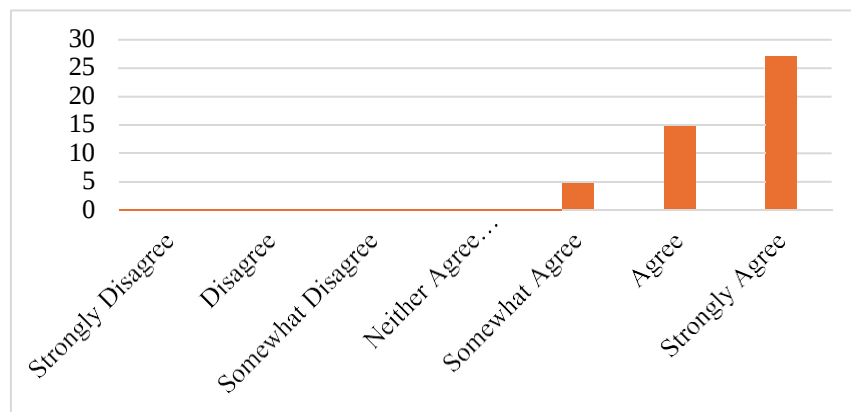


Figure 1

The Impact of Teachers' TPACK on ESL Learners' Performance

The study found that TPACK integration supports both teachers and ESL learners. Remarkably, 38% of respondents reported that TPACK decreased teacher stagnation, while 42% indicated that it alleviated teacher burnout. Furthermore, more than half of the participants reported improvements in teacher quality, agency, and particularly professional capital, the latter being the most widely acknowledged benefit. Despite these advantages, two major challenges were identified. Most importantly, insufficient school resources hindered technological integration, causing many teachers to rely on personal laptops and smartphones. Furthermore, experienced teachers struggled with technological integration, with only 25% strongly agreeing that they possessed adequate technological knowledge.

Conclusions and Recommendations

The key aim of this study was to investigate, from the perceptions of secondary-level teachers in Colombo District, how the TPACK framework, specifically, Technological Pedagogical Knowledge (TPK), Technological Content Knowledge (TCK), and Pedagogical Content Knowledge (PCK), affects the performance of ESL learners. The study effectively addressed this aim through a mixed-methods approach. The first objective examined the relationship between TPK and performance. Despite teachers' recognition of the importance of incorporating technology into teaching practices, there was no statistically significant positive correlation found. On the other hand, the study discovered a statistically significant correlation between TCK and the performance of ESL learners, highlighting the significance of aligning appropriate technology with subject matter. Additionally, the findings demonstrated a positive relationship between PCK and student outcomes, highlighting the continuing significance of effective teaching. Strong pedagogical and subject content integration is still relevant today, as evidenced by the results, which also showed a positive correlation between PCK and learner outcomes. Overall, by offering empirical insights into how various TPACK framework components affect ESL learner performance, the study achieved its specific goals. The results confirm that while technology has the potential to transform language instruction, its impact is maximized when integrated effectively with pedagogy and content.

Implications of the Study

The findings have significant implications for professional development providers, syllabus designers, school administrators, and ESL teachers. To facilitate successful technology integration in ESL instruction, the research findings emphasize the necessity of targeted training in TPK, TCK, and PCK. Teachers can apply these insights to enhance instructional strategies, while administrators can justify investments in professional development. . Syllabus designers are encouraged to embed TPACK components into curricula to create more engaging ESL programs. Ultimately, the research underscores the importance of **collaborative efforts** among educators, researchers, and training providers to develop innovative, evidence-based approaches to teaching approaches.

Limitations and Future Research

The results may not be as generalizable throughout Sri Lanka because the study was restricted to five schools in the Colombo District and included a small sample size of 52 respondents, most of whom were inexperienced teachers. Furthermore, only 10 qualitative interviews were conducted, limiting the depth and diversity of insights. Moreover, most of the respondents were novice and younger teachers, and they could be biased towards the more favorable perception of technology integration as the generation gap between them and Gen Z learners is comparatively less. However, the findings of the current study demonstrated the need for future research areas such as the impact of TPACK on teacher development, including areas like burnout, professional agency, and teacher quality, which emerged as important themes during the interview. This study did not distinguish between online and physical teaching processes. Hence, future research could differentiate between online and physical environments to better understand how delivery methods affect the effectiveness of TPACK on the ESL classroom practices. Future researchers could expand the sample across multiple provinces to reflect a more representative national context, as Colombo itself is considered one of the cities that has easy access to technology.

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The Effect of Knowledge Acquisition on Academic Development: A Comparative Study of English Medium and Sinhala Medium GCE (A/L) Arts Students in the Uva Province, Sri Lanka

W. K. N. T. Weerasekara^{1*}, M. D. N. M. U. Mahawattha², H. M. S. Priyanath³

¹Candidate in MA in English and Education, Faculty of Graduate Studies, Sabaragamuwa University of Sri Lanka

²Department of Marketing Management, Faculty of Management Studies, Sabaragamuwa University of Sri Lanka

³Department of Economics and Statistics, Faculty of Social Sciences and Languages, Sabaragamuwa University of Sri Lanka

Corresponding author*: thushariwknt@gmail.com

Abstract

This study examines the impact of knowledge acquisition on the academic growth of GCE (A/L) arts students in Sri Lanka, comparing English-medium and Sinhala-medium students in the Badulla Educational Zone of Uva Province. A quantitative approach was employed, utilizing structured questionnaires to collect primary data from 204 students (102 English-medium and 102 Sinhala-medium) through a multi-stage sampling method. The data was analyzed with Partial Least Squares Structural Equation Modeling (PLS-SEM) to examine how individual, instructional, and contextual factors influenced academic development. The results indicate that all three factors have a positive impact on the academic progress of both groups. However, instructional and individual factors have a more substantial influence on English-medium students, while contextual factors are more significant for Sinhala-medium students. The study also revealed that English-medium students achieve higher academic success than Sinhala-medium students, likely due to differences in teaching methods, resource availability, and language skills. These insights provide valuable guidance for educators and policymakers to develop targeted instructional strategies that improve student outcomes in both modes of instruction.

Keywords: academic development, English medium, GCE (A/L) arts students, knowledge acquisition, Sinhala medium

Introduction

In Sri Lanka, students who lack a strong foundation in Science and Mathematics in lower grades often select Arts and Commerce streams at the General Certificate of Education (GCE) Advanced Level (A/L). According to the Annual School Census Report (2020), out of the 2,932 schools offering GCE (A/L) education, only 1,000 schools (34.1% of those offering the GCE (A/L) stream) are classified as Type 1AB schools, which provide all streams of education: Arts, Science, Mathematics, Commerce, and Technology. The remaining schools, classified as Type 1C, typically have limited educational options. This discrepancy in the availability of schools offering diverse streams contributes to the higher enrollment rates in the Arts and Commerce streams (Ministry of Education, 2021). Furthermore, the educational system in Sri Lanka produces an excess of graduates in humanities and social sciences. Conversely, the number of graduates in fields such as science, engineering, and information technology (IT) remains relatively low. This is a concern because graduates from humanities and social sciences often struggle to find suitable jobs, with many ending up in sectors unrelated to their fields of study (Ministry of Education, 2007).

The issue of the medium of instruction plays a critical role in students' academic journeys. English has become a dominant global language, especially in the information economy, international trade, and scientific research. In Sri Lanka, Bilingual Education (BE) has been incorporated into the national curriculum, enabling students to learn selected subjects in English, particularly from grades 6 to 13. Research indicates that BE enhances students' economic prospects by improving English proficiency, which is highly valued in national and international job markets (García & Lin, 2017). In Sri Lanka, BE has gained attention, with the introduction of the BE Program in 2001 significantly changing the medium of instruction.

Despite the popularity of BE, students who complete their GCE Ordinary Level (O/L) exams in English do not always choose English medium subjects for their GCE (A/L) arts stream, possibly due to uncertainty about its long-term benefits (Fernando, 2017). Research has shown that students following the BE curriculum in junior secondary grades tend to demonstrate higher English proficiency compared to those studying in the Sinhala medium (Gunasekera & Silva, 2020). In the Uva Province (Badulla zone), BE has gained significant popularity as parents believe it enhances English proficiency and future career prospects. However, despite students' confidence in pursuing GCE (A/L) arts subjects in English, many remain uncertain about its impact on their academic development and career prospects in the future. The medium of instruction is a crucial factor in shaping students' academic success and career opportunities. However, students face challenges in choosing between the Sinhala and English medium, especially in the arts stream, where they fear they may be at a disadvantage compared to students in the science stream or those studying in the Sinhala medium. This uncertainty influences their academic decisions, career choices, and access to higher education.

Given these challenges, this study examines the impact of knowledge acquisition on the academic development of GCE (A/L) arts students in Sri Lanka, comparing those who study in English with those who study in Sinhala. This research aims to understand the role of the language of instruction in academic outcomes within the arts stream and to provide insights into how different educational media influence students' academic progress and career prospects.

Methodology

This research examines the relationship between knowledge acquisition and academic development, drawing on existing theories discussed in the literature review. Therefore, when developing the relationship between independent and dependent variables, the efficiency of the framework is deductive. As mentioned earlier, this research explores and clarifies existing theories in a practical context. Hence, the philosophy of this research is positivism. The adopted methodological approach is quantitative. The unit of analysis for this study was GCE (A/L) arts students. The sample was limited to English Medium and Sinhala Medium students to compare the effect of knowledge acquisition on academic development between these two modes of instruction. A multistage sampling method was used to select the sample. First, the study purposefully selected the Badulla education zone in Sri Lanka for the survey. Out of the six national schools in the zone, two schools -Vishaka Girls' High School and Badulla Central College-were chosen using simple random sampling. There were 566 students across both schools (146 English medium and 420 Sinhala medium). Based on the sample size calculation, 204 students were selected. Ultimately, 102 students from the English medium and 102 students from the Sinhala medium were chosen to ensure equal representation. Simple random sampling was used to select the respondents. Data was collected using a pre-tested, structured questionnaire. The questionnaire was organized into four sections to gather information from students. Knowledge acquisition was assessed through three dimensions: individual factors (using four items), instructional factors (using eight items), and contextual factors (using 14 items), as adopted by Bercovid and Feldman (2017) and Cukurova et al. (2018). Academic development was assessed through three dimensions: access to quality education (using three items), support system (using four items), and learning environment (using eight items), as adopted by Sanchez et al. (2019) and Topor et al. (2011).

A Partial Least Squares Structural Equation Model (PLS-SEM) was used as the primary analysis method to test hypothetical relationships. A first-order analysis was conducted to assess the validity and reliability of the questionnaire items and constructs. Internal consistency reliability, indicator reliability, convergent validity, and discriminant validity were used to evaluate the measurement's reliability and validity. The structural model was assessed based on first-order and second-order results. It examined multicollinearity, the significance of path coefficients, coefficients of determination, R-squared values, and the effect size.

Results and Discussion

Knowledge acquisition was evaluated using individual, instructional, and contextual factors, while the academic development assessment covered the learning environment, support system, and access to high-quality education. High indicator reliability was demonstrated by all the first-order factor loadings exceeding the preset threshold of 0.07. Moreover, at a 95% confidence level, the t-statistics indicated that each factor loading was statistically significant, showing a strong correlation with the corresponding items. The study employed Composite Reliability and Cronbach's alpha to assess internal consistency reliability, with a threshold of 0.7 or higher, considered acceptable. The study examined the convergent validity of each first-order latent variable using the Average Variance Extracted (AVE) method. The AVE values confirmed convergent validity for all first-order constructions above the necessary cutoff of 0.5. Discriminant validity measures a construct's ability to distinguish itself from other constructs reliably. The Average Variance Extracted (AVE) for each construct must exceed the highest squared correlation with any other construct to establish discriminant validity. According to the criterion outlined by Fornell and Larcker, discriminant validity is confirmed if the correlation values between latent variables are less than the square root of the AVE for each variable. The diagonal entries in the results show the correlations between the latent variables and the square root of the AVE. The second step in evaluating the structural model was to assess the importance of the proposed relationships. The PLS technique was initially used to evaluate path coefficients. It was then essential to determine the significance, magnitude, and signs of the path coefficients. The statistical significance of each path coefficient was estimated using t-values. At a significant level of 0.05, the critical t-value for a two-tailed test was 1.96. Based on the model results, Table 1 displays the hypothesis testing outcomes, as indicated by the t-value.

Table 1

Path coefficients and their significance

English Medium								
Hypotheses					Path coefficients	T statistics	P value	Decision
H1. E	Individual Development	Factors	->	Academic	0.294	4.264	0.000	Accepted
H2. E	Instructional Development	Factors	->	Academic	0.422	5.441	0.000	Accepted
H3. E	Contextual Development	Factors	->	Academic	0.288	5.632	0.000	Accepted
Sinhala Medium								
H1. S	Individual Development	factors	->	Academic	0.204	1.979	0.040	Accepted
H2. S	Instructional Development	Factors	->	Academic	0.207	1.985	0.048	Accepted

H3. S	Contextual factors -> Academic Development	0.425	3.493	0.001	Accepted
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Note. Data from the authors, 2024

An R^2 value of 72.9% for knowledge acquisition indicates that the predictors (individual, instructional, and contextual factors) account for approximately 73% of the variance in how well English medium students acquire knowledge. Similarly, an R^2 value of 56.5% for academic development indicates that the predictors account for approximately 57% of the variance in the academic development of Sinhala medium students. It indicates a moderate predictive power of the model, showing that the variables in the model can explain a significant portion of the academic development outcomes.

Discussion

According to Hypothesis 1, the relationship between English and Sinhala medium, individual factors, and the academic development of GCE (A/L) arts students in the Uva Province is positive and significant. The Sinhala medium findings for the hypothesis test show a path coefficient of 0.204, a t-statistic of 1.979, and a p-value of 0.040, which support the acceptance of the hypothesis, as shown in Table 1. The hypothesis was accepted for the English medium, where the path coefficient was 0.294 with a t-statistic of 4.264 and a p-value of 0.000. These results suggest that individual factors have a more substantial impact on the academic development of English-medium students compared to their Sinhala-medium counterparts. Specifically, English-medium students have a higher path coefficient, indicating that individual factors significantly influence their academic growth more. This finding aligns with previous studies on the influence of language and instructional medium on student performance. For example, Bista and Foster (2016) found that English medium instruction significantly improves students' academic performance due to greater exposure to global academic resources and enhanced cognitive skills.

Hypothesis 2, concerning both English and Sinhala media, posits that instructional factors have a significant impact on the academic development of students. The hypothesis was accepted after the Sinhala medium path coefficient, t-statistic, and p-value were found to be 0.207, 1.985, and 0.048, respectively. The hypothesis was likewise accepted for the English medium, where the path coefficient was determined to be 0.422 with a t-statistic of 5.441 and a p-value of 0.000. These results highlight the important benefits that instructional factors in both language media have for academic development and validate the positive correlation between instructional factors and academic development in both languages. Similarly, the work of Johnson et al. (2019) highlighted that instructional factors, including teacher quality and pedagogical approach, were more impactful in English medium instruction, leading to higher academic performance compared to students in native language instruction. The results demonstrate that the path coefficient of instructional factors on academic improvement for English-medium students is more significant than that for Sinhala-medium students. Rapid technological advancements have a profound impact on education, and multimedia technologies play a crucial role in enhancing the learning process.

According to H3 regarding English and Sinhala mediums, contextual factors have a significant positive impact on the academic development of GCE (A/L) art students. The hypothesis was accepted when the results of the hypothesis test for the Sinhala medium showed a path coefficient of 0.425, a t-statistic of 3.493, and a p-value of 0.001. The hypothesis was also accepted for the English medium, where the path coefficient was 0.288, the t-statistic was 5.632, and the p-value was 0.000. These results highlight the importance of contextual factors, such as the learning environment, socioeconomic status, and cultural influences, in shaping the academic development of students in both language media. The results further demonstrate that the contextual factors for Sinhala medium students have a more significant impact on academic development than those for English medium students. They contend that the lack of necessary cognitive stimulation that children from low-income households frequently experience is made worse by stress coping strategies, parental expectations, and parenting philosophies. These

findings align with existing research emphasizing the impact of contextual factors on academic success. Similarly, Jones and Lee (2015) found that contextual factors, including school culture and teacher-student relationships, played a crucial role in improving students' academic outcomes in English and native language media. In line with these studies, the current research highlights the critical role that contextual factors play in shaping the academic development of English and Sinhala medium students.

Conclusion

This study examined the influence of knowledge acquisition on the academic progress of GCE (A/L) arts students in Sri Lanka, with a specific focus on students in the English and Sinhala medium streams within the Badulla Educational Zone of the Uva Province. It analyzed how individual, instructional, and contextual factors influenced academic performance using a quantitative approach. The results indicated that individual and instructional factors have a more substantial effect on the academic development of students in the English medium. Conversely, contextual factors are more influential for students in the Sinhala medium. The study concluded that acquiring knowledge through the English medium has a greater influence on academic growth than through the Sinhala medium. Furthermore, the study provides empirical evidence that enhances understanding of how the medium of instruction and contextual factors shape student outcomes in Sri Lanka. The findings emphasize the importance of tailoring teaching methods to the language of instruction and highlight the need for effective knowledge transfer to foster academic success. Additionally, they highlight the importance of targeted interventions, such as teacher training, cognitive-behavioral techniques, and emotional regulation support, in addressing the specific challenges faced by students in both language streams. Based on the findings, the following recommendations are suggested to promote academic development. Schools should focus on improving teacher training, incorporating culturally relevant content in Sinhala and English, and creating customized support programs for students. Furthermore, resource allocation should address cognitive and emotional needs, ensuring that English-medium students receive appropriate cognitive support, while Sinhala-medium students benefit from emotional and behavioral interventions.

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Impact of Psychological Capital of Parents on English Language Proficiency of Students

Wimansa Dhammaweera^{1*}, Darshana Samaraweera^{2*}

^{1,2}*Faculty of Graduate Studies, Sabaragamuwa University of Sri Lanka.*

Corresponding author*: vimansavidumali@gmail.com

Abstract

This study examines the impact of parental psychological capital (PsyCap) on children's English language proficiency. PsyCap comprises four key components: self-efficacy, optimism, hope, and resilience. While previous research highlighted the role of PsyCap in workplace performance and education, its influence on English language competency remains underexplored. This study aims to bridge this gap by analyzing the relationship between parental PsyCap and student English proficiency. A correlational quantitative research design was employed, treating parental PsyCap as the independent variable and English proficiency as the dependent variable. A random sample of 104 Grade 11 students and their parents participated. Parental PsyCap was assessed using a questionnaire based on the Compound PsyCap Scale (CPC 12), while student proficiency was measured through their last-term test scores, a specially designed test, and speaking and listening assessments. Data analysis, conducted using SPSS software, revealed a strong positive correlation between parental PsyCap and student English proficiency ($R = 0.862$). The R-squared value (0.743) indicated that 74.3% of the variance in students' proficiency is explained by parental PsyCap, demonstrating its strong predictive ability. Additionally, the unstandardized coefficient ($B = 1.356$, $p = 0.000$) suggested that for every one-unit increase in parental PsyCap, students' English proficiency improves by 1.356 units. The high t-value (17.155) further confirms the significant impact of parental PsyCap. In conclusion, this study highlights the critical role of parental psychological capital in shaping students' English language proficiency, emphasizing the need to consider parental mindset as a key factor in language development.

Key words: Compound PsyCap Scale (CPC 12); Proficiency; Psychological Capital (PsyCap)

Introduction

English language proficiency is a crucial determinant of one's life and career in Sri Lanka. Numerous research has been conducted to identify the overall factors influencing education. Psychological capital, which refers to an individual's positive psychological resources that allow him to succeed in a variety of areas of life, is one such component that has recently acquired popularity. Psychological Capital (PsyCap), which is made up of four sub-constructs – self-efficacy, optimism, hope, and resilience – is defined as the state of one's positive psychology to overcome obstacles and persevere (Youssef and Luthans, 2007). This study focused on finding the relationship between the psychological capital of parents on the English language proficiency of children.

According to Ceka and Murati (2016), parents are the best role models for their children and have the most impact on them, as children always emulate the ideals and behavioral patterns of their parents. Blanka and Nada (2007)

found that the impact of the family's cultural and educational makeup, as well as the parents' proactive attitudes towards their children's education and success, leads to family stimulation. According to Luthans et al. (2007), parents with high psychological capital create a positive emotional climate at home, which fosters a supportive environment for learning, and Hoover-Dempsey and Sandler (1997) suggested that parents who believe in their ability to support their children's education are more likely to seek and utilize resources. High psychological capital in parents correlates with proactive behaviors in finding and using educational resources. A study by Masten and Reed (2002) on resilience showed that parents who manage stress effectively can create a less stressful home environment. This reduced stress level positively impacts children's ability to focus and perform in school. Furthermore, according to Hill and Tyson (2009), parental involvement in education is strongly linked to academic achievement. Parents with high levels of psychological capital are more likely to be involved in their children's education, which leads to better academic outcomes.

The idea of parental psychological capital has been largely overlooked in Sri Lankan research on parental support and involvement, which has focused on material determinants like family income, parental education, and household resources (Sajitha, 2021). However, not enough research has been done on parents' emotional and psychological fortitude in the face of hardship. Investigating this area may provide valuable insights into the internal resources parents use to assist their children's education. While studies have been done on parental expectations and their involvement in school (Aunola et al., 2000), the precise influence of PsyCap on a parent's ability to provide emotional and intellectual support has been underexplored. This research aims to find whether there is any effect of parents' Psychological Capital on the English language fluency of students, and the main objective is to identify the effect of Parents' Psychological Capital on students' English proficiency. Thus, this study enhances our understanding of Psychological Capital in education and will also provide practical solutions to enhance English language learning in Sri Lanka.

Material and methods

Conceptual Framework

The conceptual model illustrates the postulated relationships between parents' Psychological Capital (independent variable) and their children's English language competencies (dependent variable).

Participants and Sampling Methods

This study was conducted with 104 parent-student pairs. Of the 104 parents, 23 were fathers, and the rest were mothers. We used a systematic random sampling technique to select the sample and ensured that different school zones of Ratnapura were included.

The correlational quantitative research design enabled an objective analysis of the relationships between variables and was chosen as the most appropriate approach.

Data Sources and Data Collection Instruments

In this study, the secondary data sources (mark sheets from the school's formal records) were used to collect the students' marks, and the questionnaire for parents was used as the data collection tool.

Psychological Capital of Parents

To measure the Psychological Capital of the parents, the Compound PsyCap Scale (CPC 12) was used. This is a 12-item validated questionnaire that assesses four dimensions of Psychological Capital: Hope, Efficacy, Resilience and Optimism. Each item was rated on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). To align it with the study's objectives, the questionnaire was modified to reflect parenting perspectives in relation to children's education following the major article selected (Khajavy et al., 2019.) Before implementation, the pilot test was done

and then the necessary changes in the questionnaire were made, following the previous research. Finally, after the reliability and validity confirmation, the questionnaire was given to the main sample.

The reliability results for the main survey (sample size: 104) revealed notable improvements in internal consistency for some variables compared to the pilot study. Optimism ($\alpha = 0.838$), self-efficacy ($\alpha = 0.918$), and English language education ($\alpha = 0.899$) exhibit particularly high reliability, indicating a strong level of consistency among the survey items. Comparing these results with the major article referred to (sample size: 317), the present study demonstrates higher reliability across all variables. The major article reports lower Cronbach's Alpha values, with resilience ($\alpha = 0.67$) and optimism ($\alpha = 0.68$) having the weakest reliability. Hope ($\alpha = 0.71$), self-efficacy ($\alpha = 0.72$), and English language education ($\alpha = 0.80$) show moderate internal consistency but remain lower than the values found in both the pilot and main surveys. This suggests that the questionnaire used in the current study may provide more reliable measurements.

English Language Proficiency of Students

The student's English language skills were tested using numerous measures for extensive evaluation:

Marks obtained on the last term test: Taken as a standard tool for testing English language proficiency.

Specially designed tests assessed the following:

- Reading and Writing Competencies: Assessed through comprehension reading passages and written responses.
- Listening Comprehension Skills: Assessed by conducting an auditory-based test.
- Oral Interaction Skills: Assessed through an oral proficiency test.

Measures to Ensure Validity and Reliability

To enhance the validity and reliability of the study, a series of reliability tests was conducted. The reliability tests were conducted on the pilot sample, the main sample, and for the main article that was used. Cronbach's Alpha was used to determine the internal consistency of the CPC-12 scale, and standardized test scores yielded reliable measures of English proficiency. Content validity was established through expert review, and construct validity was investigated by factor analysis. Triangulation through multiple sources of data (self-reports, test scores) was used to minimize bias.

Pilot Testing

Before the major data collection, a pilot study was conducted among 25 parents to establish the reliability and the reliability of the CPC-12 questionnaire. A high reliability score (Cronbach's Alpha > 0.8) confirmed the questionnaire's consistency.

Data Analysis Techniques

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) software, employing various statistical techniques to examine the relationship between parental PsyCap and students' English language proficiency.

Justification of Hypotheses

The hypotheses drew on both Psychological Capital Theory and empirical research to associate positive psychological attributes of parents with academic achievement.

Results

Table 1

Model summary: overall model

Model Summary					
Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	
1	.862 ^a	.743	.740	.36943	

a. Predictors: (Constant), PC

Note. Data analysis outputs, 2025.

The R-value of 0.862 indicates a strong positive relationship between parental psychological capital (PC) and students' English language proficiency. The R-Square value of 0.743 suggests that 74.3% of the variance in students' English proficiency is explained by PC, demonstrating a strong predictive ability.

Table 2

Anova overall model

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	40.163	1	40.163	294.283	.000 ^b
	Residual	13.921	102	.136		
	Total	54.084	103			

a. Dependent Variable: Education

b. Predictors: (Constant), PC

Note. Data analysis outputs, 2025.

The regression model is highly significant ($F = 294.283$, $p = 0.000$), confirming that PC significantly predicts students' English language proficiency. The low residual sum of squares (13.921) indicates that the model fits the data well.

Table 3

Coefficient overall model

Coefficients					
Model		Unstandardized Coefficients		Standardized Coefficients	
		B	Std. Error	Beta	t
1	(Constant)	-1.511	.342		-4.419
	PC	1.356	.079	.862	17.155

a. Dependent Variable: Education

Note. Data analysis outputs, 2025.

The unstandardized coefficient ($B = 1.356$, $p = 0.000$) suggests that for every one-unit increase in PC, students' English proficiency increases by 1.356 units. The high t -value (17.155) confirms the strong impact of PC on students' English language proficiency.

Discussion

The research was successful in responding to the primary research question of whether parental psychological capital influences students' English language ability, with statistical tests showing positive correlations between all four dimensions of psychological capital (hope, optimism, resilience, and self-efficacy) and students' academic performance. The findings confirm that parents with higher levels of psychological capital have greater opportunities to positively impact their children's learning, such as their English ability. Moreover, the study aimed to investigate the deeper impact of the psychological capital of parents on students' educational development and postulated that developing these traits would lead to a better and more amicable learning environment. That is important for educators and policymakers as they should attempt to incorporate programs and interventions to help strengthen parental psychological capital to further promote students' educational development. This research suggests that increasing parents' hope, optimism, resilience, and self-efficacy could create a more nurturing learning environment, allowing children to overcome learning challenges, particularly with language skills. Furthermore, this study emphasizes the necessity of considering the psychological attributes of parents when designing interventions or educational support systems with the aim of improving student achievement. For policymakers, the study suggests the inclusion of psychological capital training in national school programs, and for parents, the findings highlight the importance of proactively developing their own psychological capital so that they can support their children's learning.

The study lays the groundwork for future research, which can take more diverse cultural environments into account, examine different age groups, and investigate other influencing factors such as socioeconomic status and school climate. Longitudinal studies can even provide more clarity on the long-term effects of parental psychological capital on students' academic trajectories. Future research must consider other variables that may potentially influence English proficiency. For instance, socioeconomic status is a key determinant of access to educational resources and opportunities, and it may moderate or mediate the effect of parental psychological capital on students' school performance. However, there are a few constraints on this study. The 104-participant sample may not represent broader groups, so generalizability is limited. Only the four psychological capital scales – hope, optimism, resilience, and self-efficacy – were explored; other factors potentially influencing them, such as socio-economic status or parent level of education, were not considered. Finally, cross-sectional research measures one point in time, limiting the ability to demonstrate causality.

Conclusion

This research confirmed that parental psychological capital influences students' English language ability, since the statistical tests showed positive correlations between all four dimensions of psychological capital – hope, optimism, resilience, and self-efficacy – and the students' academic performance. The regression analysis also supported that parental psychological capital is among the determinants of students' English proficiency, emphasizing the importance of building these qualities among parents as a way of promoting academic achievement. The findings show that parents with strong psychological capital create a more learner-friendly atmosphere, which has a positive impact on their children's academic success. Finally, the parents' psychological capital can be used strategically to improve students' English language skills, which can be useful in policy formulation in English language education in Sri Lanka.

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The Effect of Emotional Well-being on Polite Behavior and Teaching Effectiveness of English Teachers in Government Schools of Badulla District in Sri Lanka

K.P. Gunawardana^{1*}, H.M.S. Priyanath²

^{1*} MA in English and Education, Faculty of Graduate Studies, Sabaragamuwa University of Sri Lanka.

²Department of Economics and Statistics, Faculty of Social Sciences and Languages, Sabaragamuwa University of Sri Lanka.

Corresponding author* : kavipabaguna@gmail.com

Abstract

Many empirical studies agree that emotional well-being plays a critical role in influencing individual behavior, and the impact can directly affect work efficacy. However, the correlation between emotional well-being, behavior, and effectiveness has not been previously explored. Similarly, teachers' emotional well-being can also influence their behavior, leading to varying levels of teaching effectiveness. This study attempted to examine empirically how emotional well-being affects polite behavior and teaching effectiveness among English teachers in government schools of the Badulla District in Sri Lanka. Primary data collection was conducted using a quantitative method, involving a structured questionnaire administered to 297 randomly selected government English teachers. The study used Partial Least Squares Structural Equation Modelling (PLS-SEM) to analyze data. The results revealed that emotional well-being has a significant effect on polite behavior, which in turn has a substantial influence on teaching effectiveness. Supported by empirical evidence, this study concluded that the emotional well-being of English teachers directly influences polite behavior and teaching effectiveness. Furthermore, polite behavior plays a partial mediating role, implying that emotional well-being improves teaching effectiveness by fostering polite behavior. The findings of this study provide important insights for policymakers to enhance teachers' emotional well-being to improve the teaching effectiveness of English teachers by focusing on their polite behavior.

Keywords: English teachers, Emotional well-being, Polite behavior, Teaching effectiveness, Sri Lanka.

Introduction

Teachers, being one of the most important educational stakeholders, hold a major responsibility in providing enriching learning experiences for students through their subject expertise, pedagogical competency, and social awareness. They are expected to address students' academic needs, offer emotional and social support, and promote achievements consistent with 21st-century educational goals. (Wolomasi et al., 2019). Since teaching is linked to a wide range of obligations, teachers should demonstrate strong traits of physical, psychological, and emotional well-being to sustain in the profession. Sutton (2004) suggests that teaching is an emotional endeavor, and teachers often experience various emotions when they interact with students. Their emotional status has a strong connection to their efficacy (Hagenauer et al., 2015). Further, this research also claims that teachers' emotional well-being has an effect on students' well-being, including learning and development, and building a positive teacher-student rapport. If the teacher's emotional status is positive, it can have an impact on students' success, which is a measurement of the teacher's effectiveness. Can and Wu (2022) suggest that English as a Second Language (ESL) teaching is a 'dialogic and interactive job' that relates the emotions and behaviors of both students and teachers. Thus, their positive relationship results in favorable academic outcomes' and vice versa. The way

teachers behave towards students in different situations, including the way they instruct, lecture, respond, or interact, favors teaching effectiveness.

Despite the efforts to improve, Sri Lankan English language education is publicly perceived as a failure (Gunawardana & Karunaratna, 2017). Students, with no exception, follow the same assumptions, finding English language learning problematic. The Department of Education (DOE) (2021) reveals that 27% of the students who sat for the GCE Ordinary Level examination in 2021 failed the English language paper. This data presents the difference between the expected outcome and the reality of English language learning and teaching in Sri Lanka. If the students study English for several years yet still fail, there is a serious problem that should be addressed promptly. English teachers who are the 'most important stakeholders' of English Language Teaching (ELT) should carry much of the responsibility (Gunawardana & Karunaratna, 2017). Although the ELT paradigm has shifted from conventional lecturing methods to more activity-based, technologically enhanced ELT strategies, the ELT status in Sri Lanka is yet to improve. As ELT practitioners (teachers of English) are vital in the process, investigating the existing problems and focusing research on them is beneficial. However, scholars have not adequately studied how teachers' emotional well-being affects polite behavior and teaching effectiveness, particularly in the Sri Lankan ESL context. The mediating role of polite behavior on the relationship between emotional well-being and teaching effectiveness is yet to be investigated, as no study has explored the direct correlation among the variables of this study. This study intends to investigate the impact of teachers' emotional well-being and polite behavior on teaching effectiveness with special reference to the ESL context in Sri Lanka.

Methodology

The study adopted a quantitative method, which involves collecting data with structured instruments such as surveys. The unit of analysis of this research is English teachers at government schools in Sri Lanka. A total of 1294 English teachers are currently teaching English language and English literature in six education zones of the Badulla district. Out of the total population, 297 English teachers were selected as the sample size, based on the Krejcie and Morgan (1970) table, with support from the sample size determination formula available online at Raosoft (2004). The sample represents the six educational zones. Finally, the respondents were selected using simple random sampling.

The teachers' emotional well-being was measured through five selected items: emotional state, attributes, social connectedness, sense of belonging and accomplishments, based on Seligman's PERMA Theory of emotional well-being (2012). The selected items were previously adopted by Butler & Kern (2016). Teachers' polite behavior was measured through five dimensions: positive interactions, negative interactions, indirect anticipation, threatening interactions and non-verbal interactions, as adopted by Culpeper and Haugh (2014) and Wubbels and Brekelmans (2005). Teachers' effectiveness is the dependent variable of this study. Danielson's framework for teaching (2011) was used as the theoretical base to extract dimensions and design items accordingly. The selected dimensions and items measuring this variable, including planning and preparation, classroom environment, instruction, professional responsibilities, and psychological influence, were adopted by Smith and Johnson (2021).

Based on the measurements, a structured questionnaire was developed to collect primary data from government school English teachers. The draft questionnaire was pre-tested and adjusted based on the opinions of participants and experts. Each question was prepared as a statement to assess the answer using a 7-point Likert scale (1= strongly disagree, 2= disagree, 3= somewhat disagree, 4= neutral, 5= somewhat agree, 6= agree, and 7= strongly agree). The assessment of variable measurements and hypothesis testing were carried out using the Partial Least Squares Structural Equation Modelling (PLS-SEM). The reliability and validity of variables were assessed following a hierarchical model based on the first order and second-order analyses. The validity of variables was examined by indicator reliability and internal consistency reliability. Finally, the hypothesis testing was done after testing the multicollinearity among variables, evaluating the significance of path coefficients, and considering R-squared, effect size, and predictive relevance.

Results

Data analysis was done through both descriptive and inferential analysis. Sample characteristics were analyzed descriptively to understand the sample profile. However, these variables were not the primary focus of this study; therefore, subgroup analysis was not conducted. The descriptive analysis was done using frequency, mean, and standard deviation with the help of SPSS to analyze the behavior of variables. Partial Least Squares Structural Equation Modelling (PLS-SEM) was utilized to evaluate the constructing reliability and validity of the outer model.

The first step of PLS-SEM analysis examines the indicator reliability of two main indicators: T-statistics, which at a 95% confidence level should be greater than 1.96 to indicate significance, and indicator reliability, which requires outer loadings to exceed 0.7. Cronbach's Alpha (CA) and Composite Reliability (CR), both of which should be more than 0.7, were also used to assess internal consistency reliability. Convergent validity was established using the Average Variance Extracted (AVE), with each latent variable having an acceptable threshold greater than 0.5. Finally, the square root of AVE was used to quantify discriminant validity, and it was found to be larger than the correlations with other components. The study employed a hierarchical model (first order and second order) to evaluate the reliability and validity of measurements.

The structural model assessment was primarily based on the step guidelines provided by Hair et al. (2014). The hypothesis testing was conducted following a series of steps: first, an assessment was performed to identify multicollinearity issues; second, the significance and the relevance of the structural modal relationships were assessed; third, the level of R² and effect sizes were examined; and finally, the statistical calculation of each path coefficient was taken to measure the significance by utilizing t-values. As all t-values exceeded the threshold of 1.96, all the hypotheses were accepted as shown in Table 1.

Table 1

Hypothesis testing

Hypotheses	Path Coefficient	T statistics	P values	Decision
Direct Effect				
H1: Emotional Wellbeing -> Polite Behavior	0.896	50.386	0.000	Accepted
H2: Emotional Wellbeing -> Teaching Effectiveness	0.628	14.964	0.000	Accepted
H3: Polite Behavior -> Teaching Effectiveness	0.335	7.730	0.000	Accepted
Mediating Effect				
H4: Emotional Wellbeing -> Polite Behavior -> Teaching Effectiveness	0.300	7.572	0.000	Partial Mediation

Source: PLS-SEM Results, 2024.

To assess the significance of the correlations between variables, R-squared values were used. As demonstrated in Figure 2, the R² value of polite behavior is 0.803. Thus, emotional well-being explains 80.3% of the variance in polite behavior. The impact of emotional well-being on teaching effectiveness is 88.2%. Therefore, the impact of the predictive variables is significantly high.

Discussion

This study aimed to examine the impact of emotional well-being on polite behavior and teaching effectiveness among government English teachers in the Badulla district of Sri Lanka. Results demonstrate that polite behaviour increases by 0.869 with a one-unit increase in emotional well-being (path coefficient is 0.896, t-value is 50.386), thereby confirming the first hypothesis (H1). Consistent with these findings, Frenzel et al. (2021) highlights the importance of emotional well-being in creating a positive classroom environment, as emotionally stable teachers tend to act more positively in the classroom. The dependent variable, teaching effectiveness, was measured based on planning and preparation, classroom environment, instruction, professional responsibilities, and psychological influence. The results show a 0.628 increase in teaching effectiveness with a one-unit increase in emotional well-being (path coefficient is 0.628, t-value is 14.964), confirming the second hypothesis (H2). Validating the results of this study, Keller and Becker (2021) state that emotionally stable teachers create a constructive learning environment, as emotional well-being enhances the quality of instructional methods, which in turn improves students' outcomes. Moreover, the results suggest that teaching effectiveness increases by 0.335 when polite behavior increases by one unit (path coefficient is 0.335, t-value is 7.730), which confirms the third hypothesis (H3). This finding indicates that polite behavior fosters a respectful classroom setting with an inclusive learning environment, promoting enhanced learning outcomes (Alief & Nashruddin, 2022). The role of polite behavior between emotional well-being and teaching effectiveness is confirmed as partial mediation, indicating a path coefficient of 0.300 (t-value is 7.572). However, limited scholarly evidence is found on this specific mediation.

