

## RESEARCH ARTICLE

# Impacting factors and degree of influence on the selection of ICT subject in GCE Advanced Level

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**Abstract:** Education in Sri Lankan education focuses on accelerating the country's knowledge economy by producing skilled and knowledgeable people who suit present-day needs. Moreover, society wants universities to produce graduates, and of course, those graduates must be employable. Meanwhile, job opportunity is guaranteed for job seekers skilled in Information and Communication Technologies (ICT) nowadays. Thus, the Sri Lankan government introduced a new stream "Technology" in the year 2015 as an educational reform. The success level of this government initiative should be measured in an acceptable form for further improvements. The most productive way to measure success measuring the interest of students in ICT on GCE A/L, and the factors that influence it. This study was conducted to examine the factors influencing ICT subject selection by GCE Advanced Level students and to find out the degree of influence of each factor. The coastal region area of Ampara district of Sri Lanka was covered as a sample population for our study. Data to find out the influencing factors were collected by having One-on-One interviews with four categories of stakeholder groups, namely principals or deputy principals, teachers, students, and parents, and prepared a questionnaire with these factors and distributed among the A/L students from different schools to gather their opinions from 266 respondents to find out the degree of influence of factors using the convenience sampling technique. Later, the answers to the questionnaire were analyzed by a statistical data analysis tool which shows that the family income, awareness programme, other main subjects in A/L, and the results of mathematics, English, and ICT subjects in O/L are affecting

the ICT subject selection in A/L, meanwhile the results says that gender, parents' education, and previously followed ICT related courses are not having relations in A/L ICT subject selection, and it revealed the degree of top encouraging factors such job market, opportunities in higher education, and getting high z-score and discouraging factors such lack of resources available in the medium, having no relevancy with other main subjects, and lack of interest in IT.

Keywords: GCE Advanced Level, ICT, Secondary education

## INTRODUCTION

Adequate and quality education is the key to national development. Schools and higher education institutes have a vital role to play to produce valued human resources for this purpose. In Sri Lankan education, there have been many visionary educational reforms since 1947 for developing the nation. In the 21<sup>st</sup> century, education in Sri Lanka focuses on accelerating the country's knowledge economy by producing educated people with the skills and knowledge which suit the present-day needs.

In the present-day context, society wants universities to produce graduates, and of course, those graduates must be employable Daily Mirror (2019). There are so many sectors which facilitate human life in all areas such as health, industry, business, education, agriculture, governance and many other fields connected with our

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day-to-day activities. It should be accepted that all these fields fully / partially rely on Information and Communication Technologies (ICT) nowadays. An empirical and undeniable fact that job opportunity is guaranteed for job seekers skilled in ICT area and ICT-related degree holders. Also, the era of globalization has brought people from various location of the world logically closer to each other through communicational technologies, whereby enhance collaboration amongst people (professionals, students and others) from throughout the globe. Thus, the necessity of studying ICT for students, and global citizens has become more vital than ever before.

As an essential step, schools have the primary responsibility to train the students by increasing their knowledge level to make them selected to the universities. Secondary education is a fundamental level of the system of education. Thus, the Sri Lankan government decided to introduce ICT-related subjects into the secondary-level syllabus, as a concomitant of the GIT examination. GIT examination was introduced in August 2005 in Grade 12. Also, ICT is incorporated as a basket subject in the technical subjects' pool of GCE ordinary-level (Ilmudeen, 2013) in order to meet the needs of today's digital era. As a continuity, the Sri Lankan government incorporated ICT subject as a basket subject in all the streams of GCE Advanced Level (A/L) in the year 2011. It introduced a new stream called the technology stream in the year 2015 as an essential educational reform that suits the present-day needs (Sri Lanka, National Institute of Education, n.d.; Sri Lanka, Ministry of Education n.d.).

Moreover, during the last five (5) years, a total of twenty-nine (29) Technology degree programmes including twelve (12) technology faculties have opened up for the technology stream students ("Sri Lankan higher education system needs specific reforms: UGC Chief," 2020). The success level and the acceptability of these activities of government should be measured in any form for further improvements. The most productive way to measure the success is to measure the interest of students in ICT on GCE A/L, the progression of its preference rate throughout the years, and the factors influence on it.

