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Sociodemographic and Institutional Determinants of Subject Choice: A Case of Public University Students in Bangladesh

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ABSTRACT

Subject choice is a critical decision in students' academic and career trajectories, influenced by multiple determinants. This study was conducted to examine sociodemographic and institutional determinants that affect subject selection of the students at public university in Bangladesh. From 580 students, data were collected from a sample of 172 students using an online self-administrated questionnaire that was made available by multistage cluster random sampling method. The research recognized that parental education (p=0.045), employment (p=0.032), and wealth (p=0.023) had a good influence on the selection of science-related subjects by students. Equally, important institutional factors, including reputation (p = .045), subject status, and teaching quality (p = .004 and p = .012, respectively), were instrumental in predicting the subject(s) that were to be chosen. In this study the overall reliability of demographic index (DI) was Cronbach's α = 0.558 whereas, for institutional index (II) it was Cronbach's α = 0.939. However, the result of ANOVA suggested that the students those are studied in science and engineering faculty had relatively higher focus on socioeconomic status **(**p = 0.000**)** and institutional determinants (p = 0.002) than other faculty. Likewise, students from science background in HSC were more concerned on socioeconomic (p = 0.004) and institutional determinants (p = 0.009). The research suggests that authorities should increase financial support and provide necessary sustenance for the growth of pluralist and democratic educational environment in Bangladesh.

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Introduction

This study investigates the determinants of undergraduate students' subject choice to study in universities of Bangladesh. As higher educational institutions in Bangladesh expand and diversify, understanding these factors becomes crucial for students aiming to navigate their educational journey effectively. Understanding how students make decisions about their field of study is a complex procedure and involves a dynamic interplay of various factors. In Bangladesh, a developing nation, education is recognized as a fundamental pillar for societal advancement (Campaign for Popular Education, 2015). It plays an essential role in sustainable development, significantly impacting both individual well-being and national progress (Bangladesh Bureau of Statistics, 2015b). In Bangladesh, choosing a university subject is particularly significant as it can influence both academic experiences and future career paths. Students must navigate the challenge of selecting a field that aligns with their personal interests and strengths while also considering long-term career goals and market demands. Generally, several determinants are affecting for choosing the specific subject to study in a university. The changing patterns of higher education in Bangladesh created market-based competition, especially in universities. With increasing competition in the higher educational institutions, a vibrant understanding of why and how students select their subject is necessary to create the indispensable strategies of the universities.

Globally student enrolment has become a significant issue for universities. Institutions are encountering increasingly the complex challenges in attracting a sufficient number of students each year (Johnston, 2010). With the competitive nature of the higher education market, universities must not only secure adequate student numbers but also ensure that they admit qualified students (Obermeit, 2012). Not only students' academic achievement, but also other factors including personal attributes (Hemsley-Brown, 2015; Jeffries, Curtis, & Conner, 2019; Korpershoek, Kuyper, & Werf, 2012;

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Mangan, Hughes, Davies, & Slack, 2010; Mcmaster, 2017; Pinxten et al., 2015; Ro, Fernandez, & Alcott, 2018; Sheng, 2017), socioeconomic status (Hemsley-Brown, 2015; Mangan et al., 2010; Mcmaster, 2017), subject related factors (Dunnett, Moorhouse, Walsh, & Barry, 2012; Hemsley-Brown, 2015; Jeffries et al., 2019; Simoes & Soares, 2010), university related factors (Azzone & Soncin, 2019; Dunnett et al., 2012; Hemsley-Brown, 2015; Munisamy, Mohd Jaafar, & Nagaraj, 2014; Simoes & Soares, 2010; Thi & Thorpe, 2015) were responsible for choosing different subjects at universities. These issues, however, are still not explored appropriately in Bangladesh.

Relevant literature (Brooks, 2008; Hemsley-Brown, 2015; Mangan et al., 2010; Mcmaster, 2017) identified various determinants influencing in choosing of a subject at university. Studies identify either the personal attributes including age, sex, religion, previous academic result or socioeconomic factors like parental education, occupation and income and other university related factors including reputation and location of university, job opportunity, cost of study and entry requirements influence the subject choice of the students (Hemsley-Brown, 2015; Jeffries et al., 2019; Korpershoek et al., 2012; Mangan et al., 2010; Mcmaster, 2017; Pinxten et al., 2015; Sheng, 2017). Since achieving independence, in Bangladesh substantial strides has made in addressing gender inequality at the primary and secondary levels of education and has concentrated efforts on enhancing the quality of higher education (Campaign for Popular Education, 2009). The country has achieved notable success in reducing poverty and advancing human development, largely driven by improvements in the educational sector (Bangladesh Bureau of Statistics, 2015a). According to the report of higher education commission of Bangladesh (2023), there are currently 47 public universities and 105 private universities providing higher education across Bangladesh. This expansion of tertiary institutions has been accompanied by a widespread increase in higher education enrollment.