Conclusion

After analyzing the collected data and relating it to empirical knowledge, this study concluded that emotional well-being directly affects polite behavior and teaching effectiveness. In addition, polite behavior has an influence on teaching effectiveness, making it a partial mediator between emotional well-being and teaching effectiveness. The identified performance roles are statistically significant and thus, the current study contributes new knowledge by exploring the interconnection among emotional well-being, polite behavior, and teaching effectiveness. Specifically, it provides insights into how emotional well-being significantly affects both polite behavior and teaching effectiveness, highlighting the direct impact it exerts. Further, the mediating role of polite behavior, a factor not extensively investigated in previous research, was identified and suggested.

Although this research is context-based, the results can be generalized in a broader sense beyond the specific context due to the universality of the variables. Based on the results, several suggestions can be offered to improve the status of the English language teaching and learning process. Mainly, as teachers' emotional well-being is proven to have a significant effect on teaching effectiveness, education administration should prioritize teachers' emotional well-being as a part of their professional development. Furthermore, teacher training programs should aim to build teachers' awareness of emotional intelligence. With strong emotional well-being, teachers can demonstrate more polite behavior, leading to more effective teaching. Equipping teachers with the necessary tools to regulate emotions and maintain stability can encourage polite behavior through reflective teaching practices. Furthermore, it strengthens the teacher-student rapport, which is beneficial in classroom management and the overall well-being of students, ultimately leading to a better quality of education. Thus, this research provides guidelines for school administration, education policymakers, and education institutes to provide a more supportive environment for the teachers, as their emotional well-being ultimately influences the overall outcomes of education.

Further research on this topic is suggested to delve deeper into the proven interplay of emotional well-being and teaching effectiveness to find out other potential mediators, such as job satisfaction, professional commitment, and professional development programs. The findings of this research include the solution for low performance of the students in the English language, as it demonstrates the correlation between the teacher and the teaching effectiveness, which affects students' learning outcomes. In conclusion, this research offers an understanding of the

interplay between emotional well-being, polite behavior, and teaching effectiveness by providing a comprehensive framework for the behavior of these variables. Furthermore, it contributes knowledge to the ESL context, providing valuable insights for teachers, education administrators, and policymakers seeking to improve English language teaching and learning. Although this research is based in the Badulla district, Sri Lanka, the results have a broader applicability to any ESL context.

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Animated Films as a Pedagogical Tool for English Vocabulary Acquisition in Second Language Learners

E.M.K.G.M.T. Ekanayake ^{1*}, H.M.S. Priyanath²

¹ Faculty of Graduate Studies, Sabaragamuwa University of Sri Lanka.

² Department of Economics and Statistics, Faculty of Social Sciences and Languages, Sabaragamuwa University of Sri Lanka.

Corresponding author*: madusha8862@gmail.com

Abstract

The study investigates the effectiveness of animated films in enhancing English vocabulary acquisition among ESL learners in Sri Lanka. Research shows how animated films affect vocabulary retention, relevant understanding, and student engagement. The effectiveness of using animated movies as a tool for enhancing English vocabulary among English as a Second Language (ESL) learners has garnered increasing attention in recent years. Thus, this study explores the pedagogical benefits and potential challenges of integrating animated movies into ESL vocabulary learning. Further, the research aims to provide empirical evidence on how animated movies can facilitate vocabulary acquisition, retention, and contextual understanding among ESL learners. A quantitative research approach was used to measure the vocabulary advantage supported by survey responses to measure the pre-tests and post-tests. The study focused on grade 7 students and analyzed subtitle-based learning, learning contingency terminology, mnemonic techniques, and visual effects. The results revealed a significant improvement in terminology performance after the integration of animated films, especially when aligned with the objectives of the course. Conclusions advocate including animated multimedia in ESL education while suggesting positive implications for teachers, course designers, and education policy makers.

Keywords: Animated Movies, ESL, Multimedia in Education, Vocabulary Acquisition.

Introduction

English is widely considered a global lingua franca, playing an important role in education and communication. In Sri Lanka, English is taught as a second language in government schools, yet many students struggle with mastery due to traditional rote-learning methods. Almost all the government schools in Sri Lanka conduct their education in Sinhalese or Tamil as per the demographic demands (Karunaratne, 2003). However, only some schools offer English medium education from grade 6 to students who pass an English proficiency test. The vast majority of students in government schools are educated predominantly with Sinhala as the medium of instruction, while English is taught as a second language. The instructors, who play a significant role, are expected to encourage pupils to demonstrate creative thinking in the classroom, which demands both learning and teaching processes that are suitable for the circumstances in the class. The recent advances in multimedia have introduced animated films as attractive directional devices that merge visual and auditory elements to help learn vocabulary. The study identifies the existing gaps in ESL instruction and proposes a technology-acquired approach using animated films. Grounded in the Technology Acceptance Model (TAM) (Davis et al., 1989), the study examines how learners perceive and benefit from multimedia content. The main objective is to investigate how animated movies impact vocabulary acquisition, with an emphasis on subtitles, mnemonics, and visual methods.

The Ministry of Education (MoE) in Sri Lanka, in collaboration with several other relevant authorities, has introduced a range of resources to enhance the overall performance standards in the English language component of the Ordinary Level Examination. However, the pass rate in the English language at both Ordinary Level and Advanced Level examinations has been abysmally low (Wijesekera, 2012). Hence, this is one of the major problems that the English Language education in Sri Lanka is facing. Therefore, this research aims to investigate the effectiveness of using animated movies in improving students' performance in English. This study aims to find a workable solution for improving the English language skills by assisting students in vocabulary acquisition. Additionally, the majority of school children tend to study English outside of school and still find it difficult to deal with vocabulary, which suggests that there is a problem with the existing vocabulary learning methods used in Sri Lanka. Therefore, it is vital to investigate the effectiveness of using animated movies in learning English vocabulary among ESL Learners.

Materials and Methods

A quantitative method was adopted. The overall population of the study consists of the number of grade 7 students in the selected government school in the Kandy Educational Zone, which is approximately 400. This research considers 100 students who watched the selected animated movie as the key sample for the study. A pre-tested structural questionnaire was used to collect the data. Four independent variables were measured in the questionnaire: (1) subtitle-based learning, (2) casual learning, (3) mnemonic learning, and (4) visual effects using closed-ended questions. The reliability was confirmed using Cronbach's alpha values. The conceptual framework was designed as follows, and based on that, four hypotheses were developed.

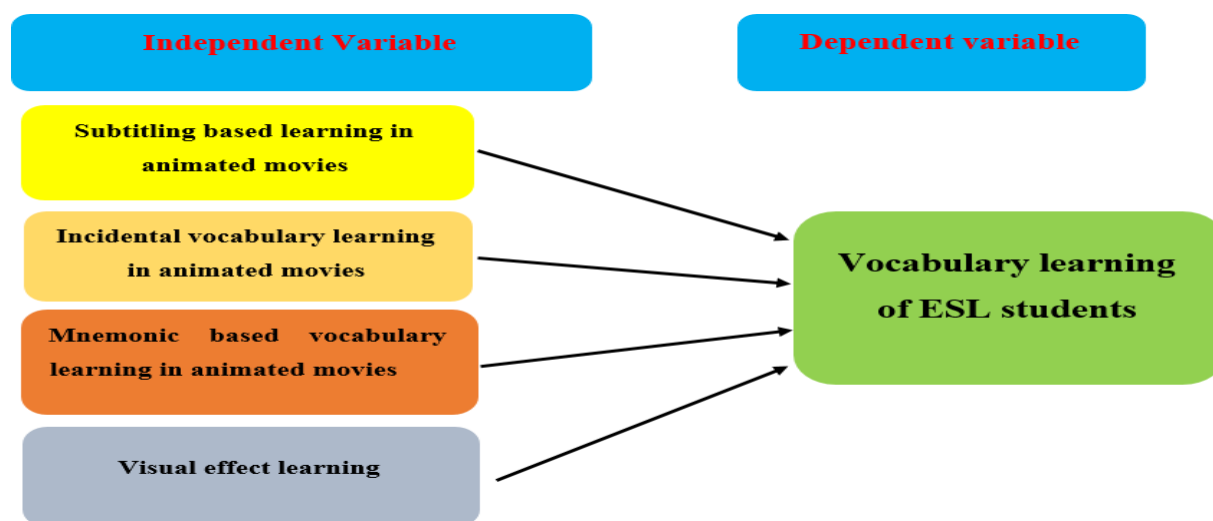


Figure 1

Vocabulary learning of ESL students

H1: Subtitling-based learning in animated movies significantly enhances ESL learners' vocabulary retention compared to movies without subtitles.

H2: Mnemonic-based vocabulary learning embedded within animated movies improves ESL learners' vocabulary recall compared to traditional classroom instruction.

H3: ESL learners exposed to incidental vocabulary learning in animated movies demonstrate a higher rate of vocabulary acquisition compared to learners using conventional vocabulary learning materials.

H4: Visual effect learning integrated into animated movies positively impacts ESL learners' vocabulary acquisition, particularly for visual and kinesthetic learners.

In the data analysis, Inferential Statistics were used to confirm or reject hypotheses (null or alternative) based on the data from Likert-scale questionnaires, which were analyzed using SPSS. Logistic regression analysis was used to examine the strength and direction of relationships between independent and dependent variables.

Results

An inferential analysis was undertaken to examine the effectiveness of learning English vocabulary through animated films among ESL learners, along with KMO, composite reliability (CR) measurement for reliability, and average variance (AVE) tests for construction validity. Logistic regression analysis was used to evaluate the predictive power of several independent variables on the vocabulary acquisition (See Table 1.

Table 1

Results

Hypotheses	Coefficient	p-value	Decision
H1: Subtitling-based learning in animated movies significantly enhances ESL learners' vocabulary retention compared to movies without subtitles.	-0.576	0.461	Not accepted
H2: Mnemonic-based vocabulary learning embedded within animated movies improves ESL learners' vocabulary recall compared to traditional classroom instruction.	0.983	0.040*	Accepted
H3: ESL learners exposed to incidental vocabulary learning in animated movies demonstrate a higher rate of vocabulary acquisition compared to learners using conventional vocabulary learning materials.	1.204	0.011*	Accepted
H4: Visual effect learning integrated into animated movies positively impacts ESL learners' vocabulary acquisition, particularly for visual and kinaesthetic learners.	-0.752	0.052	Not accepted

The analysis showed that subtitle-based vocabulary learning had a negative but statistically insignificant relationship with acquisition (coefficient = -0.576, $p = 0.461$), rejecting H1. Hence, subtitled animated films did not significantly increase the ESL learners' vocabulary retention. Further, incidental vocabulary learning showed a significant positive effect (coefficient = 0.983, $p = 0.040$), supporting H2. This suggests that casual performance for vocabulary in animated films effectively improves vocabulary among ESL learners. Similarly, mnemonic-based learning had a strong and significant positive effect (coefficient = 1.204, $p = 0.011$), supporting the acceptance of H3. This suggests that incorporating mnemonic strategies into animated films enhances the vocabulary acquisition of ESL learners. However, visual effects learning received a negative and insignificant relationship (coefficient = -0.752, $p = 0.052$), resulting in rejection of H4. Although the influence was close to being important, visual effects alone were not found to effectively support the learning of vocabulary. Finally, the study supports the effectiveness of casual and mnemonic-based learning through animated films for terminology development in ESL learners. Subtitles and visible effects, while potentially attractive, did not show a significant contribution to vocabulary acquisition.

Discussion

This study analyzed the impact of various methods of vocabulary acquisition through animated movies on ESL learners, using logistic regression to evaluate hypotheses. H1, which stated that subtitle-based learning significantly improves vocabulary retention among ESL learners, was rejected. The coefficient was -0.576, with a p-value of 0.461, indicating an insignificant and negative relationship. This contradicts several studies in the literature that support subtitling as an effective learning tool. Kusumarasdyati (2018) found that subtitled content helps learners engage more deeply with language material. Borrás and Lafayette (1994) demonstrated that subtitles enhance both language comprehension and production. Grgurovic and Hegelheimer (2020) showed that learners preferred and benefited more from subtitles than transcripts. Similarly, Grignon et al. (2018) found that subtitled and dubbed films outperformed original versions in facilitating comprehension.

H2 concerning mnemonic-based learning was accepted. A positive coefficient of 0.983 with a significant p-value of 0.04 supports the hypothesis that mnemonics embedded in animated movies enhance vocabulary recall. Research has shown that mnemonic devices, such as shapes and structures embedded in animated content, enhance memorization and recall (Danan, 2004). These tools help enhance reading and listening comprehension skills, making mnemonic-based learning a validated and effective instructional method.

H3 examined incidental vocabulary learning and was also accepted. The coefficient of 1.204 and a highly significant p-value of 0.011 indicate a strong positive relationship. Yuksel and Tanriverdi (2009) emphasize that vocabulary acquisition often happens incidentally through reading or listening. Contextual learning is essential, as isolated words may lack clear meaning (Sun & Dong, 2004). This approach mimics natural language acquisition, such as how children learn vocabulary from context-rich situations (Day, Omura & Hiramatsu, 1991) and proves similarly effective for ESL learners.

H4, relating to visual effect learning, was rejected. Despite a coefficient of -0.752 and a near-significant p-value of 0.052, the relationship was negative and statistically insignificant. This outcome contrasts with the literature suggesting that visual materials are beneficial for vocabulary learning. Research by Danan (2004) and others has consistently shown that visual cues support language acquisition and comprehension. The discrepancy may be due to variations in how visual effects were implemented or measured in this study compared to others.

Conclusion

This study has provided valuable insights into the effectiveness of utilizing animated movies in learning English vocabulary among ESL learners. When analyzing the research findings comprehensively, the study has shown the capability of animated movies as a dynamic and engaging tool for vocabulary instruction, which offers diverse learning methods and opportunities for ESL learners to improve their language proficiency. Use of animated movies promotes inspiration, understanding, and vocabulary retention. Based on the findings, it is recommended that teachers integrate animated media into ESL classes to complement traditional teaching methods. Course designers and policymakers should consider adopting multimedia approaches to bridge the existing gaps in language education. Further, this study has laid the foundation for further exploration and innovation in ESL vocabulary instruction, highlighting the potential of animated movies as a versatile and effective resource for language learning. Based on the findings, it is recommended to integrate mnemonic-based techniques, use acronyms, imagery, and other mnemonics within animated content, and to encourage students to create their own mnemonic devices to personalize and reinforce vocabulary learning. Also, it is suggested to adopt strategic uses of visual effects, employ visual cues, animations, and graphics to support contextual understanding, and to design instructional materials that enhance comprehension through well-planned visual elements. Also, conducting Professional Development for Educators by organizing

training programs to equip ESL educators with multimedia teaching skills, with special focus on integrating animated movies effectively and assessing vocabulary outcomes, is recommended.

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Leveraging LLMs for Dynamic Content Generation and Creating Contextual Quizzes to Enhance Learning Outcomes in Personalized Education

Shavinda Wanigasekara^{1*}, Kalinga Gunawardhane², Samantha Kumara³

¹Department of Computing and Information Systems, Faculty of Computing, Sabaragamuwa University of Sri Lanka,

²Department of Computing and Information Systems, Faculty of Computing, Sabaragamuwa University of Sri Lanka,

³Department of Data Science, Faculty of Computing, Sabaragamuwa University of Sri Lanka,

Corresponding author*: shavinpasan99@gmail.com

Abstract

The research study developed an adaptive learning system based on LLMs and RAG technology to deliver customized educational content. The system differentiates from traditional LLM educational software by accepting complete lecture materials, which ensure quiz responses and feedback match the specific content of the current course. The application retrieves dynamic, relevant content from lecture slides to provide focused, structured learning that goes beyond standardized, pre-trained responses. Pinecone serves as a vector database for semantic content retrieval, and OpenAI provides GPT for natural language generation from the system architecture. The educational materials undergo Sentence Transformers processing to create semantic embeddings that enable both precise content retrieval as well as contextual adjustments. Specific course materials determine the alignment of quizzes and feedback through this method instead of using pre-existing knowledge as a basis. The system's functionality verifies that it obtains lecture-specific content while producing structured quiz questions that create context-based feedback responses. The system was implemented for an individual subject, where it demonstrated its ability to generate structured quizzes and performance-based feedback. An evaluation that took 42 IT education experts confirmed high relevance (66.7% rated Very Relevant) and accuracy (54.8% Mostly Accurate, 42.9% Very Accurate) for digital learning environments. Compared to ChatGPT, the system excels in personalized content generation but requires improvements in scalability and complex content accuracy. The future research tasks will analyze new retrieval approaches alongside optimized content selection methods and different retriever comparisons to boost accuracy and adaptability rates.

Keywords: Adaptive Learning; Large Language Models; Personalized Education; Quiz Generation; Retrieval-Augmented Generation

Introduction

AI has revolutionized educational practices through new techniques for teaching and evaluating students and fostering their engagement. AI-driven technologies established themselves as essential building blocks in educational technology products and systems during the last ten years (Chaudhry & Kazim, 2022). The educational realm utilizes intelligent tutoring systems while applying automated grading systems and leveraging predictive analytics to monitor student performance, along with delivering virtual teaching assistance (Lin et al., 2023).

Teachers utilize AI to conduct instant analysis of student data for delivering learning material adapted to personal educational needs.

AI provides education with an essential advantage through its ability to scale up effectively. AI technology maintains high educational standards even when serving substantial student enrolment numbers. AI systems supply reliable feedback that helps students understand their particular skills, as well as their learning weaknesses. Accessibility presents itself as a main advantage of this technology (Shalini & Tewari, 2020). AI systems allow learners to obtain educational content at any time and from any place, which particularly enhances learning accessibility for students in distant or insufficiently supported locations (Basogain et al., 2017). Personalized learning is a new way of conducting education that pre-adjusts learning opportunities to match the capabilities, aspirations, and requirements of individual students, departing from the obsolete one-size-fits-all schooling paradigm (Tedlaff et al., 2021). It adjusts delivery of content, assessment, and teaching techniques to achieve maximum learning outcomes. Personalized learning encourages students to plan and monitor their learning goals, promoting independence and motivation, as well as creating lifelong learners (Alamri et al., 2020). However, a key weakness of existing systems based on the use of LLM in education is the fact that they use a fixed token window to process conversational context. The further the interaction evolves, and more tokens are reached, the more previously acquired materials like lecture slides or previously held discussions can be discarded, resulting in less accurate or out-of-context answers. This poses a significant obstacle to educational applications where continuity and contextualized long-term preconditions are needed. This study fills this need by examining how the Retrieval-Augmented Generation (RAG) can be integrated in merging relevant information with external resources (e.g., lecture notes or course materials) so that each user query can be dynamically retrieved, and all the contextual information can be accessed, no matter how limited in terms of tokens the user is.

Research Objectives and Research Questions

The key elements of the research design are illustrated in Figure 1 below by defining the problem statement, the respective research questions (RQs), and the core research objective and its research objectives (ROs).

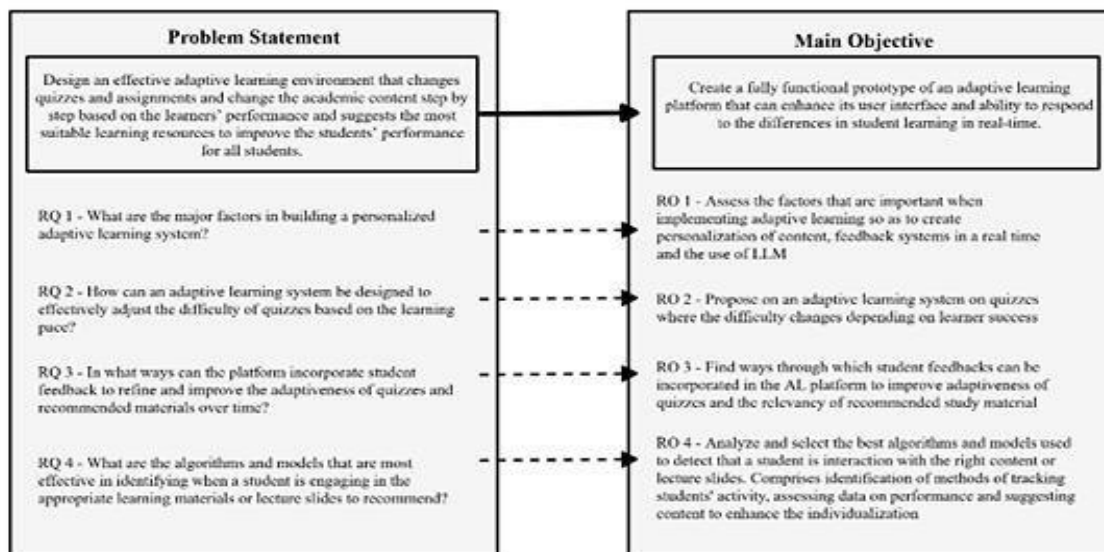


Figure 2

Research Question vs. Research Objective Mapping

Materials and Methods

The design and assessment of the adaptive learning platform described in this research chapter combine technologies of Retrieval-Augmented Generation (RAG) with Large Language Models (LLMs) in order to personalize learning. The methodology involves a systematic process involving research objectives determination, system design, information gathering, indexing, content creation, user interface development, and assessment. The process depicted in the attached Figure is represented in pictorial form, where it starts from data preprocessing and embedding, passes through the retrieval, generation, and lands on adaptive learning and iterative refinement. Thus, the system ensures it attends to individual learner needs effectively. Research objectives were developed based on a systematic process that initially involved an in-depth literature review, application of snowballing, and a systematic review on platforms such as Google Scholar, IEEE Xplore, and Springer. In this stage, crucial flaws were detected in current adaptive learning systems, for example, the lack of strong personalization algorithms, incorrect semantic search, and deficient dynamic content adjustment according to an individual's learning rhythm. More expert feedback from the experts in education technology, AI, and machine learning refined these objectives even more as it became clear that scalability to accommodate various learners and real-time personalization based on performance metrics were needed, and as such, shaped the system's focus on flexibility and effectiveness. System development included preprocessing of educational content like lecture PDFs and textbooks through a complicated preprocessing pipeline described in the initial stages of Figure 2. Text extraction based on the PyPDF (a pure Python library that can be used to manipulate PDF files), chunking for fast indexing, and semantic embedding with the help of Sentence Transformers transform the content into vector representations that are saved in the form of a Pinecone vector database. The platform also gathers student interaction information (such as quiz scores and response times) to personalize learning experiences. Issues such as the lack of consistency in the quality of content, the need to process in real-time, and scalability concerns are overcome through standardization and optimization of the system to dynamically align instructional materials to students' needs.

Semantic indexing and context retrieval are the essence of the platform's functionality to deliver relevant content, as illustrated in Figures "Embedding", "Pinecone Database Storage", and "Retrieval" stages. The semantic search, which is based on Sentence Transformers and Pinecone, converts queries into embedding with the help of cosine similarity to locate the most relevant educational content. This approach beats old-time keywords-based searches by extracting the context of the query so that the retrieved materials are compatible with the student's learning status and needs, which not only enriches his or her learning experience but also provides concise and context-centered responses.

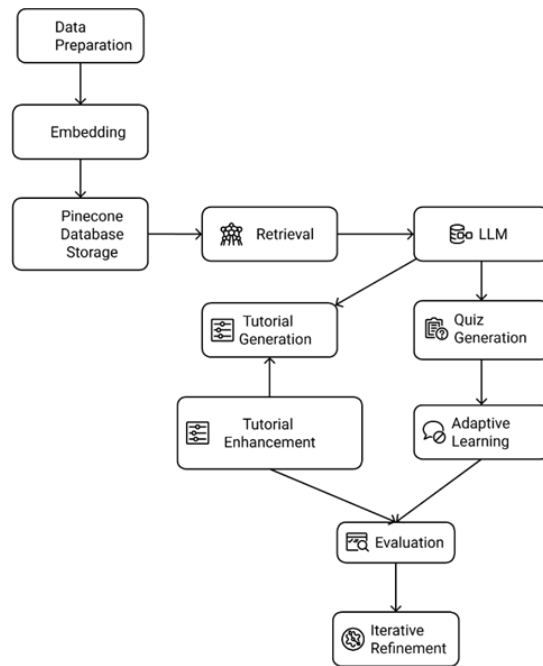


Figure 3

Methodology of the Research

The LLM makes use of retrieved content to generate individualized quizzes, explanations, and supplementary materials based on the specific pace at which each student is learning. Observed in the “Adaptive Learning” box is the adaptive learning mechanism that dynamically adapts quiz difficulty and complexity of content based on such performance metrics as results of the quiz or duration of interaction in order to guarantee an individual educational experience that considers strengths and weaknesses. Lastly, the user interface and the evaluation strategy would mark the end of forming the design of the system, as shown in the final stages of the Figure. A Streamlet-based UI offers an easy-to-use platform for students to interact with content, track progress, and get immediate feedback, which includes adjusting the difficulty of the quiz based on previous performance into consideration. “Evaluation” and “Iterative Refinement” steps include evaluation of system effectiveness by means of user testing, performance metrics, and expert analysis: Key Performance Indicators (KPIs) approach. This cycle of perpetual improvement makes the platform adapt to the educational needs of the future, providing a smooth and adaptive platform for the students.

Results

The Adaptive Learning platform proves itself to be robust in an educational tool, where it implements four central tabs – Content Management (Figure 2), Tutorial Generator (Figure 3), Quiz Generator (Figure 4), and Progress Analytics, complemented by a progress indicator to establish an efficient, personalized learning environment. Expert feedback highlights its efficacy towards exploiting loaded content, including lecture PDFs, to create one-to-one learning paths. Equipped with an intuitive drag-and-drop interface, the “Process Uploads” command, and the “Clear All Content” option, the Content Management Tab was well-appreciated for its simplicity and ease of preparing materials, laying a solid foundation for individualized learning.



Figure 2

Content Management Tab of the System



Figure 4

Quiz Generation Tab



Figure 3

Tutorial Generation Tab

The Tutorial Generator Tab automates an elaborate tutorial outline through the “Generate Tutorial Structure” button, which encompasses essential components such as Introduction, Core components, and Real-world applications, where “Enhance Section” is a customizable feature to cater to the various needs of students. The Quiz Generator Tab allows for dynamic quiz generation from chosen topics and levels of difficulty, which also involves a progress indicator for increased engagement with improvements recommended by experts for intricate subjects. Flexibility and adherence to the needs of users were stated as important strengths of both tabs.

The Progress Analytics Tab provides real-time insights, including score breakdowns and graphical analytics of strengths and weaknesses, to help instructors change content and difficulty levels due to engagement data. This tab’s real-time monitoring function was notably distinguished for making continuous improvement of learning development. Overall, the structured functionality of the platform and user-friendly interface on all the tabs were positively met by experts, and some aspects for improvement were identified.

01. How relevant is the system for modern digital learning environments?
42 responses

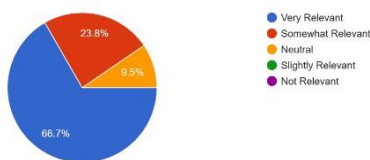


Figure 5

Relevancy to Modern Environment

02. How accurate are the generated tutorials and quizzes?
42 responses

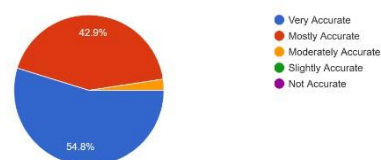


Figure 6

Accuracy of the Tutorials and Quizzes

The evaluation of the Adaptive Learning System by 42 IT education experts indicated a generally positive reception, with 66.7% rating it “Very Relevant” for modern digital learning settings, consistent with the personalized learning trends (Figure 5). The system’s ability to adapt to online as well as physical settings was well-supported by most of the participants, 23.8% suggested further adaptations, and 9.5% had a neutral opinion. Therefore, this reflects the need for greater applicability in varied teaching environments.

03. The generated questions aligned with the expected learning outcomes
42 responses

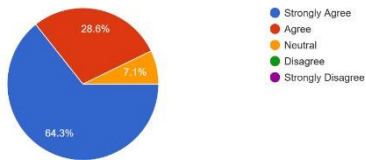


Figure 7

Questions Alignment with ILO

04. Does the system demonstrate meaningful adaptivity based on student performance?
42 responses

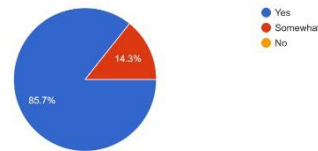


Figure 8

Adaptivity Based on Student Performance

The responses provided by the respondents suggest that the adaptivity of the system and its conformity to the learning goals were positively perceived. The system was found to show meaningful adaptivity based on student performance, with the agreement of a significant majority (85.7%) (refer to Figure 7). Additionally, 64.3% strongly agreed and 28.6% agreed that the questions generated were in line with the anticipated learning outcomes, which is a positive indication that the system not only personalizes content but also ensures the relevance of the content to the academic setting (refer to Figure 8).

The system was especially good in personalization – 85.7% of experts commented on its meaningful adaptivity in accordance with the student performance (Figure 6), and 69.5% appreciated its adaptivity for delivering individualized learning experiences (Figure 10). In addition, all experts answered that personalized feedback and quizzes highly increased student engagement (Figure 9), emphasizing the system’s effectiveness in developing

05. How well does the system personalize the learning experience based on the student's individual progress?
42 responses

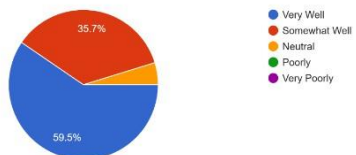


Figure 9

Learning Experience Based on Student Progress

06. Do you believe that the system improves student engagement through personalized feedback and quizzes?
42 responses

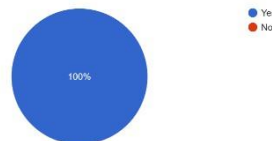


Figure 10

System Improvement Through Feedback and Quizzes

students’ motivation and involvement.

Comparative analysis of five questions (Figure 11) revealed the Adaptive Learning System to be superior to ChatGPT on depth and completeness, especially for technical and structured responses, while ChatGPT was more outstanding on accessibility and informal clarity.

Overall, the system demonstrates high potential in personalized education, with high scores for adaptivity and engagement. Nonetheless, its effectiveness and scalability in an educational context are fully realized through the implementation of refinements to content accuracy on complex topics, challenges to quizzes, and usability of the interface.

Discussion

The adaptive learning system, with help from RAG and LLMs, maximizes student and educational achievement by personalizing learning. Its performance-based customization of quizzes and tutorials allows the system’s content to be tailored to each learner’s needs, ensuring it never becomes too easy or excessively challenging. This adaptability fosters higher student commitment and enhances their knowledge of the subjects involved, resulting

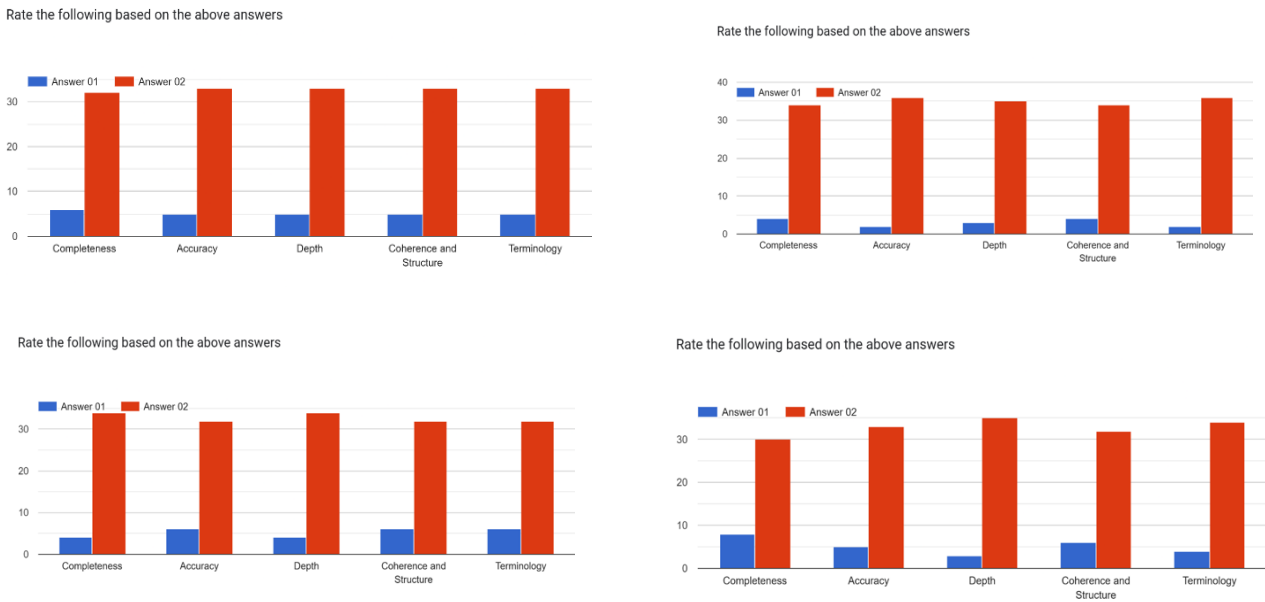


Figure 11

Responses to the Survey 2

in higher long-term success rates as the dynamic learning sequences of the system are tailored to meet the varied needs of learners.

The effectiveness of the system is very substantial owing to the combination of the RAG and LLMs, specifically GPT-4 -4 which allows high-quality content generation through the retrieval and creation of relevant educational material. The challenge, though, remains as GPT-4 and RAG computationally require high resources and power. Thus, it is not scalable for larger student populations or real-time practices. This resource-intensive nature is practically difficult to implement in large groups of students or in real-time classroom environments and may limit access to institutions with minimal infrastructure. Additionally, although the system produces relatively appropriate content, complex subjects necessitate additional refinement to ensure precision and comprehensiveness, implying a further need to continue improving the accuracy of models and the performance of the system to accommodate increasing user bases. In the absence of this refinement, there is the possibility of misinformation or superficial learning, particularly in subjects that need accurate conceptual knowledge. These constraints underscore the necessity of further optimizing models and resource-efficient implementation plans to provide equitable and reliable access to a variety of learning scenarios.

Conclusion

This research reveals that an adaptive learning system based on RAG and LLMs – such as GPT-4 – has vast potential in promoting personalized and context-specific education, as it can customize learning sequences and enhance student involvement. Expert responses from 42 educators support its potential, aligning with the OECD Learning Compass 2030, by facilitating student agency, co-agency, and transformative competencies through dynamic,

interactive learning experiences. However, to have a large scale, the system should deal with issues of scalability, increase the accuracy of content, especially for complex matters, and develop a more user-friendly interface. The future development, including pilot studies, integration of students' feedback, and expansion of multimodal resources, will be crucial for refining the system to make it effective in addressing various educational needs.

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Enhancing Geometric Construction Skills Through Targeted Interventions: A Case Study of a Grade 10 Student

Priyanga Abeykoon^{1*}, Virajith Gamage²

¹B/President College, Ambagasdowa, ²Sri Lanka Institute of Information Technology, Malabe, Sri Lanka.

Corresponding author*: amlpriyanga476@gmail.com

Abstract

Geometric construction has been one of the topics in Mathematics that accounts for poor performance in both internal and external examinations among students in school. Geometric construction has consistently posed challenges in mathematics education, contributing to low student performance. This action research aimed to identify the causes of poor engagement and errors in geometric construction among Grade 10 students, focusing on a single case study of a student from government school in the Badulla district. Using interviews, observations, and document analysis, the study diagnosed the student's difficulties and implemented a three-stage intervention strategy: integrating digital tools, introducing design rulers, and applying traditional mathematical instruments. The results indicate that the student's engagement and construction skills improved significantly through targeted and student-centered learning activities. The study underscores the value of adaptive teaching strategies in promoting geometry learning in the 21st-century classroom.

Keywords: Geometric construction; student engagement; action research; mathematics education; 21st-century skills

Introduction

Learning geometry emphasizes exploring different representations of drawing skills of shapes, angles, straight lines, and curved lines by using a ruler and compass. Teaching geometric construction remains a significant challenge in many schools due to the lack of appropriate Teaching and Learning Materials (TLMs). Although fundamental tools such as compasses and rulers are essential, students often find geometric concepts abstract and disengaging. The situation is exacerbated by limited exposure to interactive tools and practical applications. Effective geometry instruction demands visualization, construction, and reasoning skills (Duval, 1998).

This research addresses a critical issue: a Grade 10 student's consistent disengagement from geometry lessons and poor performance in geometric construction. Through targeted interventions, this study explores how structured, engaging learning environments can foster better understanding and skills in geometry.

Literature Review

Mathematics isn't just about numbers. It's about critical thinking, problem-solving, and logical reasoning skills, geometrical drawing, which are vital in our day-to-day lives. Mathematical competency, including geometrical abilities, is the key to establishing a critical thinking capacity in students. It is important to produce a generation that is competent in the field of science and technology to continually progress in the era of globalization, transforming early educational methods into globalization practices. The gap between traditional teaching methods and effective learning outcomes in geometry has been widely documented. In Ghana and similar contexts,

the unavailability of interactive learning tools contributes to poor mathematical performance (Baffoe & Mmereku, 2010). Duval (1998) emphasized the need for cognitive approaches, highlighting visualization, construction, and reasoning as essential processes in learning geometry.

Digital methods such as computer-based intervention are the most attractive methods to students because knowledge of digital instruments is a crucial part of students' lives in the current world. Instructional methods such as the Concrete-Representational-Abstract (CRA) approach have proven effective in enhancing mathematical understanding and problem-solving skills (Widel et al., 2008). These strategies encourage active participation and allow students to connect abstract concepts with real-world applications. Additionally, behaviorally rooted interventions, such as the ones used in this study, aim to improve classroom participation and focus, both crucial in mathematical comprehension.

Research Objectives

To identify specific issues affecting student engagement in geometric construction.

To implement targeted interventions to improve drawing accuracy and conceptual understanding.

To evaluate the impact of these interventions on student performance and classroom behavior.

