EVALUATING SKILLS AT SECONDARY SCHOOLS TO INCREASE THEIR CHANCE FOR STUDYING IN UNIVERSITIES: A CASE STUDY

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ABSTRACT

Entrance to a university depends on the acquisition of skill sets to enhance transition success. A case study of secondary schools of the scientific branch about their quality of education to discover which students skills are needed for students to succeed in the transition phase between high schools and universities. 220 participants from three different schools: public school, private school, and elite public school were examined. The skills were classified into six categories: literacy and numeracy skills, critical thinking skills, leadership skills, Interpersonal skills, information technology skills, and school ethic skills with different items according to the type of skill. Univariate-ANOVAs were performed to explore differences in skills among demographics. Also hypothesizes that there is no difference between the different secondary schools in the six skills. The results show that there is a significant difference among the students' perceptions of four of the six skills. Also revealed that the attitudes of elite public-school teachers were the highest, followed by the private school and, finally, the public school. This study Highlighted skills items of students' scientific branch that should be emphasized in the secondary curriculum to enhance the transitions to universities.

Keywords: skills; teachers; students; secondary school; university.

1. INTRODUCTION

Like every other aspect of life, tertiary institutions are an environment where success depends on an individual's skill sets in scaling through the challenges that belong to the institution, either as students or teachers. Institutes of higher education save no efforts to augment the quality of education and levels of granted degrees (Jansen & Suhre, 2010).

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Although the vast majority of high school students aspire to enroll in universities after their secondary education, far too many students enter university without acquiring the basic content skills of mind they need to succeed during academic study (Venezia & Jaeger, 2013). Thus, the pattern of background study in which they have been educated can be quite different. Due to inadequate training in all the skills, the transition from high school to a post-secondary environment is often a very hectic situation for most students (Parker et al., 2006; Parker et al., 2004; Pratt et al., 2000; Gall et al., 2000).

The literature has been more than vocal in describing the dilemma that students face while trying to accustom themselves to the new environment and challenges that university education presents. A major area of concern is student transition from high schools to university. In a recent study that tried to bridge this gap, Ferreira (2018) pointed out that stakeholder engagement, amongst other things, is needed to help bridge the gap between the two curricula (Ferreira, 2018). Similarly, Briggs et al. (2012) highlighted several reasons why transitioning may seem insurmountable for students, including the difference in teaching styles, broader subject content, and the difference in learning styles (Briggs et al., 2012).

Reid and Moore (2008), with the understanding of the challenges of transitioning, researched college readiness and academic preparation for university education (Reid & Moore III, 2008). They argued that students' integration into the university system will be more successful when done with the understanding of the challenge associated with transitioning. In sum, there is a rising debate about how students can be braced for the forces that will oppose them during the transition process to their new academic environment. Universities know and strive to create support systems for their students to enable them to smoothly transition to their new learning environment and improve their overall study experience.

Highlighting the challenges of transitioning for the student is crucial and highly valuable input to identify the needed skills for the successful integration of students from high school to university. Importantly, the untended stress of transition may result in greater damage that may impact students' entire psychological well-being throughout their studies at the university. Van Rooij and Jansen (2018) concluded that post-secondary preparation is essential in ensuring a smooth transition for students since their study reported the difference in students' experience based on the nature of exposure given to them by their teachers (van Rooij & Jansen, 2018).

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Jansen and Suhre (2010) also drew similar conclusions, suggesting that pre-university preparation is as important as the actual university education for students to be successful in their courses of choice in the university (Jansen & Suhre, 2010).

In Goggin et al.'s (2016) experimental study, it was concluded that exposing grade 12 students to a university program was instrumental in aiding teachers' effectiveness in preparing the students in areas such as critical thinking, learning skills, and failure avoidance, which are integral skills for achieving optimal success in university learning environments (Goggin et al., 2016).

Additionally, Foo et al. (2014) stated that acquiring reliable and relevant knowledge using information literacy skills is an important cog in the eventual success story of university students who have been exposed adequately to the use of such skills while still at the high school level. Further investigation of the result of Foo et al.'s study revealed that if high school students are not trained in the effective use of information literacy skills, they end up not using the academic facilities made available in universities (Foo et al., 2014).