Educationalist worldwide have admired various theorists for explaining subject choice from different interconnected perspectives. However, there are numerous factors that are also crucial in understanding the dynamics of subject choice. Coleman (1988) examined the effect of social capital, considering as resource for persons within the family in the community. Parental socioeconomic status (hereafter SES) and their personal attributes like age, sex, religion, are responsible for academic attainment or decisions regarding academic success. Moreover, parents with high social capital admit their children in famous institutions and subjects by fascinating information about institutional characteristics, facilities and services, reputation, from their friends, and colleagues. Several studies comply with the theory of Coleman, including Mcmaster (2017), Jeffries et al. (2019), Pinxten et al. (2015), Munisamy et al. (2014), Bock, Poole, and Joseph (2014), Briggs and Wilson (2007), Hemsley-Brown (2015), as they found that social capital plays the most crucial role in the choices of subject. Furthermore, financial and human capital together with play a vital role for the choice of subject. Lower SES are likely to attend less reputed subject (Hemsley-Brown, 2015). Besides, parental occupation, and income significantly, influence students' choice of subject. However, in their research, Callender and Jackson (2008) said that students from low-income families were more likely to report a financial limitation in subject choice. Student's previous academic background and academic achievements is very influential factors as it helps them to choose a reputed subject. Thus the study aims to investigate the determinants related to subject choice of university students focusing especially on two objectives: (i) to assess the determinants that are influencing students' subject choice, converging on socioeconomic, demographic, and university-related aspects and (ii) to explore the influence of institutional facilities i.e.; of school or faculty, department, and academic backgrounds (in both SSC and HSC) on the perceived scores of sociodemographic and institutional determinants of subject choice by the students to study in a university.

Review of Literature

To find and choose relevant research publications, initial search codes of articles are: (Title; Abstracts-Keywords ("subject choice") OR Title-Abstracts-Keywords ("subject selection" OR "sociodemographic determinants" OR "institutional determinants" OR "Tertiary education" OR "Higher education") AND Title; Abstracts; Keywords ("university related determinants"). A thorough and systematic literature review necessitates a methodical approach to guarantee comprehensiveness, relevance, and critical engagement. A thematic review of the current literature points to the determinants of subject choice by the students to study in a university align with the research objectives.

Demographic Determinants

Harker, Slade, and Harker (2001) in their study showed that in both developed and developing countries age and sex had a significant impact on the decision-making process of the students. On the contrary, some studies had found no strong significant relation between age and choice of subject (Munisamy et al., 2014). Hemsley-Brown (2015), in his study, found that in Canada female students were much more influenced by the costs of college and financial aid considerations than male students. On the other hand, men are more sensitive than women to estimate the future earnings and this can have an indirect impact on choice of subject. Munisamy et al. (2014), and Bock et al. (2014) in their studies found that, in Israel and Malaysia, male students' selected reputed universities and subject because of career prospects, academic ability and so on. Previous academic record played a vital role in the choices of subject. Ro et al. (2018), and Mcmaster (2017) in their study found that, in England, prior attainment especially higher achievement in science and mathematics was a positive predictor for student's likelihood to enroll in the universities that offer Science, Technology, Engineering and Mathematics (STEM) subjects. In both developed and developing countries, school and collage background had impact on the development of higher education especially the choice of prestigious subject. Studies in UK also revealed that because of better opportunities in schools and colleges, students performed better in examination that raises the

probability of getting chances in high-ranked universities and subject (Mangan et al., 2010).

Socioeconomic status (SES)

Socioeconomic status is very important for selecting a subject in both developed and developing countries. Sheng (2017), and Munisamy et al. (2014) in their studies stated that parents from high socioeconomic status or family background invested more and supported their children's education. They often choice reputed subject to ensure their sons and daughters capabilities of moving upwards in terms of academic qualifications. There was a strong association between parental education and children's progression to higher studies, evident in many countries around the world (Brooks, 2008). Studies from countries like China and England epitomize that higher parental education (particularly mothers' highest qualification was) positively related to STEM students' probability of enrolling at reputed universities (Mcmaster, 2017; Ro et al., 2018; Sheng, 2017). Parental occupation was also found to be a strong predictor for the choice of subject in most of the countries, including in Malaysia, Korea, UK (Munisamy et al., 2014). Mcmaster (2017) in his study revealed that in England, students with parents in managerial jobs are expected to study STEM than students with parents in working-class professions. Other studies on the contrary, (Mangan et al., 2010; Ro et al., 2018) found no direct relation between social class and parental education especially father's occupation did not directly affect the choice of subject. Study (Bock et al., 2014; Sheng, 2017) found that family's income especially parental income and financial status strongly influenced students' choice of subject in both developed and developing countries like China, Malaysia, and the USA.

Institutional Determinants

There are many institutional factors those are very influential for the choice of subject. University reputation, academic quality, sources of information, career prospects are very important for the choice of subject (Azzone & Soncin, 2019; Bock et al., 2014; Le, Dobele, & Robinson, 2019; Munisamy et al., 2014; Whitehead, Raffan, & Deaney, 2006). University reputation means the characteristics that place a university in a position of high esteem, and prestige (Dunnett et al., 2012; Hemsley-Brown, 2015). Whitehead et al. (2006) in their study found that quality education was the most important and significant factor that motivate students to choose a subject in a university. However, Thi and Thorpe (2015) and Bock et al. (2014) in their studies observed that offline information i.e., had significant influence on the choice and enrollment in a subject.

However, in developing countries, like Malaysia, Indonesia, Vietnam, there are some other determinants that determine the choice of subject, like institutional facilities and services, cost of study, geographical proximity, safety of the campus, geographical nearness, campus surroundings, quality of education, (Dunnett et al., 2012; Hemsley-Brown, 2015; Le, Dobele, et al., 2019; Munisamy et al., 2014). Thi and Thorpe (2015) pointed out that university services, including library facilities, computer lab, entertainment opportunities, health services, access to lecturers through the internet, and career guidance had a positive influence on the selection and entrances of students in a university. Similarly, Munisamy et al. (2014) and Le, Dobele, et al. (2019) in their studies also found positive relation with university resources and good facilities with subject choice of that university. Le, Robinson, and Dobele (2019), and Bock et al. (2014) in their studies showed that geographical proximity was the most important factor for selecting a subject in a higher education institution. Iacopini and Hayden (2017) and Le, Dobele, et al. (2019) in their studies explored that parents in Vietnam played an important role in decision making about matters related to education of their children and this may reflect the impact of Confucian tradition in Vietnamese culture and families, where parents have power over the future of their children.