Methodology

Data collection

This study employed an action research design focused on a single Grade 10 student referred to as "Pasindu." Data collection methods included: **Observations:** Classroom behaviors and attention levels were recorded over several weeks; **Interviews:** Conducted with Pasindu's former teacher, parent, and a peer to understand home and school influences, and **Document Analysis:** Academic records, reflection notes, and test results were examined to assess progress and patterns.

Research ethics

Data triangulation was employed, enhancing the validity and credibility of findings and mitigating research biases. The present study also followed the fundamental ethical principles of designing and implementing research, respect for society, and others. The permission was obtained, and the identification of the research participant was kept confidential.

Data Analysis and Problem Identification

Analysis of reflection notes, classroom logs, and academic documents revealed a recurring pattern of inattentiveness, lack of preparedness, and behavioral disturbances. Table 1 in the original data (column 2) shows that the primary issue—frequently observed—was Pasindu's avoidance of geometric construction tasks. Secondary issues included: Absence of required instruments; Careless handling of textbooks; Forgetfulness and non-responsiveness during Q&A; Classroom disruption and late arrival. These patterns provided the foundation for intervention design.

Intervention Plan

Concrete-Representational-Abstract (CRA) approach (Widel et.al, 2008) was used to develop intervention plans under three phases.

Phase 1: Digital Engagement

Objective: Build interest in geometric construction using laptop-based drawing tools.

Step 1: Allow drawing lines and shapes on a laptop

- Step 2: Create composite figures using digital tools
- Step 3: Transfer skills to book-based drawing

This phase capitalized on Pasindu's interest in computers. The structured digital exercises helped shift focus toward construction principles.

Phase 2: Hands-On Instrument Use

Objective: Improve freehand skills and familiarity with instruments

- Step 1: Use design rulers for circular designs
- Step 2: Practice drawing straight lines
- Step 3: Construct curved and straight lines using standard tools

This phase introduced tactile experience with instruments and encouraged motor skills improvement.

Phase 3: Real-World Application and Group Work

Objective: Reinforce learning through physical construction and collaboration

- Step 1: Create shapes on colored paper
- Step 2: Construct angles using rope and measure
- Step 3: Solve geometry problems through group tasks

This phase introduced peer-based interaction, real-world application, and collaborative learning to sustain interest and participation.

Results and Discussion

All three intervention phases yielded positive outcomes. Pasindu demonstrated marked improvement in: Drawing accuracy, Proper use of instruments, Willingness to participate in class and Group activity contribution

Table 1

Mathematical parameters in mathematics

	Before activities	After activities
Listening to the given instructions clearly	Good	Very Good
Attractively engaged in activities	Good	Very Good
Draw the geometrical constructions with good attention	Weak	Good
Clearly use of mathematical instruments	Weak	Good
Reduce the slopy drawing and clear straight lines	Weak	Good

Note. Table 1 describes parameters focused on mathematical aspects.

At the end of the third step, it was achieved better than working in the classroom previously. It was able to attract the attention of the geometrical drawing instruments. It was a successful one to some extent. Reflection notes and practical observations confirmed that disruptions decreased, and Pasindu began completing tasks with visible motivation (constructions on the middle pages of the mathematics textbook show greater clarity than the drawings on the first few pages). Clarity of drawings, attractiveness, the role of engaging, stepwise, and familiar content was central to this transformation. The study also underscores the importance of teacher awareness of student behavior, context, and preferences. Teachers equipped with such knowledge can design personalized, scalable strategies for other disengaged learners.

Implications for Practice

This research presents a viable model for teachers working with under-performing students in geometry:

Start with learner-friendly, technology-based tools - Transition to hands-on activities - Integrate real-world contexts
- Reinforce through group learning

These methods, when applied consistently, can reshape students' relationship with mathematics and rebuild confidence in problem-solving.

Conclusion

This case study demonstrates that student-centered and technology-integrated approaches can significantly enhance engagement and performance in geometry. Educators must tailor instructional methods to student needs and leverage a variety of tools to make abstract concepts tangible. It is clearly mentioned that in this research, studying geometry helps to develop communication skills. Therefore, preparation of the student with a sound background understanding of geometry makes a base for future learning. The start of the lesson from the student's perspective is more powerful than starting the lesson where the teacher wants. It says that starting the activity with drawing shapes with a computer was a more attractive activity. Such kinds of activities are addressed in this research according to the problems identified from the first endeavor of the above-mentioned student.

The research supports the broader educational goal of developing 21st-century skills, including problem-solving, critical thinking, and collaboration. Long-term adoption of similar strategies may benefit curriculum planners aiming to reduce failure rates in mathematics.

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The Ear or the Eye? Decoding the Better Route to Incidental Vocabulary Growth

Rashmike Bandaranayake*¹, Keshani Wijesuriya²

¹*Lexicon International School, Kurunegala,* ² *Sri Lanka Institute of Information Technology, Malabe, Sri Lanka.*

corresponding author*: bandaranayakerashmike@gmail.com

Abstract

Incidental vocabulary acquisition is crucial for improving learners' lexical competence. To facilitate learners' vocabulary acquisition incidentally, it is essential to understand which mode of input is more effective. This research aims to comparatively study the effectiveness of reading and listening input on incidental vocabulary acquisition and determine which modality best supports vocabulary acquisition and retention. This study employed a between-subjects design in which two groups of Grade 9 ESL learners of an international school were exposed to either reading or listening input. The input material consisted of 15 target words, which the learners were allowed to acquire incidentally. A pretest, immediate posttest, and delayed posttest design were employed to collect data. The areas of vocabulary knowledge tested were form and meaning recognition. When analyzing the data, statistical comparisons were made using independent samples t-tests. The results revealed no statistically significant difference between the groups for the acquisition scores. Similarly, the comparison of the retention scores revealed no statistically significant difference. Therefore, this study implies that both input modes produced similar acquisition and retention levels in the respective groups, concluding that both reading and listening are equally effective. The significance of this study lies in its contribution to understanding the effects of input modality in a real-world ESL context. Future research should explore the impact of combining input modalities, examine other aspects of vocabulary knowledge, such as production, and include learners of varying proficiency levels and age groups to allow for broader generalization of the findings.

Keywords: Incidental vocabulary acquisition; Vocabulary retention; Listening input; Reading input

Introduction

After years of neglect, vocabulary learning has become a field of interest among teachers, material developers, and researchers (Huckin & Coady, 1999). For example, Alhamami (2016) recognizes vocabulary as the building block of language, having a significant impact on all four skills. Therefore, it is essential to promote vocabulary acquisition among learners.

According to Huckin and Coady (1999), most scholars agree that apart from learning a few thousand high-frequency words through deliberate acquisition, vocabulary learning predominantly occurs through incidental acquisition. Incidental vocabulary acquisition primarily occurs through reading and listening. Many studies emphasize the effectiveness of extensive reading in acquiring vocabulary incidentally (Horst, 2005; Waring & Takaki, 2003). On the other hand, listening has received limited scholarly attention as a source of vocabulary acquisition. However, its potential is not denied. For example, Nation (2022) recognizes how listening to texts such as songs, radio broadcasts, and conversations can contribute to incidental vocabulary acquisition.

Given the importance of input, language educators are responsible for identifying the most suitable modality for their learners to acquire vocabulary. However, the findings of the existing comparative studies have remained limited and inconsistent. Some studies report that reading leads to greater vocabulary gains and retention than listening (Brown et al., 2008; Xiaoning & Feng, 2017; Chang & Ma, 2018; Mohsen & Almudawis, 2021) while studies such as Vidal (2011) and Hatami (2017) suggest that, regardless of reading facilitates larger immediate vocabulary gains, listening leads to a lower knowledge depletion rate. Further, studies like Feng and Webb (2020) suggest that reading and listening input modalities are equally effective. These conflicting results highlight the need for similar research.

Another notable gap in literature is the participant context. Most existing comparative studies have been conducted with undergraduate ESL learners from countries such as Japan, Spain, China, Iran, and Saudi Arabia, who have primarily encountered English as a subject in school settings (Brown et al., 2008; Vidal, 2011; Hatami, 2017). In contrast, there is limited research involving secondary school students in Sri Lanka, particularly those attending international schools where the medium of instruction is English since kindergarten. Therefore, this study aims to fill these gaps by comparing the effectiveness of reading versus listening input on incidental vocabulary acquisition in Sri Lanka concerning secondary schoolers by investigating the context of grade 9 ESL learners in an international secondary school.

Research Questions

1. How does incidental vocabulary acquisition of word form and meaning differ between learners exposed to reading versus listening input?
2. How does the retention of word form and meaning from incidental vocabulary learning vary between reading and listening input?
3. Which input mode, listening or reading, is more effective for incidental vocabulary acquisition?

Hypotheses

Hypothesis 1 (H₁): Learners exposed to reading input will show significantly higher vocabulary acquisition and retention than learners exposed to listening input.

Hypothesis 2 (H₂): Learners exposed to listening input will show significantly higher vocabulary acquisition and retention than learners exposed to reading input.

Null hypothesis (H₀): There will be no significant difference in vocabulary acquisition and retention between the groups exposed to reading and listening input.

Methodology

This quasi-experimental study employed a between-subjects design to compare the effectiveness of reading versus listening input on incidental vocabulary acquisition among Grade 9 ESL learners. The sample consisted of 30 participants from an international school in Sri Lanka, equally divided into two groups of 15. According to the school's records, the learners' English proficiency ranged from A2 to B1 based on the CEFR, and all had received instruction in English since kindergarten.

Fifteen target vocabulary items were selected and embedded within thematic stories related to crime and law, which were carefully designed to match the learners' proficiency levels. The same vocabulary assessment instrument was used throughout the study, comprising 30 multiple-choice questions, 15 assessing recognition of word forms and 15 assessing recognitions of word meaning.

Initially, all participants completed a pretest to measure their baseline knowledge of the target vocabulary. Following the pretest, one group was exposed to reading thematic stories, while the other group listened to audio recordings of the same stories. The treatment spanned three sessions conducted over one week. Immediately after

the treatment, an immediate posttest was administered to measure incidental vocabulary acquisition. A delayed posttest was then conducted two weeks later to evaluate retention of the learned vocabulary.

Data was analyzed using descriptive statistics (means and standard deviations) to summarize the acquisition and retention scores of both groups. Independent-samples t-tests were conducted to test the hypotheses.

Results

Pre-test

Pretest scores for both form and meaning recognition were compared between the reading and listening groups. For the form recognition test, the mean scores of the Reading and Listening Groups were 0.0 and 0.6, respectively. For the meaning recognition test, the Reading Group's and Listening Group's mean scores were 0.0 and 0.6, respectively.

Immediate Posttest Scores (IPTs)

Following exposure to the respective input modes for incidental vocabulary acquisition, an immediate posttest was administered. The results were then compared using an independent samples t-test, separately for both form and meaning, as summarized below:

Table 1

T-test Comparison of Reading and Listening Groups: Form Recognition Scores (IPTs)

	<i>Reading</i>	<i>Listening</i>
Mean	4.466666667	4.4
Variance	2.838095238	1.257142857
Observations	15	15
Hypothesized Mean Difference	0	
Df	24	
t Stat	0.127589458	
P(T<=t) one-tail	0.449768461	
t Critical one-tailed	1.71088208	
P(T<=t) two-tail	0.899536922	
t Critical two-tail	2.063898562	

Since P(T<=t) two-tailed P value is greater than the Alpha value (0.05), no statistically significant difference was found between the means of the two groups for the acquisition scores of the form recognition test.

Table 2

T-test Comparison of Reading and Listening Groups: Meaning Recognition Scores (IPTs)

	<i>Reading</i>	<i>Listening</i>
Mean	4.2	4.4
Variance	1.028571429	1.685714286
Observations	15	15
Hypothesized Mean Difference	0	
Df	26	
t Stat	-0.470162346	
P(T<=t) one-tailed	0.321079496	
t Critical one-tailed	1.70561792	

P(T<=t) two-tailed	0.642158991
t Critical two-tailed	2.055529439

The two-tailed P value is greater than 0.05, indicating that there is no statistically significant difference between the means of the two groups for the acquisition scores of the meaning recognition test. Delayed Post Test Scores (DPTS)

Two weeks after the immediate post-test, a delayed post-test was administered. The results were then compared using an independent samples t-test, separately for both form and meaning, as summarized below:

Table 3

T-test Comparison of Reading and Listening Groups: Form Recognition Scores (DPTS)

	<i>Reading</i>	<i>Listening</i>
Mean	2.266666667	2.666666667
Variance	1.780952381	0.80952381
Observations	15	15
Hypothesized Mean Difference	0	
Df	25	
t Stat	-0.962533422	
P(T<=t) one-tail	0.172500054	
t Critical one-tail	1.708140761	
P(T<=t) two-tail	0.345000109	
t Critical two-tail	2.059538553	

Since P(T<=t), the two-tailed P value is greater than the Alpha value (0.05), no statistically significant difference was found between the means of the two groups for the retention scores of the form recognition test.

Table 4

T-test Comparison of Reading and Listening Groups: Meaning Recognition Scores (DPTS)

	<i>Reading</i>	<i>Listening</i>
Mean	2.2	2.666666667
Variance	1.028571429	0.952380952
Observations	15	15
Hypothesized Mean Difference	0	
Df	28	
t Stat	-1.284148925	
P(T<=t) one-tail	0.104807102	
t Critical one-tailed	1.701130934	
P(T<=t) two-tailed	0.209614204	
t Critical two-tailed	2.048407142	

As the Two-tailed P value is greater than the Alpha value, a statistically significant difference between the means of the two groups was not identified for the retention scores of the meaning recognition test.

Discussion

The results of the pretest confirmed that learners in both Reading and Listening Groups had minimal prior knowledge of the target vocabulary. This indicates that the vocabulary gains demonstrated in the subsequent tests can be attributed to the input provided during the treatment. Upon exposure to the input, both groups showed notable improvement in vocabulary acquisition, demonstrating the effectiveness of both reading and listening in promoting incidental vocabulary acquisition. These findings are consistent with previous research, which has shown that vocabulary can be acquired incidentally (Brown et al., 2008; Vidal, 2011; Hatami, 2017; Xiaoning & Feng, 2017; Chang & Ma, 2018; Feng & Webb, 2020; Mohsen & Almudawis, 2021). Therefore, the pretest and posttest results validate the acquisition through both input modes.

The immediate posttest results revealed only a marginal difference in the mean scores between Reading and Listening Groups, and this difference was not statistically significant for either form or meaning recognition. This suggests that both reading and listening were equally effective in helping learners acquire new vocabulary items. Moreover, it also shows that neither mode is more effective than the other. The findings support the conclusions of Feng and Webb (2020), who also found no significant difference between input modalities. In summary, the data suggests that reading and listening are equally effective for incidental vocabulary learning in terms of recognizing both word forms and meanings.

A similar trend was observed in the delayed posttest results. Accordingly, both groups showed no statistically significant differences in the means for form and meaning retention. The findings continue to support the observations of Feng and Webb (2020), who concluded that reading and listening input produce equally effective vocabulary retention. The scores, however, were lower than those of the immediate posttest, demonstrating that there had been a decline in acquired vocabulary knowledge. This finding both confirms and contrasts the conclusions of Vidal (2011). The observation of declining vocabulary knowledge aligns with Vidal (2011), who argued that a lack of repeated exposure can lead to a depletion of vocabulary knowledge. However, a similar decline in the mean scores of both groups challenges Vidal's (2011) claim that listeners have a lower vocabulary depletion rate than readers. Consequently, it can be inferred that reading and listening are equally effective for promoting the retention of incidentally acquired vocabulary over extended periods of exposure.

However, the findings of the present study challenge much of the existing comparative research studies, which suggest one input mode is superior to the other. Previous studies, such as those by Brown et al. (2008), Vidal (2011), Hatami (2017), Xiaoning & Feng (2017), Chang and Ma (2018), Feng and Webb (2020), Mohsen and Almudawis (2021), reported that reading input is more effective than listening input. Similarly, Vidal (2011) and Hatami (2017) suggested that learners tend to retain vocabulary better through listening. The deviation of the current study from most of these findings may be attributed to the unique characteristics of the participants. The sample consists of international school learners who are equally familiar with both modalities of input from an early age. This balanced exposure may have led to a minimal difference in perceived effectiveness of the two modes. Therefore, the uniqueness of the learner cohort may have impacted the deviation of the findings from previous studies.

In conclusion, the findings of the study indicate that both reading and listening input modes equally contribute to incidental vocabulary acquisition and retention among ESL learners in international secondary schools. The lack of significant differences between the groups in both posttests suggests that learners benefit similarly from both modalities in terms of acquisition and retention. Although the outcomes align with a recent study, they contradict several previous studies. The unique educational background of international school students may contribute to these findings. These insights support the integration of both reading and listening input to promote incidental vocabulary acquisition.

Limitations and Future Research

The primary limitation of this study is the unique learner cohort and the small sample size. Future research could investigate university students, government school students and different age groups of varying proficiency levels. Another significant limitation is that the study only examines form and meaning recognition due to time constraints. This means that only passive vocabulary was tested, rather than active vocabulary. A longitudinal study over an extended period could investigate the effectiveness of vocabulary use.

Conclusion

The study investigated the effectiveness of reading and listening inputs on incidental vocabulary acquisition and retention among grade 9 ESL learners in a Sri Lankan international school. The pretest results confirmed that the learners initially had only limited knowledge of the target vocabulary. The vocabulary gains in the posttest demonstrated vocabulary acquisition through both modalities. While the posttest and delayed posttest showed a slight difference in mean scores for acquisition and retention, no statistically significant differences were observed.

These findings suggest that both reading and listening are equally effective in incidental vocabulary acquisition and retention. The results challenge the previous studies that favored one input mode over the other, indicating that the learner context may play a significant role in vocabulary gains. Thus, it leads to the rejection of H_1 and H_2 and the acceptance of H_0 . In this case, the balanced exposure to English through both reading and listening from pre-primary education may have contributed to the comparable effectiveness through both input modalities.

The study highlights the value of incorporating both reading and listening tasks into ESL vocabulary instruction. Teachers working with learners who are regularly exposed to English through multiple modes can be confident that either mode of input, or a combination of both, can lead to vocabulary development. However, repeated exposure may play a crucial role in retaining the acquired vocabulary knowledge.

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Attitudes of Sri Lankan Medical Students Towards the Medium of Instruction

Sajini Wickramasinghe^{*1}, Nipuni Hakadewaththe²

¹Department of Interdisciplinary Studies, Faculty of Engineering, University of Sri Jayewardenepura

²Department of English Language Teaching, University of Kelaniya

Corresponding author*: sajiniwsh@gmail.com

Abstract

This study explores the attitudes of medical undergraduates at a Sri Lankan state university towards English as the Medium of Instruction (EMI) within the framework of Sri Lanka's higher education language policy. It examines how EMI impacts students' academic engagement, performance, and language development. A mixed methods approach was employed, using Google-based questionnaires completed by 50 students and in-depth interviews with five second-year undergraduates. Quantitative data were analyzed using descriptive statistics to identify patterns in student attitudes, while qualitative interview responses were thematically analyzed to highlight recurring challenges, coping strategies, and language preferences. Findings reveal that while students acknowledge the global relevance of English in medicine and higher education, many face challenges in comprehension and communication due to limited prior exposure and inadequate language proficiency. A notable number expressed a preference for flexible or bilingual instruction, particularly in the early stages of their academic journey. Interviews highlighted that students often refrain from participating in class discussions due to language-related anxieties and fear of negative peer judgment. These difficulties stem from both internal factors, such as low confidence and motivation, as well as external factors, including poor English instruction at school and limited access to language resources. The study concludes that EMI, when implemented without sufficient preparatory support, can hinder academic progress. It advocates for a more inclusive and adaptable language policy at the university level, particularly in demanding professional disciplines like medicine. Key recommendations include conducting needs assessments, incorporating bilingual instruction, and providing staff training to support equitable, linguistically inclusive education.

Keywords: Bilingual; Higher education; Language proficiency; Language policy; English as the Medium of Instruction

Introduction

Language policy deals with the decisions and rules about the status, use, domains, and territories of the languages in a country. Those decisions are made formally by legislation or informally by scholars or community leaders. These decisions influence 'the right to use and maintain languages, affect language status and determine which languages are nurtured' (The Constitution of the Democratic Socialist Republic of Sri Lanka, 2015). Sri Lanka, as a multilingual country, faces several issues when defining a language for major purposes such as education. According to the Thirteenth Amendment to the Constitution of Sri Lanka (1987), Sinhala and Tamil have been defined as the official languages, while English is the link language. When considering the Sri Lanka's language

policy in education, the constitution states that a person is entitled to be educated through the medium of either of the national languages (Sinhala or Tamil). However, it stipulates ‘provisions of this paragraph shall not apply to an institution of higher education where the medium of instruction is a language other than a National Language’ (Parliament Secretariat, 2015). This clause sanctions English medium instruction in universities. The medium of instruction in many universities has been English, especially for science, engineering and medicine. The world has become increasingly globalized in recent years, and English has become the international language, which enables people from different countries to interact easily. This has led most formerly British colonized countries, including Sri Lanka, to assign English a major role in their academic curricula by introducing it as a medium of instruction into their academic programs at both secondary and tertiary levels. The Faculty of Medicine at the University of Jayewardenepura uses only English as its medium of instruction.

Accordingly, the objectives of this study are to examine the attitudes of medical students at the University of Sri Jayewardenepura towards the medium of instruction and to identify how these attitudes could be used to improve the effectiveness of language planning and policy related to the medium of instruction in higher education. Furthermore, this study addresses two key research questions. First, it seeks to examine the attitudes of medical students at the University of Sri Jayewardenepura towards English as the medium of instruction. Second, it explores how these students’ attitudes can inform and enhance the effectiveness of language planning and policy decisions related to the medium of instruction in higher education.

Learning subject matter, rather than the target language directly, has been shown to be more effective in second language acquisition. Accordingly, when language is learned through subjects like history or science, it is considered more effective for second language acquisition than direct instruction of the target language alone. By focusing on meaningful communication to comprehend subject matter, learners are exposed to the language in a natural, contextualized way, leading to deeper understanding and acquisition (Littlewood & Yu, 2009). This is attributed to the fact that since “school subjects are what children need to talk about in school”, learning content in the target language medium “provides the motivation and opportunity for meaningful communication” (Medawattegedera, 2015). Conventional ‘English as a second language’ instruction on the other hand tends to create artificial situations and unreal contexts which do not provide the same degree of motivation for meaningful communication. The concept of learning subject matter in a language that is not one’s own, to learn both the subject and another language, can be traced back many centuries. However, the contemporary notion of Bilingual Education – which has come to be understood as synonymous with English medium instruction is often viewed as being controversial because of the political implications of which language is chosen as a medium of instruction and the tensions it creates (Al-Asal & Smadi, 2011). Rubin (1983) defines the decision as to what language to use as a medium of instruction as a “language problem” which “organizations, given a mandate to fulfil the purposes of language planning, need to solve by deciding “which variety/language will be used by certain sectors of the polity” (p.4). The current Bilingual Education Policy has its official origins in a Ministry of Education (MoE) circular dated February 2001 which made GCE Advanced Level science stream courses available to students in the English medium. The first reference to Bilingual Education appears in Circular 2001/05, titled ‘Teaching of A/L Science Subjects in the English Medium’. The circular directs principals to start teaching A/L Science Subjects in English for the following reasons: i) The growing importance of English as the language of global communication, ii) The need to facilitate the transfer of students to either the world of work or to higher education in the sciences. By introducing these initiatives in government schools and universities, it was assumed that all would have equal access to linguistic capital, thus improving equity. In Sri Lankan universities, most degree programs are conducted in the English medium with the aim of improving English language proficiency among students as well as enhancing their learning and achievement levels to meet globally accepted employment competencies. The rationale for continuing to teach medicine in English focuses on the fact that English has been accepted since the twentieth century as the international language of science and medicine, and much of the scientific, technological, and academic information in the world is expressed in English. Moreover, medical students or doctors attending

international conferences, courses, or clerkships abroad need to be proficient in the English language. The entire curriculum of medical education is in English, with many terms in Greek and Latin. This dominance of English has also paved the way for the emergence of a new ESP branch (English for specific purposes), namely EMP (English for medical purposes). A large number of students who enter medical colleges in Sri Lanka have had their primary and secondary school education in a medium other than English. This sudden change in the language of instruction comes as a shock to many of them, and they find it difficult to cope with this transition and grasp subjects such as anatomy, physiology and biochemistry with ease, as compared to their peer group who have had their school education in English medium. Furthermore, this abrupt change in the medium of language, along with the introduction of terminologies, can become a potential barrier to the academic success of some students who struggle with English being the medium of instruction (Hellekjær, 2010).

Methodology

This study employed a mixed methods design, combining both quantitative and qualitative approaches to explore medical undergraduates' perceptions of English as the medium of instruction (EMI), to gain a comprehensive understanding of how EMI affects students' academic experience, engagement and language development within the context of Sri Lanka's higher education system. A total of 50 medical undergraduates were selected using random sampling from across the five academic years at the Faculty of Medicine to ensure representation across different stages of academic progression. Accordingly, a structured Google Form questionnaire titled "How English being the medium of instruction exerts influence on the medical students of the Faculty of Medicine in Sri Jayawardenepura University" was distributed to the selected 50 students. The questionnaire was designed to collect both demographic and perceptual data, and included questions such as mother tongue, second language, medium of education prior to university, medium of instruction in lectures, difficulty in adapting to EMI, perceived effectiveness of English-only instruction, impact of EMI on academic performance (grades), student recommendations for improving language support and preferred medium of instruction in medical education. Responses were collected anonymously and compiled for quantitative analysis. Quantitative data from the questionnaires were analyzed using descriptive statistics to identify patterns in student attitudes and experiences. Additionally, five second-year students were selected at random for in-depth follow-up interviews to provide deeper qualitative insights. In this mixed-methods design, the survey served as the primary source of data, while the interview component was intended to support and enrich the questionnaire findings. Accordingly, five semi-structured interviews were conducted with second-year students to provide illustrative depth, clarify patterns observed in the quantitative data, and highlight personal experiences that might not surface in survey responses. Second-year students were chosen for the interview strand because they represent a critical transitional stage in medical education. Having completed their first year, they had sufficient exposure to EMI lectures and assessments to reflect meaningfully on challenges, while not yet fully adapted to the medium as senior students might be. This makes their perspectives particularly valuable for identifying early-stage adjustment issues and the forms of language support needed during the shift from school-based learning to university-level professional education. The interviews aimed to explore students' personal experiences with EMI, including challenges in comprehension, classroom participation and coping mechanisms. Regarding data analysis, the questionnaire survey was analyzed using descriptive statistics, which are appropriate for summarizing responses and identifying overall trends in attitudinal data. Frequencies and percentages were calculated for categorical variables such as mother tongue, second language, and preferred medium of instruction, while mean values were used where applicable to show central tendencies (e.g., perceived difficulty levels). Furthermore, interviews were audio-recorded with participant consent and transcribed verbatim. The transcripts were carefully read multiple times to ensure familiarity with the data. A thematic analysis approach (Braun & Clarke, 2006) was used, following six steps: (1) familiarization with the transcripts, (2) initial coding of meaningful units (e.g., "difficulty understanding lectures," "lack of confidence in speaking"), (3) clustering codes into potential themes, (4) reviewing and refining themes against the dataset, (5)

defining and naming key themes, and (6) selecting representative extracts for reporting. Accordingly, responses were categorized to observe trends in language preference, perceived difficulty and academic impact.

Results and Discussion of Questionnaire

About the results of the Google questionnaire, 86.3% of the participants reported speaking Sinhala as their mother tongue and 13.7% of the participants reported speaking Tamil as their first language. 74.5% of the participants stated English as their second language, 15.7% mentioned Tamil as their second language and 9.8% stated Sinhala as their second language. The participants completed their Ordinary Level and Advanced Level examinations in different mediums. The highest number of students, 30 in total, had completed their Ordinary Level examination in the Sinhala medium. 15 participants had completed it in the English medium, while the lowest number five participants—had done so in the Tamil medium. The responses for the Advanced Level examination differed from those of the Ordinary Level examination responses. 76% of the participants had done their Advanced Level examination in Sinhala, 8% in English and 16% in Tamil. This indicates a decrease in the number of English medium participants at Advanced Level compared to Ordinary Level. The participants in the study were from different academic years; 20 first-year students, 9 second-year students, 12 third-year students and 9 fourth-year students. 98% of the participants stated that English was the medium of instruction in lectures, whereas 2% stated Sinhala as the medium of instruction.

In terms of difficulty in adapting to English as the medium of instruction (EMI), 4.4% of participants found it completely (100%) difficult to adapt, while 17.8% reported a 75% of difficulty. Another 17.8% found it 50% difficult to adapt to English medium instruction. In contrast, the majority -60% of the participants found it less than 25% difficult to adapt to English medium instruction.

Regarding the perceived effectiveness of English as the medium of instruction (EMI), 25% of participants stated that it is always effective to use English, while 33.3% of the participants believed it is often effective. Another 33.3% stated that it is sometimes effective, and 9.8% mentioned that it is not effective at all. When asked whether the medium of instruction affects their academic results, 27 out of 50 participants believed it does have an impact, while 23 thought that it does not. The participants who mentioned that the medium affects their results explained that using a language other than their mother tongue. As some of the students were less proficient in English, they could not understand the questions on the exam paper. Moreover, they were unable to express what they really wanted to say due to the lack of proficiency. Also, there were moments when the students hesitated to speak in English, and as a result, they were unable to clarify their doubts with the lecturers. The students who believed that the medium does not affect their results stated that the language is not a barrier in the exam, and it is justifiable to use English as the medium of instruction because most of the medical terms are in English. Hence, English is a global language it is quite effective to use English as the medium of instruction. A higher number of students (29 out of 50) recommended that learners should be given the choice of language for their studies, with 20 participants preferring to study in English, while only one student preferred Sinhala.

Results and Discussion of Interviews

Students' reaction to English being the medium of instruction was positive; almost all the interviewed students stated that English is essential for their future career. Nonetheless, two of them preferred to have Sinhala as the medium of instruction for their lectures, while the only Tamil interviewee preferred Tamil as the medium of instruction. The remaining two students wanted to study in English. The preference for the mother tongue arose due to the challenges in understanding the language, basically issues related to vocabulary and grammar. Even though two students acknowledged the necessity of using English as their medium of instruction, they reported having challenges in understanding lectures, such as the speed of the lecture, new terminology and concepts. Almost all five students found it difficult to adjust to the English medium teaching environment because of the

poor participatory style of the lecturers. Similarly, all interviewed students felt that their poor English knowledge negatively affected their performance in their subjects as well as in the examination.

Changes in English language proficiency level before and after the university entrance could be summarized as follows: - None of the students claimed that their overall language proficiency was excellent at the time of entrance to the university. Most of the students fell into the poor category, while 40% of the interviewees rated their overall proficiency as 'good'. 80% of the students reported that their listening skills were poor at the beginning and the remaining 20% placed themselves between poor and good. In terms of reading skills, 60% of the students interviewed were in the 'very poor' category, whereas 40% rated themselves as good. Regarding writing skills, 80% considered themselves poor, while 20% reported being good. Finally, 80% of the interviewees rated their speaking skills as poor, with the remaining 20% placing themselves between poor and good. Quantitative analysis indicates that there is a significant improvement in every skill. Overall, language proficiency has risen to a good category. Listening skills improved by up to 60%. Both writing and reading skills have shown considerable improvement, and speaking skills have progressed to a good category, with a 60% increase.

Reasons for students' poor language ability could be presented as follows: Students' poor English language proficiency can be attributed to both internal and external factors. Students' perspective and their motivation can be verified as the internal aspects. According to the research study, almost all the students believed that English is hard to learn, and they had lost confidence in their ability to master it. They revealed that they felt shy in the classroom, which prevented them from asking questions, answering questions, or participating in discussions. All five students acknowledged that they concentrated more on memorizing subject content rather than improving their language skills. As external factors, students mentioned that at school, they did not have proper guidance for learning English. Thus, they did not have either an English teacher in their classes or English classes were not regularly conducted. In some schools, English teachers were entrusted with duties other than teaching, which interfered with regular instruction. Many of the students could not get any help to learn English from their family or environment. It was noted earlier that they were from a rural environment. Being from rural backgrounds, students cited this as a major cause of their poor English proficiency.

The role of English medium lectures in Language learning was rated as follows. - Students mentioned that many of the lecturers' use of language motivates them to learn the language. When they were asked if they had opportunities to speak in the class, students responded negatively. Even when lecturers asked a few questions, students did not respond. Students rarely ask questions during lectures. This means they do not have opportunities to develop their language skills in subject classes, mainly speaking.

The interaction between the lecturer and the student when using English as the medium of instruction yielded the following results: According to the study, 80% of students mentioned that they did not answer questions asked by the lecturers. Students revealed shyness, language difficulties and fear as the causes of poor participation. Furthermore, 80% of the interviewees declared that the fear of being misunderstood due to unclear speech and inaccurate responses, and the fear of being ashamed by the lecturers as well as peers, led to reluctance in responding. 40% of the interviewees acknowledged that students considered some lecturers unfriendly which made them afraid to ask questions in class. However, 60% of the students revealed that they had positive interactions, which helped in using English as the medium of instruction in lectures. Conversely, 40% of the interviewees admitted that they had negative interactions, which discouraged the use of English as the medium of instruction.

Conclusion

Based on the findings, several recommendations can be made. Students should have the option to choose their preferred medium of instruction. Instructors, especially in the first year, can adopt a bilingual approach to support

comprehension. Medical faculties should conduct needs analyses to understand students' language needs, and lecturers should adopt flexible teaching methods based on student proficiency. This study has some limitations. It focuses solely on one aspect of language policy, the medium of instruction, and was conducted at a single medical college, limiting generalizability. Additionally, the sample size did not include students from all academic years. This study investigates the effect of the language of instruction on the undergraduates of the Faculty of Medicine in Sri Jayewardenepura University. Though theoretically, English medium instruction was introduced in this university with a view to enhancing the English proficiency of the students, the desired outcome has been questionable. Students at the tertiary level face many challenges in developing English language proficiency while coping with their academic studies. Higher language proficiency is crucial for successful academic study in English medium. The majority of students undertake their school studies in the vernacular languages such as Sinhala and Tamil. As a result, students entering university are mostly monolingual. Even though English is taught as a subject at schools from grade 3 to GCE Advanced Level, various reasons affect the successful learning of English at schools, including inadequate resources and the lack of motivation among the students towards the language (The World Bank, 2009). The external factors, such as not having proper guidance for learning and internal factors such as negative attitudes towards English, can lead to poor language abilities. Therefore, this limited language proficiency affects their successful learning of content subjects, and developing language proficiency by following English medium instruction seems to be difficult for them. According to Flowerdew and Miller (1992), as more students have started studying in the medium of English, especially at tertiary levels, the ability to comprehend academic lectures has been a challenge for those students. Moreover, as findings state, students seem to have lecture comprehension problems coupled with their limited language proficiency in English. According to Graddol (2010), most university students struggle to learn because the double burden of mastering their subjects and thinking in a foreign language is far too great a strain on them. Mostly, students have low English language proficiency at university entry, while this situation can lead to incompetent graduates in terms of English language skills. The tertiary level learners should be allowed to have a choice about their medium of instruction at least for the first academic year. There is a scope for policymakers, course planners, and medical lecturers to work together to find a practical approach to solve the existing problem highlighted in this study.

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Fostering Communication and Social Engagement in Quiet Learners Within the Classroom: A Case Study

O.K.P. Vayathmi ^{1*}, Shashini Tennekoon²

^{1,2}*Sri Lanka Institute of Information Technology,*

Corresponding author*: paveesha.kit@gmail.com

Abstract

This study investigated some of the barriers faced by students when participating in the teaching learning process actively, such as social anxiety, lack of confidence, or difficulty in communication. The study focused on a student in a Grade 6 classroom who consistently remained silent, avoided discussions, group work, and peer interactions. This behavior not only affected the student's learning but also influenced the classroom dynamics. Recognizing the importance of inclusive education, we conducted action research to identify the reasons behind the student's silence and to develop strategies to encourage his engagement through structured peer collaboration activities and low-pressure strategies. These strategies aimed to build confidence, foster connections with classmates, and create a supportive environment where the student felt safe to contribute. The efficacy of the strategies was assessed through teacher observations and by comparing the student's participation before and after the intervention was implemented. Findings revealed that small-group interactions and non-verbal participation methods helped the student to gradually increase his engagement in the classroom activities. Over time, his willingness to communicate improved, positively influencing classroom inclusivity. This study highlights the need to address silent learners who are often overlooked in traditional teaching approaches. By identifying individual challenges and adapting classroom practices, educators can ensure that all students feel valued and empowered. Therefore, this research underscores the importance of fostering an inclusive learning environment where every student's voice can be heard.

Keywords: Quiet Learners; Classroom Participation; Social Interaction; Teacher Strategies; Inclusive Education

Introduction

In a dynamic classroom environment, communication serves as the foundation for meaningful learning, collaboration, and personal growth (Sedova & Navratilova, 2020). However, not all students find it easy to express themselves or actively engage in classroom activities. Some remain quiet and often go unnoticed, yet their silence speaks volumes about hidden struggles, fears, or unmet needs. Addressing these silent barriers is essential in fostering an inclusive and supportive educational experience.

This investigation focused on a Grade 6 student who was given the pseudo name 'Shehan' and who consistently displayed minimal interaction and verbal communication in the classroom. The observations revealed his reluctance to participate in discussions, group work, and even one-on-one interactions. While his peers participated and engaged enthusiastically, Shehan remained physically present but socially and emotionally withdrawn. Shehan demonstrated understanding of academic content; however, his quietness appeared to hinder his ability to fully engage in the learning process and form meaningful social connections. This lack of interaction not only

negatively impacted his academic performance but also affected Shehan's confidence, sense of belonging, and overall classroom experience.

Motivated by a commitment to inclusive education, this study attempted to explore the causative factors that contributed to his silence and implemented targeted interventions to enhance his confidence, communication, and social integration. These interventions were done to change his usual demeanor as an individual who was noticeably quiet, who rarely initiated or engaged in conversations with his peers or teachers, and often avoided participating in group discussions or collaborative activities. Thus, the following research problem was addressed in this study: "How can targeted strategies be implemented to enhance the confidence, verbal communication, and social interaction of a quiet Grade 6 student who demonstrates minimal classroom participation?" Consequently the research objectives focused on how - to identify the factors contributing to the student's limited confidence, verbal communication, and classroom participation; design and implement targeted strategies (such as peer support, interactive activities, and positive reinforcement) to encourage the student's active participation; evaluate the impact of these strategies on the student's confidence and willingness to engage in verbal communication; assess improvements in the student's social interaction with peers during classroom activities; and provide recommendations for teachers to support quiet students in developing confidence and communication skills.