Using triangulated data from grade 11 and 12 students, Julien and Barker (2009) argued for the development of high school literacy skills since they will be instrumental to their development and academic performance at the university. They conclude that teachers demonstrating literacy skills to the students in the classroom is far more important than just exposing students to the skill (Julien & Barker, 2009).

The continuum of transiting to a higher education learning environment is a complex and demanding phenomenon (Dias & Sá, 2012). To be successful, students need a coping mechanism to sustain them throughout the process. Some of the coping mechanisms are related to the development of competency in pertinent areas of their changing lifestyle, such as developing purpose and integrity, managing emotions, establishing identity, and developing autonomy(Chickering & Reisser, 1993). Considering these demands in addition to many other challenging stressors for fresh students, students must develop competence in a variety of areas ranging from social to academic to facilitate their integration into the higher education system.

Consequently, most of the students are unprepared to transition to postsecondary education for many reasons; previous studies asserted that a large gap exists between the learning outcomes of the secondary school curriculum and the basic expectation of post-secondary colleges (Venezia & Jaeger, 2013; Venezia et al., 2003).

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For example, students are not engaging in problem-solving and critical-writing exercises that develop both deeper knowledge of the content and the more general logical and analytical thinking skills valued at the postsecondary level (Roderick et al., 2009).

Moreover, many studies have found that most students suffer from a lack of skills and knowledge to make effective use of information (Cunningham, 2010; Rowlands et al., 2008; Bennett et al., 2008; Foo et al., 2014). Some authors emphasize the need for researchers and policymakers to be explicit about precisely which sets of knowledge and skills shape college access and performance and about how best to measure those skills and creative and critical thinking approaches in the school curriculum (Foo et al., 2014; Herrington, 2005; Grabinger & Dunlap, 1995).

Enhancing the skills of students and their level of competency are closely related to bridging the gap regarding high school students' transitions to universities. According to Hanover Research (2014), there is a huge demand for schools to work on soft skills to improve students' prospects during their graduate studies and work (Research, 2014).

The present study answers the gap mentioned by studying preparation and the lack of knowledge of high students that will be needed during academic study in university(van Rooij & Jansen, 2018). In this respect, this study aims to three key a significant contributions: First it considers to investigate and confirm if and what differences there are in the skills gained at school in sector of North Cyprus that enable students to enroll in universities.

Second it provides insights to perspectives on the study skills of the secondary schools regarding the students' abilities about six basic skills from students and teachers. These skills are: 1) literacy and numeracy (L&N), 2) critical thinking (CT), 3) leadership (LS), 4) interpersonal (IP), 5) information technology (IT), and 6) school ethic skills (ES). Third it highlights an addresses the following two questions:

a) Do high schools in Famagusta provide grade 12 students with appropriate skills to get better chances of enrolling at the university?

b) What could be done to improve the required skills in high schools in grade 12 to match the requirements of university study?

The null hypothesis would be that the attitudes of students of three different high schools in Famagusta towards the six skills are the same. The authors would like to find out which high school is enhancing the six skills better.

Our study is of great importance as it provides the literature with more data about the skills shortage in order to improve the awareness of skills that are needed to bridge the gap between secondary schools and universities. Even more, evaluating students' skills at high schools is restricted and the best of our knowledge there are no previous studies in this scope used six sorts of skills regarding school evaluation. This study will focus on secondary schools in Famagusta, Turkish Republic of North Cyprus (TRNC) students which may limit the generalization of the result.

2. METHODOLOGY

2.1. Participants

The participants are classified into different groups according to their schools. The total sample for this study consisted of 196 (49.50% male and 50.50% female) respondents from grade 12 students those studying in the scientific branch. Additionally, there were 24 teachers respondents (4.20% male and 95.80% female) who taught them.

The students were close to graduation and were aspiring to enroll in university after they finished high school. The sample was obtained from three types of high schools that had the needed attributes and were purposively sampled for the study: Private school (17.30%), Public school (59.70%), and Elite public school (23.00%). For further demographic characteristics see Table 1.