The authors Sabani & Shafana, (2019) had done a quantitative study to check the progression of ICT subject selection on GCE A/L in Ampara District. They came up with some interesting findings. They proved that the arrival of technology stream (new stream) caused to increase in the ICT subject selection rate by GCE A/L students at Ampara District from the year 2015. The selection rate showed remarkable growth in the year 2015 and also it has a significant rise of nearly 1 – 2.5 % every

year from 2015 to 2018. The success rate of ICT students of Technology stream on the GCE A/L examination in the year 2015 was seventy-three percent (73%), and in the year 2016, this rate increased to seventy-nine percent (79%) with significant improvement.

Moreover, each year results from records reveal that more than sixty per cent (60%) students are performing well and gaining success in ICT subject examination in GCE A/L. Also, there is no remarkable difference in the growth of ICT subject selection rate in technology stream from the year 2015 to 2018. However, in the last year 2019, it showed the highest standard of 60.8%. Even though the ICT subject is one out of the eleven (11) optional subjects for technology stream students, more than fifty per cent (50%) students select it as the third main subject. One more interesting fact of students choosing the third main subject in technology stream is that Engineering Technology students are prefer to study ICT subject rather than the Biosystems Technology students. Sabani & Shafana, (2019) finally concluded that the arrival of technology stream leads to the fast progression of the selection of ICT subjects by the school students in GCE A/L at Ampara District. Their results prove us that, the timely needed reform which had taken by the Sri Lankan Government has a significant success rate among the students even though there is room to increase the success rate by identifying the problems and shorting out them.

These exciting findings made encouraged us to continue the study to find the factors that might influence students' choices of ICT. Therefore, we would like to continue our study by considering the same in Ampara district. To identify the influencing factors to motivate our local students as a community contribution and increase the number of eligible students for university entry., No previous studies have been done in this district so far, It was relatively easy to contacts local students and secure approval from the zonal director of our zone and collecting data easily, and to see whether the students of Ampara district utilizes the resources of the nearby university the South Eastern University of Sri Lanka which is offering a Bachelor of Information and Communication Technology degree for the technology stream.

This study aims to have a qualitative analysis to examine the influencing factors on GCE A/L students to choose and study Information and Communication Technology subject in the coastal area of Ampara District. Moreover, this study searches and delivers an in-depth quantitative statistical analysis of factors that encourage

or obstruct students from choosing Information and Communication Technology at the GCE A/L.

This study seeks to find the answers to the research question, what possible influencing factors that make the students select Information and Communication Technology in GCE A/L to study as one of the main subjects even though it is one of the basket subjects with the other ten (10) optional subjects at Ampara District? Is there an association between the found facts and ICT subject selection in A/L students?

Further, this study, tries to seek the answers to three subsidiary research questions. What is the perception of teachers, students, parents and school leadership about Information and Communication Technology subjects or fields of study at secondary-level schools? What are the possible influencing factors that encourage students to select Information and Communication Technology in GCE A/L at Ampara District? What are the possible influencing factors that demotivate students from studying Information and Communication Technology in GCE A/L in Ampara District?

There is not enough relevant previous studies and resources in this area for the literature analysis since there is a lack of research on this particular topic. Therefore we found that there is a classic literature gap for our research study. The findings of this proposed study would have some benefits for various people. The results of this study would help the school administration and teachers to realize the influencing factors on students' choices of selecting or neglecting Information and Communication Technology. The results might be useful for other district schools too in Sri Lanka. Moreover, different schools could also use the study to design and support career orientations work with high-grade students. The finding of this study would also be useful for the policy-makers and Sri Lankan government. This study might be useful to other researchers. It might be used to motivate the students and to make them more confident about their selection of subject. Furthermore, this research might be helpful to students, parents, school administration, and teachers to take the necessary action to build up their career lives, sort out the deficiencies in the school environment, improve the teachers' professional skills, and more.

## METHODOLOGY

This study aimed to do two types of research. The first one is qualitative research to find out the possible influencing factors on subject selection. This qualitative research is

followed by an in-depth quantitative statistical analysis to explore the degree of influence / relative influence of varied factors impacting on the choice of ICT subject in GCE A- Level.