Drawing on pedagogical theories, namely, peer collaboration and evidence-based strategies, this research aims to create a classroom environment where quiet learners like Shehan feel safe, valued, and empowered to participate in ways that align with their strengths. By documenting this journey, the study highlights the transformative potential of empathy, patience, and tailored teaching approaches in ensuring that every student's voice is heard. One pedagogical theory that was drawn on was Bandura's Social Learning Theory, where students are said to learn social behaviors through observation and imitation. "Training in social skills can effectively reduce classroom silence and shyness, which reflects Bandura's idea that students learn from modeled behaviors" (Abbasi et al., 2020). Similarly, "using social stories provides structured modeling of appropriate interactions," according to Turner (2021), which can help shy students by giving them guided ways to communicate. According to Vygotsky's Social Constructivism theory, knowledge is built through interaction and scaffolding. "Silent students show different participation patterns in classroom talk, supporting the idea that structured interaction enhances learning" (Sedova & Navratilova, 2020). Additionally, other studies, such as Medaille and Usinger (2020) emphasize that classroom environments strongly shape how quiet students engage. According to humanistic learning theories by theorists such as Rogers and Maslow, teaching should support self-esteem, motivation, and individuality. This is shown through the following study which states that "Introverted students can still be socially engaged and demonstrate higher self-esteem when supported, highlighting the importance of valuing individuality" (Tuovinen et al., 2020a, 2020b). Additionally, according to Nadiv and Ricon (2020), "Teachers' strategies that acknowledge personality differences can also foster confidence in shy learners," which further supports humanistic approaches toward teaching quiet students.

Materials and Methods

This study adopted an action research approach to systematically investigate and address the challenges faced by the quiet Grade 6 learner in classroom participation and social interaction for several reasons. The cyclical nature of action research allowed for continuous observation, intervention, reflection, and refinement of strategies tailored to the student's specific needs. The research was conducted in a government school in Sri Lanka, where the 12-year-old male student, who exhibited persistent silence and minimal interaction with peers and teachers, was enrolled. His teacher, who was also the researcher for this study, taught him Information and Communication Technology.

Both quantitative and qualitative data collection tools were employed to ensure a comprehensive understanding of Shehan's behaviors, including what caused them and how they changed. Structured observations using checklists documented the student's verbal and non-verbal behaviors during various classroom activities, including lessons,

group work, and breaks, to grasp his actual behaviors. Additionally, semi-structured interviews were conducted with his teachers, peers, and family members to gather insights into Shehan's behavior across different settings. Furthermore, document analysis of his notebooks, attendance records, and academic assessments were conducted in depth to find further evidence of his engagement patterns. Triangulation of these data sources enhanced the validity of the findings.

The intervention was implemented in two phases. The first phase focused on building trust and encouraging non-verbal engagement. Strategies included daily greetings, casual conversations, written tasks such as journals and worksheets, and structured play activities, including Ludo and cricket, to foster peer interaction. These activities were directly implemented by the teacher-researcher, ensuring consistency and alignment with the aims of the action research. The second phase aimed at scaffolding verbal participation through small-group activities such as think-pair-share and peer interviews, assigned classroom roles (e.g., book distributor, subject monitor), and choice-based sharing opportunities during circle time with visual prompts. These activities were conducted in the learner's mother tongue to minimize the influence of English language proficiency on participation. Despite this, the student continued to demonstrate reticence, confirming that the issue was not primarily linguistic but rather related to confidence and social interaction.

Data analysis involved thematic analysis to identify recurring behavioral patterns, such as avoidance of eye contact and preference for written tasks over verbal responses. Progress was measured through observable changes in the student's behavior, such as increased smiling, greater willingness to collaborate with peers, and voluntary participation in tasks. Ethical considerations were strictly followed, including obtaining parental consent and student assent, using pseudonyms to protect confidentiality, and anonymizing data when reporting.

Results

The findings of this action research demonstrated meaningful progress in Shehan's ability to engage with classroom activities and peers. Through systematic implementation of targeted interventions, observable changes emerged across multiple domains of the student's school experience. In terms of non-verbal communication, the student showed remarkable improvement from the initial withdrawn behaviors to more engaged participation. He previously avoided all eye contact and maintained closed body language, but post-intervention observations recorded consistent eye contact during 60% of interactions. His physical demeanor transformed noticeably; he no longer hid his face or hunched his shoulders; he began to display open postures and smiled frequently at appropriate times. One classroom note captured this shift aptly: "He smiled at me when I handed him the worksheet, something he never did before." These changes first emerged during one-on-one interactions with the teacher before gradually extending to peer exchanges. The chart below shows the student's weekly count of positive interactions with his peers and the teacher.



Figure 1

Weekly Count Progress

Shehan's verbal communication developed through distinct stages, beginning with single-word responses to direct questions before progressing to short sentences. The student's most significant breakthrough occurred when he voluntarily read two sentences from his journal to the class, an action that would have been unthinkable prior to the intervention. As one peer remarked afterward, "I didn't know he could read out loud like that and it was nice to hear him." While still reserved in whole-class settings, his participation in small group discussions increased substantially, particularly during structured activities such as think-pair-share exercises.

Social interactions with peers showed encouraging development. From initially avoiding group work completely, the student began actively contributing to pair and small-group activities, especially those involving his interests in science and art. Break time observations revealed new patterns of behavior, including shared laughter during games and occasional initiation of conversations with close classmates. A peer reflected, "Now he asks me if I want to play with him, but earlier he just sat alone." Peers reciprocated this engagement, with several of them spontaneously including him in activities without teacher prompting.

Qualitative feedback from stakeholders regarding Shehan was as follows. Teachers reported consistent engagement in group activities and in asking questions about unclear points. His class teacher observed, "He now says 'good morning teacher', without me reminding him." Peers commented on his increased verbal participation, and his mother provided particularly poignant testimony: "He comes home and talks with me more than he used to."

The intervention's success appears to be rooted in three key factors: the establishment of trust through consistent, low-pressure interactions; carefully scaffolded activities that allowed incremental success; and the cultivation of peer acceptance through structured collaborative work. While challenges remain particularly in whole-class verbal participation, the student's transformation from a withdrawn observer to an engaged participant demonstrates the potential of tailored, empathetic educational approaches. These results suggest that even profoundly quiet learners can develop meaningful classroom engagement when provided with appropriate support structures and sufficient time to progress at their own pace.

Discussion

This study chronicles the journey of a quiet learner from silence to gradual engagement and reveals important insights about fostering inclusive classrooms. The student's transformation unfolded through carefully structured interventions that provided space for growth at an individual pace. Beginning as a withdrawn and hesitant participant, the student progressed from tentative responses to morning greetings, to sharing thoughts through writing and eventually finding comfort in small peer group interactions. These observable changes did not emerge suddenly, but through consistent and compassionate support. The foundation for this transformation was built on establishing trust through daily, low-pressure interactions. The process mirrored constructing a bridge, one careful plank at a time, starting with simple acknowledgments before introducing more complex social tasks. The student's growing comfort manifested in physical ways, including relaxed shoulders and increased eye contact, which replaced previous tension and avoidance. These findings align with existing research confirming that emotional safety serves as a prerequisite for academic risk-taking among quiet learners. Peer connections emerged as a particularly significant factor in the students' progress. When classmates began recognizing the quiet student as a valuable contributor during structured activities, a positive feedback loop developed. Each small success, whether participating in a science project or sharing a quiet moment of laughter, created ripples that expanded Shehan's social confidence. Teachers noted increased initiation of conversations, while family members reported that the student would share school experiences at home more frequently. However, the experience also highlighted important nuances. While the student demonstrated marked improvement in small group settings, whole-class discussions remained challenging. This observation underscores that growth occurs unevenly across different contexts, similar to how plants require varying conditions at different growth stages. Some classroom situations may always feel less comfortable for quiet learners, and that reality deserves acknowledgment and accommodation.

These findings carry both practical and philosophical implications for educators. Simple modifications, such as offering alternative participation methods or providing advance notice before calling on students, can create meaningful differences. Furthermore, at a deeper level, the study emphasizes looking beyond surface behaviors. What might initially appear as disengagement often reflects internal processing and engagement. Classrooms that welcome diverse participation styles benefit not only quiet learners but the entire educational community through enriched perspectives. Shehan's journey serves as a powerful reminder that educational inclusion focuses not on uniformity, but on creating conditions where everyone can thrive. The quiet learner in this study did not need to transform into an outspoken participant but rather required support to contribute in authentic ways. In an educational landscape that frequently favors extroverted expression, these findings affirm the value of honoring all communication styles and cultivating classrooms where every voice can find its place.

Conclusion

This case study demonstrates that quiet learners can thrive in mainstream classrooms when provided with targeted, empathetic support. The student's journey from silence to gradual engagement underscores the transformative power of patience and individualized interventions that honor different communication styles. Key findings reveal that building trust through consistent low-pressure interactions, creating structured peer collaboration opportunities, and valuing non-verbal participation forms serve as critical catalysts for quiet students' academic and social growth. The study highlights several important takeaways for educators. First, quietness should not be misinterpreted as disengagement but rather recognized as a distinct learning style requiring alternative pathways for expression. Second, small, incremental changes in participation, whether through written work, small group interactions, or classroom responsibilities, can collectively lead to meaningful progress. Third, the classroom environment plays a pivotal role, where psychologically safe spaces and peer acceptance significantly influence quiet learners' willingness to engage. While challenges remain, particularly in whole-class settings, Shehan's demonstrated growth affirms that inclusive teaching practices can help quiet learners find their voice without

compromising their authentic selves. These findings advocate for a paradigm shift in how educators perceive and support quiet students, moving away from deficit-based perspectives toward strength-based approaches.

Future research could explore longitudinal outcomes of such interventions across diverse cultural contexts and age groups. However, this study's immediate contribution lies in its practical demonstration that when classrooms make space for quiet learners to participate on their own terms, the entire learning community benefits from their unique perspectives and contributions. Ultimately, truly inclusive education recognizes that every student's voice matters, whether spoken softly, written thoughtfully, or expressed through other meaningful forms of engagement.

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Empowering Reflective Learners: An Action Research Study on Reflection-for-, in-, and on-Action in Junior Secondary English as Second Language Classrooms

Heleen Sandhya Fernando^{1*}, Chethika Abeygunawardhana Samarajeewa²

¹ *Lincoln University, Malaysia- Sri Lankan Campus, Nawala*

² *Lincoln University, Malaysia*

Corresponding author*: i.heleen.s.f@gmail.com

Abstract

Reflective practice refers to learning through and from experience towards gaining new insights into self and practice. Zimmerman (2002) highlights the importance of self-regulated learning, where reflection enhances academic performance. This action research project was initiated by a teacher educator with the central aim of exploring the application and impact of reflective learning strategies among junior secondary English as a Second Language (ESL) learners. The sample consisted of two groups: three in-service teachers and 63 ESL learners in grade 9. The research was conducted over a four-month period as part of a teacher development program, in its 'Current Trends and Practices in Education' course. Various data collection methods were utilized, including teacher interviews, focus group discussions with students, classroom observations by the teacher educator, teacher reflective logs, student reflective journals and student portfolios. The findings, obtained through both quantitative and qualitative data indicated that irrespective of the fact that culture shock as the main challenge to be faced, reflective strategies such as goal setting (learning contracts), self-monitoring checklists, peer feedback cards, learner journals and whole class debriefs led to enhanced learner engagement, improved language awareness, and stronger self-directed learning habits. Thus, the study affirms the effectiveness of embedding reflective learning in ESL education.

Keywords: reflective strategies, English as a Second Language (ESL) junior secondary learners, action research

Introduction

Reflective practice has long been recognized as an important aspect of teacher education. Yet, it has not been adequately utilized in fostering reflective learners in the secondary school context, which can be considered a crucial element in learner-centered education. Zimmerman (2002) states that self-regulated learners are proactive in their efforts to learn because they are guided by personally set goals and task-related strategies and are aware of their strengths and limitations. Further, the importance of learner reflection in autonomy is emphasized by Nunan (1999), who states that "helping learners think about and reflect on their learning is central to the development of autonomy and effective language acquisition" (p. 61).

Reflective practice in the ESL context can be highly beneficial in fostering meaningful learning and growth, particularly when learners encounter challenges such as language barriers, cultural adjustment, and lack of confidence. Schön (1983) asserts that reflection is not a single act but rather a multifaceted process that can occur

before, during, and after practice. These three forms—reflection-for-action, reflection-in-action, and reflection-on-action—offer a theoretical foundation for developing pedagogical interventions that foster deeper learning. By using reflective techniques, students can better understand their own development and obstacles and modify their methods accordingly. "We do not learn from experience, we learn from reflecting on experience," (Dewey,1933). This is especially important for ESL students, who can benefit from actively evaluating which strategies are effective and which ones are not in their language learning process. According to Oxford (2011), "reflection allows learners to identify the strategies that lead to success and to discard those that do not serve them well" (p. 36).

Thus, the current study aimed to design and implement a range of reflective learning strategies, grounded in Schön's (1983) typology of reflection-for-action, reflection-in-action, and reflection-on-action which included goal setting (learning contracts), self-monitoring checklists, peer feedback cards, learner journals and whole-class debriefs as reflective strategies in the ESL classroom.

Research Objectives

The overall purpose of the study is to develop and evaluate the effectiveness of reflective practice strategies, framed by Schön's reflection-for-, reflection-in-, and reflection-on-action in promoting learner autonomy, metacognitive development, and engagement in junior secondary ESL classrooms.

Objectives

1. To design reflective learning strategies rooted in theory and appropriate for junior secondary ESL learners
2. To implement these strategies in the classroom setting
3. To evaluate the impact of reflective strategies on learner autonomy, metacognitive development, and engagement in junior secondary ESL classrooms

Research Methodology

The present study was action research conducted to develop and evaluate the effectiveness of reflective practice strategies framed by Schön's (1983) reflection-for-, reflection-in-, and reflection-on-action in promoting learner autonomy, metacognitive development, and engagement in junior secondary ESL classrooms.

Action Research

Action research involves using critical reflection and collaboration to bring about positive change (Arteaga, 2022). According to Koshy (2010), action research is a process for improving educational practice undertaken by individuals who share a common purpose. There are four basic stages in the cyclical action research process: reflect, plan, act, and observe, followed by reflection to continue the cycle (Dickens & Watkins, 1999), providing the researcher with the opportunity to continuously evaluate and improve practice through informed decision-making.

The Present Study

The present study was conducted with three in-service teachers following a teacher development program, undertaking an assignment in its 'Current Trends and Practices in Education' course. It was conducted over a period of four months. Multiple data collection instruments are illustrated below.

Table 1*Multiple data collection instruments*

Research Objective	Data Collection Tools	Data Sets
1. To design reflective learning strategies rooted in theory as appropriate for junior secondary ESL learners	-Teacher interviews - Focus group discussions with students	- Transcripts of teacher interviews on current reflective practices and needs - Transcripts of student perceptions and expectations regarding learning methods
2. To implement these strategies in classroom setting	-Classroom observations -Teacher reflective logs - Student reflective journals	- Observation notes during implementation of reflective strategies - Teachers' weekly reflection logs on classroom practices
3. To evaluate the impact of reflective strategies on learner autonomy, metacognitive development, and engagement in junior secondary ESL classrooms	-Student portfolios	- Journal entries reflecting learner thoughts post-task - Portfolios showcasing progressive learning tasks

The action research was conducted by using a systematic procedure.

In this assignment, the in-service teachers implemented the intervention plan designed by the teacher educator which incorporated reflective strategies for reflection-for-action, reflection-in-action, and reflection-on-action as illustrated below in the intervention plan. Further, the three in-service teachers kept their reflection logs while learners were encouraged to keep reflective journals and portfolios of their language activities.

Table 2*Intervention Plan*

Type of Reflection	Strategy	Activity Description	Tools Used
Reflection-for-Action	Goal setting (Learning Contracts)	Students complete a goal-setting template outlining what they want to improve (e.g., vocabulary, speaking fluency) and how they plan to do it.	Goal-setting template
Reflection-in-Action	Self-Monitoring Checklists	During group speaking or writing tasks, students use a checklist to monitor their use of specific target <u>language structures or vocabulary.</u>	Task-specific checklist
	Peer Feedback Cards	While watching or listening to a peer's presentation, students fill in a feedback card with prompts like "I noticed..." or "Next time, try..."	Peer feedback cards
Reflection-on-Action	Learner Journals	After completing a project or task, students write journal entries	Guided learner journal template
	Whole-Class Debriefs	Teacher facilitates a discussion after a major activity (e.g., presentation, group work), asking students to share strategies, challenges, and successes.	Discussion prompts

This intervention was conducted over a period of four months, and the researcher made random visits to observe the implementation and evaluate the effectiveness of the intervention.

As a pre-requisite, a series of workshops to train the learners in the use of reflective strategies for ESL learning and alongside regular briefing sessions for the teachers.

Data Analysis and Recommendations

The action research study on empowering reflective learners in Junior Secondary ESL classrooms generated a wealth of information, providing a comprehensive understanding of the reflective strategies and their impact on learner engagement, improved language awareness, and the development of stronger self-directed learning habits. The findings can be organized and presented as follows.

Reflective Learning Strategies Appropriate for Junior Secondary ESL Classrooms

The summary of the data sets collected through teacher interviews on current reflective practices and needs and focus group discussions with students on perceptions and expectations regarding learning methods can be presented as follows.

Teacher Perceptions on Current Reflective Practices and Needs

The data analysis of teacher interviews conducted prior to planning the intervention brought insights into the intervention plan and the most emerging themes can be outlined as below.

All the three in-service teachers were in complete agreement that reflective learning is crucial in ESL learning to overcome the barriers, yet, in spite of its own advantages, reflective practice is rarely implemented practiced in junior secondary context due to varied reasons such as lack of training, traditional mindset of both the teacher and the learner, exam-oriented ESL classrooms. They spoke about the visible gap between the theoretical underpinning and practical classroom application of reflective strategies.

Further, the need for practical guidance, professional training and educational reforms to bring about to promote reflective learning was emphasized by all the three in-service teachers. *"To deviate from traditional methods, it needs the awareness and support from all the stakeholders"*. Importantly, reflective learning strategies such as goal setting, self-monitoring, peer feedback, journaling, classroom debriefing were identified as the most rewarding and feasible in the junior secondary ESL classroom.

Student Perceptions and Expectations on ESL Learning Methods

The insights from focus group discussions with students can be summarized as follows.

Most of them were unfamiliar with reflective learning strategies. They were surprised at the possibility of new methods such as goal setting and self-monitoring. However, a few students shared the classroom debriefing sessions once participated and peer feedback activities particularly when learning English with a foreign teacher.

Almost all the students expressed interest in new learning methods and were curious to know more about the application of the same in their own learning.

They highlighted the need for practice and guidance needed in the use of new methods and it seemed to be the worry they all had in their mind about the new methods of learning ESL.

Further, in spite of the enthusiasm, a majority of them in their limited English expressed conveyed aa lack of confidence in using the language. One student expressing his disappointment, asked *"Are you taking only the good one's teacher?"* a remark that underscored their eagerness to engage with English learning in more interactive and student-centered ways compared to traditional teacher-centered methods.

Considering both data gathered through teacher interviews and student focused group discussions with students, teacher briefing sessions, training workshops for students and the intervention was planned and implemented.

Measurement of the Success of the Intervention

The results of the intervention which aimed to develop and evaluate the effectiveness of reflective practice strategies framed by Schön's reflection-for-, in-, and on-action—in promoting learner autonomy, metacognitive development, and engagement in junior secondary ESL classrooms can be presented as follows: the summary of qualitative data gathered through the analysis of the student reflective journals, teacher reflective logs and observations made by the teacher educator and the quantitative data gathered through the evaluation of the student portfolio.

The Analysis of Qualitative Data

Qualitative data collected to evaluate the effectiveness of the intervention were primarily obtained from student reflective journals, teacher reflection logs and observations conducted by the researcher. The findings can be summarized under three sub-headings: Student Reflections, Teacher Reflections and Teacher Educator Observations.

Student Reflections

The emerging themes from student reflections which consisted of both positive and negative comments can be summarized as follows.

On a Positive Note:

A majority of the students repeatedly commented that setting goals prior to the activity made it easier to accomplish the target for it help them maintain focused attention. *'When I know the goal of the activity, I know what to do and I can focus on that. Now I understand the difference. That was why I was clueless about what I was supposed to do then'*. It can be inferred that the learner engagement was high due to self-monitoring and peer feedback during reflection-in and majority of them commented positively on this for these strategies were seen as a facilitation. *'Using the checklists given helps me to correct myself easily and quickly. I enjoy doing it'*. *'Checking my own work is a new experience in learning English and it makes learning easier. I feel I can learn English now'*. *'Feedback cards made us engage in more productive group work and that is the best part of our new learning method'*. *'Keeping journals though less preferred at the beginning is now my favorite part of the new method'* stated one student repeatedly and a majority of them expressed the same feelings about reflective journals. They believed that it improved their writing skills though they used mixed code in keeping records. Further, they commented that it helps them to develop their thinking and planning as well. According to them, they started thinking that learning is their responsibility and learning English is not as impossible as they once believed. *'Learning is my job. Teachers are there to help us. I know it now'*.

On the Flipside:

A considerable number of students initially stated that *'this is a tiring method as each and every activity involves a series of tasks'*. This clearly indicates the culture shock in adopting the new method in which the learner needs to use a series of reflective strategies for self-directed learning. Many of them commented on their low language proficiency and served as a barrier to using reflective learning strategies.

Teacher Reflections

The emerging themes from the teacher's reflections can be presented as follows.

On a Positive Note:

All three in-service teachers consistently commented on how the new method adopted indicated the improved learner autonomy, metacognitive development, and learner engagement. *'Most of the students who hardly spoke in*

the classroom, now take responsibility for their own learning and ask questions, set their own goals, review and revise their own language using checklists etc.'.

'Setting goals made the learner stay focused and take the responsibility of accomplishment of the task on their shoulders. This idea was repeated in their reflections.

Keeping journals enables students to improve their writing skills. 'I am so surprised to see how my students, most of them becoming more thoughtful in their reflections. I can clearly see the transition from general comments to thoughtful reflections. Their language is also developing. Maybe they take conscious efforts.

On the Flip Side:

Time constraints were identified as the most significant challenge stated by all the three in-service teachers. *'It is good to practice learner-centered methods, yet practical concerns are there. I am becoming more conscious about covering the syllabus and preparing my students for the upcoming term test.*

The need for scaffolding in reflection, especially during the initiation stage, was regarded as a challenge faced by them in the implementation of the intervention.

Observations Made by the Teacher Educator / Researcher

The teacher educator's observations of the classroom, which triangulated with the teacher and student reflections, validated the overall effectiveness of the reflective learning intervention. Key observations are as follows:

On a Positive Note:

There was clear evidence of enhanced student participation and engagement. *'Students were very active, especially during peer feedback sessions, they were referring back to goal-setting templates and using checklists as well, and it clearly indicates the enthusiasm taken by the learners in reflective learning'.*

There were instances of metacognitive development and a gradual increase in the display of metacognition was also recorded. *'Some students verbalized not only what they did but also why they did it and it is a clear sign of the development of metacognition.'*

The majority of students showed improved reflective abilities applied to their learning. The quality of journal entries improved gradually in terms of language as well as in analytical thinking.

On the Flip Side:

Despite the progress, initial resistance was observed among some students, particularly those with lower language proficiency. Additionally, time constraints within the school schedule created challenges in maintaining consistency across all strategies.

All in all, the analysis of the qualitative data can be summarized stating that reflective learning has its own pros and cons and if implemented with proper planning, it could be very effective as a strategy in enhancing learner autonomy, metacognition and learner engagement.

The Analysis of Quantitative Data

Quantitative data used to measure the effectiveness of the intervention were collected through an analysis of the student portfolios, which included progressive language tasks, goal-setting templates, peer feedback records, checklists, and journal entries. Portfolios were assessed based on criteria aligned with targeted ESL and reflective learning competencies, namely Goal-Setting Ability, Self-Monitoring, Peer Interaction, Depth of Reflection, Language Development and Learner Engagement.

A rubric-based scoring system using a five-point scale (1–5) was used across all portfolios for each skill area and the following bar graph illustrates the average scores of the 63 learners.

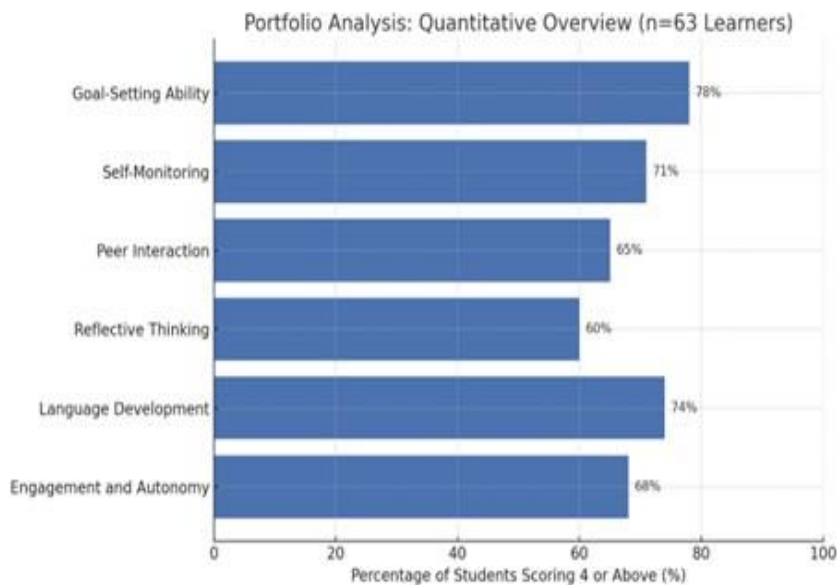


Figure 1

Portfolio Analysis: Quantitative Overview

As illustrated above, students' goal-setting abilities and metacognitive awareness demonstrated significant growth. Speaking fluency and vocabulary development were aided by reflective techniques. Over time, portfolios showed an increase in learner ownership of the learning process. Nonetheless, many students still struggle with reflective journal writing and require teacher guidance. Due to irregular participation or low confidence, 15% of students demonstrated limited progress.

Recommendations

Based on the intervention and its measurement of effectiveness the following recommendations could be proposed. Reflective learning strategies can be effectively implemented in the junior secondary ESL classrooms, if proper planning and student training are provided. Culture shock experienced by teachers could be overcome through proper planning, and training provided to the learner on the use of reflective strategies would be useful in overcoming the culture shock experienced by the learner. Scaffolding in reflective learning through strategies such as teacher modeling, templates, checklists and language prompts is crucial in the initial stages of reflective learning.

Embedding reflective strategies into the existing ESL curriculum should be supported through syllabus adjustments and flexible scheduling. To address the time constraint, reflective learning should be integrated into the curriculum, without making it out of syllabus context.

Ongoing professional development for ESL teachers on reflective pedagogy is essential to ensure consistency and effectiveness. Teachers require continuous exposure to the principles and practices of reflection-for-, in-, and on-action, along with support in designing classroom activities that foster autonomy and metacognition.

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Effect of the Use of Videos vs. Images in Instruction on the Achievement in Science of Grade 9 Students

K.V.A.T. Kavindi Jayawardhana^{1*}, K.G.S.K. Perera²

^{1,2} Sri Lanka Institute of Information Technology, Malabe, Sri Lanka

Corresponding author*: kavindijayawardhana0127@gmail.com

Abstract

Multimedia contributes to a well-equipped, interactive, and student-centered learning environment. Integration of multimedia into science education can enhance students' achievement and motivation to learn. This study attempts to find out which multimedia tools are more effective for students, to investigate the challenges and barriers teachers face in integrating multimedia into science classrooms, and to examine the motivation and attitudes of students. A one-group quasi-experimental design was used. The same group of students were taught using images in control condition and later with both images and videos during experimental conditions. Data was collected through both quantitative and qualitative methods using unit tests, observations, and questionnaires. Participants included four science teachers and five students from a private school in the Kaduwela educational zone, selected through convenience sampling. Data were analyzed using statistical test like the Mann-Whitney U test and descriptive statistics like the mean, while qualitative data underwent thematic analysis. The study was guided by Keller's ARCS model of motivation and by Mayer's Cognitive Theory of Multimedia Learning. Qualitative findings indicated that videos had a positive impact on students' achievement, motivation, and attitudes. However, the study also identified challenges and barriers faced by teachers when using multimedia in classrooms. Post test results indicated no statistically significant difference between the control and experimental groups at a 0.05 level. This study is significant for helping educators understand how multimedia meets students' needs in science education. The findings will also contribute to academic literature and practical applications in the field of educational technology.

Keywords: Mayer's Cognitive Theory of Multimedia Learning; Keller's ARCS model; Mann-Whitney test; Images; Videos

Introduction

Multimedia combines diverse forms of elements such as audio, text, graphics, animation, and video to present information. Multimedia offers a variety of powerful tools that can help transform the traditional classroom into an interactive and vibrant learning environment (Mahajan, 2012). Videos can illustrate complex concepts more simply, which is often more beneficial than spoken explanations alone (Liu, Peng, Kang, Iliyasu, Niyato, & Abd El-Latif, 2020). Multimedia facilitates the development of fundamental skills, enhances conceptual understanding, fosters collaborative learning, and assists teachers in effective classroom management. Multimedia technology is adopted and experimented with different academic organizations worldwide through their designed methods (Kumar & Agarwal, 2016).

The use of multimedia instruction has proven to be highly effective, significantly arousing learners' motivation to learn. It provides distinct and valid information, impacts positively on the attitudes of students and promotes independent learning (Sun, Fu, Zang, & Chen, 2022). A significant relationship was found between the abundance of technological practices in teaching and students' attitudes towards science. The study showed the importance of incorporating interactive technological practices that address different learning styles of students (Yildirim & Kansiz, 2017, as cited in Yildirim & Sensoy, 2018). The emotional design in the multimedia learning process focuses on enhancing motivation and emotion through visual elements such as colors, shapes, and cartoon-like figures (Estrella & Mayer, 2014). It has been found that the integration of multimedia has a positive effect on students' science achievement in the Sri Lankan school system (Perera, 2011). The ARCS model (Attention, Relevance, Confidence, and Satisfaction) was developed to understand the main effects of motivation on learning. (Keller, 2010).

The use of multimedia cannot replace hands-on learning, but it can significantly enhance and reinforce activities within the science classroom. Utilizing modern information tools such as streaming video and audio allows educators to effectively demonstrate scientific concepts. Some schools have adopted strategies that use the internet and digital media to enhance traditional education. However, multimedia use also comes with certain barriers in education. These barriers include a lack of proper knowledge and skills, time constraints, limited resources, high maintenance costs, and an unfriendly user interface (Butler & Sellbom, 2002). This study is based on Mayer's Cognitive Theory of Multimedia Learning, which emphasizes that students learn better through combined verbal and visual inputs (Mayer, 2002).

This research also aims to find out which technological tools are most effective in enhancing students' learning in science education as well as which technological tool/tools are most preferred by students. Moreover, this study will help to understand how technology can facilitate motivation in students in science education. The purpose of this research is to investigate the impact of using multimedia in science education. This paper aims to determine whether the use of videos and images when teaching science lessons can have a positive impact on students' achievement, attitudes and motivation in comparison to the use of only images when teaching science. The study shows why it is beneficial to integrate multimedia in the classroom. However, the extent to which multimedia technology can truly enrich learning experiences remains a topic of ongoing exploration and debate. Even though multimedia tools like images and videos are useful in science education, earlier studies have rarely compared the effects of using images and videos in science education. There are not many studies with the direct comparison of their effectiveness in science education. Additionally, limited research has explored the barriers and challenges faced by teachers when integrating multimedia into science education. Addressing this gap is crucial for upgrading the effectiveness of the teaching-learning process in science education within the Sri Lankan context.

Objectives of the Research

This study was guided by the following research objectives to accomplish its purpose.

1. To identify which multimedia tool(s) are most effective for students in science education
2. To investigate the challenges and barriers faced by teachers in integrating multimedia into science classrooms
3. To examine students' performance, motivation, and perceptions of learning science through these of multimedia

Hypothesis of the Study

The following hypothesis was developed in accordance with the objectives of the study.

Grade 9 students who learn science using both video and images show higher achievement in science than those who learn science using images only.

Methodology

Research Design

A quantitative-qualitative mixed method was used in this study. As stated by Johnson and Onwuegbuzie (2004) when the research approach was mixed mode, it helps to reduce the disadvantages associated with relying on a single method. The study employed a one-group post-test quasi-experimental research design for the quantitative aspect of the study. Post-test can be used to compare the marks of students and to find the effect caused by intervention. The observation method and open-ended questionnaires were used to collect the qualitative aspect of the research. One questionnaire was used to investigate students' attitudes and motivational aspects, while the other was used to examine the challenges are.

Sample and Instruments

A convenient sampling method, a type of non-probability sampling, was chosen due to the researcher's easy access to participants. The participants were five students from Grade 9 who were studying the national curriculum in science in English medium from a private school in Jayawardhanapura Education Zone. Furthermore, four science teachers from the same school were selected to participate in a survey using an open-ended questionnaire. As mentioned earlier, the study was conducted with a single class of five students as only one Grade 9 class was available at the school. Therefore, the same group of students was used for both the control and experimental conditions. Thus, the sample included five students and four science teachers.

One main instrument used in the study was open-ended questionnaires. These questionnaires were distributed to students and teachers through an online Google Form link. The questionnaire given to students included items based on Keller's instructional material motivational survey (Keller, 2010) and was administered using a Likert scale to measure the motivational effect. The second questionnaire was given to science teachers in the school to identify challenges and barriers that arise when integrating multimedia into the teaching/learning process.

Another data collection instrument used in this study was unit tests. Each unit test paper was composed of twenty multiple-choice questions. Each question included four distractors with only one correct answer. The unit test papers were developed by the researcher based on expert opinion and aligned with the lesson objectives. They were reviewed by two experts in the school: the sectional head and the secondary school coordinator. Based on their feedback and suggestions, some questions were revised to produce a final set of 20 multiple-choice questions.

The study was conducted over a period of 10 weeks. Five lessons, namely Nature and Properties of Matter, Force, Pressure, Natural resources, Micro-organisms, were taught using images only. For each lesson, the relevant content was explained while showing the images through a multimedia projector. This continued over a period of five consecutive weeks, with one lesson taught each week. For example, in the lesson on "Nature and Properties of Matter" images were used to illustrate the arrangement of particles in solids, liquids and gases. In the lesson on "Force" images were used to explain how objects are pulled, pushed or compressed by invisible forces.

Another five lessons, namely "Human Eye & Human Ear, Human Circulatory System, Electrolysis, Lightning and Natural disasters" were taught using both images and videos. For these lessons also the relevant content was explained while showing the images and videos through a multimedia projector. For example, in the lesson on "Human Circulatory System, animated videos were used to show the flow of blood, oxygen transport within the human body, and heart pumping, while images were used to explain the parts of the blood circulatory system. In the lesson on "Electrolysis" videos demonstrated the decomposition of water into hydrogen and oxygen, while images were used to discuss the experimental setup. Each lesson was taught for one week and continued over five consecutive weeks with a duration of 40 minutes per period as part of the regular school timetable. The selected lessons had not been taught previously. Observations were taken by researchers during the lessons and recorded.

Multiple instruments were used in this study as depending on a single instrument could lead to distortions or biases in certain information (Kothari, 2004).

The Method of Data Collection and Analysis of Data

The purpose of the study was explained to the school management and permission was requested to conduct unit tests and administer questionnaires to Grade Nine students and science teachers at the school.

After completing a particular lesson, the unit test was conducted by the researcher during the regular science class period within the normal classroom schedule. Students were asked to answer the questions within 40 minutes. The highest mark a participant could score on the test was 100 points. The marks scored by participants were recorded separately. One questionnaire was given to students (participants) once the selected lessons were completed. The other questionnaire was given to teachers (participants) during the final week of the study. All the participants were asked to give their honest responses. Anonymity was ensured and participants were informed that their responses would be kept confidential. Observations were conducted daily during the lessons.

A 16-item questionnaire was administered to the students, while a separate 5-item questionnaire was given to teachers. Both questionnaires were designed using 5-point Likert scale ranging from “strongly agree” to “strongly disagree. Responses from the motivational questionnaires were analyzed based on the motivational components of the ARCS model of motivation (Keller, 2010), with items grouped to represent each element of the ARCS model.

Thematic analysis was used to examine the classroom observations. The observations recorded during the lessons were transcribed and categorized according to emerging themes.

Due to the small sample size, non-parametric inferential statistics were used. The Mann-Whitney U test was conducted to determine significance differences between the experimental and control group means, with a significance level set at 0.05.

(<https://www.socscistatistics.com/tests/mannwhitney/default2.aspx>)

Results and Discussion

Quantitative data were analyzed using descriptive and inferential statistics and qualitative data were analyzed thematically. Descriptive statistics such as the mean were used to analyze data.

Data Analysis for Research Objective 1

Observations were taken during the control condition and experimental condition. They were categorized under four key themes namely “Student Engagement, Understanding, Critical thinking and Analysis, and Creative Responses” (Table 1).

Table 1

Categorization of Observations of Students

Theme number	Theme	Observations during Control Condition	Observations of Experimental Condition
01	Student Engagement	Students paid attention to the details in the images and compared them with the things that they learned. Students engaged in discussions with peers about the images.	Students were more attentive during the lesson. Students showed expressions of surprise, curiosity and excitement. Students appeared fully engaged during the lesson.

		They shared their thoughts with others.	They listened well and followed along the instructions.
			Every student appeared to be focused on the lesson.
02	Understanding	Students could describe content accurately.	Students understood abstract concepts and complex ideas well.
		They recognized and recalled relevant details.	Students remembered a greater amount of content. Students attempted to relate the things that they saw with the real-life things.
03	Critical thinking and Analysis	Students asked questions about the images.	Students made predictions about what will happen next.
		Students related the image to prior knowledge, different concepts or personal experiences.	Students had a desire for deeper understanding. Students offered different interpretations, considered multiple viewpoints and brought diverse perspectives.
04	Creative Responses	Students were inspired to do related drawings.	Students responded attentively to questions in less time. Students pointed out different outcomes, alternative perspectives and future scenarios. Students brought up different interpretations.