Table 1: Demographic data for secondary school students and their teachers for the three types of schools

Variable	Categories	N	Participants (%)
Teachers			
Gender	Male	1	4.20
	Female	23	95.80
Education level	Bachelor's degree	14	58.30
	Master's degree	9	37.50
	Ph.D. degree	1	4.20
Teaching time	Part-time	1	4.20
	Full-time	23	95.80
Years of teaching experience	1–5	8	33.30
	6–10	4	16.70
	10 +	12	50.00
School of teaching	Private school	5	20.80
	Public school	7	29.20
	Elite public school	12	50.00
Students			
Gender	Male	97	49.50
	Female	99	50.50
Age	Up to 17	93	47.40

	18–20	89	45.40
	Over 21	14	7.10
Are there tutorial sessions?	Yes	104	53.10
	No	92	46.90
What is your score out of 10 in grade 11?	5–7.5	71	36.20
	7.51–10	125	63.80
Schools	Private school	34	17.30
	Public school	117	59.70
	Elite public school	45	23.00

2.2.   Questionnaire

This research used a quantitative data collection method, i.e. questionnaires. The questionnaire was developed from existing research(Heimler, 2010) based on an internationally compiled set of skills and knowledge and was modified and shortened to fit the needs of the study.

The first part elicited the background characteristics (Table 2), and the second part included six groups of statements to assess autonomous skills (refer to Appendix A, Table 1-A). The questionnaire was designed using a Likert-type scale based on 5-points, presuming that the strength/intensity of the experience is linear, i.e. on a continuum from strongly disagree to strongly agree for each item. Due to research needs, the variables were divided as dependent and independent. The dependent variable is the average Likert scale for each attitude. The independent variables are:

- School type (private school, public school, and Elite public school).

- Participants' gender and tutorials (students and teachers).

- Each of six skills: L&N, CT, LS, IP, IT, and ES.

Reliability is the desired degree to which a test reliably performs a measurement. The reliability and validity of the questionnaires was examined by the authors, the Cronbach's alpha result was 0.933 when the number of items (n) was 36. Therefore, all test items are reliable and consistent.

2.3.   Statistical analysis

This study employed the SPSS 21.0 statistical software package for statistical analysis. The methods used a factorial design analysis model to analyze the collected data and comprised descriptive analysis and frequency.

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3. RESULTS

In general, two way (ANOVA) factorial design analysis is most efficient for a study involving the effects of factors. Therefore, factorial design analysis with a confidence level 95% i.e. $\alpha = 0.05$ was an appropriate test for data analysis. The descriptive statistics for all variables are provided as mean and standard deviations of participants based on the skill attitudes of the three types of schools, as shown in Table 2.

Table 2: Descriptive statistics of participants' percentage agreement

Statistics	Mean			Max			Min			SD		
	PRS	PS	EPS	PRS	PS	EPS	PRS	PS	EPS	PRS	PS	EPS
Students	75	75	78	91	90	95	50	48	49	10.4	9.2	10.3
Teachers	64.6	62	90	100	100	100	44	17	58	13.5	22.5	8.9

Note: PRS = private school; PS = public school; EPS = elite public school

The responses of teachers and students regarding the skills learned by the students showed an agreement between private and elite public-school teachers and students, as shown in Table 3. Both agreed that the learners have the skills with one difference, teachers' percentages were higher than the students. In the private school, the teachers' responses were higher than the students' except in two skills, leadership and school ethics.

Regarding the elite public school, the teachers' expectations about the acquired skills were higher than the students in all the skills. Nevertheless, the responses of the teachers in the public school were exactly the opposite. They thought that the students did not acquire the mentioned skills as much as the other schools' teachers did.

The expectations of the public school students were high while their teachers had a lower evaluation of the skills learned by the students except for interpersonal skills and information technology.

Table 3: Agreement in students' and teachers' responses in the three types of schools for the six skills (%)

Six skills	Students				Teachers		
	Private school	Public school	Elite school		Private school	Public school	Elite school
Literacy and numeracy	72.94	75.38	88.44		80.00	54.28	98.34
Critical thinking	72.05	71.93	79.62		80.00	50.42	91.63
Leadership	80.25	77.41	73.65		69.29	56.11	86.93
Interpersonal	81.17	85.47	82.22		88.56	88.36	88.36
Information Technology	63.72	68.09	65.18		95.83	71.45	90.28
School ethics	84.55	80.98	79.44		75.00	50.00	81.28

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Table 4 shows the comparison of the students' perceptions of their knowledge of the six skills according to their types of schools. An ANOVA model test was used to check for a significant difference (P < 0.05). The results showed that there is a significant difference between student responses based on the type of school. The following skills were significant: literacy and numeracy (L&N), critical thinking (CT), interpersonal skills (IP), and information technology (IT).

