Gender and Parental Income Disparities in Secondary School Students' Hard Skills Levels: A Study in Sri Lanka

ABSTRACT

Aims: This research investigates the intricate interplay between gender and parental income as pivotal determinants influencing hard skills proficiency among secondary school students in Sri Lanka. Positioned within the dynamic landscape of secondary education, the study aims to unravel the nuanced factors that contribute to educational disparities.

Study design: Methodologically, a quantitative research design was employed, utilising a survey-based approach to gather data from a diverse sample of 1350 secondary school students in Sri Lanka. The sampling strategy employed was stratified random sampling, ensuring representation across various socio-economic strata. The study used rigorous measures to guarantee the questionnaire's validity and reliability, enhancing the findings' robustness.

Place and Duration of Study: Situated within the diverse socio-economic landscape of Sri Lanka, the research spans secondary schools in different regions of the country. The study duration encompassed a specific timeframe, providing a snapshot of the current state of affairs within the evolving educational system of Sri Lanka

Methodology: The findings revealed moderately high overall hard skills proficiency levels among secondary school students, with notable variations in language skills and project contribution. Significant gender-based disparities and parental income variations were identified, underscoring the necessity for targeted interventions. The study's contribution to the discourse on educational equity and social justice is evident, emphasising the broader societal and economic contexts.

Results: The research findings highlight gender-based differences and parental income disparities, shedding light on specific areas where interventions are urgently needed. Language skills and project contribution emerged as key domains where variations were pronounced, providing actionable insights for policymakers and educators

Conclusion: This research highlights the urgency of implementing gender-sensitive educational interventions, initiatives to enhance computer skills, and targeted support for low-income families in Sri Lanka. Emphasising the necessity for policy changes prioritizing educational equity and advocating for community engagement initiatives, the successful application of these recommendations in Sri Lanka could serve as a blueprint for fostering inclusive and equitable learning environments globally.

Keywords: Secondary Education, Hard Skills Proficiency, Gender Disparities,Parental Income, Educational Equity

1. INTRODUCTION

In the dynamic landscape of secondary education in Sri Lanka, a comprehensive understanding of the multifaceted factors influencing students' hard skill levels is crucial for fostering equitable and inclusive learning environments. This research endeavors to delve into the intricate interplay of gender and parental income as pivotal determinants shaping hard skills proficiency among secondary school students in the Sri Lankan context. As education remains a cornerstone for individual development and societal progress in Sri Lanka, addressing and recognising disparities in skill acquisition is imperative for cultivating effective and inclusive educational practices.

The unique significance of this study lies in its focused examination of two key variables—gender and parental income—within the specific socio-economic landscape of Sri Lanka. These variables are deeply intertwined with broader social and economic contexts that characterise the country. While gender dynamics have long been acknowledged as influential factors in shaping educational outcomes, the inclusion of parental income introduces an additional layer of complexity to the ongoing discourse. The study aims to unravel the intricate connections between these variables and their collective impact on variations in hard skills levels among secondary school students

Sri Lanka, with its rich and diverse socio-economic landscape and continuously evolving educational system, provides an intriguing and pertinent context for this investigation. Beyond the borders of the island nation, the findings of this study carry the potential not only to contribute to a deeper understanding of educational disparities within the Sri Lankan context but also to offer valuable insights that may be applicable in addressing similar challenges faced by secondary school students in other global settings.

By directing attention to these critical issues at the secondary school level, where foundational skills are honed and future educational and career trajectories are shaped, this research aspires to make a meaningful contribution to the broader discourse on educational equity and social justice within the Sri Lankan educational framework. In the forthcoming sections, the paper will meticulously explore existing literature on gender and parental income differentials in the Sri Lankan education system, elucidate the theoretical framework guiding the study, outline the research methodology employed, and present the results along with their implications. This comprehensive examination aims to shed a spotlight on the intricate dynamics influencing hard skills levels among secondary school students in Sri Lanka, ultimately paving the way for well-informed interventions and policy recommendations tailored to the unique characteristics of the Sri Lankan educational landscape.

2. LITERATURE REVIEW

The reviewed literature underscores the pivotal role of hard skills in shaping students' educational outcomes and future employability. Hard skills, encompassing academic and vocational competencies acquired through formal education and training, represent a permanent and transferable knowledge base, in contrast to soft skills influenced by dynamic interpersonal contexts (Crady, 2015). The cognitive domain framework, particularly Anderson's Revised Classification and Bloom's original taxonomy, elucidates the hierarchical nature of hard skills, ranging from knowledge acquisition to synthesis (Bloom, 1956; Anderson, 2001; Sedere, 2019).