Theoretical framework

Numerous factors are crucial in understanding the dynamics of subject choice. The study adopted Coleman's social capital theory and Bourdieu's cultural capital theory align with research objectives. Coleman's (1988) theory of social capital is one of the most prominent theories stressing the financial, human and social capital that are disparagingly influencing students' subject choice. Financial capital is assessed by family income that helps the students for choosing of a better subject delivering physical resources. Human capital is approximately measured by parents' education and provides a cognitive environment for the child that aids learning. Coleman (1988) examined the effect of social capital, considered as resource for persons within the family in the community. He delineated three fundamental forms of social capital: (i) obligations and expectations, (ii) information channels, and (iii) effective norms, which are related with students' future scholastic and professional success. The social capital of the family, on the other hand, represents the relations between children and parents. Social capital – time and effort spent by parents, within the family is vital for the intellectual development of children.

In "The Forms of Capital" Bourdieu (1996) analyzed cultural capital among two other categories: (i) economic capital, that means the command of economic resources (money, assets, property); and (ii) social capital, which refers the actual and potential resources related to the possession of a durable network of institutionalized relationships of mutual acquaintance and recognition. Smith (1776) was one of the first economists to develop the underlying principles of the rational choice theory. Smith elaborated on his studies of self-interest and the invisible hand theory in his book "An Inquiry into the Nature and Causes of the Wealth of Nations." which was published in 1776. Following the theoretical perspectives, the study highlights both demographic characteristics including age, sex, family and ethnic identity and institutional determinants.

Materials and Method

This study was explanatory in nature, aiming to elucidate the reasons behind certain events by establishing links and causal connections among variables. This study employed a quantitative research design to examine the influence of sociodemographic and institutional determinants on students' subject choice at the university level in

Bangladesh characterized by systematic investigation that prioritizes numerical data, objective measurements, and statistical analysis from a problem centered perspective (Creswell, 2013).

Study settings and sampling

This study was carried out at a public university situated in southwestern region of Bangladesh. Data were collected from a public university namely Gopalganj Science and Technology University (GSTU), which was randomly selected (Hemsley-Brown, 2015; Le, Dobele, et al., 2019). To serve the objectives of the study, data were collected from university students considering several specifications: (i) the participant must be an undergraduate student (first year), (ii) must not be a term or year repeater, and (iii) enrolled in the specific departments of selected university. The study population was 580. Considering the following criteria data were collected from an initial 180 (Table 1) responses, 172 were considered suitable to retain in the study following certain exclusion criteria, including incompleteness of the SAeQ, using multi-stage cluster random sampling procedure, representing 31% of the selected population. For a population of 580**,** with a 20% estimated population proportion and using 95% confidence level and 5% margin of error, the minimum required sample size is 173 participants (Kaur, 2017). It is important to note that the sample size was determined by the sampling formula given by Cochran. According to Cochran (1963), for a 580 population, the representative sample size should be 173 with a 95% confidence interval with 5% margin of error.

Data Collection Instrument

In this study data were collected through using an e-questionnaire, which was distributed via email and social media platforms among the students. The instrument was divided into various sections focusing on (i) sociodemographic determinants including: gender, parental education, occupation, socioeconomic status, and educational background, and (ii) institutional determinants including: perceptions of institutional reputation, subject prestige, teaching quality, and availability of facilities related with the subject choice of university students. The questionnaire utilized a 6 point Likert scale ranging from 0 (Not applicable) to 5 (Strongly agree). To ensure interpretability of mean scores, scoring intervals were calculated, as shown in Table 1. Prior to the main data collection, a pilot study was conducted with 50 students to test the clarity, relevance, and structure of the items.

Table 1: Scoring range of Likert scale

Value	Interval	Difference	Interpretation
0	0-0.82	0.82	Not applicable
1	0.83-1.65	0.82	Strongly disagree
2	1.66-2.48	0.82	Disagree
3	2.49-3.31	0.82	Undecided
4	3.32-4.14	0.82	Agree
5	4.15-5.00	0.82	Strongly agree

Note: Maximum value of likert scale response = 5, Minimum value of likert scale response = 0
Range = (Maximum value – Minimum value) = (5-0) = 5, Interval = 5/6 = 0.83

Ethical issues

This study was approved by the Ethical Clearance Committee of Khulna University, Bangladesh (Reference Number–KUECC– 2024/05/33). However, the study was proceeded with a written endorsement letter from Sociology Discipline, Social Science School, Khulna University to the authority of Gopalganj Science and Technology University (GSTU) for cooperation, and with their kind consent data were collected from the respondents. The participants responded voluntarily by filling up a written informed consent letter in the first section of the SAeQ that assured their anonymity and right to withdraw. Thus, the respondents were free to decline from the web-based survey at any moment without prior justification.

Measures

Subject choice

In this study subject choice is considered as the selection of a specific field of study or academic discipline. It refers to the specific subject the students choose at the tertiary level education especially in university in their higher education including Computer Science and Engineering, Mathematics, Sociology, Economics, Accounting, Management and so on.