This statistically implies that there is a strong correlation, which exists regarding being able to clearly understand and perform basic mathematical computations skills in addition to skills received, such as technology and group work.

Table 4: Two-way ANOVA: Students' responses of skills versus school types.

Items	SS	DF	MS	F	P
L&N	16.758	2	8.379	7.460	0.001*
CT	178.022	2	89.011	163.841	0.000*
IP	7.475	2	3.737	4.029	0.018*
IT	11.150	2	5.575	4.413	0.012*
LS	5.523	2	2.761	2.558	0.078
ES	3.296	2	1.634	1.674	0.188

*P<0.05.

The lowest significant difference is critical thinking (0.00), which proves that students of different schools have different responses to their attitudes on the skills received during their academic study. To get more details, a Least Significant Difference (LSD) analysis was conducted as shown in Table 5.

The results showed a meaningful difference existed between public, private, and elite public schools. The public school scored higher mean ratings (M = 4.87) than the elite public (M = 4.11) and private schools (= 3.84).

Table 5: Dependent Variable: Response of participant LSD (CT) students

School of participant	School of participant	MD	SE	P	95% CI	
					Lower	Upper
Private school	Public school	-0.95	0.059	0.000*	-1.07	-0.84
	Elite school	-0.19	0.068	0.005*	-0.33	-0.06
Public school	Private school	0.95	0.059	0.000*	0.84	1.07
	Elite school	0.76	0.053	0.000*	0.66	0.86
Elite school	Private school	0.19	0.068	0.005*	0.06	0.33
	Public school	-0.76	0.053	0.000*	-0.86	-0.66

LSD was done for all the other skills for students (Appendix B, Tables 1-B, 2-B, and 3-B). There are also significant differences among teachers. Table 6 shows the significance of all the skills except the Interpersonal (IP) skill for all types of schools.

Table 6: Two-way ANOVA: Teachers' responses to skills versus school types.

Items	SS	DF	MS	F	P
L&N	6.781	2	3.390	6.298	0.004*
CT	24.839	2	12.419	22.024	0.000*
LS	23.775	2	11.888	11.681	0.000*
IT	5.762	2	2.881	5.944	0.004*
ET	10.029	2	5.015	4.564	0.017*
IP	10.184	2	5.092	.116	0.891

Due to the relationship between students' and teachers' responses regarding their attitudes for all skills, a meaningful difference existed at various schools. The outputs illustrated the significant difference between the schools where multiple comparisons showed that the majority of the skills in Private and Elite Public schools had the highest score while Public school scored the lowest mean ratings.

According to the results, the weak skills, i.e. less than 50%, were selected as common skills between schools by teachers in the Venn diagram, as shown in Figure 1.

One item of the skills between public and private schools is identified, as described in (Appendix B Table 4-B) in addition to skill items of the public school.
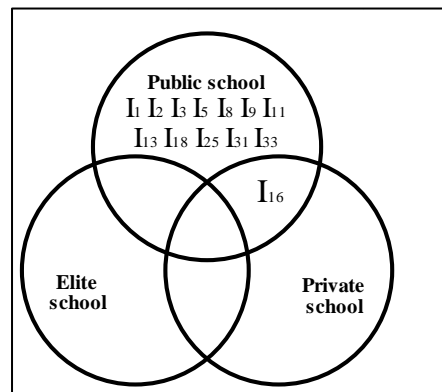

Figure 1: Common student skills that are improving.

4. DISCUSSION

The study examined the skills gained by students at secondary schools to prepare them for university. The assessment took the view of both teachers and students from three different school types: public, private, and elite schools. The responses of the students in all the schools were nearly the same. All 196 students described their attitudes with the largest percentage of the agreement for six skill categories; they have mastered them efficiently.