Qualitative research attempt to delve into the phenomenon in its natural context through exploring, understanding, and interpreting the views, experiences, and perceptions of the participants in the study. The participants must be deliberately selected since the qualitative research methods rely on the experience, views, and perspectives of participants chosen for the in-depth search of a central phenomenon (Creswell, 2012). Consequently, the perceptions of stakeholders whoever directly or indirectly influences students' subject selection are essential to consider in this study. The opinions of the students who choose the ICT subject must be learnt to explore the encouraging factor, and the views of another group of students who do not select the ICT subject must also be known to examine the discouraging factors. Likewise, the perspectives of teachers who teach ICT and other subjects, and school administrators must also be collected. The parents are like the innermost environmental layer, and they influence their children. So, the opinions of parents must also be considered. Therefore, interviews were conducted with four categories of stakeholder groups, such total of seven (07) principals and two (02) deputy principals, nine (09) teachers, twenty (20) students, and five (05) parents. We selected each group by the purposeful sampling approach. All the interviews were conducted as One-on-One interviews. One-on-one interviews are suitable for interviewing participants who can share ideas comfortably without being hesitant to speak, and articulate (Creswell, 2012) since the students might have some sensitive influence, such as parents' education level, and low economic status. It was proper to have an individual interview with these students to set up an environment to feel free to answer questions without reluctance and peer stress. In this interview, each participant is requested to answer the above-mentioned three subsidiary questions.

The qualitative study was carried out through semi-structured interviews in several Government schools, especially in the ICT subject offering schools in GCE A/L at the coastal area of Ampara District. Ampara district covers a total of seven (7) educational zones, namely Sammanthurai, Ampara, Kalmunai, Dehiyathakandiya, Akkaraipattu, Thirukkivil, and Mahaoya. Among these seven zones, this study provisionally concentrated only on five (5) zones of Thirukkivil, Ampara, Sammanthurai, Kalmunai and Akkaraipattu as it was able to collect sufficient information from seven (07) schools in these zones. In order to collect the data, prior permission was

taken from the Zonal Director of Education (ZDE) to proceed with this study on the school environment. Next, it is a must to gain permission from the principals to interview with students, teachers, and deputy principals in a school environment. Therefore, the approvals were taken from principals wherever we decided to conduct the interview and collect the data. Soon after obtaining the principals' permission, participants were identified, and an accurate date and time were scheduled to each participant to arrange the interview with them as the data collection was carried out during school hours.

The honest answers of those four categories of participants were listed out and a questionnaire (see Annexure I) was prepared to conduct the quantitative analysis to explore the degree of influence. The survey was responded to by a group of Advance Level students of those selected seven schools. We used the convenience sampling method to collect the response from the students who were present at the school on that day. The sample size of our study was 266 after eliminating incomplete questionnaires from the total responses. This group included the students who had chosen the ICT subject and the students who did not select the ICT subject in Technology stream as well. Later, the answers of the questionnaire were tabulated and analyzed by a statistical data analysis tool called "Statistical Package for the Social Sciences" (SPSS) to find out the degree of influence of listed factors of the previous qualitative analysis.

## RESULTS AND DISCUSSION

The findings of this study aim to answer the research question mentioned earlier that guided the study. What are the influencing factors that encourage students to select Information and Communication Technology in GCE A/L at Ampara District? What are the influencing factors that demotivate students from studying Information and Communication Technology in GCE A/L at Ampara District?

These findings came out from the data collected through the semi-structured interview with four types of participants: parents, students, school administration and teachers at Ampara district. The collected data exposed several influencing factors on students' choices of studying Information and Communication Technology subject as the third main subject at the GCE A/L. These factors reveal the following:

An important reason is that Sri Lankan Advanced Level education system is designed to have continuity

with a future career. Students and parents have some overview information about preferred professions and demanding professions of the future. During the subject choice, they always try to make a connection with the subject and future careers. They gain this background information through awareness programs, motivated by someone in a close circle (like teachers, friends, and parents), and workshops. In the present-day context, students have demanding job opportunities in ICT-related careers all around the world. If any student or parent got a chance to attend a well-organized awareness program or workshop, then they would get a piece of pertinent information about this subject and would prefer to choose ICT as a subject in GCE A/L. Therefore, it can be said that getting proper awareness about job opportunities for ICT careers in future industries or markets might influence as a motivational factor. Moreover, attending awareness programs, and workshops, and getting advice from a close circle also can behave as a motivational factor. Knowledge and awareness about this profession and fields of study may lead to neglect of the ICT subject.