Descriptive information of the respondents

The age of the respondents was measured by years (19, 20, 21, and 22), and disseminated into female and male categories considering their sex identity. Religious groups were separated into Islam, *Sanatan and* Buddhism. The academic background of the students in HSC and SSC were divided into three categories including Arts and humanities, Business Studies as well as Science. Faculties were pooled into three categories – Arts, Humanities/ Humanities, and Social Science. The discipline/ department was divided into ten categories. Finally, living arrangements were categorized in with family/ siblings or other relative, boarding house/ with friends/ mess, university hall.

Socioeconomic Status (SES)

Considering socioeconomic status parental education was measured in year of schooling (‘0’ for not-literate, ‘1-5’ for primary, ‘6-10’ for secondary, ‘11-12’ for higher secondary and ‘≥13’ for tertiary education) and respondents reported fathers’ occupation into six major occupational grouping; deceased, retired/unfit, informal/unskilled, government services, non-government services, and business/entrepreneurs. However, mothers’ occupation presented into three categories – deceased, housewife/unfit/retired and working mothers. Father’s income was measured by BDT per month, and it was categorized into four different income levels including, no income, ‘≤ 20,000’, ‘20001-40000’, and ‘≥40001’. Finally, mother income categorized into no income, and ≤ 20000 and ≥ 20001.

Indices

To examine the influence of various factors on subject selection, a set of 15 items were developed using a six-point Likert scale, ranging from 0 (Not Applicable) to 5 (Strongly Agree) (Mondal, Oyshi, & Hossain, 2024). These items were organized into three indices based on thematic relevance: the Demographic Index (DI), the Socioeconomic Index (SEI), and the Institutional Index

(II). Each index captured a distinct dimension of the determinants influencing subject choice. Internal consistency of the indices was evaluated using Cronbach's alpha, ensuring the reliability of the constructs (Mondal et al., 2024).

Socioeconomic Status Index (SESI)

In this study, socioeconomic status (SES) index was assessed by adding three items and each item contains with 6 possible responses, including '5' for 'Strongly Agree', '4' for 'Agree', '3' for 'Neutral' ('Neither Disagree, nor Agree'). '2' for 'Disagree', '1' for 'Strongly Disagree' and '0' for 'not applicable. However, the overall reliability of SESI was Cronbach's $\alpha = 0.912$.

Demographic index (DI)

Demographic index was developed by adding five indicators (age, sex, permanent residential location, role of family and ethnic identity) with 6 possible responses, including '5' for 'Strongly Agree', '4' for 'Agree', '3' for 'Neutral' ('Neither Disagree, nor Agree'). '2' for 'Disagree', '1' for 'Strongly Disagree' and '0' for 'not applicable. However, the overall reliability of DI was Cronbach's $\alpha = 0.558$.

Institutional index (II)

Institutional index (II) comprises seven items (institutional reputation, subject reputation, location of university, socio-political environment of university, medium of instruction, teaching quality, teacher expertise, tuition fees, facilities and services of the university, information sources) contains with 6 possible responses, including '5' for 'Strongly Agree', '4' for 'Agree', '3' for 'Neutral' ('Neither Disagree, nor Agree'). '2' for 'Disagree', '1' for 'Strongly Disagree' and '0' for 'not applicable. However, the overall reliability of II was Cronbach's $\alpha = 0.939$.

Analysis

The quantitative analyses were executed by using computer software SPSS 23.0, while relevant literature has been reviewed using NVivo 12.0®. Data were analyzed in four consecutive stages by utilizing various analytical techniques considering the nature of data: firstly, the descriptive analysis, including the percentage, mean (*M*) and standard deviation (SD), was estimated to show the personal information of the participants; secondly, rank order was executed to identify the influential important determinants related to subject choice of university students. Thirdly, Pearson's chi-square was used to find out the significant statistical relationship between dependent variable and independent variables (Pallant, 2011). Finally, one-way independent analysis of variance (ANOVA, *F*-test) was executed to determine statistically significant differences of faculty, department and academic background (in both SSC and HSC) regarding the perceived scores of Socioeconomic Status Index (SESI), Demographic Index (DI), Institutional Index (II) (Pallant, 2011).

Results

The study is an attempt to identify the socioeconomic, demographic and institutional factors that are influencing during admission for choosing a subject at a university. The study focused on personal information about the respondents, parental socioeconomic status and finally highlight significant associations between students' subject choices and various sociodemographic and institutional determinants. To examine the association and variations of the factors are also elaborated with different tables and figures to underscore the observed trends and relationship effectively.

Personal information of the respondents

Among 172 university students, as Table 2 shows, around half of the students' (45.3%) age was 20. From the study it is found that, more than half of the students (54.1 %) were male, and nearly 82% were Muslim. Study also shows that, most of them were from science background and among them 46% of students took science in HSC. In this sample, 40% of the students were from Science and Engineering faculty and 16.9% were from Biotechnology and Genetic Engineering department. However, 77.3% of their living arrangement was boarding house/ with friends/ mess.