These skills are not only useful for them in high school but will also contribute to their academic performance during their transition to university. This is consistent with Finn et al (2014), who found substantial positive correlations, especially for numeracy skills, in charter public schools for academic performance (Finn et al., 2014).

Rooij et al (2017) stated that it may be useful if students receive and develop learning skills during high school (van Rooij et al., 2017). This finding of students' responses also reflects the level of confidence in their abilities toward skills; they seem to be ready for the challenges of university transition.

Conversely, the results showed that teachers' responses are significantly different. The attitudes of the teachers' regarding the skills of public schools exhibited the lowest percentage agreement compared to the other schools in terms of the attitude toward skills.

This outcome indicated that private and elite schools teach these skills to prepare their students for university. In general, all the students in all the schools believe they have these skills, which will help them at the university. This is because both the private school and elite public schools follow a different educational program (GCSE/t-MBA) from the one in the public school. These programs support all six skills (Ratehub. 10 things private schools won't tell you. 2019. AUGUST 8).

Nevertheless, only public-school teachers believe that their students do not have these skills compared to teachers in the other two schools. The responses of the teachers regarding L&N skills show that elite and private schools converged in terms of their awareness and abilities toward L&N skills and have better knowledge than the public school. To avoid disparities, teachers of public schools should focus on enhancing the skills for their students during their academic study by developing critical thinking and performance(Darling-Hammond & Richardson, 2009).

The results also showed that the attitudes of teachers towards information technology were high in elite public and private schools with no significant difference. This balance between schools is attributed to convergence for the development of electronic technology and multimedia education, such as tablets devices and computer labs (Montrieux et al., 2015).

In contrast, the public school needs to improve these skills for the secondary students to prepare them for the transition to university. Conversely, the multiple comparisons toward information technology skills from teachers' responses show differences among schools, where

the elite school was better than the other schools. This indicated that there is good support for technology by this school, which should be followed by the other schools since blended learning is blooming worldwide (Montrieux et al., 2015).

For example, Psycharis and Kallia's (2017) study indicates that computer programming is important for students to improve their reasoning skills (Psycharis & Kallia, 2017; Gorman & Bourne, 1983).

The results also showed that all students believe that they have critical thinking skills. Nevertheless, the teachers' responses varied among schools, in which the public-school teachers tend to believe that their students do not have critical thinking compared to the other two schools. The recent literature has insisted on the importance of teaching critical thinking skills using innovation in learning (Rowlands et al., 2008; Syafii & Yasin, 2013; Doppen et al., 2008).

This study found that there are differences in the attitudes of students from different schools towards IP, IT, L&N, and CT skills (Appendix B).

The study shows that the teachers of the public and private schools believe that there is a need for more support for leadership skills. Therefore, more support is needed in this skill, such as immersing the blended learning and giving positive feedback.

5. LIMITATION

The major drawback associated with the current research is that significant issues have not been considered, which include the branches of schools such as the literary branch. Furthermore, the study did not include any test of skills for students.

Future studies to more participants and schools for both study branches (Literary and scientific) to contribute to the accuracy in detecting the skills should be conducted. In addition to conducting tests of skills, example Intelligence Quotient (IQ) test.

6. CONCLUSIONS

The transition from secondary to postsecondary education for students still forms an obstacle for students. To address this concern, this study investigated the teachers' perceptions of the necessary skill acquisition and students' attitudes toward skills received in high schools to increase their chances for after school education.

First, six skills that might be important aspects of students' readiness were considered as necessary attributes to a successful transition from school to university.

Second, the attitudes of teachers and the students as graduates from their schools toward the skills that need improvement were evaluated. Thus, the perceptions of the participants can help produce a comprehensive understanding of the six skills that should be provided to students to enhance the transition to university.

The study included an assessment of the participants' attitudes to the skills, whereas students' have a comprehensive understanding of all the addressed skills in the academic study to enable them to enroll at university. In terms of the students' attitudes towards the skills received in academic study, literacy, critical thinking, and information technology skills are highly important.

These kinds of skills will support them to pass the entrance exam at university. Hence, schools must follow an appropriate approach to alleviating gaps by addressing the lack of skills. Additionally, the authors suggest that the literacy and numeracy, critical thinking, information technology, and school ethics skills of public school should be improved in the school curriculum, as should the leadership skills of public and private schools.