Some of the teachers think that, as this study was carried out in Ampara District, gender and ethnicity might influence subject choice. As the data collected mostly from the schools following Tamil medium, the ethnicity religious identification may be Ilam, Hindu, and Christian. ICT career students get demanding jobs in industries rather than governmental sectors. Most of the industries are placed in far away districts like Kandy, and Colombo. Most of the parents and students who practice above-mentioned ethnicities would not prefer to send females to faraway places to find job. Therefore, they might think that an ICT career is unsuitable for female students which might be a discouraging factor.

The students who took the ICT subject in GCE O/L and got a good passing grade in the final O/L examination would also prefer to take the ICT subject in GCE A/L too. They think they can get a good result in A/L because they were able to get high results in O/L. Same as this, the students who followed any courses (workshops, training courses, certificate level, or diploma level) related to ICT before entering to GCE A/L would also prefer ICT in A/L as they are interested in this path.

Students are controlled by internal and external factors, which directly or indirectly influence their choices. Socioeconomic background of the students is an external factor that directly influences on subject and career choices. The students who have a passion for continuing their higher education after their first graduation aim to secure either scholarships or grants

because their parents may not be able to pay for the costs due to their low financial status. Therefore, they strive to select those subjects which have possibilities for getting scholarships. Thus, it is obvious that the family's monthly income influences on students' subject choice. The educational levels of the father and mother are surreptitiously somewhat reflecting on family income. Usually, educated parents may guide their children in a proper path that well suitable for the present and future context. Some students seek help from their parents to learn the contents of their subjects. The ICT subject only has a few years of history as it is newly introduced. Most of the parents are unable to teach this new subject like they teach other usual subjects like history, agriculture, and commerce, because of unfamiliarity with this new subject. Some of the innovative students prefer technical or practical matters. Rather other students like to study theoretical subjects like history and geography. One of the opinions of experienced teachers is that, male students are more willing to take technical subjects while female students prefer theoretical ones. Some students favour taking relevant subjects with their other main subjects in CGE A/L. Sri Lankan education system uses a Z score scheme to select and enroll the student various state universities within the country. The concern about the Z score creates an impact on the in-depth mind of students and their parents. Therefore, they think about choosing the subjects that can lead them to achieve a higher z score than the cut-off.

In continuation of the answers to research questions, one more exciting factor was identified that, regardless of their interest in the subject, teachers somehow influence students in subject selection. One of the students who is taking the ICT subject said that he chose the ICT subject because he likes the teaching method of their ICT teacher. Another student from a different school expressed concern, saying, 'I like the ICT subject, but we don't have a qualified teacher or sufficient ICT laboratory facilities at our school to properly teach it. Because of this, most of my friends have neglected ICT. However, one of my friends chose to study it, trusting in internet resources, and he also has a computer at home. Now, he feels more comfortable studying ICT since there are more resources available online than he expected, and he is fluent in English, which helps him use those learning materials.

Nevertheless, the worry is my friend who chose this subject with me is struggling in his study because he is not fluent in English and there are very few resources in the language medium of A/L study". Apart from this, some students choose ICT subjects if they have private tuitions in the region. It can be interpreted from this story that, apart from the own interest of students, there are

some other external influencing factors, such sufficiently qualified teachers, adequate ICT laboratory facilities in the school, private tuition in the region, and computer or internet facility at home. A parent revealed that friendships of school students are already strengthened, and their opinion on choices of a profession is not discarded. Furthermore, they are willing to study together in the same classes. Therefore, some students take the subject of what their friends choose.

The qualitative analysis presented that various factors influence students' choice of Information and Communication Technology. Such as the influence of professional choice, own interest, scholarship opportunities, parents, teachers, peers or friends, career choice, economic status, available resources, and subject preferences. A questionnaire was distributed, which included all these factors to collect the students' opinions. Besides, a quantitative analysis using a Chi-Square test was done to find out the association among these factors of influence.

Taken hypotheses:

The 'null hypothesis' is:

$H_0$ : ICT subject selection is not related to (associated with) the respective factor

and an 'alternative hypothesis' is:

$H_1$ : ICT subject selection is related to (associated with) the respective factor

As the first step in this test, a group of students were classified in terms of ICT subject selection (ICT and non-ICT) and gender (male, female). ICT subject selection and gender category are categorical data. Data of this type are presented in the form of a table (cross-tabulation), sometimes called a contingency table.