Table 2: Personal information of the respondents

Variables	Response *N* (%)
Age (in Year)	
19	24 (14.0)
20	78 (45.3)
21	50 (29.1)
22	20 (11.6)
Sex	
Male	93 (54.1)
Female	79 (45.9)
Religion	
Buddhism	2 (1.2)
Islam	141 (82.0)
Sanatan	29 (16.9)
Academic background in SSC	
Arts and Humanities	19 (11.0)
Business Studies	55 (32.0)
Science	98 (57.0)
Academic background in HSC	
Arts and Humanities	33 (19.2)
Business Studies	59 (34.3)
Science	80 (46.5)
School/Faculty	
Arts, Humanities and Social Science	47 (27.3)
Business Studies	56 (32.6)
Science and Engineering	69 (40.1)
Discipline/Department	
Accounting	16 (9.3)
Bangla	8 (4.7)
Biotechnology and Genetic Engineering	29 (16.9)
Computer Science and Engineering	18 (10.5)
Economics	15 (8.7)
English	6 (3.5)
Finance and Banking	27 (15.7)
Management	8 (4.7)
Marketing	6 (3.5)
Mathematics	4 (2.3)
Pharmacy	17 (9.9)
Sociology	18 (10.5)
Living arrangement (where you are currently living)	
Home (with relatives)	4 (2.3)
Boarding house/with friends/Mess	133 (77.3)
Hall	7 (4.1)
Home (with parents)	28 (16.3)

(Field Survey, 2024)

Parental Socioeconomic status

Among the family members, Table 3 shows, most of the father's (30.2%) years of schooling was tertiary (≥13) education, and the study found that most of the fathers were involved in informal or unskilled workers (33.1%) and 33.1% were businessperson. However, most of their (30.2%) income was about BDT 10001- 20000. On the other hand, 38.4% of mothers' years of schooling was secondary (6-10) education, and most of them (90.1%) were housewife. Hence, most of them (83.7%) had no income.

Table 3: Socioeconomic status of the respondents

Variables	Response *N* (%)
Information regarding Parents	
Education of father	
Not-literate (0)	2 (1.2)
Primary (1-5)	36 (20.9)
Secondary (6-10)	41 (23.8)
Higher secondary (11-12)	41 (23.8)
Tertiary (≥13)	52 (30.2)
Occupation of father	
Deceased	6 (3.5)
Retired/unfit to work	10 (5.8)
Informal/unskilled works	57 (33.1)
Government services	15 (8.7)
Non-government services	27 (15.7)
Business/entrepreneurs	57 (33.1)
Income of father (in BDT)	
No income	9 (5.2)
1-10000	39 (22.7)
10001- 20000	52 (30.2)
20001-30000	15 (8.7)
30001-40000	26 (15.1)
≥40001	31 (18.0)
Education of mother	
Not-literate (0)	2 (1.2)
Primary (1-5)	33 (19.2)
Secondary (6-10)	66 (38.4)
Higher secondary (11-12)	44 (25.6)
Tertiary (≥13)	27 (15.7)
Occupation of mother	
Deceased	2 (1.2)
Housewife	155 (90.1)
Working mothers	15 (8.7)
Income of mother (in BDT)	
No income	144 (83.7)
≤ 20000	18 (10.5)
≥20001	10 (5.8)

(Field Survey, 2024)

Determinants of subject choice at university level students

Table 4 presents the descriptive analysis including percentage, mean and standard deviation, as well as order for each item, about socioeconomic, demographic, and institutional determinants related to subject choice of university students. Among demographic determinants the role of family emerged as the most significant influence, with a mean score of 4.10 (SD = 1.14), ranking 1st overall. However, among institutional determinants including, teacher expertise (M = 4.04, SD = 1.20), subject reputation of the university (M = 3.95, SD = 1.18) was the most influential ones. Among socioeconomic factors, parental education scored the highest, with a mean of 3.70 (SD = 1.42), ranking 6th overall.

Association of subject choice with parental socioeconomic status and institutional determinants

In this study the association between students' subject choice and independent variables are examined. About socioeconomic status, findings (Table 5) suggest that students whose parents have a higher level of education (χ^2_{yate} = 4.016, p = .045, φ = .153), occupations (χ^2_{yate} = 4.587, p = .032, φ = .163) and income (χ^2_{yate} = 5.182, p = .023, φ = .174) are more likely to pursue Science than Humanities/Business Studies. Among institutional determinants, institutional reputation (χ^2_{yate} = 4.016, p = .045, φ = .153), subject reputation (χ^2_{yate} = 8.187, p = .004, φ = .218), medium of instruction (English) (χ^2_{yate} = 6.379, p = .012, φ = .193), university facilities and services (χ^2_{yate} = 6.442, p = .011, φ = .194), teaching quality (χ^2_{yate} = 6.364, p = .012, φ = .192) had a strong positive association with Science choice. But there is no significant relationship of university location (χ^2_{yate} = .019, p = .889, φ = .011), and socio-political environment (χ^2_{yate} = .099, p = .754, φ = .024).

Variations in Socioeconomic, demographic, and Institutional determinants

From this study differential impact of faculty, department, and academic background (SSC and HSC) was identified on the perceived scores of socioeconomic, demographic, and institutional determinants. Table 6 presents the results of one-way ANOVA conducted to examine the differential influence of faculty, department, and academic background (SSC and HSC) on the perceived scores of socioeconomic, demographic, and institutional determinants. The study found that, students from Science and Engineering faculty focused on socioeconomic status (SES) [F (2, 169) = 8.654, p < 0.001; η^2 = 0.09] and institutional determinants (ID) [F (2, 169) = 6.445, p < 0.002; η^2 = 0.07] compared to other faculty. In contrast, demographic determinants did not show a significant difference across school/faculty groups [F (2, 169) = 0.795, p > 0.453, η^2 = 0.009], indicating that perceptions of demographic factors are relatively consistent regardless of school/faculty.

Furthermore, study found a significant impact of socioeconomic status [F (10, 161) = 2.146, p < 0.024; η^2 = 0.11] and institutional determinants [F (10, 161) = 2.061, p < .031; of η^2 = 0.11] for the choice of departments and CSE department had the highest focus on socioeconomic status and Accounting students had the highest focus on institutional determinants. However, students from science background in HSC had the highest concerned on socioeconomic [F (2, 169) = 5.610, p < .004; η^2 = 0.06] and institutional determinants [F (2, 169) = 4.791, p < .009; η^2 = 0.05]. In contrast, students' with academic background in SSC had no significant differences.