Noteworthy studies have explored the relationship between socio-environmental support and students' academic achievements, emphasising parental involvement, classroom climate, peer influence, and prior academic performance (Shukla et al., 2015; Kiwanuka et al., 2015). Ganal and Guiab (2014) and Cheng et al. (2019) highlighted challenges in mastering mathematical competencies, suggesting the importance of teacher support, family-related factors, and targeted interventions for rural students. Kwak (2012) and Soewarno et al. (2014) delved into science teaching methods and chemistry competencies, respectively, emphasising the role of pedagogical approaches and resource availability.

Language skills, particularly English proficiency, emerged as a crucial factor for future job opportunities, with Mosha (2014) and Zainuddin et al. (2019) linking language competence to employment prospects and multinational companies' preferences. Information communication and technology (ICT) skills were recognised as essential in the contemporary workforce, with Claro et al. (2012) and Aničić et al. (2016) highlighting the need for comprehensive ICT education and career development strategies.

Sri Lanka's context was explored through studies on Sinhala and Tamil language competency (NIE, 2014), employability challenges across different academic disciplines (Ariyawansa, 2008), and the mismatch between university graduates' skills and industry demands (Weligamage and Siengthai, 2003). These studies underscore the need for targeted educational interventions and curriculum improvements to address the specific challenges faced by students in Sri Lanka.

In the educational landscape, understanding the intersectionality of gender and parental income is crucial for unveiling disparities in students' hard skills levels. This literature review synthesises existing research, focusing on the nuanced relationship between gender, parental income, and hard skills acquisition among secondary school students. Research has consistently highlighted gender disparities in educational outcomes, with a specific emphasis on hard skills. OECD's (2009) study on student performance in mathematics, science, and reading skills across OECD countries revealed variations in achievement levels between male and female students. Such disparities may be indicative of societal expectations, gender stereotypes, and differential access to educational resources. The influence of parental income on educational achievement has been extensively studied. Shukla et al. (2015) found a significant association between parental educational support and academic achievement in mathematics among high school students. Kiwanuka et al. (2015) established that parental support, along with other socioeconomic factors, plays a pivotal role in shaping students' mathematics achievement.

Ganal and Guiab (2014) explored challenges in mastering learning competencies in mathematics, revealing issues related to teacher support, family problems, and peer-related difficulties. These socio-environmental factors contribute to educational well-being and may exacerbate or mitigate gender and income-related disparities. Beyond Sri Lanka, studies in different global contexts provide insights into gender and income-related educational disparities. For instance, Cheng et al. (2019) identified factors affecting students' educational outcomes in rural areas in Taiwan, emphasising the impact of low parental academic levels and occupational status on learning outcomes. The importance of language skills, particularly English proficiency, has been linked to socio-economic factors. Mosha (2014) identified factors such as home environmental support and teacher quality as crucial determinants of English language proficiency among secondary school students in Zanzibar. Studies specific to Sri Lanka shed light on employability challenges and skill mismatch. Ariyawansa (2008) identified varying employment prospects across academic disciplines, emphasising the relevance of skills acquired through education. Weligamage and Siengthai (2003) highlighted the mismatch between the skills of university graduates and the demands of the labour market in Sri Lanka.

In conclusion, the reviewed literature underscores the intricate interplay of gender, parental income, and skill levels among secondary school students. These disparities manifest in various educational contexts, influenced by socio-environmental factors and global perspectives. The subsequent research aims to contribute to this body of knowledge by providing a nuanced understanding of how gender and parental income intersect in shaping hard skills outcomes among secondary school students, specifically within the Sri Lankan context.

3. PROBLEM STATEMENT

The hard skills of secondary school students in Sri Lanka gauged through national examinations like the G.C.E. O/L, present alarming trends. From 2015 to 2019, passing rates have hovered around 70%, with poor performance in English, Mathematics, and Science subjects, indicating a pressing need for improvement (MOESL, 2020). Notably, gender disparities persist, with girls consistently outperforming boys across educational levels (Vengadeshvaran et al., 2108). Such disparities are reflected in the 2015 G.C.E. (O/L) examination, where a higher percentage of female students qualified for G.C.E. (A/L) compared to their male counterparts (Department of Examination, 2016).