According to the observations, students were more active and engaged when using both images and videos. More observations were recorded during the experimental conditions indicating that the use of both images and videos was beneficial. During the experimental condition students showed high levels of engagement as they appeared more attentive, focused and responsive. Students demonstrated a strong understanding of abstract and complex concepts and made real-life connections. Students were able to make predictions and offer interpretations. In contrast, during the control condition students had lower engagement as they were less attentive. They showed limited understanding. Students could not make many predictions and interpretations. They also struggled to provide creative responses to the questions asked. This underscores the effectiveness of using both images and videos in learning science, as these tools touch multiple senses and improve the learning process by providing rich, dual-channel input. These findings align with Mayer's Cognitive Theory of Multimedia Learning (2002) that highlights the significance of using both auditory and visual elements to improve understanding. Table 2 illustrates the mean marks obtained on post-tests in both approaches.

Table 2*Post-test Mean Marks*

Group	Post-test Mean Marks
Control	66
Experimental	80.8

The U-value was calculated using the mean values of the marks of the students in the control group and that in the experimental group. The U-value is 6. The critical value for U at $p < 0.05$ is 4. Therefore, the result is not significant at $p < 0.05$. Additionally, the z-score is -1.25336. The p-value is 0.10565. Thus, the result is not significant at $p < 0.05$.

Data Analysis for Research Objective 2

The observations taken by the researcher while conducting the lessons and the responses given by teachers in the questionnaire were considered to identify the challenges and barriers faced, from the teachers' point of view. Four themes were generated: "environmental distractions, language barriers, technical issues, and teacher preparedness & workload. Table 3 presents the categorization of observations and responses of teachers for the questionnaire.

Table 3*Categorization of Observations and Responses Related to Challenges*

Theme number	Theme	Observations and Responses
01	Environmental distractions	The sound was not enough, due to the noise from neighboring classrooms. Issues with arrangement of class space and school space organization
02	Language barriers	Students could not follow the accents in videos. In some videos, subtitles were not available.
03	Technical issues	Projectors, speakers, and laptops did not work as expected. Insufficient bandwidth and internet speed. Insufficient number of interactive whiteboards.
04	Teacher preparedness and workload	Additional time had to be spent selecting relevant images and videos, which increased the workload of teachers.

Through this study, it was found that several challenges and barriers occur when using multimedia in science education. These different types of issues limit the teacher in delivering lessons in an interactive and engaging manner. Furthermore, they disrupt the flow of lessons and reduce the impact of multimedia content. According to the above-mentioned observations, various challenges and barriers can interrupt the use of multimedia in science education. These challenges affect science education by limiting its potential to bring up the learning experience. These findings correspond with the earlier study of Butler and Sellbom (2002).

Data Analysis for Research Objective 3

Table 4 presents the responses of the motivational questionnaire. They were analyzed based on the elements of the ARCS model: Attention, Relevance, Confidence and Satisfaction (Keller, 2010). For each component of the ARCS model, mean values were calculated in percentages.

Table 4

Analysis of ARCS Model on Students

Element	Item	Percentage (%)	Average
Attention	Use of images and videos during the class stimulates my attention	100	100
Relevance	I can easily understand the topic with the integration of image and videos <u>technology</u>	100	100
	Use of images and videos awakens <u>my interest in the class</u>	100	
	Through the images and video, it is <u>easy for me to remember the details.</u>	100	
	I don't feel sleepy when images and videos are used in the lesson.	100	
Confidence	I can compare and contrast things easily when images and videos are <u>used.</u>	100	100
	I acquire broader knowledge about the lesson when images and videos are used.	100	
Satisfaction	Use of images and videos awakens <u>my interest in the class</u>	100	100
	Use of images and videos inspires me to learn.	100	

The overall motivational effect in the ARCS model (the overall effect of Attention, Relevance, Confidence, and Satisfaction) was calculated by considering the responses provided by students in the questionnaire. The average value was found to be 100% (Keller, 2010).

Table 5 shows some of the responses given by students during the lessons conducted by the researcher under both control and experimental conditions.

Table 5

Responses of Students

Responses of Students	
Control Group	<u>"Sometimes I don't get it from the text, but when I see the image, I can understand well"</u>

Experimental Group	"I can focus more when there is an image"
	"Sometimes I get confused with the content, but when I see it, I get it"
	"It's a nice video"
	"Can you play the video again"
	"Yesterday teacher showed some nice videos, you missed them"
	"I like it when the teacher shows some videos and then explains it with images."
	"It feels more interesting, and I don't get bored".
	"I can understand everything clearly"
	"I can remember things better when I see both images and videos"
	"Sometimes I watch the videos shown by the teacher again at home, it helps me to learn science well"

According to Table 5, there were more responses from students in the experimental group. This highlights that the use of both images and videos helps in motivating students to learn science. The responses of students showed that they had a positive attitude towards the use of multimedia in science lessons. This shows that when teaching is enriched with multimedia, it can notably improve students' attitudes towards learning science. According to their responses, multimedia was highly engaging and effective for helping students understand scientific concepts. This was clearly reflected in the observations as well. The researcher observed that during the experimental conditions, students were more engaged and explored a broader scope of learning. This finding aligns with the earlier studies of Sun, Fu, Zang, and Chen (2022) and Estrella and Mayer (2014).

Limitations and Suggestions for Future Research

There were several limitations of this study. The duration of students' engagement in both learning modes did not last long enough to have a significant impact. Additionally, the impact of the two distinct approaches on information retention could be examined if the tests were conducted after a longer period. The small sample size may have influenced the results. It would be preferable to conduct the study with a larger sample size, over an extended period. It was difficult to find videos that were both educationally sound and aligned with curriculum standards. Another limitation was the lack of geographical diversity in the sample, as it was confined to the Kaduwela educational zone and drawn from a single school. These constraints may have impacted on the reliability and validity of the current study's findings. Since the sample size is quite small, the results may not be suitable for a generalization. Therefore, this study can be considered a pre-pilot study.

Future studies could explore the long-term effects of using multimedia in science education. Furthermore, future researchers could investigate the most effective multimedia tools for different scientific topics and age groups. It appears necessary to conduct further research with a larger sample size to determine which multimedia tools best support students' achievement, motivation, and preferences in learning science.

Conclusion

According to the qualitative data, it can be concluded that students strongly preferred using both images and videos during science lessons.

Another conclusion from this research concerned different challenges and barriers. These distractions emphasize how crucial it is to provide a suitable classroom environment for using multimedia in the teaching-learning process. This study highlights the necessity of having well-chosen instructional resources. The workload of teachers can be alleviated with institutional support. Other significant practical challenges, such as lack of adequate digital content and teaching materials, reduced time for discussion of subject matter when showing images and videos during

limited class periods, limited access to up-to-date, scientifically accurate visual resources, and sometimes the requirement of subscriptions or purchase for high-quality videos, need to be addressed. At least some of the selected lessons should include videos and images.

With the results of the ARCS model, it can also be concluded that students were more motivated when images and videos were used in science lessons. The interest, motivation and engagement of students in learning science increased. Multimedia captured students' attention and fostered greater curiosity and interest in learning science.

According to the inferential statistics, the results are not significant. Under quantitative approach, it can be stated that including videos in lessons did not significantly improve the effectiveness of learning science in terms of achievement compared to the use of images alone. Therefore, the hypothesis of the study: "Grade 9 students who learn science using video and images show higher achievement in science than those who learn science using images only" was not supported.

This study offers valuable insights by advancing inclusive and effective science education through multimedia tools. By demonstrating how multimedia can enhance learning science, particularly for students with diverse learning needs, the study supports more equitable access to quality education. In the long term, fostering scientific literacy among students contributes to building an informed society.

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Effect of Online Learning Environment on Behavioral Changes and Academic Performance of Children in Pre – Adolescence

C.M. Mudalige^{1*}, S.G.S. Samaraweera², H.M.S. Priyanath³

¹*Faculty of Graduate Studies, Sabaragamuwa University of Sri Lanka*

²*Department of English Language Teaching, Faculty of Humanities and Social Sciences, University of Ruhuna*

³*Department of Economics and Statistics, Faculty of Social Sciences and Languages, Sabaragamuwa University of Sri Lanka*

Corresponding author*: chulanimudalige@gmail.com

Abstract

The evolution of education paradigms in the new millennium has been influenced by the rapid integration of technology in learning environment worldwide, with Sri Lanka being a notable exception until recent times. The global pandemic triggered an unprecedented shift in Sri Lanka's educational landscape demanding a rapid transition from traditional classroom learning environment to online learning environment in 2020 as a resolution to the island-wide lockdown process. Very little was known about its effectiveness and challenges, although the process has become widely popular and mandatory in the system of education in the country. This paper aims to explore the impact of online learning environment on behavioral changes and the academic development of children in pre -adolescence. A survey questionnaire was administered to 120 participants studying in the Badulla educational zone to collect data related to the study. The study adopted a subjective approach and analyzed quantitative measures of academic performance using Partial Least Square - Structural Equation Modelling (PLS - SEM) among pre -adolescent students engaged in an online learning environment. Findings of the study suggested that the online learning environment has a positive impact on both behavioral changes and the academic performance of pre-adolescent students. The process has been empirically evaluated as an effective strategy for both learners and teachers to enhance their knowledge and skills in accomplishing intended academic goals in the new millennium. The study also demonstrated that the process fosters learner autonomy and motivates them to be authentically engaged in academic activities even though it brings challenges in social interaction and emotional well-being. These insights underscore the significance of educators and policy makers to design online curricula that not only promote academic achievement but also nurture the holistic development of pre-adolescent children during their critical formative stage.

Keywords: Academic development, Behavioral changes, Education paradigms, Online learning, Pre - adolescents.

Introduction

The evolution of educational paradigms in the 21st century has been greatly influenced by the swift integration of technology in the learning environment worldwide, except Sri Lanka until the global

pandemic. Online learning environment, a new mode that facilitates the delivery of subject content via the internet, has gained significant prominence, particularly in times of global crisis. Subsequently, the unexpected strike of the COVID-19 virus served as a catalyst for re-evaluating conventional educational pedagogy. The crisis has brought a dramatic change in the pedagogy of education worldwide with the emergence of the online learning environment (UNESCO, 2020). Accordingly, a digital pedagogy or online Learning Environment has emerged with the use of contemporary Information and Communication Technology in Sri Lanka during the crisis stated (Haththotuwa, 2021).

This study investigates the impact of the pandemic on the educational experiences of pre - adolescent children in Sri Lanka, particularly focusing on the transition to online learning environments. The process has resulted in several significant changes that require thorough examination, especially regarding academic development and behavioral changes of pre-adolescent children. The target group of the study typically consists of children aged 9-13 and is particularly sensitive to changes in the learning environment owing to the cognitive, emotional and social development that occur during this period. Pre-adolescence is a crucial stage for developing both emotional and social intelligence in children. They tend to improve their interpersonal skills that enhance social interaction which eventually lead to emotional and social development. Hence, this new learning process can also be social dynamics. This may raise curiosity about how this novel process will affect the social behavior of these children. In contrast the new pedagogy projects great potential improving the quality of education island- wide identified by the government. (Ministry of Education, 2020).

Hence, the rapid shift of paradigms in education, online learning environment has resulted in a direct impact on learners' behavior and academic development which seemed to be a global phenomenon and opened a trail for this particular study. The impact of the online learning environment on children's behavior remains unclear and all these challenges undoubtedly have an impact on learners' behavior and academic performance (De Silva, 2020). Subsequently, the behavioral changes of pre-adolescents associated with the transition to online learning platform present a significant issue within the target group. The cultural context cannot be avoided in understanding the research problem. The study of Dias & Eliatambi (2020) stated that the new circumstance of uncertainty and the rapid swift of paradigms have created a series of challenges that are sensitive and unique in the Sri Lankan context. Further, they mentioned that the online learning environment has its strengths, obstacles and challenges, which are the major concern of this paper.

A review of existing literature further indicates that most of these issues are contemporary, and they are not confined to a single nation-state, thus a global phenomenon. The current scenario seems to be a common global issue and authors' pre investigations revealed that existing literature could not explain the methodological and empirical aspects related to the research topic. The tentative and formidable nature of the technologies integrated in the learning and teaching process created a substantial theoretical gap in the study. It seemed that still there is no theory or strategy that can comprehensively address certain sensitive issues pertaining to the target group. The lack of empirical evidence shows that the dearth of research on these concerns and the dire necessity for further investigation to explore the effectiveness of the online learning environment as well as its impact on both academic development and the behavioral change in young learners in pre-adolescence, especially in the Sri Lankan context. This shift provides a unique opportunity to explore the effect of online learning on the academic development of pre-adolescent children - a pivotal demography marked by critical cognitive and psychological growth.

Pre-adolescence, scientifically defined as ages 9 to 13, which in turn characterized by heightened curiosity, socialization and the formation of self-reliance and identity. The transitional period in which foundational learning experiences and certain behavioral traits are solidly established. As a result of this new learning

environment, a dual impact is presented by opportunities and challenges, especially for pre-adolescent children within the diverse Sri Lankan context. This thesis aims to navigate these complexities, providing insight into the intricate relationship between online learning environment and the academic development of those children. The study aims to explore the dual nature of this rapid transition, identifying both the challenges and opportunities it presents for the target group, pre-adolescent children. In addition, how online can be optimized for accomplishing future goals in education.

Literature Review

The literature review examines the transformative role of technology in education, with a specific emphasis on the evolution of online learning environments as a substantial alternative to traditional learning and teaching methodology gained insufficient and insignificant attention during the crisis. The reviews recognize the platform's capability to boost motivation and engagement among young learners by fostering independence and interactive exploration of new knowledge.

The analysis draws on key theories, constructive learning of Vygotsky's and ecological theory of Bronfenbrenner (1992), emphasizing the crucial role of social interaction in learning, a key aspect that online learning environment can effectively replicate. The reviews also acknowledge the challenges faced by young learners of pre-adolescence and their teachers and parents.

The increased accessibility of the internet and the World Wide Web have created multitudes of opportunities for non-traditional education through online learning platform (Karber, 2003). Technology has become an essential part of our social, commercial and educational life. The use of the internet has a vital role in disseminating knowledge via online classes (Silva and Cartwright, 2017). Karber (2003) mentioned that the online process has rapidly expanded due to the increased accessibility of the World Wide Web and the internet. The process has created a vast opportunity for non-traditional education which levels all sorts of physical or social crises.

Arthur (2017) argued that the online learning environment acts as an alternative tool to overcome the abrupt crises. An online learning environment is considered as an entertaining way to learn, and the process has a positive impact on both students and teachers alike (Bouhnik & Marcus, 2006). Online learning process plays a significant role in learning during the closure of schools and the lockdown period. Moreover, having properly maintained the technical infrastructure is required for its success at schools (Nikdel & Fardia, 2020). Research conducted by Zhang (2004) shows that the use of the internet and multimedia technology can change the way of imparting knowledge, and it can be an alternative to traditional classroom learning which Sri Lankan schools are engaging right now and projecting high academic development within the children of pre-adolescence.

At the initial implementation of the process, online learning requires various devices such as smartphones, laptops, computers, tablets or iPhones that facilitate access to information regardless of time and distance (Gikas & Grant, 2013). The annual report of the Central Bank of Sri Lanka (2021) mentioned that online learning process is a challenge for almost all the prospective learners and teachers due to the economic crisis resulted by the pandemic.

Piaget's cognitive developmental theory provides insight into the difficulties children face in online learning processes particularly in understanding abstract and hypothetical concepts (Thomas, 2000). In contrast, traditional face to face learning environment, teachers can provide constant assistance and guidance on students' learning process and that may help them to comprehend complex concepts. Hence, the amount of guidance significantly drops in online learning environment and often students often face challenges and

obstacles independently. (Barbour, 2013).

In addition, digital learning can open new learning opportunities for creating outstanding students whilst considerably altering learning provision and the competitive surroundings. Virtual connectivity overcomes time and vicinity regulations by providing academic opportunities to distant students and permitting them to attain mastering of soft skills. The process also supports learner autonomy. It has additionally advanced and passed the distribution of fixed content to the use of dynamic, public-school rooms, and digital education stated de Souza Rodrigues (2021).

The improvement of prospective students will be decided whether online has effective or bad effects (Kirkwood, 2006). Students will hastily get bored if the demonstration of the gaining knowledge of content material isn't effectively designed or seems like a textual study. Moreover, the teachers who are not aware about the technology and their poor understanding of the digital era, may not be able to gain intended learning outcome while they engage in online teaching and it is certain that those teachers find the process a challenge (Madhubhashini, G. T., 2021). The role of the teacher is shifted to that a facilitator, whereas pupils need to enhance their ability to initiate autonomous learning and keep concentration on the lesson taught via online (Cozma, 2003). Regardless of substantial investments made by governments, universities, and service providers, the entire advantage and the cost of virtual mastering structures have yet to be realized (Barclay, 2018). This involves ongoing research into the factors that affect student satisfaction (Herrador-Alcaide, 2019).

Technological proficiency is a major factor determining the effectiveness of online learning (. Duncan, 1964) The research of Ogburn & Duncan (1964) claimed that change depends on the ability to utilize technology in learning and teaching. Salman (2000) argues that technology cannot be an independent factor, if the knowledge, concepts and skills are absent. Rogers (2003) mentioned that the use of technology is an individual decision.

Thus, Wahyuni & Latih (2018) argued that teachers must have a substantial knowledge of IT in order to produce quality human resources. Offir (2010) states that knowledge of IT and other electronic devices; electronic platforms allow teachers to achieve pedagogic goals. Offir (2013) also argues that it enhances quality of teaching. Freeman (1989) has mentioned that the new pedagogy helps teachers to reach teaching goals. Bloom (1956) mentioned that teaching goals indicate the performance of learners and the teacher's responsibility is to help learners to achieve academic goals. Moore (2003) also suggests that the most crucial role in online process is pedagogy and not the temporal or physical barriers that separate the respective participants.

However, there is a disparity between the intended outcomes and actual outcomes of online learning on students' academic achievements. This paper has investigated the above-mentioned gap formulating research questions.

Methodology

The study design adopted in this research is positivist, which is significant in comprehending the paradigms in the process of scientific discoveries through theoretical assumptions and obtaining empirical evidence to strengthen the effects of research constructs. The results are generated by a tested hypothesis. Quantitative method was employed to test the hypotheses statistically. Primary data was collected from pre-adolescent students who are studying in the bilingual stream. A survey questionnaire was used to collect data. The study used a multi-stage sampling to select the appropriate sample for the study. The initial sample of 30 students has been selected purposively to test the suitability of the questionnaire. Next, the selection was done randomly to form the target sampling group. A total of 120 students from 6 schools in the Badulla educational zone engaged in the final survey.

The study has designed a theoretical model with the integration of three dimensions of the online learning

environment, adopting a deductive approach and aligned with testing intended hypotheses of the online learning environment. The study tested the following hypotheses.

H1. The online learning environment has a positive impact on the academic development of young children.

H2. The online learning environment has a positive impact on the behavior of young children.

H3. There is a correlation between behavioral change and the academic development of children in pre-adolescence.

H4 Behavioral changes have a mediate effect on the relationship between the online learning environment and academic development.

A structural questionnaire with seven Likert scales was given to 120 recipients of the targeted group of children in pre-adolescence. The data was analyzed using disruptive statistics using SPSS Statistics 25'

statistical software. Hypothetical relationships were tested employing Partial Least Square Structural Equation Modeling with the support of smart PLS version 4.

The study measured the effect of online learning environment using three dimensions, including technology, quality of teaching, and physical environment, as adopted from Chen (2018). Behavioral changes were evaluated with four dimensions, such as devices, motivational factors, level of learner autonomy and emotional management, applied by Wang (2022).

The academic performance of the target group was measured further by knowledge, skills and attitudes of students adopted by Usta (2016). A seven Likert Scale was used for the statistical evaluation of students' preferences towards each item in the survey questionnaire. PLS - SEM was used to analyse quantitative data with the support of Smart PLS software.

The variables were measured using a two-step hierarchical model, including measurement model and a structural model. The construct validity was evaluated using convergent validity and discriminant validity. Indicator reliability and internal consistent reliability were used to measure reliability. Structural model was utilized in case of satisfactory reliability and validity and the appropriateness of the research structure (model fit). The structural model evaluated the multicollinearity, the significance of path coefficients, coefficients of extermination and R - squared.

Results

The study analyzed data initially measuring variable's reliability and validity and then moved to the structural model to test hypotheses. In the measurement model evaluation, all the variables were evaluated using indicator reliability and composite reliability. The reliability and validity assessments confirmed that the measurement model was strong and appropriate for further analysis. The variables were measured by employing convergent and discriminant validity. After evaluating the reliability and validity of the variables, the study tested the hypotheses by considering path coefficients and their significance. The results are presented in Table 1. The results confirmed that all hypothetical relationships were statistically supported.

Table 1*Path Coefficient (Hypotheses Testing)*

Hypotheses	Path	T statistics	Decision
Direct Effect			
H1: Learning Environment -> Academic Performance	0.445	5.149	Accepted
H2: Learning Environment -> Behavioral Changes	0.884	36.903	Accepted
H3: Behavioral Changes -> Academic Performance	0.524	5.962	Accepted
Indirect Effect: Mediating Effect of Behavioral Change			
H4: Learning Environment -> Behavioral Changes -> Academic Performance	0.463	5.757	Partial Mediation

The indicator reliability was ensured that all outer loadings exceeded the recommended threshold of 0.7 indicating strong relationship between indicators and their constructs. T-statistical value above 1.96 confirmed statistical significance and it reinforced the reliability of the indicators. Further, internal consistency reliability is validated through composite reliability and Cronbach 's alpha values, both exceeded 0.7 demonstrating that items within each construct are highly correlated and measure the same underline concept.

Also, the convergent validity was established with Average Variance Extracted (AVE) values above 0.5 which again indicated that each construction has a sufficient portion of variance in its indicators, further strengthening its validity. Subsequently, discriminant validity was also as each construct displayed a higher correlation with itself than others, ensuring that the constructs were distinct and they were measured in separate dimensions. These results collectively fostered the reliability and validity of the research model, which eventually indicated a strong foundation to test hypothetical relationships in this study.

The results of the study indicated that the independent variable collectively explained 88.3% of the variance in academic performance. The variance of behavioral changes shown 78.0% in overall performance in academic pedagogues. The overall findings of the study have proven the fact that there is a strong and greater effect of the tested learning environment online on the behavior of respective learners who were engaged in it.

Discussion

The study highlights the correlation between learners' behavioral changes and their academic performance within the process of online pedagogy. Thus, the study concludes that the learning environment positively affects behavioral changes and academic performance. The study has several theoretical implications as it advances the existing literature by studying the effect of moderating variables, behavioral change and its association with academic development of targeted learners. The study also provides a comprehensive framework for policymakers to develop strategies for advancing this new educational pedagogy and

enhancing quality output which ultimately provides direction for future studies. To achieve this, authors suggest that the process should be further industrialized in order to facilitate critical thinking and innovative learning platform for young learners in pre-adolescence. Hence, the online learning process should be closely monitored by all the responsible stakeholders, including teachers and parents in particular that will eventually reduce the negative impacts on young learners' behavior which has been the major expectation of this study. The improvement of this platform will certainly enable the entire community to accomplish 21st-century academic goals. The development of subjective research from these perspectives would be much more beneficial and they would absolutely bring about a greater and positive impact on the entire learning and teaching community in the country.

It is evident that the online learning environment which emerged during the outbreak of the global pandemic, has a strong effect on learners' development (cognitive, psychological and social) by creating a very supportive classroom environment that motivates young learners engaged in this study duly aligned with the theoretical findings mentioned by Bronfenbrenner (1970) in his theory of Ecology. The theory explained five major environment systems that influenced development of young learners in pre-adolescence, the target group in this study. The theory of 'micro system' in his study is directly related to the impact of immediate environment of the learners (the setting, people, activities and experiences) which in turn could directly align with the findings of the tested learning environment in the study, the effect of online learning environment on young learners. Accordingly, this study will certainly be an authentic example of the effect of prospective learning environment on children in pre-adolescence mentioned by Bronfenbrenner (1970).

The study has also revealed that healthy home environment and parental support can enhance the academic performance of these young learners and prevent them from being techno-savvy and being engaged in various digital malpractices, which seem to be a recurring phenomenon at present. Hence, this platform provides wider and quicker access to multitudes of resources to obtain information related to various subjects they intend to study to pursue better prospects in future.

Conclusion

This study extends the currently available literature from several perspectives through the tested hypotheses. The results generated by inferential analysis indicated that there is a positive and potent effect between the tested learning environment and the academic performance of the target learners, children in pre-adolescence (H1). The study also indicates that the impact of online learning environment on the behavior of the children (H2) and the correlation of two constructs, behavioral changes and academic development (H3) are statistically significant. A partial mediation is also found within the study, which indicated that online learning has an indirect influence on behavior change in acquiring academic achievements. (H4). Therefore, the main objective of this study, exploring the impact of online learning environment in response to the health crisis struck in the country has been achieved. The study further asserted that the process fosters learner-centered learning. The authors believe that this new approach will widen the avenue for learner autonomy in which every prospective learner becomes more responsible and critically decisive in their prospects. The emergence of this process greatly influences the educational pedagogy that meets the current demand for digital literacy required in the twenty-first century.

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An Analysis of the Relationship Between Ordinary Level English Performance and Cambridge English Placement Test Scores Among Foundation Programme Students in Sri Lanka

Nimesha Amarasooriya^{1*}, Nalaka Wickramasinghe²

^{1,2}*Informatics Institute of Technology,*

Corresponding author*: nimesha.a@iit.ac.lk

Abstract

The teaching and learning of second languages in local educational settings is of great importance, particularly due to the need to enhance students' proficiency in the English language. This study aimed to conduct a comparative analysis of students' Ordinary Level English results and their scores on the Cambridge English Placement Test (CEPT) among students enrolled in the foundation program at a higher educational institute in Sri Lanka. A sample group of 373 students was selected based on the total enumeration sampling technique, and each student was administered the CEPT. Their CEPT scores, along with their English grades from the GCE O/L, Edexcel O/L, or Cambridge O/L, were utilized for the analysis. Data analysis was performed using SPSS software, with close monitoring of the dataset's behavior through both descriptive and inferential statistics. The study's findings confirmed a moderate positive correlation of high statistical significance between students' Ordinary Level English results and their CEPT scores. Notably, it was revealed that only 24% of the students who took the Cambridge English Placement Test demonstrated the necessary level of competence, specifically the CEFR B2 level, which is widely regarded as the international standard for language proficiency required for enrollment in undergraduate programs. The observed deficiencies in language skills can be attributed to the inability of local English curricula to adequately address all four language skills. Therefore, it is recommended that a targeted approach to learning and teaching be developed to enhance specific language skills, enabling students to meet international language requirements.

Keywords: English as a second language; Cambridge English Placement Test (CEPT); English language competency; English language curricula; International language requirements

Introduction

Second language learning has become a socially valued and vital learning process, as it has the potential to form, shape, and change individual's social identity towards positive recognition. The English language is identified as the lingua franca, as it is widely accepted as the language of international business, economics, education, and global communication. Due to its globally imperative role, the English language has the potential to expand learning opportunities and provide individuals with options, as well as openings for enhancing their prospects. In the Sri Lankan social system, while Sinhala and Tamil are recognized as the primary languages of most people, English serves as the second language or target language. Through a gradual social transformation, English has become the most prestigious language in society, and competence in English is now a key requirement for social recognition and mobility. Thus, the educational process of learning English as a second language has become a highly acknowledged and vital component of the Sri Lankan educational system (Amarasooriya, 2023).

According to Indrarathne and McCulloch (2022), although English holds prominence in the fields of business, administration, and higher education, most students who follow a compulsory English program in their curriculum fail to attain the requisite level of language proficiency. This inadequacy impedes their ability to perform effectively in both higher educational contexts and the labor market. Most specifically, based on their observations, it was noted that by the end of Grade 11, most students demonstrate proficiency at only the CEFR level A1, categorized as the Basic User level. This limited proficiency is particularly evident in their performance on speaking and listening tasks, where they consistently struggle to meet the expectations necessary for effective communication. As Amarasooriya (2023), Brunfaut & Green (2019) and Liyanage (2014) state, in Sri Lanka, significant limitations and impediments to English language proficiency have been observed, particularly in areas such as writing, especially the ability to develop formal documents, reading, spelling, grammar accuracy, and oral communication. Additionally, the low levels of written and verbal communication skills in English lead individuals to exhibit less confidence in their ability to communicate effectively in the language.

These deficiencies were identified as negative outcomes stemming from the failure to integrate all four skills: listening, reading, writing, and speaking, into the teaching and learning processes of English as a Second Language (ESL) contexts (Indrarathne and McCulloch, 2022). Although the curriculum provides guidelines emphasizing the importance of improving all four skills, these instructions are often ambiguous and lack a specified timeframe for developing each skill. In contrast to the curriculum directives, teacher guides tend to place greater emphasis on reading and writing, which is problematic (Indrarathne and McCulloch, 2022; Rohan, 2012). These lapses in the teaching mechanism negatively impact the overall language performance and English language proficiency of the students, as they are guided primarily to enhance their reading and writing, focusing on preparing them for the GCE Ordinary Level English exam. The discrepancies that exist between teaching guides, materials, exam structures and curriculum hinder students from mastering all four skills and achieving a high level of English language proficiency. Thus, the current study, through scrutinizing this issue, aims to explore the performance levels of students in the GCE Ordinary Level English exam and the Cambridge English Placement Test, in order to determine the proficiency level, they achieve based on the Common European Framework of Reference for Languages (CEFR), the global scale of reference for language ability.

English Language Teaching in the Sri Lankan Education System

Diverse language policy reforms have been incorporated into the Education System in Sri Lanka to enhance English language proficiency among the population at large, including students, undergraduates, and the community in the labor market. However, according to Liyanage (2021), these policy adjustments were unable to adequately address the persistent language deficiency, which remains a critical issue in Sri Lanka. Further, according to Bogamuwa (2023), even though several General English and Specific English programs have been implemented in Sri Lankan universities, students in English as a Second Language (ESL) classrooms, who lack adequate prior exposure to the language, often show reluctance to actively engage in learning activities. Furthermore, she noted that the teaching methods employed in the ESL classroom are conventional, and due to the large number of students in the classes, direct monitoring and providing feedback are not practical. Moreover, students with prior exposure to English tend to dominate classroom interactions, while course materials typically target individual language skills without fostering active participatory learning.

In-depth observations on the O/L and A/L English assessment structures affirmed that listening and speaking competencies are not tested, while only grammar and writing are examined (Indrarathne & McCulloch, 2022). Furthermore, these assessments lack standardization and do not comply with international guidelines for designing effective tests. Since they contain inauthentic test items and irrelevant areas to test language ability, certain issues related to the validity and reliability of the exams occur. Consequently, these exams fail to assess the exact language proficiency level of the students.

Thus, in providing undergraduates with the opportunity to acquire and develop their English language competency, an innovative and interactive English language learning and teaching platform needs to be developed. Therefore, incorporating an internationally accredited curriculum and assessment methods into the existing program structure would enhance the quality and creativity of the program while making it more beneficial for students. Thus, a higher education institute in Sri Lanka, introduced the Cambridge English programs and assessment structures and conducted the Cambridge English Placement Test to assess the English language competency level of students enrolled in the Foundation Program. The study aimed to investigate the correlation between students' performance in GCE O/L, Edexcel O/L, or Cambridge O/L English examinations and their scores on the Cambridge English placement test.

Materials and Methods

The research was conducted within the framework of positive philosophy, employing a quantitative research approach due to its reliance on numerical data such as test scores and grades. The data collection process encompassed both primary and secondary methods. For the primary data collection, students enrolled in the Foundation program at a higher education institution in Colombo were selected as the sample population, and their English subject results from the GCE O/L, Edexcel O/L, or Cambridge O/L were gathered. In selecting the sample, the entire population was included in the study through total population sampling. The selected students share common characteristics, including being registered in the Foundation program at the chosen higher education institute and achieving at least a credit pass in the English subject at the GCE Ordinary Level exam. The details of the students' grades for English were obtained from a database maintained by the Registrar's Department at the selected higher education institution.

The study utilized the Cambridge English Placement Test (CEPT) structure to evaluate the students' competency level, and the examination paper was developed in accordance with the format of the Cambridge English Placement Test. The Cambridge English Placement Test assesses the most important skills required for learning English, and its results correspond to the Common European Framework of Reference for Language (CEFR), the global scale of reference for language ability. The results of the CEPT determine the CEFR levels (A1, A2, B1, B2, C1, C2) of the students based on their language performance (Cambridge Assessment English, 2021; Cambridge University Press & Assessment, 2024a; Cambridge University Press & Assessment, 2024b).

In the study, the placement test was conducted for all the students who registered to follow the Foundation Program, and a cohort of 373 students completed the examination. Their test scores on the CEPT and their English grades from the GCE O/L, Edexcel O/L, or Cambridge O/L were utilized for the analysis. The data was analyzed using SPSS software, and the behavior of the data set was closely monitored through descriptive and inferential statistics. Thus, the calculations were carried out to analyze frequencies, means and crosstabulations under descriptive statistics, while Pearson's correlation and regression analysis were conducted under inferential statistics to observe the existence of a statistically significant relationship between students' CEPT scores and grades received at O/L examination.

The secondary data obtained from journal articles and British Council reports provided a comprehensive overview of the issues within the Sri Lankan English education system, encompassing both school and higher education contexts. This information was instrumental in establishing the context for the investigation and in analyzing the primary data with a solid understanding of the purpose of the study.

Results and Discussion

The study focused on investigating the relationship between the students' Cambridge English Placement Test (CEPT) scores and their O/L English results. The Cambridge English Placement Test assesses the most important

skills required for learning English, and its results correspond to the Common European Framework of Reference for Languages (CEFR), the global scale of reference for language ability. Therefore, the analysis was performed using descriptive statistics to observe the distribution of grades in relation to each CEFR level.

The CEFR Level Distribution

Table 1

The Distribution of O/L English Grades in Relation to CEFR Level

		O/L Grade												
		A	A*	B	B Edexcel	C	C Edexcel	Cambridge C	D	IELTS 6.5	Level 09	S	Count	%
V9	BA1	0	0	0	0	2	0	0	0	0	0	0	2	1%
	A1	7	0	11	0	24	0	0	0	0	0	1	43	12%
	A2	46	0	30	0	17	1	0	0	0	0	0	94	25%
	B1	109	1	23	2	8	0	1	0	1	1	0	146	39%
	B2	74	3	6	0	4	0	0	1	0	0	0	88	24%
		63%	1%	19%	1%	15%	0%	0%	0%	0%	0%	0%	373	373

As the overall trend, within the sample group, two students were classified as 'Below A1 level', and no students were classified as above B2 level. It was observed that from the total number of students who enrolled in the foundation program, 63% of the students obtained an 'A' for their O/L English, while 19% of them received a 'B' grade, and only 15% received a 'C'. This highlights that most of the students enrolled to follow the Foundation program have 'A' grades in the English discipline. Among the students who received 'A' grades, 183 were classified within the B1-B2 range, with a high representation in the B1 category. Most of the students who received 'B' grades were in the A2 (30) and B1 (23) levels, with the highest representation in the A2 category. The data indicate that most students with 'C' grades are at the A1 (24) and A2 (17) levels. It was observed that two candidates with 'C' grades were classified as Below A1. Additionally, it was noted that students who received 'C' grades in GCE O/L were generally at a lower competency level compared to those who received 'C' grades in Edexcel O/L and Cambridge O/L. While most students in the former group achieved A1 level, those with Edexcel 'C' grades attained A2 level, and those with Cambridge 'C' grades reached B1 level. Furthermore, among the Edexcel and Cambridge categories, students with 'C' grades from Cambridge are generally at a higher level than those from Edexcel.

Furthermore, the mean values were comparatively analyzed to observe the relationship between O/L grades and the mean of the total score (out of 50) on the CEPT.

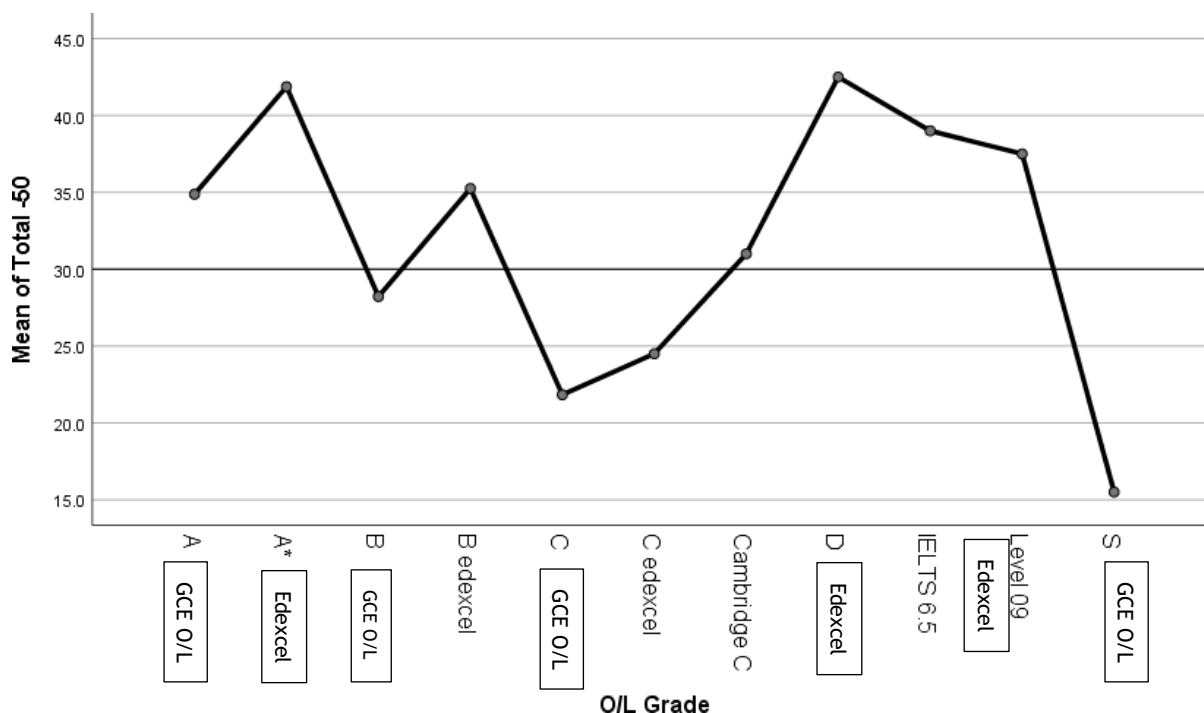


Figure 1

The Distribution of Mean Values in Relation to O/L Grades

The analysis of mean values across the various grade levels reveals a notable trend: students who obtained 'O/L A' grades and 'Edexcel A grades demonstrated significantly higher mean scores on the Cambridge English Placement Test (CEPT), with average scores of 35 and 42 respectively. The mean CEPT score of students with 'Edexcel B' (35 mean value) is higher than that of students with 'GCE O/L B' (27 mean value). Another notable finding is that the average CEPT score of students with 'GCE O/L 'C' is notably lower, with a mean value of 21, whereas students in the Edexcel 'C' and Cambridge 'C' categories achieved relatively higher average scores of 24 and 31, respectively.