The results of a survey of 266 students are tabulated in Table 1. The results show that Pearson Chi-Square statistics,  $\chi^2 = 3.47$ , and  $p > 0.05$ ; i.e., a minimal probability of the observed data under the alternative hypothesis of relationship with the gender. The null hypothesis was accepted, since  $p > 0.05$ . Subject preference is not significantly related to gender. .

The next test carried out to find the association between the subject selection and their Ordinary Level (O/L) exam results of Mathematics, Science, English, and ICT subjects, respectively. The students' group was classified in terms of ICT subject selection (ICT and non-ICT) and the result of the Mathematics subject (Low,

**Table 1:** Gender vs subject selection (ICT and non-ICT)

			ICT	Non-ICT	Total
Gender	Male	Count	100	59	159
	Female	Count	55	52	107
Total		Count	155	111	266

  

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.473 <sup>a</sup>	1	.062		
Likelihood Ratio	3.465	1	.063		
Linear-by-Linear Association	3.460	1	.063		
N of Valid Cases	266				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 44.65.  
b. Computed only for a 2x2 table

**Table 2:** Results of Mathematics in O/L vs subject selection (ICT and non-ICT)

			ICT	Non-ICT	Total
O/L Maths Results	Low (S or F grades)	Count	13	40	53
	Moderate (C grade)	Count	79	34	113
	High (A or B grades)	Count	63	37	100
Total		Count	155	111	266

  

Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	32.033 <sup>a</sup>	2	.000
Likelihood Ratio	32.375	2	.000
Linear-by-Linear Association	14.479	1	.000
N of Valid Cases	266		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.12.

Moderate, High results). The grades S and F are defined as low, grade C is defined as moderate, and grades A and B are defined as high results.

The results show that Pearson Chi-Square statistics,  $\chi^2 = 32.03$ , and  $p < 0.05$ ; i.e., a minimal probability of the observed data under the null hypothesis of no relationship. The null hypothesis was rejected at 95% of the significant level. ICT Subject preference is significantly related to the results of the mathematics subject in the O/L examination. Most of the technology stream students from those who got a moderate or higher result in mathematics have selected the ICT subject as the third optional subject for A/L studies. A low percentage (24.5%) of the students with low results in mathematics have selected the ICT subject (the results are tabulated in Table 2).

Moreover, when we see the results of the association between the ICT selection and O/L results of Science

subject, it seems there is no significant relationship between them because the null hypothesis was accepted. Pearson Chi-Square statistics,  $\chi^2 = 1.57$ , and  $p = 0.457$  which is greater than 0.05 ( $p > 0.05$ ); i.e., a very small probability of the observed data under the alternative hypothesis of relationship with the results of Science subject.

However, in the case of the results of the English subject, it has a significant association between the ICT subject preference and the achieved grade in English. The selection percentage gradually increases with the grades achieved. Thus, 46.1% of students from who got low results (S or F) in English selected the ICT subject, 63.5% of the students from who got moderate results (C grade) preferred the ICT subject, and 79.2% of students with higher results (A or B) gainers' have selected ICT subject. Moreover, the results show that Pearson Chi-Square statistics,  $\chi^2 = 18.36$ , and  $p < 0.05$ ; i.e., a minimal

**Table 3:** Results of English in O/L vs Subject selection (ICT and non-ICT)

		ICT	Non-ICT	Total	
O/L English Results	Low (S or F grades)	Count	59	69	128
	Moderate (C grade)	Count	54	31	85
	High (A or B grades)	Count	42	11	53
Total	Count	155	111	266	
Chi-Square Tests	Value	df	Asymptotic Significance (2-sided)		
Pearson Chi-Square	18.361 <sup>a</sup>	2			
Likelihood Ratio	19.113	2			
Linear-by-Linear Association	18.276	1			
N of Valid Cases	266				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 22.12.

**Table 4:** Results of ICT in O/L vs Subject selection (ICT and non-ICT)

		ICT	Non-ICT	Total	
O/L ICT Results	Low (S or F grades)	Count	88	105	193
	Moderate (C grade)	Count	23	4	27
	High (A or B grades)	Count	44	2	46
Total	Count	155	111	266	
Chi-Square Tests	Value	Df	Asymptotic Significance (2-sided)		
Pearson Chi-Square	47.230 <sup>a</sup>	2			
Likelihood Ratio	56.281	2			
Linear-by-Linear Association	45.067	1			
N of Valid Cases	266				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.27.

probability of the observed data under the null hypothesis of no relationship. The null hypothesis was rejected at 95% of the significant level. ICT Subject preference is significantly related to the results of the English subject in the O/L examination (the results are tabulated in Table 3).