Despite the government's longstanding commitment to free education, access remains a concern. The Child Activity Survey Sri Lanka (Department of Census and Statistics, 2017) reveals that approximately 10% of children aged 5–17 are not attending school, citing reasons such as disinterest, financial difficulties, and unsafe school environments. Moreover, socio-environmental and demographic factors contribute to school dropouts, including low parental educational support, poverty, weak teachers, and inadequate facilities (Aturupane et al. 2018; Department of Census and Statistics 2017; National Education Commission 2016). The problem is further exacerbated by a higher dropout rate among boys, reflecting an urgent need to address gender-specific challenges in education (Department of Census and Statistics, 2017). Despite an increase in the number of schools, ensuring equitable access to quality education remains a persistent challenge.

In summary, the amalgamation of insufficient skills development, poor academic performance, gender disparities, and challenges in educational access constitute a complex problem affecting student well-being and future employability in Sri Lanka. Addressing these issues requires a comprehensive understanding of the root causes and a strategic approach to reforming the education system for the holistic development of students.

5. METHODOLOGY

This research adopted a quantitative research design utilising a survey-based approach to investigate the enhancement of hard skills among secondary school students in Sri Lanka. The study specifically focused on socioeconomic factors, particularly parental income and gender. The target population encompassed secondary school students across Sri Lanka, with a study sample of 1350 participants selected using a stratified random sampling method to ensure diversity in socioeconomic backgrounds.

Data collection involved a Likert Scale questionnaire with two sections: assessing students' socioeconomic status and gauging their perceptions of hard skill enhancement. A Likert Scale with five response options was employed to measure the level of hard skills. Rigorous measures were implemented to ensure the validity and reliability of the questionnaire, including seeking expert opinions and assessing internal consistency using Cronbach's alpha coefficient, which demonstrated high reliability of 0.945. The questionnaire was administered in selected secondary schools with explicit informed consent from students and their parents or guardians. Trained enumerators facilitated the distribution and collection of the questionnaires, ensuring confidentiality and anonymity to encourage candid responses.

Data analysis encompassed both descriptive and inferential statistical techniques. The descriptive analysis involved calculating means and standard deviations to offer insights into the enhancement of hard skills among students. Inferential analysis, specifically Multivariate Analysis of Variance (MANOVA), was conducted to explore potential significant differences in hard skill enhancement based on variables such as parental income and student gender. The Statistical Package for the Social Sciences (SPSS) software was employed to comprehensively examine hard skill enhancement, aiming to identify potential disparities associated with parental income and student gender.

This robust methodology was designed to ensure the reliability and validity of the findings, contributing valuable insights to the broader discourse on socioeconomic influences on student education in Sri Lanka. The research seeks to shed light on the nuanced dynamics of hard skill enhancement and the role played by socioeconomic factors, providing a foundation for informed educational interventions and policy recommendations.

5.1 Objectives of the Study

01 Determine students' hard skills proficiency levels.

02 Examine Hard skills disparities among students based on Student Gender.

03 Evaluate variations in students' hard skills based on Parental Income.

5.2 Null Hypotheses

01. Hard Skills have no significant difference based on Student Gender

02. Hard Skills have no significant difference based on Parental Income

6. RESULTS AND DISCUSSION

6.1 Students' Hard Skills Proficiency Levels

The descriptive analysis is used to determine the level of students' enhancement of hard skills for effective functioning and building up of capabilities. Seven items were constructed to determine the

respondents' level of agreement from the aspect of students' enhancement of hard skills, as shown in Table 1

Table 1 Level of Hard Skills Development

No.	Item	Mean	S. D	Interpretation
My ability has been increased to……				
1	apply the knowledge and skills of the specific field in order to practice perfectly	3.905	0.968	Moderate High
2	answer questions and give specific and practical explanations in order to be understood simply by people of different fields	3.838	0.953	Moderate High
3	contribute to complete a project / group task	4.078	0.953	High
4	correlate what has been studied beforehand in the scope of my knowledge in oral and written presentation	3.863	0.979	Moderate High
5	My computer skills to get a job in future has been enhanced	3.734	1.158	Moderate High

Table 1 shows the level of enhancement of students' hard skills, functioning and capabilities; the overall mean for this is 3.924, the overall S.D. is 0.732, and the interpretation is moderately high. The highest item for this aspect is 7, which is about students' language (Sinhala/ Tamil) skills enhancement in terms of reading, listening and speaking to qualify them for a job; the mean for this item is 4.189 (S.D. =0.732) and the interpretation high. Item 3 relates to enhancing students' ability to contribute effectively to complete a project or a group task; the mean for this is 4.078 (S.D. =0.953), while the interpretation is also high. The lowest item (5) is about enhancing students' computer skills to enable them to get a job in future; the mean for this is 3.734 (S.D. =1.158), and the interpretation is moderately high.