The results of the study further suggest that, students from the Science and Engineering faculties demonstrated a stronger emphasis on both socioeconomic and institutional factors compared to other faculties. Among individual disciplines, CSE students showed the highest concern for socioeconomic factors, whereas, Accounting students prioritized institutional determinants.

Additionally, students with a Science background in HSC exhibited the strongest focus on both socioeconomic and institutional influences. These findings highlight the complex interplay of social and institutional factors in shaping students' academic pathways, emphasizing the need for targeted policy interventions to ensure equitable access to diverse educational opportunities.

Table 4: Association among the Determinants of subject choice at university level students

Factors	Response *N* (%)						*Statistics* *M* (SD)	*Rank/ Order*
	Not applicable	Strongly disagree	Disagree	Undecided	Agree	Strongly agree		
Socioeconomic Determinants								
Parental education	13 (7.6)		15 (8.7)	30 (17.4)	53 (30.8)	61 (35.5)	3.70 (1.42)	**6**
Parental occupation	11 (6.4)		13 (7.6)	32 (18.6)	73 (42.4)	43 (25.0)	3.66 (1.33)	**8**
Parental income	16 (9.3)	3 (1.7)	9 (5.2)	29 (16.9)	84 (48.8)	31 (18.0)	3.48 (1.41)	**13**
Demographic Determinants								
Age of the student	46 (26.7)		14 (8.1)	35 (20.3)	77 (44.8)		2.56 (1.72)	**18**
Sex of the student	11 (6.4)	5 (2.9)	15 (8.7)	34 (19.8)	73 (42.4)	34 (19.8)	3.48 (1.32)	**12**
Permanent residential location	7 (4.1)	6 (3.5)	17 (9.9)	36 (20.9)	71 (41.3)	35 (20.3)	3.53 (1.21)	**11**
Role of family	5 (2.9)	2 (1.2)	9 (5.2)	14 (8.1)	67 (39.0)	75 (43.6)	4.10 (1.14)	**1**
Ethnic identity	25 (14.5)	3 (1.7)	14 (8.1)	35 (20.3)	58 (33.7)	37 (21.5)	3.22 (1.62)	**17**
Institutional Determinants								
Institutional reputation of the university	6 (3.5)	3 (1.7)	10 (5.8)	38 (22.1)	77 (44.8)	38 (22.1)	3.69 (1.14)	**7**
Subject reputation of the university	7 (4.1)		9 (5.2)	26 (15.1)	66 (38.4)	64 (37.2)	3.95 (1.18)	**3**
Location of university	10 (5.8)	8 (4.7)	26 (15.1)	28 (16.3)	73 (42.4)	27 (15.7)	3.32 (1.35)	**15**
Socio-political environment of university	12 (7.0)	6 (3.5)	22 (12.8)	47 (27.3)	59 (34.3)	26 (15.1)	3.24 (1.34)	**16**
Medium of instruction	12 (7.0)	2 (1.2)	4 (2.3)	34 (19.8)	87 (50.6)	33 (19.2)	3.63 (1.26)	**9**
Teaching quality	9 (5.2)	2 (1.2)	2 (1.2)	33 (19.2)	73 (42.4)	53 (30.8)	3.85 (1.21)	**4**
Teacher expertise	8 (4.7)	2 (1.2)	1 (.6)	25 (14.5)	64 (37.2)	72 (41.9)	4.04 (1.20)	**2**
Tuition fees	15 (8.7)	1 (.6)	13 (7.6)	52 (30.2)	63 (36.6)	28 (16.3)	3.34 (1.34)	**14**
Facilities and services of the university	9 (5.2)	3 (1.7)	19 (11.0)	29 (16.9)	64 (37.2)	48 (27.9)	3.63 (1.33)	**10**
Information sources	8 (4.7)	2 (1.2)	5 (2.9)	39 (22.7)	80 (46.5)	38 (22.1)	3.72 (1.15)	**5**

(Field Survey, 2024)

Table 5: Association of subject choice with parental socioeconomic status and institutional determinants

Variables	Subject choice		Test statistics	*p*-value	Effect size
	Humanities and Business Studies *N* (%)	Science *N* (%)			
Socioeconomic Status					
Parental education					
Disagree	21 (20.2)	6 (8.8)	4.016[a]	.045[*]	.153[*b]
Agree	83 (79.8)	62 (91.2)			
Parental occupation					
Disagree	22 (21.2)	6 (8.8)	4.587[a]	.032[*]	.163[* b]
Agree	82 (78.8)	62 (91.2)			
Parental income					
Disagree	23 (22.1)	6 (8.8)	5.182[a]	.023[*]	.174[* b]
Agree	81 (77.9)	62 (91.2)			
Institutional Determinants					
R14 Institutional reputation					
Disagree	21 (20.2)	6 (8.8)	4.016[a]	.045[*]	.153[* b]
Agree	83 (79.8)	62 (91.2)			
R15 Subject reputation					
Disagree	23 (22.1)	4 (5.9)	8.187[a]	.004[**]	.218[** b]