A general observation of the study indicates that, out of all candidates who took the placement test, the majority (39%) were placed at the B1 level, followed by 25% at the A2 level, 24% at the B2 level and 12% at the A1 level. As per the language proficiency standards set by the Government of the United Kingdom, students must attain a CEFR B2 level to qualify for admission to a degree program. From this standpoint, it is evident that only 24% of students who faced the Cambridge English Placement Test possess the required level of competence. The gap that exists between the competency levels of students following the local English syllabus and those following the Edexcel and Cambridge syllabuses highlights the weaknesses and deficiencies of the local English curriculum. Although 236 out of 373 students enrolled in the foundation program had obtained 'A' grades in English at the GCE O/L examination, only 74 of them achieved B2 level on the Cambridge English Placement Test, which is internationally regarded as the minimum level of language proficiency required for pursuing a degree. This crucial discrepancy raises serious concerns about the validity and reliability of the 'A' grades as an indicator of actual language proficiency. Moreover, it reflects critically on the overall credibility of the Sri Lankan examination system and its grading standards.

Correlations			
		Level	OL_Grade
Level	Pearson Correlation	1	.489**
	Sig. (2-tailed)		.000
	N	373	373
OL_Grade	Pearson Correlation	.489**	1
	Sig. (2-tailed)	.000	
	N	373	373

** . Correlation is significant at the 0.01 level (2-tailed).

Figure 2

The Relationship between CEPT Scores (CEFR Level) and O/L Grades

The correlation between the CEPT scores and the O/L grades of the students was examined using the Pearson correlation coefficient, and the results revealed a statistically significant, moderately strong positive relationship. With the strength of correlation ($r = .489$) and the significance level ($p = .000$), the findings indicate that as O/L grades improve, there is a corresponding increase in the students' language competency levels too.

Assessment of Writing Skills

It is essential to consider writing accuracy as a key indicator of students' language proficiency. Since the Cambridge English Placement Test (CEPL) does not assess writing skills, a separate writing component was incorporated into the examination without altering the original CEPT format and guidelines. This component focused on evaluating students' ability to construct coherent sentences using appropriate grammar and sentence structure. Accordingly, the scores obtained for the writing task were analyzed to examine the distribution of mean values of the writing scores across the different competency levels.

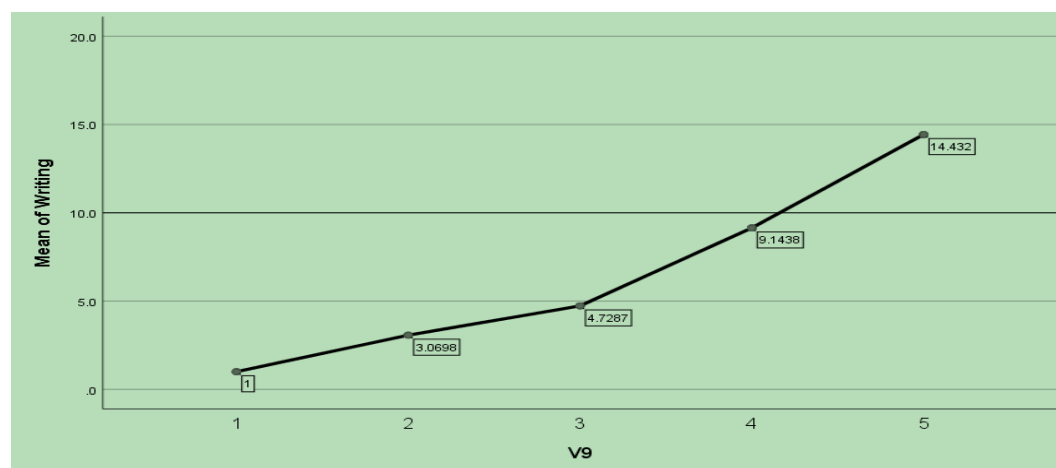


Figure 3

The Distribution of Mean Values of the Writing Scores

The graph above depicts the correlation between students' CEFR levels and the average writing scores for each level. The data clearly show that lower competency levels, such as A1 and A2, received lower mean values, while higher competency levels, namely B1 and B2, received higher mean values. Notably, only the B2 level obtained

mean values above the average level, with the rest of the competency levels falling below average.

Correlations

		Level	Writing
Level	Pearson Correlation	1	.587**
	Sig. (2-tailed)		.000
	N	372	372
Writing	Pearson Correlation	.587**	1
	Sig. (2-tailed)	.000	
	N	372	372

Figure 4

The Correlation between the Writing Scores and the CEFR Levels

The analysis of the correlation between writing scores and the CEFR levels indicates that as competency levels increase, the mean writing score consistently improves. With a Pearson correlation coefficient of ($r = 0.587$), which is statistically significant at $p < .001$ level, the trend represents a moderately strong positive relationship between writing scores and CEFR levels. It is worth noting that students at the A1 and A2 CERF levels exhibited inadequate writing skills. Additionally, students at the B1 level did not demonstrate proficiency at the expected standard in their writing abilities.

Significance of Enhancing all Four Skills

Emphasizing the balanced development of all four language skills is a key requirement that is often lacking in local English curricula. This issue can be illustrated through the performance of students on the Cambridge English Placement Test, and an accompanying analysis is presented using a scatterplot.

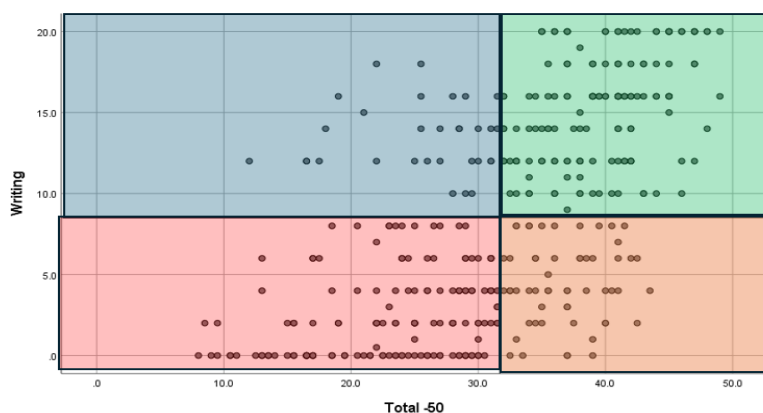


Figure 5

The Distribution of the Individual Total Score and Corresponding Writing Score

This scatter plot visually segments the performance of individuals based on their total scores and writing scores. The total score was ascertained based on assessments conducted in the domains of listening, reading, grammar,

and vocabulary. Each dot on the chart represents an individual observation for the total score and the corresponding writing score. The chart is divided into four sections based on thresholds for both writing and total scores. The blue quadrant indicates the students who scored high (above 10) for writing and less (below 30) for the total scores. The orange quadrant represents individuals who demonstrated strong overall performance, scoring above 30, but exhibited a deficiency in writing skills, scoring below 10. The red quadrant highlights the individuals who performed poorly, scoring low in writing (below 10) and receiving low overall scores (below 30). The green quadrant represents the best-performing individuals who received high scores for writing (above 10) along with high total scores (above 30).

Analysis of the scatter plot shows that the overall performance of students in the green quadrant is commendable. Conversely, while students in the blue quadrant demonstrate strong writing abilities, their weaker performance in areas such as reading, listening, vocabulary, and grammar highlights the need for improvement in these domains. Students in the orange quadrant, who excel in most areas but struggle with writing, would benefit from targeted guidance to enhance their writing skills. The red quadrant is particularly concerning, as students here exhibit both low writing scores and overall performance, indicating an urgent need for focused interventions to improve their language proficiency across all areas.

Linear regression analysis was conducted to examine the relationship between total scores and writing scores, specifically to determine the extent to which total scores predict writing scores. This analysis explored the impact of knowledge and performance in listening, reading, grammar and vocabulary on students' writing skills.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
	B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1									
	(Constant)	-5.853	.962		-6.083	.000	-7.744	-3.961	
	Total_50	.453	.029	.629	15.556	.000	.396	.510	1.000

a. Dependent Variable: Writing

Figure 6

The Relationship between Total Score and the Writing Score

The results of the regression analysis indicate that the total score is a strong and statistically significant predictor of writing scores. The positive slope of 0.453 suggests that for every 1-point increase in Total 50, the Writing score increases by approximately 0.45 points. The Beta coefficient value of 0.629 indicates a moderately strong positive relationship. Accordingly, the results highlight the fact that the students with higher total scores tend to perform better in writing. Thus, it is essential to address the issue of unequal emphasis on the four language skills in local curricula by highlighting the importance of offering balanced attention to each skill. Focusing exclusively on the improvement of one or two skills will not enhance the overall English language proficiency of the students. Therefore, the balanced approach that emphasizes the simultaneous improvement of all language skills ensures that each skill complements the others, facilitating a more effective and holistic use of language in various contexts.

Implications for Curriculum Development

The secondary-level English curriculum in the Sri Lankan education system is based on a competency-oriented approach, and its competency descriptors are not clearly defined, making them vague. It was further observed that the curriculum does not adequately focus on improving speaking and listening skills, nor does it adequately train

students to use English for career purposes. The emphasis is instead placed primarily on writing skills aimed at passing the GCE O/L English examination (Brunfaut & Green, 2019). Upon conducting a comprehensive analysis of the content in textbooks and learning materials used in the English curriculum of government schools, it was observed that the overall focus fails to emphasize the development of students' communicative competence. Furthermore, these materials feature inauthentic language tasks, overemphasize writing and underemphasize speaking tasks. The lack of clear guidance for teachers, ambiguity regarding the specific skills targeted in individual activities, and the inclusion of lengthy and complex materials are among the notable issues identified in the content (Aloysius, 2015; Brunfaut and Green, 2019; Indrarathne and McCulloch, 2022). Due to these issues, international schools often replace the prescribed textbooks with Cambridge textbooks and teachers' guides.

Listening and vocabulary are two vital components that are evaluated in the Cambridge English Placement Test. Thus, the results of these two components impact the overall performance of the students in the CEPT and low competence in reading and listening is a key influential factor that prevents students from reaching the B2 level. Further analysis shows that the secondary-level English curriculum in Sri Lanka does not focus on improving speaking, usage of vocabulary in different contexts and listening skills. While government schools neglect speaking and listening skills, they utilize a curriculum that lacks clear details and guidance. According to further research, some private schools registered under the Ministry of Education follow the government curriculum, but allocate extra time for speaking, reading and listening. In addition, international schools following the Cambridge English curriculum, allocate equal space and time for enhancing all four skills while using English as the medium of instruction (Brunfaut and Green, 2019; Indrarathne and McCulloch, 2022).

The knowledge and awareness of teachers regarding the range of language assessment formats is limited, creating gaps between the content of the curriculum and the test tasks (Bandara, 2014; Brunfaut and Green, 2019; Indrarathne and McCulloch, 2022; Liyanage, 2014; Sedere et al., 2016). Therefore, providing training for the teachers, examiners, paper setters, and moderators on designing high-quality tests adhering to the international language testing is crucial (Indrarathne and McCulloch, 2022).

Mitigation of the existing deficiencies within the national English education system requires internationally standardized strategies. A systematic mapping of curriculum content, textbooks, teachers' guides, and exam content is recommended to ensure proper alignment. Inclusion of listening and speaking skills within the curriculum and allocating equal weight and space to all four skills: reading, writing, speaking, and listening is highly required, while it is equally important to include speaking and listening components in the assessment structure. Revising textbooks according to international language teaching standards and developing comprehensive teaching guides is another key strategy (Brunfaut and Green, 2019; Indrarathne and McCulloch, 2022).

To address the deficiencies within the Sri Lankan English education system, it is essential to incorporate significant modifications, including the implementation of an internationally recognized English curriculum and assessment framework. This approach would enhance the quality of language education and ensure that assessments effectively measure students' actual language proficiency and communicative abilities.

Conclusion

The results of the study affirmed that a moderately strong positive correlation can be observed between students' Ordinary-Level English results and their scores on the Cambridge English Placement Test. Additionally, it was found that most students receiving 'C' grades at the O/L level were classified in A1-A2 CEFR levels. These students need to improve their English language skills to reach the CEFR B2 level, which is widely recognized as the international standard for language proficiency required for undergraduate program enrolment.

Among all the candidates who took the Cambridge English Placement Test, only 24% of students enrolled in the Foundation Program possess the required competence at the CEFR B2 level to pursue a degree program. Notably, a moderately strong positive correlation, which is statistically significant, exists between students' CEFR levels and their average writing scores, with only the B2 level achieving mean values above the average level, while the other competency levels fell below the average.

A group of students showed low performance across all skills, while another group excelled in all areas. Conversely, some students demonstrated high proficiency in writing but struggled with other skills, and another group scored well in reading, grammar, listening, and vocabulary but showed lower proficiency in writing. Therefore, it is recommended to design a targeted learning and teaching approach to enhance specific language skills, as this could significantly improve students' overall English language proficiency.

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Impact of Artificial Intelligence on Academic Integrity in Higher Education, Sri Lanka

Kumarage Don Samira Nandika Wijayasiri*

National Institute of Business Management (NIBM)

Corresponding author* : samirakumarage4@gmail.com

Abstract

The blistering pace of artificial intelligence (AI) adoption in the college and university sector has, in effect, revolutionized the academic sector, offering high potential while simultaneously encompassing numerous obstacles regarding academic integrity. This study examines the various ways in which artificial intelligence has impacted academic integrity in higher education institutions in Sri Lanka. Investigating the ever-developing field of AI through the prism of professional literature, this research addresses the issue of how the use of AI tools, mainly large language models, such as ChatGPT, is reinventing the familiar pattern of assessments, establishing new patterns of academic dishonesty, and causing the emergence of new solutions to the problem of preserving academic integrity. The results indicate that although current AI-based technologies provide significant value to personalized learning and educational improvement, they also present significant risks to academic integrity, which must be addressed promptly by educators, policymakers, and institutional officials. The following paper proposes an approach to addressing these issues by redesigning policies, course and examination evaluation, and incorporating ethical AI strategies tailored to the specific context of Sri Lankan higher education.

Keywords: Artificial Intelligence, Academic integrity, Higher education, Sri Lanka, Educational technology, Assessment strategies

Introduction

The advent of artificial intelligence as a revolutionary element in education has caused a paradigm shift in the traditional discipline of academic integrity across various educational institutions worldwide. Sri Lanka, like many developing countries, faces a serious challenge in balancing the rapid adoption of AI technologies with the preservation of educational values and academic integrity. As the use of AI-enabled tools, particularly generative artificial intelligence like ChatGPT, becomes widespread, the challenges they present are complex. They cannot even be simply described as straightforward technology adoption (Evangelista, 2025).

Historically known for their dedication to academic integrity and concepts of honesty, trust, fairness, respect, and responsibility in academic performance, AI technologies and capabilities are challenging academic integrity levels like never before due to the confusion between human authorship and the creation of machine-generated works. The historical model of educational malpractice, which primarily concerns plagiarism, cheating, and unaccepted collaboration, needs to be expanded to new domains of dishonesty that are enabled by advanced AI tools (Perkins, 2023). Such evolution requires immediate coverage by Sri Lankan higher education establishments, which should develop a detailed approach to meet such new challenges and utilize the beneficial potential of AI technologies.

This matter is of utmost importance to higher education in Sri Lanka, as the institution is rapidly progressing towards adopting digital technologies to enhance education quality and accessibility. However, the mere use of AI

tools without corresponding changes in academic integrity and assessment systems has created vulnerabilities that undermine the value of accredited degrees (Tamanna & Sinha, 2024). Understanding these dynamics is crucial for developing effective strategies to uphold academic standards while embracing technological advancement.

Research Problem

The main issue addressed in this research is the absence of empirical knowledge on the effect of artificial intelligence in academic integrity in higher education in Sri Lanka because most current studies focus on international contexts.

Research Questions

1. What is the impact of AI adoption on academic integrity issues in higher education in the world?
2. What are the main gaps and issues related to AI and academic integrity in the higher education of Sri Lanka?
3. What are the recommendations that can be offered to make AI integration uphold and not subvert academic integrity in Sri Lanka?

Research Objectives

4. To investigate the trends of AI use in higher education across the world and how it can impact academic integrity.
5. To examine in detail how much these challenges and opportunities are applicable to the Sri Lankan higher education situation.
6. To recommend measures that can enable the Sri Lankan universities to embrace a culture of academic integrity when incorporating AI technologies.

Literature Review

The Evolution of AI in Higher Education

Application of artificial intelligence in higher education has evolved remarkably since it was employed as a simple administrative tool into sophisticated systems capable of generating human-like text, complex issues, and providing personalized learning experience. On the one hand, AI technologies have changed the whole educational landscape, bringing a new reality of learning, and, on the other hand, have raised certain ethical challenges that institutions must listen to and respond to, Fowler (2023) says. AI tools and technologies have become especially widespread, the impact of which cannot be reduced to the introduction of technologies but rather discussed as the crucial issues related to the nature of learning and assessment per se (Ganguly & Pandey, 2024).

Modern artificial intelligence technologies, according to the existing research, can be of enormous assistance in enhancing education, including the formulation of personalized learning journeys, automatic grading, and intelligent tutoring systems. However, the same technologies have posed complexities that jeopardize the traditional approaches of upholding academic integrity. With giant language models, established norms have been dented because such systems can generate highly academic content, which is hard to tell apart from human-produced content (Ateeq et al., 2024).

Academic Integrity Challenges in the AI Era

The emergence of generative AI as a reality has enabled it to generate novel types of academic integrity violations that were previously inexplicable. The review of the literature by Sozon et al. (2024) revealed that cases of academic integrity violations in post-secondary education are becoming more sophisticated and increasingly complex to detect. Existing plagiarism detection software uses parallels between words (or phrases) copied and published

earlier. Still, it fails to identify text created by an AI-based program, which can be original but not necessarily created by the student.

Khatri and Karki (2023) also affirm the progressive reduction of education and academic ethics and integrity regulations regarding the implementation of AI in the upper education process. The old definition of academic misconduct, as they demonstrate in their study, needs to be revised to incorporate AI-aided cheating, unauthorized use of AI to complete an assessment, and submissions produced by AI as unique and original work by a student. These new patterns of academic dishonesty are a serious threat to educational establishments that aim to hold standards and objective assessment practices.

The implications of these challenges not only cause ineffective individual performance of malpractice but also question the integrity of higher education itself. The fact that academic degrees may be given any significance becomes quite questionable as soon as students learn to use AI to do their homework, pass exams, and write research papers without devoting time and acquiring actual knowledge or skills (Plata et al., 2023).

Impact on Assessment Strategies and Educational Practices

The widespread adoption of AI-driven technologies has necessitated a reevaluation of assessment development and educational practices, which has proven to be a deep-seated issue. Evangelista (2025) posits that, in the era of ChatGPT and other automated technologies, exams and assignments can no longer be considered a reliable method for ensuring academic integrity. Schools need to re-evaluate their assessment initiatives by abandoning the assessment units that can be readily completed using AI in favor of assessments that evaluate student learning and efficacy.

Based on the study by Neves et al. (2024), which compares technological advances in the context of education, the consequences of the impact of artificial intelligence on academic integrity are questions that institutions must fully address. Policy development, faculty member training, student learning, and technological solutions are examples of ways in which such responses should be involved. The key problem with this is that assessment strategies must be designed not only to avoid AI but be pedagogically valid, in that they measure actual student learning and not the knowledge of the AI system itself.

The article by Moya et al. (2024) is a concise scoping study, and it is explicitly aimed at academic integrity and its use in the framework of higher education, in the example of artificial intelligence. The implications of their findings state that the most high-profile establishments should use holistic approaches which integrate both technological, pedagogical and ethical aspects. Such integration will necessitate heavy investment in faculty development, infrastructural development, and policymaking in the development of academic sustainability in AI-enhanced learning spaces.

Emerging Policy and Ethical Frameworks

Universities across the globe have played a significant role in shaping policies and frameworks related to ethical AI. Roquiza Chavez et al. (2023) devoted a systematic review study to the influence of artificial intelligence on academic integrity in learning. Their research demonstrates that AI technologies pose a significant threat to what is conventionally considered academic integrity; nevertheless, the possibility of enhancing the quality of education and preventing academic fraud is a reality, if it is implemented properly.

The latest trend of opinion among academicians and practitioners suggests that preventive measures regarding the application of AI in the learning process have become technically unsustainable and counter intuitive. Instead, the strategies that institutions must develop must incorporate subtle policies that can differentiate between the use of AI that is acceptable and otherwise and offer transparent guidelines to students and policymakers. Such policies must be culturally sensitive and contextually appropriate, considering the needs and constraints of specific educational systems and cultural contexts.

Limitations

This research acknowledges some limitations that could affect the applicability of its results. It was restricted to literature published between 2023 and 2025, which might overlook earlier foundational studies on AI and scholarly integrity. Most analyses focused mainly on publications in English, which could have limited access to other relevant research published in different languages or regional contexts.

The fast-paced development of AI technology indicates that findings might become out-of-date soon, as the new AI potentials will outrun academic studies, which need to define the implications of such tools. Moreover, the scarcity of empirical evidence in the context of Sri Lankan higher education led to the need to generalize on the findings of foreign studies, which might not encompass all cultural, technological, and institutional peculiarities. Also, the research failed to capture empirical data among Sri Lankan higher education stakeholders. The interviews with academic personnel of local universities would have been beneficial to get first-hand information about the specifics of the challenges within the institution, attitudes toward AI implementation, and the practical-related issues of academic integrity. Such perspectives should have been included in order to give the study a more contextual depth and minimize the fact that they depend on global generalizations' scope of the study was also limited by the information available as peer-reviewed literature on this emerging topic, which may limit identification of valuable grey literature sources or institutional reports that may contain useful information on the challenges and solutions of executing programs practically.

Table 1

Literature review summary

Author(s) & Year	Focus of Study	Methodology	Key Findings	Relevance to Current Study
Fowler (2023)	AI in higher education	Conceptual	AI technologies transform teaching/learning but raise serious ethical concerns	Highlights ethical risks of AI adoption in Sri Lankan context
Perkins (2023)	LLMs & academic integrity	Conceptual	ChatGPT challenges traditional plagiarism detection	Shows limitations of current integrity tools
Khatri & Karki (2023)	AI in higher education	Empirical	AI-assisted cheating requires new definitions of misconduct	Expands integrity framework for AI
Plata et al. (2023)	Policy themes in AI & education	Conceptual	Global institutions still lack cohesive AI policies	Underlines need for Sri Lankan policy alignment
Rodríguez Chávez et al. (2023)	AI & academic integrity	Systematic Review	AI can both undermine and enhance academic integrity	Supports balanced, ethical integration of AI
Ateeq et al. (2024)	AI & academic integrity	Empirical	AI challenges plagiarism and holistic assessment norms	Demonstrates risks of LLMs in higher education
Ganguly & Pandey (2024)	AI tools in research	Conceptual	Deployment of AI tools raises ethics and research concerns	Highlights need for faculty awareness/training
Moya et al. (2024)	AI & integrity in HE	Scoping Review	Integration requires policy + pedagogy for sustainability	Provides holistic model for Sri Lanka

Neves et al. (2024)	Tech innovations in education	Scoping Review	AI impacts require valid, AI-resistant assessments	Supports authentic and process-based assessments
Sozon et al. (2024)	Integrity violations in HE	Systematic Review	AI-related misconduct is increasingly complex to detect	Strengthens case for updated detection tools
Tamanna & Sinha (2024)	AI in higher education (Bangladesh)	Case Study / Conceptual	AI creates opportunities and risks for academic quality	Regional relevance for Sri Lanka
Evangelista (2025)	Exam design in AI era	Conceptual	Traditional exams unreliable in AI age	Suggests redesigning assessments for integrity

Methodology

The research employs the literature review approach, in which 12 peer-reviewed academic articles published between 2023 and 2025 will be collected to learn more about how artificial intelligence will be used in the field of academic integrity in higher education. The selected articles have a diversity of geographical location and methodological approaches, which are systematic reviews, scoping reviews, conceptual reviews, and empirical studies. The study will help find major themes, challenges, and come up with solutions regarding AI and academic integrity, the features of the challenges as they concern higher education institutions in Sri Lanka, in particular.

The approach methodology would imply a thematic review of the selected literature and the identification of general patterns and tendencies in the problem of academic integrity around AI. This paper concentrates on the case of higher education in Sri Lanka and especially emphasizes the technological infrastructure, cultural values, and the institutional opportunities of the introduction of AI-based policies and practices.

In this research, the literature review approach has been utilized, as the peer-reviewed academic articles published in 2023-2025 were analyzed to comprehend the position of artificial intelligence in academic integrity in higher education.

Paper Collection

First, 38 articles were found in large academic databases, such as Scopus, Web of Science, Google Scholar, and ResearchGate. The reason why these databases were selected is because they cover in detail quality peer-reviewed journals in the field of education and technology.

Keywords Used

The search terms that were entered to cover a wide range were the following, used in various combinations: artificial intelligence in higher education, AI academic integrity, AI plagiarism detection, Sri Lanka higher education AI, AI assessment strategies, and AI ethical use in education.

Out of the 38 initial studies, abstracts were initially screened in terms of relevance. A complete review was then conducted to be sure that it was methodologically and thematically compatible with the research problem. The product was 12 articles that were used in the analysis.

Theoretical Framework

The given research is informed by the framework of the International Center of Academic Integrity (ICAI) (2019), which presents a set of fundamental principles of honesty, trust, fairness, respect, and responsibility. These

principles were applied to include the problems of AI technologies, including machine authorship, cheating with the help of AI, and the reaction of institutions to the maintenance of academic integrity.

The systematic literature review can be explained by the fact that AI is emerging in the sphere of higher education, and the empirical data available in Sri Lanka are not plentiful. This strategy allowed identifying and synthesizing the most important trends in the world, and they could be applied to developing the Sri Lankan higher education system. Although the lack of local interviews or survey data is a weakness, the thematic synthesis of 12 peer-reviewed articles offers a high-quality and credible base on which the recommendation can be worked out in the case of Sri Lanka.

Findings and Discussion

Primary Challenges to Academic Integrity

The discussion highlights several key concerns that AI technologies pose to academic integrity within the context of higher learning institutions. The most significant limitation is the inability to distinguish between human- and AI-produced content. Even conventional plagiarism detection tools often fail to detect complex AI-generated work, resulting in gaps in institutional capacity to uphold scholarly norms (Perkins, 2023).

A significant issue is the potential overlap between the acceptability of AI assistance and academic misconduct. Although AI tools can also be used as practical learning tools, similar to calculators or reference materials, there is a problem in defining the level of usage. Students are likely unsure how to distinguish between the potential benefits of AI aid and academic cheating, particularly when there are few to no guidelines at the institutional level (Ateeq et al., 2024).

The pace of AI development and advances continues to challenge how quickly educational institutions develop policies. Schools often lag in technological progress, and their policies are not aligned with the rapidly emerging capabilities of AI. This gap leaves students and staff uncertain about what and how AI should be adopted, as well as how to respond to potential misapplications (Evangelista, 2025).

Although the risks of AI to academic integrity have been a central topic in the analysis, it is equally crucial to note that AI can be used to better the academic institution. The personalized learning and minimizing inequities in students can be supported by AI-controlled tutoring systems, adaptive learning platforms, and automated feedback tools. As an example, AI can assist underprepared students in recognizing the learning gaps, offering them instant formative feedback, and making them more engaged with the course content. Such applications can be used in the Sri Lankan context to ease the workload among the faculty and enhance access to quality education, especially in institutions with restricted resources. Thus, the concept of AI cannot be merely presented as a danger but also as a tactic that, with a robust system of integrity, can enhance the performance of the learning process and the overall quality of a particular institution.

Implications for Assessment Design

The research proved that knowledge measurement processes should be inherently configured to preserve their reliability in the age of AI. Multiple-choice questions, the usual essay questions, and the usual research reports are a challenge as it is easy to apply AI software to complete these tasks without really knowing whether learning and achievement has taken place. Learning institutions are required to develop novel non-AI-computable and yet pedagogically valuable assessment models (Moya et al., 2024).

A process-based approach to assessment is relatively new and thus very promising as an alternative to traditional, product-focused assessment. Such methods are purported to focus on the learning experience, rather than the end product, by incorporating features such as reflective portfolios, iterative drafts, instructor comments, and archives

of research and writing processes. These approaches can encourage students to make full use of AI-related assistance and contribute to higher learning involvement (Neves et al., 2024).

It is also possible to address AI-related challenges by using authentic assessment strategies. Such tests require students to apply these facts and abilities in real-life situations that cannot be easily simulated with AI assistance alone. These case studies involve the integration of personal experiences, collaborative activities that require interaction with peers, and presentations, which necessitate spontaneous responses to questions (Fowler, 2023).

Institutional Response Strategies

The literature presents various types of institutional responses to academic integrity issues related to AI. Policy development has become an essential need, and institutions require thorough guidelines that cover what constitutes appropriate uses of AI, what is prohibited, and the penalties for infringement. Such policies should be disseminated regularly, in response to changes in technology, and should include clear illustrations and scenarios to guide the actions of students and faculty (Plata et al., 2023).

It is indicated that faculty development and training programs are essential elements of effective institutional responses. Teachers require guidance in comprehending AI capabilities, identifying potential ways to utilize AI in student work, and adapting their teaching and assessment activities accordingly. It requires continuous and extensive training, encompassing both technological and educational aspects of AI integration in education (Ganguly & Pandey, 2024).

Opportunities for Positive AI Integration

Nevertheless, this paper identifies considerable prospects for the constructive use of AI in higher education, which can improve, rather than damage, academic integrity. AI-based plagiarism detectors continue to advance, and there are even tools specifically designed to detect AI-generated work. Question: As technologies that do not solve the problem of academic dishonesty, they are not without their faults; however, they can significantly help academic standards as they are included in the integrity strategies (Rodriguez Chavez et al., 2023).

AI tutoring and learning support systems introduce opportunities to improve the quality of education without compromising the principles of integrity. Assignments do not need to be completed to receive feedback on knowledge gaps and what should be learned next, as well as personalized feedback. The well-timed introduction of such tools may enhance the outcomes of the learning process and maintain the authenticity of student work (Tamanna & Sinha, 2024).

Automated assessment and feedback systems also have the potential to be beneficial in enhancing academic integrity, particularly in conjunction with improved educational efficiency. AI can provide a direct response to drafting work, highlighting weak aspects and suggesting revisions for students to make. The strategy promotes learning without interfering with individual student responsibility in ensuring the quality and originality of the end-product (Sozon et al., 2024).

Contextual Considerations for Sri Lankan Higher Education

When translating these findings into practice regarding Sri Lankan higher education, it is also necessary to consider certain contextual factors that can influence implementation practices. The lack of technological infrastructure in certain institutions might restrict the provision of advanced AI detection tools or broad learning management systems.

The approaches to AI integration and academic integrity may also be influenced by the cultural values and educational traditions within Sri Lanka. Generational attitudes toward cooperative education and knowledge exchange can be a reason to pay close attention to drafting policies regarding the application of AI and establishing academic autonomy. The responses of organizations should not be oblivious to cultural values and realities of technology.

The corporation provides further consideration for policy development to the diverse economic and technological backgrounds of Sri Lankan students. The availability of AI tools is not equal, which can raise issues of fairness when other students possess an advantageous access to technology. Besides the culture and equity factors, there are several pragmatic issues that make AI-integrity strategies a difficult move in Sri Lanka. The low financial resources and allocation of funds do not allow the universities to invest in the advanced AI-detection systems or overall digital infrastructures. The culture of high-exam remains to be very strong in the sphere of higher education, which complicates the move to process-based and authentic assessment methods. Furthermore, not all academic personnel have access to systematic professional training in the fields of digital pedagogy and AI literacy, which lowers the willingness of the institutions to implement reforms. These are the challenges that underline the significance of offering context-sensitive and progressive approaches instead of expecting a comprehensive change.

Recommendations

Using a comprehensive analysis of available literature, it is possible to make several main recommendations to provide to institutions of higher learning in Sri Lanka to address the problem of AI-related academic integrity at the supramarginal level.

Policy Development and Implementation

Institutions are also supposed to seek solutions in the policies to ensure they embrace the use of AI fully where acceptable and unacceptable practices are explicitly stated. These policies must be updated every now and then to match the technological changes and should also include stunning examples of the different scholarly research. Violation penalties should also be adequately defined, and there should be avenues of appeal that attempt to capture the complexity of AI-misconduct cases.

Such policies can be reduced to the existing University Grants Commission (UGC) quality assurance systems in the Sri Lankan context in a cost-efficient and non-innovative manner to prevent the establishment of new systems.

Assessment Reform and Innovation

Future education should focus on creating assessment practices that minimize interference with pedagogical purposes while maximizing the elimination of inappropriate AI assistance.

Reforms make more sense in the Sri Lankan context: because universities can test authentic and process-based assessments in a few faculties before being implemented on a systemwide basis, the reforms will be less disruptive to the established exam culture.

Faculty and Staff Development

Thorough training opportunities should be developed to enable faculty to comprehend the potential of AI, identify potential AI applications in student work, and adapt their teaching activities accordingly. This should be a continuous training program that encompasses both technological and pedagogical aspects.

Affordable options in the Sri Lankan environment are collaboration with foreign (international) universities or EdTech vendors to provide training online, which will allow to address the lack of the necessary resources.

Student Education and Support

Students need to be properly advised on the proper use of AI, fully understand the concepts of academic integrity as applied to AI and acquire skills that supplement the functionality of AI. The importance of authentic learning and the difficulty of academic dishonesty should have been the focus of educational programs.

In the Sri Lankan case, the awareness programs could be incorporated into the student orientation programs and student counselling services, so that the various groups of students could be aware of the risks and ethical applications of AI.

Technology Integration and Infrastructure

Detailed technological architecture to aid AI-based detection, learning management, and educational enhancement must be invested in by institutions but to keep the competitive playing field, all students should have equal access to this technology without discrimination on the basis of economic status.

The awareness programs, in the Sri Lankan case, can be integrated into the student orientation programs and student counselling services, whereby the different groups of students would be informed about the risks and ethical uses of AI.

Conclusion

Artificial intelligence is a groundbreaking duality in the academic integrity of higher education in Sri Lanka that not only breaks the established paradigms but also creates a new gateway to academic development as never before. As this literature review shows, AI technologies have radically changed the face of academic dishonesty by introducing sophisticated new trends of misconduct and incredibly efficient educational improvement and integrity detection tools.

Those challenges demand urgent and comprehensive reform in Sri Lankan educational institutions, policymakers, and stakeholders. Traditional intellectual property protection is insufficient against the capabilities of advanced AI and necessitates broad changes in policy development, assessment policies, and teaching frameworks. However, the potential benefits are also significant, as AI will enhance personalized learning, provide educational agents with innovative ideas, and strengthen the integrity checks if implemented correctly.

This will require collaborative efforts across all levels of institutions, and recommendations must be adapted to fit specific circumstances in Sri Lanka and should be updated regularly as technology evolves. A delicate balance between technological innovation and the preservation of educational values will determine the future of academic integrity in higher education within the Sri Lankan academic system. With increasing digitalization, Sri Lanka's experience in handling academic integrity issues related to AI could steer the global conversation on educational innovation and position the country as a leader in the ethical application of AI in higher education.

Although the research offers a thorough discussion on the effects of AI on academic dishonesty, certain parts could be better elaborated and enhanced in language. Some of the passages are very descriptive and will be better placed with shorter sentences. Further revisions will focus on tightening the stream of the narrative, maintaining uniformity in terminology (e.g. AI tools, generative AI), and clarifying complicated concepts to make them more user friendly.

Originality and New contribution to knowledge

This work is original and unique in its contribution to the global discussions on AI and academic integrity, as the field of higher education in Sri Lanka has not yet been well-researched. It offers an analytical framework of the challenges and the opportunities of AI adoption by synthesizing 12 recent peer-reviewed studies. Although a significant part of the discussion is devoted to the issues of plagiarism and assessment validity, the research also mentions the positive aspects of AI in the context of personalized learning, workload distribution, and student engagement. This balanced view also makes sure that the research does not just warn of the threats but also adds to actionable information to be taken by policy makers, academics, and institutions interested in harnessing AI responsibly in Sri Lanka.

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Fostering Active Learning of English Tenses among Teacher Trainees through Interactive Language Games

Madhu Nawamalika Nawarathne^{1*}

¹*Hapitigam National College of Education, Mirigama*

Corresponding author*: Nawarathnemadhu@gmail.com

Abstract

This study explores the effectiveness of interactive language games in enhancing teacher trainees' active participation in practicing and mastering English tenses. Traditional grammar teaching methods often lack sufficient engagement to promote sustained learning. This study examines how language games can serve as interactive instructional strategies to enhance learners' motivation and understanding of tense structures. A mixed-method research design was employed, involving a random sample of 40 pre-service teacher trainees at a National College of Education. Participants were randomly divided into two groups: control and experimental groups. Over a six-week intervention period, nine language games were introduced to the experimental group to teach nine types of English tenses. Data was collected through two written tests, classroom observations, and a student feedback questionnaire. Quantitative data, including test scores, were analyzed using averages, percentages, and ANOVA (via SPSS) to identify significant differences. Qualitative data from the observation checklists and the student questionnaire were analyzed through manual thematic analysis procedures. Findings revealed a significant improvement in students' motivation, willingness to participate, and overall confidence in using English tenses accurately in both written and spoken contexts. Moreover, the collaborative and enjoyable nature of games helped reduce learner anxiety and fostered a more interactive and supportive learning atmosphere. The results emphasize the importance of incorporating learner-centered, interactive approaches such as language games into grammar pedagogy, particularly in contexts where English is taught as a second language. Recommendations for teacher

Introduction

educators and curriculum developers are provided to support the incorporation of game-based learning in language classrooms to improve grammatical competence among teacher trainees.