6.2 Hard Skills Differences Based on Student Gender

Multiple MANOVA tests were used to see the difference in mean scores for Hard skills variables. Table 2 below shows the MANOVA analysis for the difference mean score on hard skills based on gender.

Table 2 MANOVA Difference Aspects of Hard Skills based on Gender

Gender	N	Mean	S. D	Type III Sum of Squares	Df	Total Square	F	Sig.
Male	675	3.825	0.749	13.358	1	14.282	25.327	0.000
Female	675	4.024	0.701					

Table 2 shows significant differences in students' educational well-being regarding the hard skills and capabilities that students need to live a happy and fulfilling life based on gender. Moreover, Table 2 shows that students' academic well-being in terms of hard skills is higher for female students (Mean = 4.024 and S.D. = 0.701) than for males (Mean = 3.825 and S.D. = 0.701).

6.3Hard Skills Differences Based on Parental Income

Multiple MANOVA tests were used to see the differences between the mean scores in the students' Hard skills development based on parents' income level. Table 3 shows the MANOVA analysis for the difference in mean scores on students' Hard skills based on parental income.

Table 3 MANOVA Difference Aspects of Students' Hard Skills based on Parent Income Level

Income Level	N	Mean	S. D	Type III Sum of Squares	Df	Total Square	F	Sig.
>Rs. 15,000	487	3.831	0.759	15.299	3	5.100	9.681	0.000
Rs.15,001-46,000	609	3.912	0.706					
Rs.46,001-150,00	215	4.132	0.685					
< Rs.151,001	39	4.131	0.809					

Table 3 shows significant differences in children's Hard skills development [F = 9.681 and sig = 0.000] based on the parent income.

Table 4 Post-Hoc Analysis of Difference Aspects of Student Hard Skills Based on Parent Income.

Dependent Variable	(I)Parental Income	(J)Parental Income	Mean difference (I-J)	Std. Error	Sig
Hard Skills	>15,000	15,001-46,000	-.08112	.04412	.337
		46,001-150,000	-.30127*	.05943	.000
		<151,001	-.30025	.12078	.104
	15,001-46,000	>15,000	.08112	.04412	.337
		46,001-150,000	-.22015*	.05758	.002
		<151,001	-.21913	.11988	.342
	46,001-150,000	>15,000	.30127*	.05943	.000
		15,001-46,000	.22015*	.05758	.002
		<151,001	.00102	.12632	1.000
	<151,001	>15,000	.30025	.12078	.104
		15,001-46,000	.21913	.11988	.342
		46,001-150,000	-.00102	.12632	1.000

According to Post Hoc test results shown in Table 4 obtained using the MANOVA analysis, hard skills enhancement aspects showed a significant difference between parental income below Rs. 15,000 and parental income in the Rs. 46,001-150,000 range. Based on Table 3 and Table 4, it can be concluded that the children's hard skills, functioning, and capabilities that students need to live a happy and fulfilling life are higher among Upper-Middle-Class children than among Upper-Class, Lower-Middle-Class, and Poor children. On the other hand, Poor children's hard skills, functioning, and capabilities that students need to live a happy and fulfilling life are the lowest in Sri Lankan secondary schools.

7.CONCLUSION AND DISCUSSION

This study aimed to explore the interplay of gender and parental income as determinants shaping hard skills proficiency among secondary school students in Sri Lanka. The research utilised a quantitative research design with a focus on socioeconomic factors, and the findings shed light on nuanced dynamics within the Sri Lankan context. The results indicated a moderately high overall mean (3.924) for students' hard skills enhancement. Notably, language skills (Sinhala/Tamil) and the ability to contribute to projects/group tasks received high mean scores, while computer skills had a moderately high mean. This suggests that there is room for improvement, particularly in enhancing students' computer skills. Significant differences were found in hard skills development based on gender. Female students exhibited higher mean scores (4.024) compared to male students (3.825). This aligns with previous research suggesting gender disparities in educational outcomes and highlights the need for targeted interventions to address this gap. Significant differences were observed in students' hard skills development based on parental income levels. The upper-middle-class children demonstrated higher hard skills proficiency compared to upper-class, lower-middle-class, and poor children. This underscores

the impact of socioeconomic factors on educational outcomes, emphasising the need for tailored interventions to bridge these disparities.