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APPENDIX A.

Table 1-A: Thirty-three items in secondary school graduates' skills are categorized under six types of student skills.

Items	Skills description	Type of skills
I1	Able to clearly understand and perform basic mathematical computations.	Literacy and numeracy
I2	Able to organize basic ideas via oral communication.	
I3	Able to clearly create documents in writing a clear, concise, and logical manner.	
I4	Able to respond to verbal messages that are basic, as well as able to interpret them.	
I5	Able to interpret graphs as well as schedules and manuals.	
I6	Able to generate new ideas.	Critical thinking
I7	Able to specify goals and evaluate alternatives.	
I8	Able to organize and process symbols, pictures, graphs, objects, and other information.	

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I9	Able to recognize problems and devise and implement a new idea.	
I10	Able to use digital sources to gain knowledge and skills.	
I11	Able to discover rules or principles underlying the relationships between two or more objects and apply them in solving a problem.	
I12	Able to work hard and commit to achieving a specific goal.	Leadership
I13	Able to a positive attitude attaining.	
I14	Able to set goals, progress to goal attainment, and take responsibility for my actions.	
I15	Able to choose ethical courses of action.	
I16	Able to effectively communicate ideas.	
I17	Able to conduct, forecast, and convince others.	
I18	Able to prepare schedules according to priority.	
I19	Able to cooperate in group work.	Interpersonal
I20	Able to pass skills to other colleagues.	
I21	Able to communicate well with students and interact with others.	
I22	Able to work with both genders from diverse backgrounds.	
I23	Able to demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings.	
I24	Able to understand how to use tools and equipment, including computers and related technology.	Information technology
I25	Able to set up and use computer software.	
I26	Able to solve problems using computers and other technology.	
I27	Able to identify the need for data and obtain data from existing sources or create it and evaluate its relevance and accuracy.	
I28	Able to organize processes and maintain written or computerized records.	
I29	Able to acquire information by using computer programs.	
I30	Able to attend classes on time.	School ethic
I31	Able to achieve personal goals independently.	
I32	Able to respect the regulations and laws within the school.	
I33	Able to complete a mission before its due date.	

APPENDIX B.

Table 1-B: Dependent Variable: Response of participant LSD (L&N) students

School of participant	School of participant	MD	SE	P	95% CI	
					Lower	Upper
Private school	Public school	-25	092	006*	-44	-07
	Elite school	-47	108	000*	-68	-26
Public school	Private school	25	092	006*	07	44
	Elite school	-21	084	011*	-38	-05
Elite school	Private school	47	108	000*	26	68
	Public school	21	084	011*	05	38

Table 2-B: Dependent Variable: Response of participant LSD (IP) students

School of participant	School of participant	MD	SE	P	95% CI	
					Lower	Upper
Private school	Public school	-19	084	027*	-35	-02
	Elite school	-03	098	762	-22	16
Public school	Private school	19	084	027*	02	35
	Elite school	16	076	040*	01	31
Elite school	Private school	03	098	762	-16	22
	Public school	-16	076	040*	-31	-01

Table 3-B: Dependent Variable: Response of participant LSD (IT) students

School of participant	School of participant	MD	SE	P	95% CI	
					Lower	Upper

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Private school	Public school	-14	089	113	-32	03
	Elite school	-01	104	899	-22	19
Public school	Private school	14	089	113	-03	32
	Elite school	13	081	111	-03	29
Elite school	Private school	01	104	899	-19	22
	Public school	-13	081	111	-29	03

Table 4-B: The skill items that require additional training

Items	Type of skills	Public school (%)	Private school (%)
I1	Literacy and Numeracy	50	-
I2	Literacy and Numeracy	50	-
I3	Literacy and Numeracy	50	-
I5	Literacy and Numeracy	50	-
I8	Critical Thinking	16.70	-
I9	Critical Thinking	28.60	-
I11	Critical Thinking	28.60	-
I13	Leadership	42.90	-
I16	Leadership	50	50
I18	Leadership	28.60	-
I25	Information Technology	42.90	-
I31	School Ethic	40	-
I33	School Ethic	42.90	-

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