Agree	81 (77.9)	64 (94.1)			
R16 Location of university					
Disagree	88 (84.6)	57 (83.8)	.019[a]	.889	.011 [b]
Agree	16 (15.4)	11 (16.2)			
R17 Socio-political environment of the university					
Disagree	89 (85.6)	57 (83.8)	.099[a]	.754	.024 [b]
Agree	15 (14.4)	11 (16.2)			
R18 Medium of instruction					
Disagree	18 (17.3)	3 (4.4)	6.379[a]	.012**	.193** [b]
Agree	86 (82.7)	65 (95.6)			
R19 Teaching quality					
Disagree	27 (26.0)	7 (10.3)	6.364[a]	.012**	.192** [b]
Agree	77 (74.0)	61 (89.7)			
R22 Facilities and services of the university					
Disagree	25 (24.0)	6 (8.8)	6.442[a]	.011**	.194**[b]
Agree	79 (76.0)	62 (91.2)			

Note*:* *(Field Survey, 2024)*

*** Significant at 0.01%; * Significant at 0.05%;*

a Yate's continuity correction b Phi (φ)

Table 6: Variations in Socioeconomic, demographic, and Institutional score by School/Faculty, Department, and Academic Background in HSC and SSC

Variables	Socioeconomic Status Index (*M* & SD)	Test	*p* value	η^2	Demographic Index (*M* & SD)	Test	*p* value	η^2	Institutional Index (*M* & SD)	Test	*p* value	η^2
School/ Faculty												
Science and Engineering	13.5 (1.92)				18.0 (2.79)				31.6 (4.68)			
Arts, Humanities and Social Science	11.8 (2.45)	8.654	.000**	.09	17.4 (3.65)	.795	.453	.009	28.0 (5.36)	6.445	.002**	.07
Business Studies	12.4 (2.51)				18.1 (3.60)				29.3 (6.19)			
Department/ Discipline												
Accounting	13.1 (1.98)				19.2 (3.26)				31.9 (3.59)			
Bangla	12.0 (3.20)				16.8 (5.12)				28.6 (7.01)			
BGE	13.6 (1.80)				17.4 (2.87)				31.4 (5.03)			
CSE	13.8 (1.50)				17.2 (2.09)				32.3 (3.51)			
Economics	11.4 (2.02)				17.5 (4.24)				27.1 (4.48)			
English	12.5 (2.95)	2.146	.024*	0.11	19.2 (1.60)	1.812	.062	0.10	29.2 (6.88)	2.061	.031*	0.11
Management	11.9 (2.88)				17.4 (3.99)				27.5 (7.47)			
Marketing	13.1 (1.55)				19.5 (2.26)				30.6 (3.62)			
math	12.6 (2.75)				17.3 (3.46)				30.4 (5.29)			
Pharmacy	13.2 (2.38)				19.9 (2.19)				30.9 (5.57)			
Sociology	11.8 (2.40)				16.9 (2.85)				28.2 (5.05)			
Academic Background (in HSC)												
Science	13.3 (2.11)				17.6 (3.25)				31.1 (5.02)			
Arts and Humanities	11.8 (2.80)	5.610	.004**	0.06	17.4 (3.67)	1.378	.255	0.016	27.7 (6.40)	4.791	.009**	0.05
Business Studies	12.4 (2.29)				18.4 (3.16)				29.4 (5.44)			
Academic Background (in SSC)												
Science	13.1 (2.35)				17.7 (3.16)				30.6 (5.42)			
Arts and Humanities	12.0 (2.65)	2.755	.066	0.03	17.1 (4.12)	1.792	.170	0.02	28.0 (6.17)	2.503	.085	0.03
Business Studies	12.3 (2.24)				18.5 (3.23)				29.2 (5.46)			

Note*:* *(Field Survey, 2024)*

M, Mean; SD, Standard deviation; *** Significant at 0.01%; * Significant at 0.05%;*

Discussion

This study was designed to identify the influential sociodemographic and institutional determinants of subject choice of university students in Bangladesh through a web-based cross-sectional study by administering a self-administered e-questionnaire (SAeQ), based on Google Form that was carried out in a public university of in Bangladesh, named Gopalganj Science and Technology University (GSTU). The findings of this study highlight several significant relationships between socioeconomic status, institutional determinants, and students' subject choices (Humanities/Business Studies or Science). However, it offers critical insights into how various factors influence academic pathways, which could have broader implications for educational policy and institutional strategies.

This study contributes to the growing body of literature on subject choice in higher education by examining both sociodemographic and institutional determinants in the context of a developing country. In alignment with the research objectives, it confirms that parental background and institutional reputation significantly shape students' academic trajectories. The findings fill a notable gap in Bangladeshi educational research, where limited studies have quantitatively assessed these factors together. By revealing that students from science backgrounds place higher importance on socioeconomic and institutional influences, this study highlights structural inequalities in access to preferred disciplines. These insights offer implications for policymaking in terms of targeted financial support and academic counseling.

Studies (Mcmaster, 2017; Ro et al., 2018; Sheng, 2017) stated that higher level parental education positively related to STEM students' probability of enrolling at prestigious universities. Findings of the present study showed that higher parental education is associated with an increased preference for science. On the contrary, Jeffries et al. (2019) stated that parental education was not a significant direct predictor for the choices of subjects. Mcmaster (2017) in his study revealed that students, whose parents work in managerial occupations are more likely to study STEM than students with parents in working-class occupations. Similarly, this study also found a significant association exists between parental occupation and subject choice. The study reveals that students whose parents hold higher-status occupations are more inclined toward Science, compared to Humanities and Business Studies. On the contrary, Sheng (2016) in his study illustrated that there was no significant differences in the choice of subject between the students whose parents had different occupational backgrounds opposed by Hemsley-Brown (2015). Complying with Coleman's (1988) theory of social capital through this study it is identified that the family's income especially parental income level and financial aid significantly influence students' choice of subject and university (Ahmed & Hossain, 2023; Bock et al., 2014; Sheng, 2017). On the contrary, some studies found no strong relation with parental income and the choices and chances of subject and university (Jeffries et al., 2019; Mangan et al., 2010; Whitehead et al., 2006). Together, these socioeconomic factors suggest that students from families with higher educational, occupational, and financial resources are more likely to pursue Science. This may be due to both cultural expectations within such families and the financial means to support educational pursuits aligned with STEM fields that .is also supported by Adam Smith's rational choice theory.