The findings of this study align with previous research emphasising the importance of socioeconomic factors in shaping educational outcomes. Studies by Shukla et al. (2015) and Kiwanuka et al. (2015) have highlighted the influence of parental support on academic achievement, resonating with the observed disparities in hard skills based on parental income.

The gender-based differences in hard skills align with the broader discourse on gender and education. The OECD's (2009) study on student performance in mathematics, science, and reading skills across countries corresponds with the gender disparities found in this study, emphasising the persistent nature of these challenges. Comparisons with global contexts, such as Cheng et al.'s (2019) study on factors affecting students' educational outcomes in rural areas in Taiwan, provide a broader perspective on the role of socioeconomic factors in shaping educational well-being. Similarly, Mosha's (2014) work on language skills in Zanzibar supports the importance of language proficiency for future job opportunities, echoing the findings related to Sinhala/Tamil language skills in Sri Lanka. The post hoc analysis revealed significant differences in hard skills based on parental income levels. This aligns with Ariyawansa's (2008) identification of varying employment prospects across academic disciplines in Sri Lanka, emphasising the relevance of skills acquired through education. In conclusion, this study contributes to the understanding of the intricate dynamics influencing hard skills levels among secondary school students in Sri Lanka. The findings underscore the need for targeted interventions and policy recommendations to address disparities based on gender and parental income, fostering more inclusive and equitable educational practices in the country. The research also provides valuable insights for global contexts facing similar challenges in the pursuit of educational equity and social justice.

8. RECCOMANDATIONS

A Gender-Sensitive Educational Interventions: Implement gender-sensitive educational interventions to address the observed disparities in hard skills based on gender. This may include targeted programs that encourage female students to engage in STEM subjects and vocational training, as well as initiatives to challenge gender stereotypes in education.

Enhancement of Computer Skills: Develop and implement programs to enhance students' computer skills, as identified by the study as an area with moderate improvement. This could involve integrating technology into the curriculum, providing access to computer labs, and offering specialised training to both teachers and students.

Parental Involvement Programs: Promote parental involvement programs that extend beyond financial support. Encourage parents to actively engage in their children's education, providing support for academic activities and career guidance. This can help bridge the gap in hard skills development based on parental income levels.

Targeted Support for Low-Income Families: Design targeted support programs for low-income families, acknowledging the impact of socioeconomic factors on hard skills outcomes. This may involve scholarships, mentorship programs, and additional resources to ensure that students from economically disadvantaged backgrounds have equal opportunities for skill development.

Inclusive Language and Communication Skills Training: Emphasize inclusive language and communication skills training that considers the linguistic diversity in Sri Lanka. This can contribute to improved English, Sinhala, and Tamil language proficiency, aligning with the identified high mean scores in language skills as crucial for future job opportunities.

Professional Development for Teachers: Provide ongoing professional development opportunities for teachers to enhance their pedagogical skills, particularly in addressing gender-specific learning needs

and catering to students from diverse socioeconomic backgrounds. Well-equipped teachers can play a pivotal role in reducing educational disparities.

Collaboration with Industries: Foster collaboration between educational institutions and industries to align curricula with the evolving demands of the job market. This can help ensure that students acquire relevant and up-to-date hard skills that meet the requirements of the contemporary workforce.

Longitudinal Studies: Conduct longitudinal studies to track the impact of interventions over time. This will provide a comprehensive understanding of the effectiveness of programs and policies in reducing disparities in hard skills among secondary school students in Sri Lanka.

Policy Advocacy for Educational Equity: Advocate for policy changes that prioritise educational equity, taking into account the intersectionality of gender and socioeconomic factors. Engage with policymakers to implement evidence-based strategies that foster an inclusive and equitable educational environment.

Community Engagement Initiatives: Encourage community engagement initiatives that involve local communities in the educational process. This can include awareness campaigns, workshops, and collaborative projects that promote a collective commitment to fostering educational equality and social justice.

Implementing these recommendations will require a concerted effort from educational institutions, policymakers, communities, and other stakeholders. By addressing the multifaceted factors influencing the development of hard skills, Sri Lanka can move closer to creating an inclusive and equitable educational landscape that empowers all students for future success.

Consent

As per international standards, parental written consent has been collected and preserved by the author(s).

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