Keywords: Game-based learning; Interactive language games; Learner-centered approach; Mixed method; English as a Second language

Mastering English verb tenses is a fundamental component for achieving overall language proficiency and essential to the professional development of teacher trainees. English language proficiency is not only important for effective communication, but also for modeling accurate language use in their future requirements. Conventional teaching methods are often based on rote learning and tend to be teacher-centered, which often results in limited learner engagement and ineffective learning outcomes. The results of present-day examinations indicate that most students learning English as a second language have not achieved the minimum standard expected of them. In this regard, many studies have been conducted. A study by Navaz and Sama (2017), based on teaching grammar in the English language classroom: Perceptions and practices of students and teachers in the Ampara district, suggested that

teachers should use new methodologies for teaching grammar to make English grammar more interesting. Yolageldili and Arican (2011) revealed that language games promote a fun learning environment and provide students with opportunities to learn through practical and enjoyable experiences. Rosa (1998) found that the use of language games breaks down students' stereotypical learning patterns and creates more engaging learning experiences. This study highlights that interactive, learner-centered methods such as game-based activities have emerged as a promising alternative, encouraging active participation and making grammar instruction more meaningful. Game-based approaches provide opportunities for language learners to apply tense structures in real-life scenarios, improving both retention and communicative competence. According to Yaccob (2019), teachers should adjust their lessons to suit the different learning styles of students, by employing various methods, particularly language games. Willis and Willis (2013) suggest that language games allow students learning English as a second language to work in groups, thereby creating more opportunities for language use. Adeng and Shah (2012) presented the view that games are highly suitable for learning second language grammar because they create interesting communication opportunities unlike traditional school textbooks and resource books. Philpot (2003) argues that language games help make language learning more memorable and accessible

Language-based activities provide a learner-friendly environment that combines emotional, social, and cognitive elements of language learning. They support learner self-satisfaction, reduce anxiety, encourage active participation as well as the practical application of tense rules. According to Brewster and Ellis (2002), adding variety to learning situations while changing the pace of a lesson helps to maintain students' motivation. They state that games provide implicit practice in specific language patterns. Wang (2010) pointed out that the communication activities in a language game provide a context for using targeted language to convey information and engage in meaningful interaction with others.

Despite recognizing the benefits of interactive learning, there remains a considerable lack of research focused on English tense improvement programs for teacher trainees in the National Colleges of Education in Sri Lanka, especially in non-native English-speaking contexts. In particular, the exploration of learners' attitudes towards game-based methods for grammar instruction is insufficient.

This study aims to achieve the following objective:

To study the effectiveness of interactive language games in enhancing teacher trainees' active participation in practicing and mastering English tenses.

Materials and Methods

Research Design

This study implemented a mixed-method experimental design, using both quantitative and qualitative approaches to evaluate the effect of language games on teaching English tenses to English as a second language learners.

Sampling Method

Forty teacher trainees from the National College of Education were randomly selected and equally divided into an experimental and a control group. The following data collection methods were employed.

Methods of Data Collection

1. Two Tests

Pre-test: Designed to measure the existing knowledge of tense usage among both groups.

Post-test: Conducted after the intervention to measure the improvement in tense-related performance of both groups.

These two tests were administered using a similar test paper, which contained twenty sentences to be completed using the correct tense form.

2. Classroom Observation

Conducted with a structured observation checklist focusing on students' interaction and engagement during the intervention. The experimental group of 20 participants was observed in the classroom by their English lecturer. The involvement of each student was observed using ten criteria, focused on learners' active participation, cooperation, interaction, and engagement. No observation was carried out for the control group, as the intention was to measure the effects of the intervention.

3. Students' Feedback Questionnaire

Administered in the Sinhala language to ensure comprehension and to collect qualitative feedback on participants' engagement and perceptions. This was conducted for the experimental group after the intervention. Before the intervention, both groups were given a pre-test to assess their existing knowledge. The experimental group received instruction on English tenses through language games, focusing on making tense practice more interactive. These activities included sentence construction games, board games, picture clues, covering nine types of tenses, and storytelling prompts with visual aids such as pictures. The control group was taught using traditional teacher-centered methods of grammar teaching involving textbook exercises and teacher-led explanations. After the intervention, both groups completed a post-test. The questionnaire and classroom observations were conducted simultaneously to gather qualitative data. Quantitative data from the two tests were analyzed using descriptive statistics, and statistical tests such as ANOVA to compare mean scores before and after the intervention. Quantitative data were analyzed using manual thematic analysis by converting the results of the checklist and the questionnaire into numbers where possible. The two analyses provided a mixed-method approach, combining both statistical evidence and descriptive insights into the study.

Results

1. Test Performance

The test results indicated a significant improvement in the experimental group compared to the control group. The following table presents the types of language games used with the experimental group to teach tenses and the progress made by the learners after engaging in the language game activities.

Table 1

The Overall Progress of the Two Groups in Using Tenses at the Two Tests

Type of Tense	No. of correct answers. pre-test-Experimental group	No. of correct answers Pre-test-control group	Prevai led level	Number of correct answers. Post-test Experimental group	Number of correct answers Post-test control group	Level of progress
Simple Present	26/60	36/60	10/60	42/60	40/60	+2/60
Simple Past	19/40	20/40	-1/40	31/40	23/40	+8/40
Simple Future	22/60	23/60	-1/60	48/60	40/60	+8/60
Present Continuous	17/40	9/40	+8/40	31/40	14/40	+17/40
Past Continuous	18/40	17/40	+1/40	22/40	20/40	+2/40
Future Continuous	13/40	22/40	-9/40	30/40	15/40	+15/0
Present Perfect	19/40	13/40	+6/40	29/40	19/40	+10/40
Past Perfect	16/40	18/40	-2/40	26/40	18/40	+8/40
Future Perfect	7/40	12/40	-5/40	19/40	7/40	+12/40

2. Classroom Observation

Participants in the experimental group exhibited a significant level of engagement, frequent interaction in English, and displayed greater confidence in using tenses. Peer correction and the natural use of target forms were frequently observed. The following data were collected through the checklist.

Table 2

Results of the Observation Checklist

Participant's ID (Eg)	Observation Checklist									Yes =1 No =0		Total
	C1. Pay attention in class	C2. Involves a collaborative activity with others.	C3. Attempts to do his/her work well.	1. Participates actively in	C4. Asks more questions to get	C5. Speaks in the target language	C6. Perform well in games	C7. Engages in games enthusiastically	C8. Learning seems to be fun.	C9. Expresses thoughtful ideas,		
Eg1	1	1	1	1	1	1	1	1	1	1		10
Eg2	1	1	1	1	1	1	0	1	1	1		9
Eg3	1	1	1	0	0	1	1	0	1	0		6
Eg4	1	1	1	1	1	1	1	1	1	1		10
Eg5	1	1	1	1	1	1	0	1	1	1		9
Eg6	1	0	0	0	0	0	0	1	1	1		4
Eg7	1	1	1	1	1	1	1	1	1	1		10
Eg8	1	1	1	1	1	1	1	1	1	1		10
Eg9	1	1	1	0	0	0	0	1	0	1		5
Eg10	1	1	1	1	1	1	1	1	1	1		10
Eg11	1	1	1	1	1	1	1	1	1	1		10
Eg12	0	0	1	0	0	1	1	1	1	1		6
Eg13	1	1	1	1	1	1	1	1	1	1		10
Eg14	0	0	0	1	1	0	1	0	1	1		5
Eg15	1	0	0	1	1	1	1	1	1	1		8
Eg16	1	1	1	0	0	0	0	0	1	0		4
Eg17	0	1	0	0	0	0	0	0	0	0		2
Eg18	1	1	0	1	0	1	0	1	0	1		6
Eg19	1	1	1	1	0	1	1	1	1	1		9
Eg20	1	1	1	1	1	0	1	1	1	1		9

3. Students' Feedback Questionnaire

The feedback from the questionnaire showed increased engagement, confidence, and motivation among the participants. The results revealed that most participants in the experimental group found the language games engaging and reported a better grasp of tense forms. Learners indicated that the games helped them grasp complex

tense structures more easily and increased their motivation to learn tenses. This analysis highlights the participants in the experimental group had varied experiences. They acknowledged the value of language games in learning English tenses, as they are more creative and learner-friendly than conventional methods of learning tenses. They also expressed positive opinions about the effectiveness of language games in providing practical learning experiences.

Discussion

The findings highlight that integrating language games into the teaching of tenses can significantly enhance grammatical accuracy and learner engagement among teacher trainees. The experimental group's higher test scores and positive feedback demonstrate the potential of this approach in transforming grammar lessons into active, student-centered learning experiences. Language games provide real-life situations for active learning. The responses of the questionnaire showed that interactive language games improved learner engagement, confidence, motivation, and collaboration while reducing anxiety, supporting the observed progress in tense mastery.

This aligns with pedagogical theories advocating for experiential learning and further supports the need for innovative methods in English as a second language education. In educational reforms and curriculum development for English language teaching, it is important to integrate interactive and communicative learner-centered teaching strategies to enhance English as a second language learning in Sri Lanka.

Conclusion

This research confirms that game-based learning strategies, when integrated into tense instruction, positively influence the mastery of English tenses among teacher trainees. The approach not only improved test performance but also cultivated a more dynamic and interactive classroom environment. The results of this study contribute to the existing body of knowledge by demonstrating how language games improve ESL teacher trainees' mastery of tense forms, promoting active involvement, reducing anxiety, and refining grammar learning outcomes in the field of ESL teacher education. These results suggest that incorporating such methods into teacher training curricula could enhance future language teaching. These findings further highlight the value of rethinking conventional grammar teaching in the National Colleges of Education and other higher education institutions. Future research is recommended to examine long-term impacts, scalability of such interventions, and their integration into formal curriculum planning.

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Enhancing Interactive Learning in English-Medium Science: A Practitioner Intervention within the CLIL Framework

Muzammil Mukarrama^{1*}, Harsha Dulari Wijesekera²

¹ *Open University of Sri Lanka, Post Graduate Institute of English*

² *Sri Lanka Institute of Information Technology*

Corresponding author*: muzammilmukarrama@gmail.com

Abstract

Interactive learning is essential for meaningful engagement in science classrooms, especially in Sri Lanka's bilingual education (BE) system, where students transition from Mother Tongue Instruction (MTI) to English Medium Instruction (EMI) in Grade Six. Student reluctance to participate in EMI science lessons, often due to limited English proficiency, remains underexplored in this context. This study investigated the root causes of student reticence and implemented targeted interventions to enhance interaction through collaborative group work, evaluating the efficacy of these interventions. The research involved 21 Grade 8 Tamil-English emerging bilingual female students from a government school in the Western Province of Sri Lanka, who exhibited varied levels of English proficiency. None had prior exposure to Content and Language Integrated Learning (CLIL), the specified teaching approach to EMI, which is the main strategy deployed in the study. For this purpose, a single-group, quasi-experimental mixed-methods action research design was employed, structured around Lim's (2007) balanced model. Data collection occurred over three stages: before, during, and after intervention, using academic records, structured oral tasks, focus group discussions, classroom observations, and questionnaires. The intervention used collaborative group strategies within a CLIL framework, incorporating multimodal scaffolding, translanguaging (navigation between L1 and L2), and motivational techniques to foster engagement. Qualitative data underwent Thematic Content Analysis (TCA), and the quantitative written and oral evaluation marks from pre-test, test during the intervention, and post-test were compared using a Paired t-test. Foreign Language Classroom Speaking Anxiety (FLCSA) was inferred through pre-test qualitative indicators. The mid-intervention and the post-test findings confirm that collaborative CLIL activities, when novel, cognitively stimulating, and linguistically supportive, can significantly enhance interactive learning, reduce anxiety, and promote engagement in bilingual EMI classrooms. This study offers practical implications for science educators seeking to apply integrative pedagogical approaches tailored to the linguistic and cognitive needs of BE learners. Further research should explore long-term retention and use validated anxiety measures within control group settings.

Keywords: Bilingual Education; Interactive Learning; CLIL; FLCSA; EMI, Collaborative Learning

Introduction

Student interaction is vital in science classrooms, as it promotes inquiry-based learning, critical thinking, and conceptual understanding through dialogue and collaboration. In Sri Lanka's Bilingual Education (BE) framework, where students shift from their MTI to EMI in Grade 6, language proficiency often becomes a barrier to active

engagement. Although many students perform reasonably well in written General English¹ (GE) tests, classroom observations reveal ongoing challenges in integrated, context-dependent spoken Basic Interpersonal Communication Skills (BICS) and Cognitive Academic Language Proficiency (CALP) (Cummins, 2000), particularly needed during science instruction. BICS refers to conversational fluency in informal settings, whereas CALP involves cognitively demanding academic language (Cummins, 2000). Despite their written General English (GE) proficiency, these students hesitate to articulate academic ideas or engage in peer discussions and collaboration, limiting interactive learning. Coyle, Hood, and Marsh (2010) link 'language of learning' with CALP and 'language for learning' with BICS in their Language Triptych model. This distinction emphasizes that content-specific language (CALP) and classroom interactional language (BICS) required for science differ from General English and necessitate explicit pedagogical support in EMI classrooms.

Initial classroom observations and student oral presentations, triangulated by questionnaire responses, show students' low performance/conceptual understanding and reluctance to participate in oral interaction. These pre-intervention data corresponded with the participants' low performance in science, whose pre-intervention written test data typically ranged between 45 and 60, indicating low verbal and written ability in CALP. These challenges demand a pedagogical approach that integrates language development into subject instruction. As such, the teaching approach recommended in EMI classrooms is CLIL, which is "an educational approach in which various language-supportive strategies are integrated into subject teaching to enhance both content and language learning" (Coyle, Hood, & Marsh, 2010, p. 1; Wang & Liu, 2024). This CLIL framework revolves around the 4Cs—Content, Communication, Cognition, and Culture—which ensure a holistic integration of subject matter and language learning (Coyle et al., 2010). However, CLIL has not yet been effectively adopted in Sri Lankan EMI classrooms due to major gaps in pre- and in-service teacher training (Wijesekera & Nanayakkara, 2024).

Although EMI has been widely implemented in the Sri Lankan BE context, few empirical studies have explored targeted CLIL interventions, particularly to reduce reluctance to speak and improve science engagement, which is almost non-existent in the Sri Lankan context, to our knowledge. This study, therefore, aims to explore the root causes of student reluctance from teacher and student perspectives and implement targeted CLIL interventions to foster active and confident participation in BE science learning.

Multiple interrelated factors may contribute to student reticence in EMI classrooms, spanning affective, linguistic, psychological, and environmental dimensions (Irwanthi, 2017; Nagodavithana & Premarathne, 2023). Among these, it was perceived that Foreign Language Classroom Speaking Anxiety (FLCSA) may play a significant role. FLCSA is a speaking-specific form of Foreign Language Anxiety (FLA), defined as "a distinct complex of self-perceptions, beliefs, feelings, and behaviours related to classroom language learning arising from the uniqueness of the language learning process" (Horwid, Horwid, & Cope, 1986, p. 128). In EMI settings, fear of making mistakes and being judged, especially when the English language (L2) is perceived as a symbol of status, deters students from speaking (Fattahi Marnani & Cuocci, 2022; Wijesekera, 2012; Wijesekera, 2018). Linguistic barriers, such as limited content-specific vocabulary and underdeveloped academic language proficiency, hinder comprehension and expression. These challenges are compounded by low self-confidence and fear of negative evaluation, core features of FLA that suppress participation (Horwid, Horwid, & Cope, 1986). Additionally, limited teacher-student rapport may further reduce opportunities for meaningful engagement in teaching/learning. Collectively, these factors create a classroom environment that discourages speaking and interactive learning. In response, a CLIL-based intervention was introduced, integrating translanguaging (Wei, 2010) to support content processing and lower anxiety, while gradually building students' ability to express scientific concepts in English. Collaborative group work, an essential aspect of CLIL's 4Cs, formed the core of the intervention, supported by multimodal

¹ General English or English as a Second Language (ESL) is taught in Sri Lankan Schools from Grade 3 to 13, aiming to teach BCIS. Since only writing and reading skills are tested in public examinations, the negative washback effect impacts teaching and learning. This results in focusing only on writing and reading, especially neglecting speaking.

scaffolding tailored to students' linguistic and curricular needs. These strategies aimed to reduce student reticence and mitigate the perceived impact of FLCSA, promoting a more interactive, inclusive, and linguistically supportive EMI science classroom.

Theoretical Underpinnings

This study is grounded in the premise that perceived FLCSA is a significant obstacle to interactive learning in EMI settings. According to Krashen's Monitor Model, high affective filters such as anxiety can hinder both language acquisition and academic performance (Krashen, 1982). This is emphasised in recent findings showing that speaking anxiety continues to be a major barrier to student engagement and participation in foreign language classrooms (Nuralieva et al., 2024). In response, this study implemented an intervention blending collaborative learning, motivational strategies (Ahmed, 2012), and linguistic scaffolding to mitigate FLCSA in the BE science classroom.

This study draws on Sociocultural Theory, which emphasizes the role of social interaction in learning and language development. Vygotsky (1978) underlines how expert peers scaffold learning through tools such as metatalk and peer collaboration, which facilitate both comprehension and acquisition. This is supported by findings on Language-Related Episodes (LREs), which emerge during collaborative group tasks and enhance fluency and understanding (Wijesekera, 2012). Furthermore, effective group interaction depends on principles like positive interdependence, individual accountability, and supportive dynamics, all of which foster communicative competence in L2 contexts (Ahmed, 2012; Ibrahim & Adnan, 2019; Johnson et al., 2014, as cited in Wijesekera, 2012).

The intervention was framed by the CLIL approach, which promotes simultaneous content and language development (Coyle et al., 2010). CLIL fosters meaningful communication and has been shown to improve oral outcomes, reduce anxiety, and boost motivation in EMI settings (Marshall, 2000; Moate, 2011; Held, 2017; De Diezmas, 2016). In this study, CLIL was operationalised through instructional strategies grounded in social constructivist pedagogy, which views learning as co-constructed via interaction, negotiation, and scaffolding (Dewey, 1938; Piaget, 1970). Interactive, task-based activities such as Think-Pair-Share and information gap tasks supported purposeful peer communication (Prabhu, 1987). Task-based activities promote meaningful communication, fluency development, and reduce speaking anxiety by shifting the learner's attention toward interaction and collaboration (Ahmed, 2012; Ellis, 2003; Sholeh et al., 2020).

While past research often treats FLCSA and interactive learning as separate challenges, this study explores their intersection in the BE science classroom. By embedding collaborative group work within a CLIL framework, the study demonstrates how anxiety reduction, language development, and content mastery can be simultaneously achieved, offering a practical model for strengthening bilingual education in Sri Lanka and other similar EMI contexts.

Objectives

1. To investigate the root causes of student reticence in the EMI science classroom through teacher and student perspectives and propose targeted interventions.
2. To identify which CLIL-based strategies are most effective in promoting verbal engagement and reducing speaking anxiety.
3. To implement the selected strategies in a classroom setting and evaluate their efficacy on student participation and performance

Materials and Methods

Participants and Research Design

This study involved 21 Grade 8 Tamil-English bilingual female students from a 1AB government school in Sri Lanka's Western Province, each with heterogeneous L2 proficiency. These students had not previously been exposed to Content and Language Integrated Learning (CLIL), and the first author, as their science teacher, was newly appointed to their class. This study adopted a quasi-experimental, single-group, mixed-methods action research design, guided by the balanced model proposed by Lim (2007). The research design integrated a multi-dimensional pre-test phase, mid-intervention monitoring, and a post-test to assess student performance and interaction over time.

The pre-intervention phase combined existing academic scores of L2 and Science with newly administered oral presentations and fresh qualitative insights gathered through structured observations and student questionnaires. This approach enabled a comprehensive baseline assessment of learners' cognitive, linguistic, and affective starting points. FLCSA was inferred from qualitative indicators such as visible anxiety, self-reports, and a structured protocol used in teacher observation. The design was particularly suited to the action research context, where iterative reflection and continuous improvement are central to both process and outcomes.

The Intervention

The core intervention centered on collaborative group work aligned with CLIL principles. Students were organized into five heterogeneous groups considering L2 fluency, subject knowledge, and ethical considerations such as student willingness and equitable participation (Ibrahim & Adnan, 2019). To foster engagement, a range of multimodal (Lian, 2025), task-based activities were implemented, including Think-Pair-Share, information gap tasks (Prabhu, 1987), mini whiteboards, multimedia group presentations, and live experiments with activity recordings. On a par with social constructivism, scaffolding strategies were utilized to support language gaps and content comprehension. These strategies included sentence starter prompts, process diagrams, vocabulary blanks (Ibrahim & Adnan, 2019), and multimedia aids to address linguistic and conceptual gaps. Additionally, translanguaging (Garcia & Wei, 2014) between L1 and L2 in metatalk was intentionally encouraged (Garcia, 2009) to reduce cognitive load (Sweller, 1988) and enable flexible thinking within group discussions. A blended learning component was also introduced, with home-based pre-lesson tasks designed to activate background knowledge and support in-class performance. Motivation was reinforced through praise, relaxation techniques, and a rubric-based scoreboard that fostered a psychologically safe and competitive learning environment. Together, these CLIL-driven strategies aimed to enhance interaction, reduce anxiety, and build both linguistic confidence and scientific understanding in the EMI classroom.

Instruments, Data Collection and Data Analysis

Pre-intervention quantitative data were collected from students' written evaluation marks of L2 (GE) and science, alongside oral presentations assessed using rubrics. Qualitative insights into students' speaking, writing, and comprehension abilities were obtained through classroom observations, structured/open-ended questionnaires, followed by focus group discussions. These instruments primarily informed the identification of root causes behind student reticence and guided the refinement of the intervention. Data during intervention included rubric entries, scoreboard marks, focus group notes, observation records, and teacher-reflective journals, used to evaluate the effectiveness of CLIL strategies in promoting verbal engagement and reducing perceived FLCSA. Post-intervention data were drawn from written science marks, group presentation scores, student reflections, focus groups, and observation records to assess the intervention's overall impact on participation and performance. A mixed-methods analysis approach was adopted (Simons et al., 2019; Lim, 2007). Qualitative pre-test data were examined using root

cause analysis (Anderson & Fagerhaug, 2006), underpinned by behaviorist and cognitive psychology theories (Hardin, 2003). Quantitative pre-test data were analyzed via Pearson's Correlation Coefficient to explore links between L2 and science performance. Thematic Content Analysis (TCA) (Braun & Clarke, 2006), informed by expert-novice problem-solving theory, a framework from cognitive psychology that examines how experts and novices differ in their approaches to solving problems (Hardin, 2003; Sweller, 1988; Chi et al., 1981), was applied to the data during and post-intervention qualitative data. Comparative analysis of pre- and post-intervention outcomes used paired t-tests for quantitative results and TCA for qualitative findings, framed by higher-order learning theories (Hardin, 2003).

Results and Discussions

Pre-Test Results:

The pre-intervention assessment (pre-test) revealed notable disparities in student performance, with General English evaluation marks ranging from 70–90 and lower science scores between 40–65 (Figure 1). Statistical analysis showed a weak positive correlation between the two subjects ($r = 0.3493$, $p = 0.122$) (Table 1), indicating no significant link between GE proficiency and science achievement.

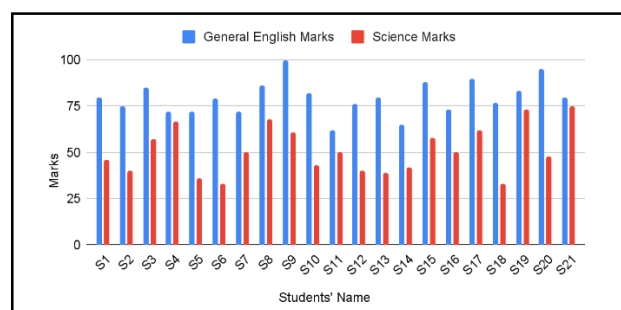


Figure 1

*Pre-Test: General English and Science Marks(L2).
Students represented as S1-S21.*

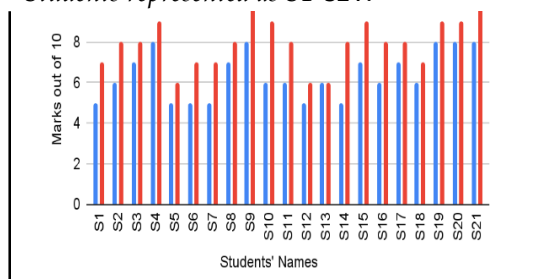


Figure 3

Science(L2) Oral Evaluation Marks Pre-Test and Post-Test.

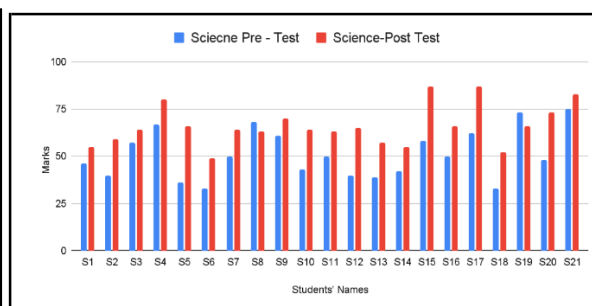


Figure 2

*Students' Science(L2) Written Test Marks
Comparison: Pre-Test and Post-Intervention Test*

Qualitative data supported the above findings: structured questionnaires highlighted high perceived FLCSA and limited CALP in science writing. Oral pre-tests exposed struggles with content-specific vocabulary and sentence construction, often paired with visible anxiety. Focus group discussions and classroom observations further revealed gaps in BICS, limiting interactions. A consistent theme was students' reluctance to engage with the new science teacher due to fear of making content or language mistakes. Together, these findings reveal a range of layered linguistic, affective, and psychological barriers that contribute to student reticence.

During-Intervention Test Results

During-intervention data concentrated on the effectiveness of collaborative CLIL strategies, with six codes identified through TCA and categorized into three main themes: pedagogical strategies, psychological and emotional support, and educational outcomes and effectiveness.

Pedagogical Strategies

A key theme that emerged was collaborative group work. Students demonstrated improved interaction with peers and teachers in problem-solving and presentations, particularly when tasks included novelty, cognitive challenge, and were preceded by pre-lesson activities. Enthusiasm also increased during information gap tasks, which encouraged peer communication. However, motivation declined when tasks were repetitive or lacked creativity, and when the limited resources restricted simultaneous group experimentation. As a response, subsequent lessons incorporated more authentic learning with enhanced resource allocation, including home-based equipment. The second point was language development and scaffolding. Sentence starter prompts and process diagrams helped bridge language gaps in line with CLIL principles. Notably, translanguaging, especially code-switching to L1 during metatalk, significantly enhanced comprehension and language acquisition, as seen in formative assessments. Nonetheless, some students disengaged when peers outperformed them, highlighting the need for targeted motivational strategies.

Psychological Support

A central theme was creating a supportive environment to build student confidence and reduce the fear of using L2 or anxiety. The teacher played a key role by interacting as a collaborative participant and offering consistent moral support. Code-switching to L1 was also employed strategically to address CALP gaps, helping reduce anxiety, preventing suppression of expression and feelings of alienation. Respect for student autonomy was evident as learners were permitted to switch groups upon reasonable request. Another prominent theme was motivational strategies to enhance engagement. Students responded positively when errors were addressed with constructive feedback and encouragement. Motivation was further sustained through a healthy competitive environment, where rubric scores were regularly displayed, and individualized feedback, praise, and rewards were used to foster active participation and minimize disengagement. While many students began speaking more confidently, complete comfort in using English remained challenging, although the observable signs of anxiety had noticeably declined.

Engaged Learning and Learning Outcomes

The critical aspect of this theme was engaged learning, and it was evident that students showed increased enthusiasm for collaborative group competitions through active participation, aiming to score more points on the scoreboard. Secondly, the expertise development theme highlighted progressive development from novice to expert in solving scientific problems. It was unveiled that students progressively used critical thinking and problem-solving strategies to score more points, positively impacting learning outcomes and reducing anxiety. These results show instructional effectiveness in content comprehension, cognition and language acquisition through a healthy group competition.

Post-Test Results

As illustrated in Section 4.1, the quantitative post-test confirmed significant improvement in student performance. Written science scores increased from a pre-test range of 40–65 to 60–80 (Figure 2), with a paired t-test T-value of 7.13 and $p < 0.05$ (T1) (Table 2). Similarly, oral Science presentation scores (Figure 3) showed a T-value of 9.65 (T2), also with $p < 0.05$ (Table 2), indicating a statistically significant effect on students' oral language use in L2. These

results demonstrate the intervention's positive impact on both written performance and spoken L2 fluency. Qualitative data further supported these findings. Student reflections highlighted improved L2 fluency, increased interest in science, greater willingness to collaborate, and enhanced confidence in presenting in English as perceived by them. Classroom observations confirmed higher engagement and interaction, reduced language anxiety, and improved BICS (language for learning). However, students continued to require support in forming accurate written sentences, as reflected in their grammatically flawed reflective entries. Though perceived FLCSA had declined, difficulty in accurate oral L2 usage persisted. Overall, the findings suggest the intervention effectively reduced reticence and enhanced interaction in EMI science classrooms, strengthening BE.

Conclusion and Suggestions

This study focused on BE science students' reluctance to engage in interactive learning. In direct response to the first objective, the root cause of this reticence was identified as a combination of multiple interrelated factors: insufficient CALP; limited BICS; perceived FLCSA (especially, fear of L2-related mistakes); and anxiety toward the newly assigned teacher. To address the second objective, the introduction of collaborative CLIL group activities—characterized by novelty, cognitive challenge, and pre-lesson preparation, and when combined with built-in scaffolding and translanguaging—proved most effective in promoting verbal engagement and reducing speaking anxiety, which significantly reduced reticence and improved classroom interaction. These strategies enhanced both language acquisition and subject comprehension through multimodal scaffolding. Motivational techniques further alleviated anxiety and strengthened students' confidence in oral presentations, strengthening CLIL outcomes. In contrast, tasks lacking novelty with monotony, less cognitive challenge, and insufficient resources proved less effective. The implementation and subsequent pre- and post-evaluations revealed overall efficacy as per the third objective. Despite the success, students continued to struggle with constructing accurate written and spoken L2 sentences, even though their perceived FLCSA was notably reduced. This highlights the need for continued linguistic support. As such, this study underscores the urgent need for EMI-focused teacher training, emphasizing policy reforms to embed CLIL, translanguaging, and scaffolding, aligning with NEC study findings (Wijesekera & Nanayakkara, 2024).

Limitations

The absence of a control group limited the generalizability of results. Moreover, had FLCSA been measured with a validated scale, more robust and individualized insights could have been generated, possibly improving the intervention's precision and impact. Future research should assess the long-term sustainability of improved confidence and interaction. However, embedding collaborative CLIL strategies into bilingual science classrooms offers a promising pathway to enhance student engagement, linguistic competence, and cognitive development, contributing meaningfully to the advancement of BE.

Acknowledgement

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Mindfulness for equity and engagement: A case study of innovative pedagogy in rural Sri Lanka

H. Samadhi Chathuprabha Hapuarachchi^{1*}, Chathuri Samarasinghe²

^{1,2}*Sri Lanka Institute of Information Technology*

Corresponding author*: samadi1999a@gmail.com

Abstract

This study examines the impact of mindfulness practices as an innovative pedagogy on holistic student development of grade 10 and 11 students at a secondary school in a rural area of Sri Lanka. Using a quasi-experimental design (N = 154), the study implemented structured mindfulness sessions three times per week over a six-week period, assessing their effects on students' emotional well-being, social behavior, and academic performance. Quantitative results using DASS-21 revealed significant reductions in stress, anxiety, and depression ($p < 0.001$) among the mindfulness group. Quantitative self-report questionnaire data showed increases in social relations, focus, and concentration, but no statistically significant difference in academic achievement was discovered. This study shows that mindfulness intervention can effectively improve students' emotional control, attentiveness, and social interactions, supporting its potential as an inclusive, lifelong learning strategy aligned with global educational priorities.

Keywords: Mindfulness; innovative pedagogy; Emotional Well-being; Social Behavior; Academic Performance

Introduction

A fundamental change is taking place in today's educational environments towards a more comprehensive understanding of student development that goes beyond academic competence. The growing understanding that social skills, emotional intelligence, and resilience are just as important for managing life's difficulties as cognitive ability is what is driving this transformation (Goleman, 1995). As a result, innovative pedagogies must prioritize holistic development beyond academic metrics, emphasizing the importance of nurturing the whole learner—intellectually, emotionally, and socially.

In line with Social-Emotional Learning (SEL) frameworks that place an emphasis on self-awareness, self-management, social awareness, relationship skills, and responsible decision-making, schools are increasingly implementing mindfulness to foster students' emotional and social competencies in addition to their cognitive development (Weissberg et al., 2024). Because of its capacity to promote both academic and personal development, mindfulness—a centuries-old practice—has become increasingly popular in contemporary schools (Kabat-Zinn, 2003). By raising awareness of one's thoughts, feelings, and immediate surroundings, mindfulness—which is defined as the deliberate practice of paying attention to the present moment with openness and without judgment—improves emotional regulation, reduces stress, and improves focus (Brown & Ryan, 2003). Zenner et al. (2014) have shown that mindfulness improves attention and resilience and acts as a mental health buffer in high-pressure educational contexts. By improving working memory, focus, and attention—all of which are essential for learning and problem-solving—mindfulness has been connected to good effects on academic accomplishment in addition

to emotional advantages (Zeidan et al., 2010; Schonert-Reichl & Roeser, 2016). Additionally, mindfulness promotes positive social behavior, enhancing communication, empathy, and cooperation—all of which help create a more encouraging and helpful learning environment (Sklad et al., 2012).

Given the rising prevalence of mental health issues among Sri Lankan youth, including stress, anxiety, and depression, this work has both academic and practical value (Rasalingam, Rajalingam, Chandradasa, & Nath, 2022). This project investigates mindfulness as a low-cost, culturally flexible teaching tool in response to the pressing need for efficient, scalable therapies. In resource-constrained rural areas, where access to mental health support is frequently restricted, mindfulness emerges as a particularly appropriate method through the integration of traditional practices such as breathwork and visualization into structured classroom routines.

This study presents mindfulness as an innovative pedagogy that supports the fundamental abilities necessary for lifelong learning, rather than just as a therapeutic practice (Jha, Krompinger, & Baime, 2007; Schonert-Reichl & Roeser, 2016). Although there is a wealth of research on the broad advantages of mindfulness for adults, little is known about its overall effects on student outcomes, especially when it comes to social behavior, mental health, and academic performance taken together.

Few studies have looked at the combined impacts in an actual classroom, despite the fact that few have addressed one or two of these characteristics. For example, after receiving mindfulness training, Sri Lankan pupils showed increased attention and engagement (Karunananda & Wijetunga, 2016). However, there are still disagreements on the best frequency, length, and kinds of mindfulness exercises for various age groups (Schonert-Reichl & Roeser, 2016). Consistent teacher preparation and institutional support are also essential for implementation (Kang, Rizzo, May, & Gupta, 2013; Zeidan, Johnson, Diamond, David, & Goolkasian, 2010).

By providing a thorough case study of how structured mindfulness practices affect students' emotional well-being, social behavior, and academic achievement in a secondary school in a rural area of Sri Lanka, this study fills these gaps. By doing this, it adds to the expanding corpus of studies on inclusive, egalitarian, and sustainable educational advances.

This study aims to answer the following research questions:

1. Do mindfulness exercises help students feel less stressed and anxious? If so, how does this affect their academic performance?
2. What effects does the practice of mindfulness have on students' behavior in the classroom, attention span, and focus?
3. Can students who participate in mindfulness programs develop better emotional regulation and self-compassion? If so, how may this help their social connections with classmates and teachers?

Materials and Methods

Research design

The effects of mindfulness techniques on students' social behavior, emotional health, and academic performance were examined in this study using a quasi-experimental design. Due to logistical limitations, a non-randomized pre-test/post-test control group technique was employed instead of randomly allocating students.

Study Context

The study was carried out at a secondary school in a rural area of Sri Lanka. The intervention focused on students in grades 10 and 11 (ages 15–16 years) during a pivotal lifelong learning transition: O/L exams. These students are

at a critical stage of cognitive, emotional, and social development and often experience both academic and emotional challenges. The varied academic and socioeconomic backgrounds of the school offered an appropriate setting for assessing the effects of mindfulness programs.

Participants and sampling

With the support of the school, a purposive sample of 154 grade 10–11 students (77 male, 77 female) were recruited as intact classroom groups from four classes. This approach minimized academic disruption while enabling the real-world implementation of mindfulness as a classroom pedagogy. The students were assigned to two groups: The “mindfulness” group ($n = 77$) participated in structured mindfulness-based classroom sessions conducted three times a week for six weeks, and the control group ($n = 77$) continued with their regular classroom routines without the integration of mindfulness practices.

Mindfulness Intervention

The six-week mindfulness protocol was implemented as a pedagogical innovation tailored for low-resource classroom environments. The intervention featured 10-minute sessions conducted three times a week—on Mondays, Wednesdays, and Fridays. Designed to coexist with and complement academic instruction, the sessions were facilitated by a qualified classroom teacher with academic training in sociology and psychology, reinforcing the approach's sustainability without reliance on external specialists. Each session included guided breathing techniques (e.g., inhaling and exhaling to a 1-2-3 count), posture and body awareness training, visualization exercises (such as color focus and “serene tree” imagery), and basic emotional regulation and relaxation strategies.

These activities were designed with the purpose of enhancing students' present-moment awareness, emotional control, and attention span and incorporated Kabat-Zinn's (1994) core mindfulness tenets such as present-moment focus, non-judgmental stance, and simplified practices for adolescent attention spans.

Instruments and Data Collection

Three primary sources of information were used:

1. **Academic Performance:** Test results for the first and second terms (average term test marks for all subjects for each student) were gathered from school records to assess any changes in academic achievement. The first-term test served as a baseline to confirm group comparability before the mindfulness intervention, and the second-term test, which was administered after completing the mindfulness program, served as a post-test to assess changes in academic performance between the two groups over time.
2. **Emotional Well-being:** After the intervention, emotional states were measured using the Depression, Anxiety, and Stress Scale (DASS-21), which has been validated for the local population. The DASS-21 comprises 21 items rated on a 4-point Likert scale, measuring levels of depression, anxiety, and stress. This scale was selected because it provides a reliable and efficient measure of key aspects of emotional well-being that mindfulness interventions are designed to influence.
3. **Social Behavior and Perception:** After the intervention, students' self-perceptions of focus, behavior, emotional control, and peer interactions were evaluated using a researcher-developed quantitative Likert-scale questionnaire, designed with reference to prior studies, relevant literature, and recommendations from the teacher who delivered the mindfulness program to ensure contextual appropriateness.