The results in Table 4 show that the association between ICT subject preference in A/L and the results gained for ICT subject in O/L gradually increases with the achieved grade as same as the association with English results. Our analysis says that the selection percentage slowly increases with the grades of ICT achieved. Thus, 45.6% of students who got low results (S or F) selected the ICT subject in A/L as well, 85.2% of the students who got moderate results (C grade) and 95.7% of students with higher results (A or B) gainers' have selected ICT subject. Moreover, the results show that Pearson Chi-Square statistics,  $\chi^2 = 47.23$ , and  $p < 0.05$ ; i.e., a minimal probability of the observed data under the null hypothesis of no relationship. The null hypothesis was rejected, since  $p < 0.05$ . ICT Subject preference is significantly related to the results of the ICT subject in the O/L examination. Moreover, 58.3% of students from

the total sample students who took ICT in O/L have taken ICT in A/L as well.

Another result shows that parents' (father and mother) education is not associated with the ICT subject preference. Pearson Chi-Square statistics of father's education,  $\chi^2 = 2.01$ , and  $p > 0.05$ ; i.e., a minimal probability of the observed data under the alternative hypothesis of relationship with the father's education. The null hypothesis was accepted, at 95% significant level.

Moreover, the null hypothesis of the mother's education was also accepted, since  $p > 0.05$ , and the Pearson Chi-Square statistics of the mother's education,  $\chi^2 = 0.495$ .

An undeniable fact found that the family income associated with the ICT subject selection in A/L. The students were classified in terms of ICT subject selection (ICT and non-ICT) and the family monthly income (Low, Moderate, High income). A monthly income of less than 20,000 is defined as low, an income between 20,000 – 50,000 is defined as moderate, and an income of more than 50,000 is defined as high results. Pearson

Chi-Square statistics indicates,  $\chi^2 = 7.08$ , and  $p < 0.05$ ; the null hypothesis was rejected, since  $p < 0.05$ . Most of the students; eighty-seven (87) out of hundred and thirty-seven (137) with moderate incomes(63.5%) are willing to take the ICT subject in their A/L, thirty-five (35) out of fifty-six (56) with high income(62.5%) has taken the ICT subject. Furthermore, thirty-three (33) out of seventy-three (73) with low income (45.2%) has chosen the ICT (results are tabulated in Table 5).

Another assumption that there might be an association between the ICT selection and the followed ICT related courses before A/L was proved as wrong by the results of Pearson Chi-Square statistics,  $\chi^2 = 2.86$ , and  $p = 0.091$  which greater than 0.05 ( $p > 0.05$ ); the null hypothesis was accepted.

Even though the assumption of the awareness program about ICT influences as motivation to select the ICT subject had been proved as true with the Pearson Chi-Square statistics,  $\chi^2 = 11.13$ , and  $p < 0.05$ ; here the null hypothesis was rejected. Furthermore, to find the awareness program organized by whom affects more on

students in the subject selection, the test was carried out with the groups in terms of ICT subject selection (ICT and non-ICT) and the program organizers (School, Divisional education office, Zonal education office, a non-profit organization, private institutions). The results show that there are no specific organizers' impacts at different levels in ICT selection, but the awareness programs' impact as a motivation to the ICT era, and the Pearson Chi-Square statistics,  $\chi^2 = 5.25$ , and  $p > 0.05$ . Table 6 and Table 7 illustrate the results of the association of ICT subject selection with the awareness programs and the organizers, respectively.

One more interesting finding (Sabani & Shafana, 2019) had been proved by one of our tests that the Engineering Technology students were more willing to take the ICT subject than the BioSystems Technology students. Overall students of Engineering Technology, sixty-five point five percent (65.5%) students had selected for the ICT subject. In Biosystems Technology, it was only forty-nine point two percent (49.2%). The Pearson Chi-Square statistics,  $\chi^2 = 7.25$ , and  $p < 0.05$ ; a

**Table 5:** Family income vs subject selection (ICT and non-ICT)

			ICT	Non-ICT	Total
Family Income	Low (income < 20k)	Count	33	40	73
	Moderate (income between 20k-50k)	Count	87	50	137
	High (income > 50k)	Count	35	21	56
Total		Count	155	111	266
Chi-Square Tests		Value	Asymptotic Significance (2-sided)		
Pearson Chi-Square		7.079 <sup>a</sup>	.029		
Likelihood Ratio		7.016	.030		
Linear-by-Linear Association		4.540	.033		
N of Valid Cases		266			

a. 0 cells (0.0%) have expected count of less than 5. The minimum expected count is 23.37.