For choosing a subject, university or institution reputation or public image played a significant role (Dunnett et al., 2012; Hemsley-Brown, 2015). Similarly, most of the studies (Azzone & Soncin, 2019; Bock et al., 2014; Le, Dobele, et al., 2019; Munisamy et al., 2014; Whitehead et al., 2006) considered reputation of the university as a most significant factor for the choices of the subject and university. This study also found that, students choosing science related subject tend to place greater importance on institutional reputation than the students of Humanities/Business Studies. On the contrary, Le, Robinson, et al. (2019) found no significant relationship with subject choices and its reputation. In their studies, Dunnett et al. (2012), Simoes and Soares (2010) found that in choosing between universities, subject prestige is the most significant factor among the students because it represent the career prospect of the students. Besides these, some other studies (Le, Dobele, et al., 2019; Pinxten et al., 2015) also found a positive relationship between course prestige and subject choices and the enrollment of the students. However, this study suggested that, **s**ubject reputation has one of the strongest associations with subject choice. This indicates that students who value the reputation of their field, especially in STEM areas, view science as prestigious or as providing better future prospects, thus shaping their preference.

Simoes and Soares (2010), Robinson, et al. (2019), Mangan et al. (2010) and Bock et al. (2014), in their studies, showed that geographical proximity was the most important determinant for selecting a higher educational institution. But institutional factors the findings of this study suggest that, the geographic location and socio-political environment of a university do not influence the subject choice between Science and Humanities/Business Studies. As identified by Bourdieu (1996) the study implies that students prioritize academic and reputational factors over geographical or socio-political considerations when choosing their field. The association between **t**he medium of instruction and subject choice suggests that, science students prioritize instruction in a particular language like English, possibly due to its importance in scientific discourse and professional standards. However, Whitehead et al. (2006), in their study, examined that teaching quality was the most important and significant determinants that motivated the students to choose the particular subject in a university. This study also reveals that, the students of science background are more likely to agree that teaching quality is essential (89.7% vs. 74.0%), indicating that they may consider effective teaching as critical for success in science disciplines, which often require clear explanations and structured learning. However, Thi and Thorpe (2015) in their study explored that the university facilities and services include library facilities, computer laboratories, entertainment facilities, health services, access to lecturers through the internet, on-campus accommodation, and career guidance, etc. had a positive impact on subject choice of the students. The present study found that facilities and services is also

significantly associated with choosing science related subject. That is due to the resource-intensive nature of science studies, which often require laboratories, equipment, and technological support. Thus, the policymakers should consider addressing the resource gaps between high- and low-demand disciplines in public universities in Bangladesh.

Despite some exciting findings, generalization of the results is limited to the students at a public university only. Future research should include students from multiple universities across diverse geographic and academic contexts to enhance generalizability. The study also relied exclusively on quantitative data, which may not fully capture the underlying motivations. Integrating mixed-methods, particularly interviews can offer deeper insights into the motivations behind subject selection. While the study provides robust empirical evidence, especially with a high reliability score for the institutional index (Cronbach's $\alpha = 0.939$), refining the demographic index is recommended to enhance the accuracy of sociodemographic measurements. However, it may not be entirely possible to understand whether subject choices made by the respondents are exclusively determined by sociodemographic or institutional aspects. Notwithstanding these drawbacks, statistical analysis provides a responsible approximation to identify the variables impacting subject choice, offering insightful resource about the subject choice dynamics for the university students in Bangladesh.

Conclusion

This study emphasizes the vital role played by socio-demographic and institutional factors in determining subject choice among university students in Bangladesh. Key socio-demographic determinants, such as parental education, income, and academic background, greatly influence students' decision-making processes, often steering them toward subjects that align with their family's socioeconomic status and available resources. Additionally, institutional factors, including the reputation of specific fields, teaching quality, and available facilities, play a critical role in shaping students' perceptions and choices. Expanding financial aid, particularly for students from lower socioeconomic backgrounds, would provide more equitable access to high-demand disciplines like science and engineering. However, improving resources and facilities in less-funded areas, such as humanities and social sciences, can elevate the appeal of these fields. Investments in teaching quality, research opportunities, and career counseling in these disciplines would offer students a more balanced set of options. The study suggests that parental choice, income, and institutional reputation directly influence students' academic opportunities, thereby perpetuating already existing disparities for access to prestigious fields. Not only these findings are a significant contribution to the existing literature on subject choices of university students in the context of Bangladesh, but also this evidence, is essential for policymakers to (re)-think and (re)-consider the explored factors when offering subject at universities. In addition, establishing comprehensive career counseling services can help students make more informed decisions about their studies, considering both their personal interests and realistic career pathways. By addressing these recommendations, public universities in Bangladesh can foster a more inclusive and supportive academic environment that values and empowers students from all sociodemographic backgrounds to pursue fields aligned with their talents and interests, ultimately promoting greater equity and social mobility.

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Competing Interest

The authors declare that they have no competing interests.

Credit Author Statement

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