Data analysis

Quantitative data were analyzed using IBM SPSS Statistics (Version 21), and the following analyses were conducted:

1. Compared the mindfulness and regular groups' academic performance using the term test scores of the students. To ensure the validity of results, key statistical assumptions were tested prior to hypothesis testing. Normality was assessed using the Shapiro–Wilk test. For the first-term test marks, normality was met for both the mindfulness group ($p = .672$) and the regular group ($p = .333$). For the second-term test scores, normality was met for the regular group ($p = .214$) but violated for the mindfulness group ($p = .006$). Homogeneity of variance was evaluated using Levene's test, which indicated that the assumption of equal variances was met for both the first-term ($F(1,152) = 0.582, p = .447$) and second-term ($F(1,152) = 0.043, p = .837$) test marks. Outliers were checked using boxplots, with no outliers detected in either term test marks.

An independent samples t-test was used to compare academic performance between the mindfulness and regular groups for the first-term test marks, as assumptions of normality, homogeneity of variances, and absence of outliers were met. For the second-term test marks, where normality was violated in the experimental group, the non-parametric Mann–Whitney U test was employed to compare the two groups.

2. DASS-21 evaluation: Emotional states were measured using the DASS-21, which assesses depression, anxiety, and stress. Each subscale's raw score was doubled to make it comparable with the full 42-item DASS (DASS-42), allowing scores to be classified using the standard severity categories: normal, mild, moderate, and severe. This adjustment ensures that the results can be interpreted against established normative cut-offs. Clustered bar graphs were then used to visually compare the distribution of these severity levels across the mindfulness and control groups.
3. Chi-squared test was used to analyze responses on the researcher-developed Likert-scale questionnaire to assess how the mindfulness group and the regular group differed in terms of attentiveness, emotional control, and social engagement. The assumptions for the chi-square test include independence of observations and sufficient expected cell frequencies (all expected counts ≥ 5 or all expected count ≥ 1 and at least 80% of all expected counts ≥ 5). However, some expected cell counts were below this threshold. Therefore, these categorical levels were meaningfully combined to meet the adequate expected frequencies.

Results

Academic Performance

An independent samples t-test was conducted to compare baseline academic performance (first-term test marks) between the mindfulness and regular groups. Results showed no significant difference in baseline scores between the groups, $t(152) = 1.35, p = .179$. The mean difference was 3.58 percentage points (95% CI: -1.65 to 8.82), with a small effect size ($d = 0.216$), suggesting the two groups were reasonably comparable. Figure 1 shows that both the Mindfulness group and the Regular group had higher mean test marks in the second term compared to the first term, with the second term value being similar across groups.

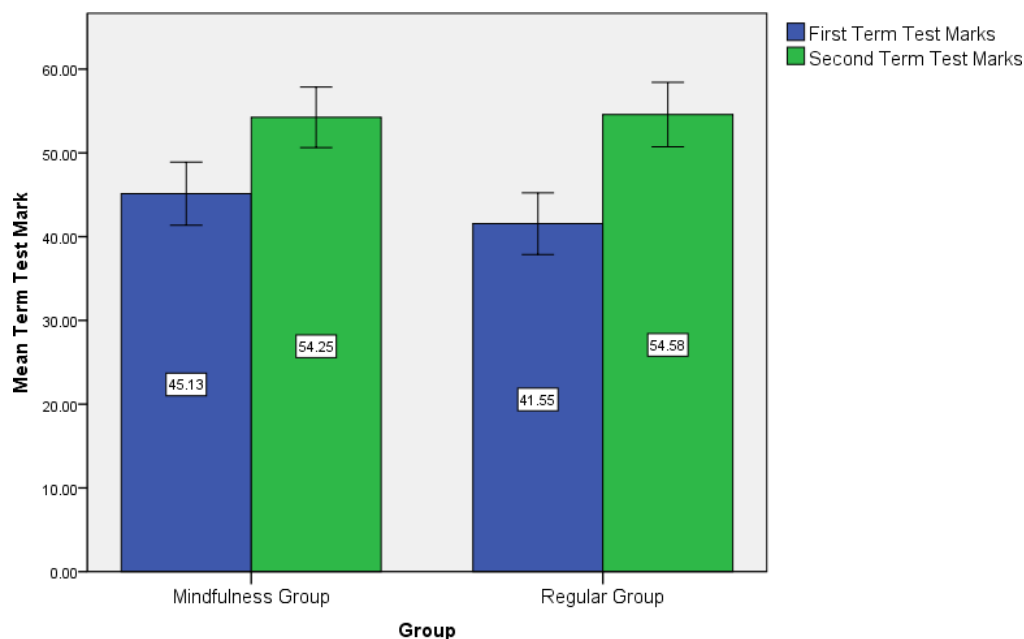


Figure 4

Clustered bar chart of the mean first and second-term test marks. Bars represent a 95% confidence interval of the group means.

Due to a violation of the normality assumption in the mindfulness group (Shapiro–Wilk $p < .05$), a non-parametric Mann–Whitney U test was conducted to compare second-term academic performance between the mindfulness and regular groups. The results showed no statistically significant difference between groups, $U = 2953$, $p = .968$. The effect size, measured using rank-biserial correlation, was very small ($r_{(b)} = 0.004$), indicating no practical difference in post-test performance following the mindfulness intervention.

Emotional well-being (DASS- 21 Analysis)

Students took the DASS-21, which evaluates stress, anxiety, and depression, after the intervention. As shown in Figure 2, the scores were divided into normal, mid, moderate, and severe levels. The clustered bar chart shows that nearly all students in the mindfulness intervention group reported normal levels of depression, anxiety, and stress, with almost no cases in higher severity categories. In contrast, the no-intervention group had significantly fewer students in the normal range and notable numbers experiencing mild to extremely severe symptoms.

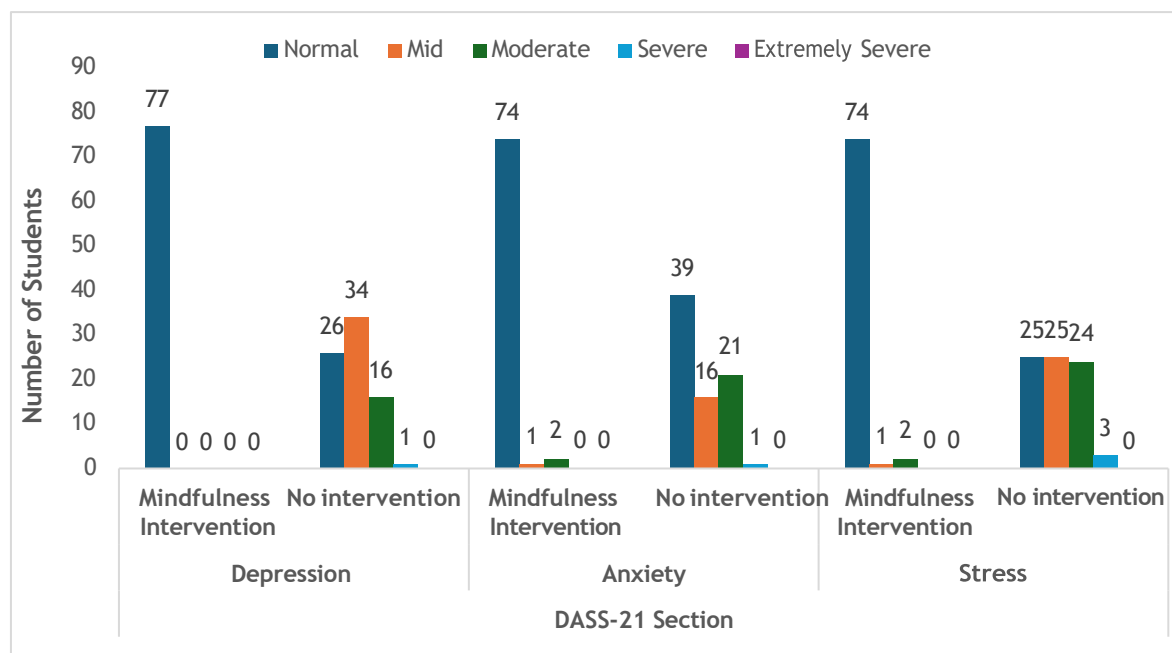


Figure 5

Clustered bar graph of the count of students for each DASS-21 section

Social behavior (Researcher-developed questionnaire analysis)

To determine whether replies varied substantially from the control group, a chi-square test was employed, and the following results, shown in Table 1, were obtained. The null hypothesis (H_0) posits that there is no relationship between students' responses to each questionnaire item and whether or not they received the mindfulness intervention.

Table 1

Chi-Square analysis output summary for the researcher-created Likert-scale questionnaire

Question		χ^2 Value	Df	p-value	H_0 Decision
1	Do you feel that mindfulness practices helped you to focus better in class?	139.062	4	< .001	Rejected
2	Do you feel that mindfulness practices helped you to pay attention to your teacher more effectively?	124.249	4	< .001	Rejected
3	Since participating in mindfulness practices, have you noticed any improvement in your focus and concentration during class?	27.769	2	< .001	Rejected
4	Do you feel it is easier to complete your homework and assignments?	5.168	3	.160	Not Rejected

5	Have your grades improved since you started practicing mindfulness?	111.468	3	< .001	Rejected
6	Since participating in mindfulness practices, do you feel that you have become more patient and understanding of others?	1.192	4	.879	Not Rejected
7	Do you find it easier to control your anger and frustration?	18.561	2	< .001	Rejected
8	Do you feel more confident in your interactions with peers?	154.000	4	< .001	Rejected
9	Have you noticed any changes in your ability to empathize with others?	122.985	3	< .001	Rejected
10	Do you believe that mindfulness practices have helped you develop stronger relationships with your peers?	135.579	3	< .001	Rejected

Discussion

The most significant outcome of this study was the improvement in students' emotional well-being. According to DASS-21 score analysis, students in the mindfulness group reported lower levels of depression, anxiety, and stress compared to those in the control group. This corroborates past studies on the advantages of mindfulness for mental health.

In addition to emotional improvements, students who practiced mindfulness reported greater attentiveness and focus during the class. The chi-square analysis (Table 1) revealed a statistically significant association between students' responses and mindfulness intervention for 8 out of 10 questionnaire items, particularly in areas such as improved focus, emotional regulation, confidence, empathy, and peer relationships, with the mindfulness group reporting more favorable outcomes. This suggests that even a short intervention can contribute meaningfully to classroom behavior and students' ability to manage emotions and engage socially.

However, no statistically significant improvement was found in academic performance, as measured by term test scores. This could be because of the program's brief duration or the academic assessment's narrow focus. Long-term impacts should be investigated in future studies.

A noteworthy finding is the contrast between the objective and the students' self-reported perception of academic performance. Although the Mann-Whitney U test showed no statistically significant improvement in the term test scores, the chi-square analysis (Table 1, question 5) indicated that students who received mindfulness training perceived their grades as having improved ($p < .001$). This suggests that while the short-term intervention may not have been sufficient to impact measurable academic performance outcomes, it fostered a greater sense of academic self-efficacy, confidence, and optimism among students, leading them to have a more positive outlook on their academic abilities. This divergence between perception and reality is a significant finding and warrants further exploration in future research.

The study has several limitations. The intervention was short-term, only lasting six weeks, data were collected from a few classes in a single school, and relied heavily on self-reported data, including Likert-scale responses. Future

research should consider longer interventions, multiple schools, and mixed-methods approaches to gain deeper insights into both short- and long-term impacts of mindfulness practices.

Conclusion

This study demonstrates that mindfulness practices serve as an effective, low-cost pedagogical intervention for improving emotional well-being and classroom engagement among Grade 10–11 students in rural Sri Lanka, despite showing neutral effects on short-term academic performance.

Key findings revealed that, in terms of emotional resilience, students in the mindfulness group showed significantly lower levels of depression, anxiety, and stress. In class, they also reported improved social relations, focus, and attentiveness. These results demonstrate the importance of mindfulness for the well-being of students. Although academic benefits may take longer to manifest, the improvements in behavior and emotional stability observed here suggest that mindfulness has the potential to contribute to sustained academic growth over time. Overall, mindfulness emerges as a promising teaching strategy that supports students' emotional, social, and cognitive development.

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Examining Teacher Readiness for Blended Learning: A Case Study in a Sri Lankan Government 1AB School

Wasundara Kumarihamy^{1*}, Lakmal Kumara²

^{1,2} Sri Lanka Institute of Information Technology

Corresponding author*: wasundaraanuradha@gmail.com

Abstract

The integration of Blended Learning (BL), where traditional face-to-face instruction combines digital and online tools into general education, has become increasingly significant with the COVID-19 pandemic to ensure the continuity of education. BL provides flexible, personalized education that promotes student responsibility and digital literacy, but a gap remains between Sri Lanka's policy goals and teachers' potential to implement them. This article explores teacher readiness for implementing the BL approach at a Sri Lankan Government 1AB school, focusing how teachers express their preparedness for BL in terms of digital skills, pedagogical strategies, and resource availability; challenges teachers face when implementing BL; and support systems and resources required to enhance teacher effectiveness as research objectives. A qualitative research methodology was employed, and data were collected from six teachers representing different subject disciplines in grades 6-11 through semi-structured interviews. The responses were thematically analyzed to identify key patterns and themes. According to the findings, participants are open and positive towards BL, but limited resources and infrastructure, a lack of subject-specific digital content, language barriers, and a lack of training on digitalization and education technology hinder its effectiveness. Resource limitations led teachers to utilize their personal devices, which is a privacy concern between work and personal life affairs, and they must depend on freely available learning management platforms such as e-Thaksalawa and DP education. Digital tools are mainly used for content delivery and communication, with the least utilization for assessment and interactive learning. The study highlights the need for improved infrastructure, ongoing professional development, supervision, and contextualized pedagogical innovations, offering key insights for policymakers, educational leaders, and teacher educators to foster an inclusive, technology-enabled education system in Sri Lanka.

Keywords: Blended learning; Digital skills; General Education; Infrastructure; Pedagogical strategies; Teacher readiness

Introduction

Blended Learning (BL), commonly defined as the integration of face-to-face instruction with online or computer-mediated learning experiences, represents a pedagogical approach that leverages the strengths of both environments to enhance access, flexibility, and effectiveness (Graham, 2006; Garrison & Kanuka, 2004; Hrastinski, 2019). Blended learning (BL) has evolved from a simple combination of face-to-face and online instruction into a multifaceted approach that incorporates varied pedagogical strategies and delivery modes (Cuesta Medina, 2017). Effective BL requires improvements in infrastructure, teacher support, and student services (Kumari & Jayasinghe,

2021; Liyanagunawardena et al., 2014). In Sri Lanka, initiatives such as C-DELTA have aimed to enhance digital literacy and leadership; however, schools continue to face challenges with limited ICT facilities (Karunanayaka & Weerakoon, 2020). ICT integration has long been identified as essential for building a knowledge-based economy (Fernando & Ekanayake, 2010), while smart classrooms have demonstrated positive effects on student achievement (Mailewa et al., 2020). Despite this, many schools reverted to traditional methods after the pandemic due to workload, time, and infrastructure constraints, underscoring the need to prioritize digital education for future reforms (Cunningham et al., 2022).

Globally, teaching digital competence is defined by frameworks such as Dig Comp, which emphasize information management, collaboration, content creation, problem-solving, and ICT security (Holik et al., 2023). Yet, digital divides persist in the Asia-Pacific, influenced by factors such as income, education, and gender (Maji & Laha, 2021; Ono, 2005). Research also highlights pedagogical innovations that strengthen BL, including gamification, adaptive technologies, and multimedia content (Duterte, 2024; Fionasari, 2024). Strategies such as flipped classrooms, project-based and inquiry-based learning, and personalized learning are effective in enhancing engagement and outcomes (Balida et al., 2023; McGee, 2014).

In Sri Lanka, BL has shown potential across subject areas, from Oriental Music at the secondary level to mobile game-based learning in primary schools (Kaushal & Panda, 2019; Bandara, 2018). Teachers value BL for integrating online and traditional methods to meet diverse needs (Zhang, 2023; Ashraf et al., 2021; Pardede, 2019), though concerns remain about limited pedagogical skills, exam-oriented systems, and workload pressures (Ashraf et al., 2021; Banihashem et al., 2023). Overall, while BL offers opportunities to strengthen Sri Lankan education, sustained investment, strategic teacher development, and contextualized support are required (Vithanapathirana, 2021).

Against this backdrop, this study examines teacher preparedness for BL in a Sri Lankan government school. It focuses on teachers' digital skills, pedagogical strategies, resource use, challenges, and professional development needs, aiming to generate insights that inform both practice and policy.

Materials and Methods

This study adopted a qualitative case study design to explore teacher readiness for blended learning (BL) in a Sri Lankan government school. The approach was chosen to generate in-depth insights into teachers' preparedness, challenges, and support needs. Six teachers from different subject areas with experience in blended learning were intentionally selected to provide diverse perspectives. Data was gathered through semi-structured interviews focusing on digital skills, pedagogy, challenges, resources, and support, and were analyzed thematically to identify patterns and themes.

The study population comprised 79 teachers from grades 6–11, representing various subjects and teaching in Sinhala and English media, many of whom actively integrate digital tools within BL. The participants were chosen to ensure diversity of subject expertise and varying levels of experience with BL, allowing for rich perspectives while reaching thematic saturation. The six participants represented diverse subject areas, including Business and Accounts Studies, Science and Technology, English, and Western Music. Their teaching experience ranged from 5 to 28 years, with service at the current school varying between 2 and 10 years. Training backgrounds also differed, with some having received recent ICT training while others reported little or no formal preparation.

Data Collection Method

Semi-structured interviews were conducted with six teachers to explore their experiences of blended learning. The interview guide was aligned with the study objectives and focused on three areas:

1. Teacher preparedness in terms of digital skills, pedagogical strategies, and resource availability.
2. Challenges encountered when implementing BL practices.
3. Strategies and support systems required to enhance teacher readiness.

Each interview lasted 45–60 minutes, and participants were encouraged to provide detailed accounts of their practices and needs.

Data Analysis

Data was analyzed using a thematic approach. Interview transcripts were read several times to gain familiarity and then manually coded. Initial codes were developed based on research questions (digital skills, pedagogy, resources, challenges, and support needs), while additional inductive codes were identified from emerging patterns. Similar codes were clustered to form broader categories, which were refined into themes through iterative comparison. To ensure credibility, themes were cross-checked with another researcher and verified against raw data for consistency. The final themes captured teachers' preparedness, barriers to implementation, and strategies required to strengthen blended learning.

Results

Thematic analysis revealed the following key themes.

Table 1

Identified Key Themes

Theme	Description
Attitudes and perceptions	and Stakeholders, including school administration and education authorities, support BL, and students show enthusiasm for digital tools. While discipline issues are minimal, concerns remain over privacy, supervision, and connectivity.
Challenges to implementation	BL Limited infrastructure, subject-specific content gaps, LMS issues, and language barriers hinder implementation. Additional concerns include high teacher workload, lack of advanced training, and risks of technology misuse.
Resource availability	The school has smart classrooms, interactive boards, a computer lab, and Wi-Fi, although issues with electricity and connectivity persist. Teachers and students also rely on personal devices and LMS platforms such as e-Thaksalawa, e-Nenapiyasa, and DP Education.
Pedagogical strategies	Teachers mainly use digital tools for content delivery and communication, with limited use in assessments. Some employ Google Classroom, ministry websites, and simulations to address subject-specific needs.
Digital skills	Teachers possess basic digital knowledge gained through formal training and self-directed or peer learning. They are open to adopting advanced tools, while students adapt readily to digital education.
Further support and resource needs	Although some training programs exist, teachers require more advanced training in digital pedagogy and technology integration, as well as better supervision of resource utilization.

Discussion

Teachers and students are receptive to BL, but structural, technical, and digital skill gaps limit full implementation. A participant stated, “Sinhala medium students show less tendency to search the internet for learning materials because most of the content is in English”. Language disparities and privacy concerns highlight the need for inclusive content and clear policies. The study, limited to one school, offers in-depth insights with implications for supporting teacher readiness for BL in similar contexts. The findings of this study indicate that teachers are generally open to adopting BL, yet infrastructural, pedagogical, and skill-related limitations constrain their readiness. This aligns with an earlier Sri Lankan study, which highlighted the tension between policy aspirations for digital education and ground-level implementation gaps (Karunanayaka & Weerakoon, 2019). Participants valued the potential of BL but reported challenges in integrating digital tools within exam-driven school systems.

A key finding is that teachers mainly used digital technologies for content delivery and communication, while assessment and interactive strategies were underutilized. This pattern echoes international evidence that effective BL requires more than delivery tools; it requires active learning, adaptive technologies, and sustained feedback mechanisms (Protsiv et al., 2016; Zhu et al., 2021). Without targeted professional development, teachers risk reproducing traditional teaching styles in digital form, limiting the transformative potential of BL. The lack of subject-specific content and reliance on freely available platforms such as e-Thaksalawa and DP Education reflects broader issues of resource inequity in Sri Lankan schools. Prior studies confirm that infrastructure gaps and digital divides in the Asia-Pacific are shaped by socioeconomic factors such as income and language (Hossain, 2021; Liyanagunawardena et al., 2014). In this context, the finding that teachers often resorted to using personal devices also raises concerns about privacy and sustainability, reinforcing calls for systemic investment (Owen et al., 2020).

Teachers in this study demonstrated basic digital competencies, gained largely through self-directed and peer learning, with limited structured training. This supports Yin and Mohamad (2023), who emphasize that digital competence is multidimensional and requires ongoing professional development. The gap between teachers’ willingness and their limited pedagogical confidence highlights the importance of models such as TPACK, which integrate technological, pedagogical, and content knowledge for meaningful implementation. Such integrated frameworks are crucial for transforming teachers from mere users of technology into skilled facilitators of technology-enhanced learning experiences, especially given the challenges of resource constraints and the necessity for adaptable pedagogical approaches (Gayur, 2021).

Importantly, the study reveals that students were often more adaptable to digital tools than teachers, which was also stated by participants, a dynamic observed in other contexts (Zhang, 2023; Banihashem et al., 2023). While this enthusiasm presents opportunities, it also raises the need for structured guidance to prevent superficial or problematic use of technology in classrooms. This highlights the critical role of teacher professional development in fostering a balanced and effective integration of digital tools, ensuring that technological proficiency translates into enhanced pedagogical outcomes rather than merely serving as a substitute for traditional methods (Spiteri & Rundgren, 2018).

Implications

The study underscores the need for stronger infrastructure, stable connectivity, and inclusive digital content in local languages. Teacher professional development should prioritize digital pedagogy and subject-specific integration, while ongoing monitoring and support are essential to ensure effective classroom application.

Limitations and Future Research

As a single-school case study with six participants, the findings are context-specific and not widely generalized. Future studies should involve multiple schools, student perspectives, and mixed method designs to validate results and examine the broader impact of blended learning on both teaching and learning outcomes.

Conclusion

This study explored teacher preparedness for BL in a Sri Lankan government 1AB school, highlighting positive attitudes alongside barriers like limited resources, training, and infrastructure. Findings underscore the need for professional development, improved infrastructure, and collaborative support. The study concludes that teachers in Sri Lankan government schools demonstrate a positive orientation towards blended learning but remain only partially prepared to implement it effectively. While they possess basic digital skills and show willingness to adopt new tools, their readiness is constrained by limited infrastructure, unstable connectivity, a lack of subject-specific content, and insufficient professional development.

The findings highlight the need for systemic support, including stable ICT facilities, contextualized digital content in local languages, and continuous training in digital pedagogy. Importantly, training must go beyond tool use to focus on integrating technology with subject knowledge and interactive teaching methods. By drawing attention to the gap between teacher willingness and systemic constraints, this study contributes practical insights for policymakers, school leaders, and teacher educators seeking to strengthen blended learning in Sri Lanka. Although limited to a single case study, the findings offer implications for similar contexts where schools face resource and capacity challenges. Future research across diverse school settings and with larger samples is recommended to further explore teacher readiness, student experiences, and the long-term impacts of blended learning adoption.

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ESP Needs Analysis for Nursing Students at a Sri Lankan Higher Education Institution

A.K.S. Jayarathna¹, W.M.K.C. Wanasooriya², D.D.H.G.Y. Senarathne³, B.D.S.V.U.de Silva⁴, D.R.W. Jayasinghe⁵,
L.V. George⁶, H.D. Wijesekera*

^{1,2,3,4,5,6,7} School of Education, Faculty of Humanities and Sciences, Sri Lanka Institute of Information Technology, Sri Lanka.

Corresponding author*: harsha.wi@sliit.lk

Abstract

This study analyzes the effectiveness of existing English for Academic Purposes (EAP) modules in meeting the English language requirements of the Higher National Diploma Nursing program at a non-state Higher Education Institute (HEI) in Sri Lanka. Drawing on the Nation and Macalister's Language Curriculum Design framework, a needs analysis was conducted. This comprised determining students' linguistic needs, aspirations, and gaps in academic and clinical settings through a validated questionnaire, followed by interviews with two lecturers of core subjects, one English language lecturer, and twenty-eight students. The data were analyzed thematically using an inductive approach. The findings indicate that the current EAP modules are insufficient to meet the professional communication needs of nurses. A substantial proportion (65%) of students reported not using English daily, while (52%) reported low confidence, mainly in oral communication, and (57%) emphasized the need for improving medical communication. Students and lecturers emphasized the need for interactive language instruction with a nursing focus. Next, the study compared the international ESP curriculum models with the existing EAP module, supported by the findings, and observed significant content differences. The study recommends that English for Specific Purposes or English for Nursing should be integrated into nursing school curricula along with faculty development support, differentiated instruction, and authentic materials. Language instruction should be keyed to actual communication needs to promote academic achievement and professional competence at the global level.

Keywords: Clinical Communication, Curriculum Development, EAP, ESP, Medical English, Needs Analysis, Nursing Education.

Introduction

This report presents the findings of a needs analysis conducted to evaluate the English language syllabus for nursing students enrolled in the Higher National Diploma in Nursing program (HNDNP) at a non-state HEI in Sri Lanka. Using the Nation and Macalister (2010) curriculum design model, the study assesses how effectively the current curriculum meets students' academic and professional language needs. It examines perspectives from students, English lecturers, and subject nursing lecturers. The study also compares the current English language modules with ESP courses offered in other nursing programs. The analysis focuses on students' needs, wants, and lacks in language learning, aiming to inform curriculum improvements.

Context and Background

The focused HNDNP aims to prepare students with theoretical knowledge and practical skills for the healthcare sector. Since nursing is a communication-intensive profession, English proficiency is crucial for academic success and effective interaction with patients, colleagues, and supervisors, locally and internationally. Specifically, since these students follow a pathway to degree programs in an English-speaking country, they require a minimum IELTS score of 7.0.

Currently, students are enrolled in a general English for Academic Purposes (EAP) course focused on academic communication skills. However, they also need English for Specific Purposes (ESP), which targets discipline-related language use. According to Hutchinson and Waters (1990), ESP tailors content and methods to learners' professional goals, while Febriyanti (2017) highlights that student 'needs should guide the learning process. Therefore, English instruction for nursing students should be directly linked to medical and healthcare contexts. Despite this, the existing curriculum remains focused on general academic purposes, highlighting a need for more targeted, professional-specific language training to meet the students' needs, wants, and lacks.

Purpose of the Study

The needs analysis aimed to evaluate the English language requirements of nursing students enrolled in the HNDNP at the non-state HEI across Years 1, 2, and 3. Given the essential role of English in both nursing education and clinical practice, the study aims to determine whether the current English for Academic Purposes (EAP) courses adequately meet students' academic and professional needs. By collecting input from students, English language lecturers, and subject lecturers, the study sought to identify language proficiency gaps that may hinder or support academic success and effective communication in healthcare settings. The insights will guide future curriculum development to ensure students are equipped with the necessary language skills. The study was guided by the overarching question (1): What are the specific English language skills needed by Higher National Diploma in Nursing students for academic and clinical success? This was supported by the following sub-research questions.

1. How well does the current general EAP course align with students' academic and professional language needs?
2. What do current nursing students believe they need (want) to succeed in their academic and professional careers?
3. What language deficiencies (lacks) are identified by students, English lecturers, and mainstream lecturers?
4. What additional elements are needed in the curriculum to address the identified gaps?
5. What are the differences between the existing English syllabus at a Non-state Higher Education Institute in Sri Lanka and ESP modules used in international nursing programs?

Scope of the study

This study is limited to exploring the English language needs, wants, and lacks nursing students pursuing the HNDNP at a non-state Higher Education Institution (HEI) in Sri Lanka, with a pathway to a reputed foreign university. The analysis specifically focuses on students in Years 1, 2, and 3 of the programs. The primary objective is to identify gaps in English language skills that are critical for academic success and professional communication within the nursing field. By examining these areas, the study aims to inform the development of targeted language support strategies to enhance the learning experience and career readiness of nursing students.

Materials and Methods

This study employed a qualitative research approach to explore student experiences in English language learning and the perspectives of mainstream lecturers on supporting language development. The research included 31

participants in total: 28 students, one English language lecturer, and two mainstream subject lecturers. Data collection was conducted through a student survey using a Google Form and in-depth interviews with both mainstream lecturers and an English language lecturer, which were later transcribed for analysis.

Participants

The 28 students represented diverse academic disciplines and had varied experiences with English language learning. The English language lecturer focused on supporting students' language development, while the 2 mainstream subject lecturers taught courses in non-language-specific subjects but still interacted with students on language issues

Data Collection Instruments

Student Surveys:

A structured survey was administered to the students using Google Forms, consisting of six sections designed to explore different dimensions of the students' English language learning experience. These sections covered:

1. Demographic information, Self-assessment of English language proficiency.
2. Perceptions of the challenges faced in learning English.
3. Effectiveness of support received from the English language lecturer.
4. Experiences with mainstream subject lecturers regarding language support.
5. Open-ended questions for additional comments or suggestions.

In line with good questionnaire design guidelines, the purpose of the survey was clearly defined to gather insights into students' challenges, perceptions and support experiences related to English language learning. The target group was well-identified, ensuring that the questions were suitable and relevant for the participants.

The survey employed simple and clear language to make it accessible to all participants. Questions were kept short and focused to avoid misinterpretation. The survey followed a logical structure, beginning with general information such as demographic details and self-assessment of proficiency, and gradually progressing to more specific areas like feedback on lecturer support. A mix of closed-ended questions and open-ended questions was used to collect both quantitative and qualitative data.

To ensure fairness, all questions were neutral and unbiased, designed to encourage honest and thoughtful responses. Clear instructions were provided at the beginning of each section to guide students through the process. Finally, the survey was administered electronically to enhance accessibility, and all responses were anonymized and stored securely, upholding standards of confidentiality.

Lecturer Interviews:

Semi-structured interviews were conducted with the English language lecturer and the two mainstream subject lecturers. The interviews were conducted in person and lasted approximately 15 minutes each. They aimed to understand lecturers' perspectives on supporting students' language learning in their respective teaching contexts. An interview guide with open-ended questions was used, allowing lecturers to discuss their experiences, strategies, and challenges in providing language support. The interviews were audio-recorded with the consent of the participants for accurate transcription and analysis.

Results

Needs analysis among nursing students and lecturers revealed significant professional and linguistic gaps that prevent academic and work achievement. The information was collected by means of a student questionnaire and lecturer interviews. The findings are presented thematically as: (1) Purpose and

Frequency of English Use, (2) Skills Emphasized vs. Desired, (3) Learning Preferences, (4) Student Challenges, and (5) Lecturer Perspectives.

Purpose and Frequency of English Use

In the questionnaire, students were asked why they studied English and when do they typically use it. The responses show a clear gap between required and actual language exposure among the students.

Table 1

Responses: Why do you study English?

Purpose	Percentage
Higher Education	42.9%
Future profession	39.3%
Communicating with patients	17.8%

Table 2

Responses: When do you use English?

Usage Context	Percentage
Only during classes	64.3%
During daily tasks	14.3%
With friends/family	21.4%

Hence, it is evident that most students (64.3%) have reported that they use English only during classroom activities, and not in everyday contexts, indicating limited exposure outside the formal classroom settings.

Skills Emphasized vs. Skills Desired

Students were asked which skills were emphasized in class and which they most desired to improve.

Table 3

Percentage: Which skills are emphasized in class?

Skill	Percentage
Grammar	35.7%
Reading	28.6%

Speaking	21.4%
Writing	10.7%
Listening	3.6%

Table 4

Percentage: Which skills do you want to improve?

Skill	Percentage
Speaking	50.0%
Listening	25.0%
Writing	17.9%
Grammar	7.1%

While grammar and reading are the most emphasized skills in the class, students have expressed a strong preference in proving their speaking (50%) and listening (25%) skills, reflecting their professional communication needs.

Learning Preferences and Classroom Practice

Students were asked about their preferred learning styles and teaching strategies.

Table 5

Preferred Learning Style

Preference	Percentage
Activity-based learning (role play, group work)	78.6%
Lecture-based only	21.4%

Table 6

Preferred Mode of Classroom Interaction

Interaction Type	Percentage
Group or pair work	82.1%
Individual tasks only	17.9%

Students show a clear preference for interactive, learner-centered approaches including role plays and group work, consistent with Communicative Language Teaching (CLT) practices.

Table 7*Self-Perceived Challenges*

Students were asked about their perceived difficulties in learning and using English.

Challenge	Percentage
Lack of confidence in speaking	53.6%
Understand medical terminology	25.0%
Writing structured reports	17.9%
Grammar rules	3.6%

Over half of the students (53.6%) reported a lack of speaking confidence, highlighting the need for oral communication practice.

Lecturer Insights

English language and mainstream nursing lecturers provided valuable input. The English language lecturer saw a requirement for the integration of English for Specific Purposes (ESP) instruction and suggested introducing specifically designed modules with medical vocabulary and patient communication. Existing modules (e.g., EAP and Communication Skills) were reported to give some background but lacked depth of clinical use.

Mainstream subject lecturers were unanimous that there are substantial language problems that students face, specifically at the start of the program. Normal problems were quoted as difficulties with oral presentation, academic writing, and the understanding of grammatical structures such as passive voice. While some improvement was quoted in year three, lecturers were focused on modifications to existing modules and not fresh ones added. They emphasized the need to coordinate language training with nursing material so that students would be able to work successfully within real-life professional environments.

Discussion

The needs analysis of the Higher National Diploma (HND) Nursing students at a Non-state Higher Education Institute in Sri Lanka clearly indicates that the existing General Academic English curriculum does not necessarily meet the students' academic and professional communication needs. The feedback from the students, nursing lecturers, and the English lecturer points out several serious gaps that need to be addressed in order to render the English program more relevant, practical, and beneficial.

One of the serious issues is the irrelevance of the course content. The current syllabus is directed to general English competence but without such major components as medical vocabulary, communication with patients, or healthcare records. According to Waters (1987) ESP standards, particularly students' professional requirements must be served straightaway by the course material. Otherwise, students will become bored because they cannot feel the applicability of what they are learning to their future profession in health care. This is also consistent with Vygotsky's note that learning makes sense only once it is linked with real-life use.

Moreover, the lack of focus given towards communicative competence can also be identified as another major issue. Although speaking and writing are included in the curriculum, these are not practiced within contexts relevant to healthcare. The students are not given enough practice in the kind of communication they would be conducting in hospitals, such as communicating with patients or reporting to the medical staff. Following Canale and Swain (1980), pragmatic and sociolinguistic abilities - apart from grammar - are a crucial part of actual communicative competence. Without this targeted instruction, learners may be left stressed and unready to manage real-life situations, substantiating Krashen's (1982) hypothesis that stress hinders effective language acquisition.

The various levels of proficiency of the students also stand as another problem. Some can cope with the material while others cannot. However, the curriculum currently does not offer differentiated instruction to help students of different levels. According to Tomlinson (2001) it stresses the imperative to customize teaching to suit different needs, but this is at the expense of further planning and resources.

Another major issue identified is the separation of English instruction and nursing curriculum. The English modules are learned in isolation and not fused with nursing study. It discourages the ability of the students to apply language learning in clinical settings. Based on Content and Language Integrated (CLIL) theories, mixing up language study with nursing material can increase interest and relevance.

In addition, no well-trained teachers are available. Good ESP instruction for nursing requires some awareness of English and healthcare. Subject lecturers observed that English teachers are not aware of nursing-specific vocabulary, which affects the quality of the lessons. As Dudley-Evans and St John (1998) emphasize, ESP instructors are supposed to possess at least some subject area knowledge.

Finally, testing methods practiced today do not reflect the real language skills required in nursing. It's all about traditional academic testing, and not on functional communication skills like writing patient records or speaking with patients. As Bachman and Palmer (1996) assert, tests should reflect real-life functions for the learners' profession.

From these findings, a series of key recommendations can inform curriculum development. First, the content of the course must be specific to nursing, specifically including relevant vocabulary, documentation skills, and interaction ability. It needs to be combined with nursing modules as well, so students get the opportunity to apply their language skills in meaningful, subject-specific contexts. The new course can also promote experiential learning via role-plays, simulations, and case studies to give students real-life practice in clinical communication. In the meantime, the curriculum must also include differentiated learning pathways to accommodate students with different proficiency levels. Besides that, ongoing formative assessment together with regular feedback can help track improvement as well as confidence building. Finally, if these changes are going to be implemented, there needs to be faculty development. Instructors need to be educated not only in the methodology of teaching English, but also in the working knowledge of nursing jargon and health communication techniques.

Conclusion

Needs analysis indicates that the existing EAP course provides a general language base, yet it fails to address the needs of communication by nursing students. It lacks an ESP component of focused content, causing huge gaps in clinical communication, medical vocabulary, and communicating with patients. Not practicing English sufficiently outside the classroom renders it difficult to develop skills and self-confidence. To address these issues, the report recommends the incorporation of healthcare-specific ESP courses, authentic materials, and experiential approaches such as simulations and role-plays. There ought to be improved collaboration between the language and nursing departments to align teaching with employment requirements.

In addition, frequent evaluation and increased opportunities for daily use of English are necessary for improved clinical communication. Research in the future must investigate how the integration of ESP impacts things over a long period of time and the effectiveness of instructional approaches such as Task-Based Learning and Content-Based Instruction. Overall, curriculum change is necessary to equip nursing students with effective communication in various healthcare environments globally.

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