**Table 6:** Awareness program participation vs subject selection (ICT and non-ICT)

			ICT	Non-ICT	Total
Awareness Programme Participation	No	Count	56	63	119
	Yes	Count	99	48	147
Total		Count	155	111	266
Chi-Square Tests		Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided) Exact Sig. (1-sided)
Pearson Chi-Square		11.132 <sup>a</sup>	1	.001	
Likelihood Ratio		11.167	1	.001	
Linear-by-Linear Association		11.090	1	.001	
N of Valid Cases		266			

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 49.66.  
 b. Computed only for a 2x2 table



**Table 7:** Awareness program organizers vs subject selection (ICT and non-ICT) (only among the students who have participated to awareness program)

			ICT	Non-ICT	Total
Awareness Programme Organised By	School	Count	56	27	83
	Divisional Education Office	Count	4	3	7
	Zonal Education Office	Count	5	0	5
	non-profit Organization	Count	4	5	9
	Private Institute	Count	30	12	42
Total	Count	99	47	146	
Chi-Square Tests			Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square			5.246 <sup>a</sup>	4	.263
Likelihood Ratio			6.572	4	.160
Linear-by-Linear Association			.049	1	.825
N of Valid Cases			146		

a. 5 cells (50.0%) have expected count less than 5. The minimum expected count is 1.61.

**Table 8:** Major subject vs subject selection (ICT and non-ICT)

			ICT	Non-ICT	Total
Main Technology streams (ET / BST)	BST	Count	58	60	118
		Count	97	51	148
	E Tech	Count	155	111	266
Total		% of Total	58.3%	41.7%	100.0%
Chi-Square Tests			Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square			7.251 <sup>a</sup>	1	.007
Likelihood Ratio			7.259	1	.007
Linear-by-Linear Association			7.224	1	.007
N of Valid Cases			266		

a. 0 cells (0.0%) have an expected count of less than 5. The minimum expected count is 49.24.  
 b. Computed only for a 2x2 table

minimal probability of the observed data under the null hypothesis of no relationship, and the null hypothesis was rejected (results are tabulated in Table 8). The major subjects significantly influence the selection of ICT subject as the third main subject.

Furthermore, through this study, we collected the reasons for their preference by two separate open-ended questions which have listed out some possible reasons to be chosen as well. Accordingly, most of the students in our participants, a total of hundred and fifty-five (155) out of two hundred and sixty-six (266) have preferred to choose the ICT subject. To summarize, the students who had selected the ICT subject had remarked on five top reasons based on their perception. Many opportunities in Industry/job Market were the chief reasons that took place in the minds of hundred twenty-seven (127) students out of hundred and fifty-five (155). The second important reason chosen by hundred, twenty-three (123)

students was that the possibility of getting a high z-score is high in the Advanced Level final examination through ICT. Subsequently, third importance was given by the students those who were on the thirst for further studies in higher education. Moreover, those who had previous exposure/interest in IT preferred ICT in A/L as well. Finally, the students who are interested in the technical or practical-oriented subject also have mostly chosen to study ICT subject as they understood ICT as a technical or practical-oriented subject. The main reasons for selecting ICT subject in GCE A/L and the number of students who have preferred it as one of the top five reasons are shown in Table 9.

Conversely, the ICT subject was rejected by a hundred and eleven (111) students out of two hundred and sixty-six (266) from our participants. The main reason out of five for this rejection was not having previous exposure/interest in IT. Moreover, one of the results stated earlier

**Table 9:** Reason for selecting ICT in GCE A/L and preferences

Reason for select ICT subject	No. of students selected as one of their top five (05) preferences	Students' percentage (%) -selected as one of their top five (05) preferences
Previous exposure/ Interest in IT	95	35.8%
Can get high z-score	123	46.3%
More relevance with other GCE A/L subjects	14	5.3%
Many opportunities in industry/ Job market	127	47.8%
Many opportunities in higher education	116	43.7%
Technical/practical oriented subject	91	34.3%
Have a computer/ internet facility at home	20	7.6%
Friends take ICT as a GCE A/L subject	5	1.9%
More resources available in the language medium of study	18	6.8%
Availability of sufficient teachers in school	10	3.8%
Availability of sufficient ICT laboratory facilities in the school	4	1.6%
Availability of sufficient ICT laboratory facilities in the school	6	2.3%
Motivated by teachers	5	1.9%
Motivated by friends/ family members	8	3.1%
Motivated by awareness (for subject selection in GCE A/L) program	15	5.7%
Any other	3	1.2%

**Table 10:** Reason for not to select ICT in GCE A/L and preferences

Reason for not to select ICT subject	No. of students selected as one of their top five (05) preferences	Students' percentage (%) -selected as one of their top five (05) preferences
Do not have previous exposure/ interest in IT	73	27.5%
Cannot get high z-score	30	11.3%
Not relevant to other subjects	58	21.9%
Lack of opportunities in industry/ Job market	4	1.6%
Lack of opportunities in higher education	5	1.9%
Technical/practical oriented subject	26	9.8%
Do not have a computer/ internet facility at home	42	15.8%
Friends do not take ICT as a subject	22	8.3%
Lack of resources available in the medium of study	29	11%
Availability of insufficient teachers in school	26	9.8%
Availability of insufficient or no ICT laboratory facilities in the school	9	3.4%
Availability of insufficient private tuitions in the region	15	5.7%
Demotivated by teachers	12	4.6%
Demotivated by friends/ family members	27	10.2%
Demotivated by awareness (for subject selection in GCE A/L) program	26	9.8%
Any other	20	7.6%

that the students who had previous experience preferred the ICT subject in A/L as well. In conclusion, from these two perceptions, we can say that having prior experience influences on the selection of an ICT subject strongly. Similarly, half of the students who had rejected the ICT subject had stated that they selected non-ICT subjects as they thought that the ICT subject not relevant to the other two main subjects that they liked.

An unavoidable fact that ICT requires some essential requirements such as computers and internet facilities at home for self-study. Thus, the lack of these resources was one of the important factors in rejecting the ICT subject. In addition to this, thirty (30) students out of one hundred and eleven (111) thought that they would not get a high z-score from ICT subjects. It has been mentioned earlier that most of the students had selected the ICT subject because they thought that they would get a high z-score. It can be concluded that it is necessary to give a clear awareness about the value of choosing an ICT subject over the other optional subjects and its higher impact on getting a z-score. Beyond this, as we mentioned earlier in this study, this survey was conducted in Tamil medium schools. Unfortunately, there is a lack of recommended readings or resources in the Tamil language.

Consequently, some of the students were turned away from ICT to some other subject for which they could get a rich source. Therefore, we have decided to publish some books or learning materials in the Tamil language which could be very useful for Tamil medium students as our future works. The main reasons for not selecting ICT subjects in GCE A/L and the number of students who have preferred it as one of the top five reasons are shown in Table 10.

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## CONCLUSION

Through our qualitative research, we pointed out many possible encouraging and discouraging factors in ICT subject selection. A total of hundred and fifty-five (155) out of two hundred and sixty-six (266) have preferred to choose the ICT subject. Meanwhile, the ICT subject was rejected by a hundred and eleven (111) students out of two hundred and sixty-six (266) from our participants. Furthermore, our study has analyzed the degree of influence of these factors by SPSS. Through the analysis, we can conclude that the subject preference seems not to be related to gender and the results of the science subject in the O/L examination. However, the results of mathematics, English, and ICT in O/L examination, and

awareness program significantly influence the subject choice.

Moreover, family income is somehow associated with the ICT subject selection. In addition to these, the students have pointed out the topmost five (05) reasons for their selection. From their reasons, we can conclude some motivation factors that they thought there are many opportunities in the industry/job market for the ICT sector, the possibility to get a high z-score in advanced level by taking ICT, more chances to get scholarships and to continue further higher studies in this discipline. Subsequently, previous exposure/interest in IT had preferred ICT in A/L as well. The students those who are interested in the technical/practical oriented subject also have mostly preferred to study this subject. The demotivating factors were such that not having previous exposure/ Interest in IT, non-relevancy with the other two main subjects which they chose as main subjects, and lack of resources like computer and internet facilities. Also thought that they would not get a high z-score from the ICT subject, and the lack of recommended readings or resources in their medium of study of A/L.

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