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Evaluating Self-directed Learning of Students across different Educational Level

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ABSTRACT

Self-directed learning (SDL) refers to a student's ability to integrate their attitudes, enthusiasm, and actions into their personal and academic lives, taking responsibility for the quality of their learning. India's high dropout rate is largely due to unattractive teaching methods, lack of engagement in classroom activities, and a significant gap between expected and actual learning levels. As a result, they remain dependent on others for learning, rather than developing autonomy as they grow older. The objective of our education system should be to cultivate self-directed learners who can independently determine how to achieve their educational goals. This evolution involves moving from pedagogy, where students are guided by teachers, to andragogy, where they take more responsibility for their learning, and ultimately to heutagogy, where they become fully self-determined learners. The goal of any teaching-learning system is to guide students through this progression, fostering their development from dependent to self-directed and eventually self-determined learners. This paper aims to assess the level of self-directedness in learning among students at variability with respect to various classification variables. A cross sectional survey was conducted on a sample size of 665 ranging from school education to higher education using a simple random sampling at Kolkata district of West Bengal. Sixty-five item SRSSDL questionnaire (Williamson, 2007) along with data on baseline characteristics of the students. The level of Self-directedness in learning was found to have significant variations with differences in gender, differently abled, class, stream, locality of students and siblings.

Keywords: Self-directed Learning, Adolescents, Students, Pedagogy, Self-awareness. Dependency to Self-dependency

Self-directed learning is a process whereby an individual determines their own learning according to their needs and interests (*Self-directed Learning | Educational Planning*, n.d.). We understand learning as a change or modification in our behaviour. The reason we observe differences in learning outcomes is due to individual learning styles, which vary from person to person and depend on one's own needs and desires. When we ask what learning means ("Learning," 2024). So, the question is, what's the distinction between learning and education? While both concepts involve changes in behaviour and personal growth.

The process of learning is a lifelong one, and education is also a lifelong process (Mir, 2014). As a child grows up, their learning process changes day by day. Initially, a child is a dependent learner, but as they grow older, they become independent learners. This process continues through socialisation and schooling (*Best & Top Schools in Greater Noida West*, n.d.). Moreover, learning a specific aspect of the broader process of education, which encompasses not only knowledge acquisition but also socialisation, personal development, and long-term growth. In today's global era, students must engage in Self-Determination Learning (SDL) to become lifelong learners, learning beyond the

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confines of formal schooling (Garrison, 1997). A number of factors can influence a student's learning style, including age, gender, family background, language, caste, class, stream, schooling background and social environment (Lata *et al.* 2014). These attributes can result in variations in the learning process. Additionally, self-directed learning is also influenced by personal preferences, needs and goals, which means that each learner's journey is unique(Dr. W. Christopher Brandt, 2020).

In India, the high dropout rate is largely attributed to unattractive teaching methods (*Dropout Rates in Schools in India | Education for All in India*, 2023). For instance, a child in class 3 often struggles to read text meant for class 1, highlighting a significant gap between expected and actual learning levels. This issue is compounded by a lack of engagement in classroom activities, which prevents students from becoming independent learners. As a result, they remain dependent on others for learning, rather than developing autonomy as they grow older. The objective of our education system should be to cultivate self-directed learners who can independently determine how to achieve their educational goals. This evolution involves moving from pedagogy, where students are guided by teachers, to andragogy, where they take more responsibility for their learning, and ultimately to heutagogy, where they become fully self-determined learners. The goal of any teaching-learning system is to guide students through this progression, fostering their development from dependent to self-directed and eventually self-determined learners. So, if a teacher can understand how their students' learning is influenced by factors like age, gender, caste, language, school, and social environment, they can determine how much self-direction is needed for each student. Then, they can help students achieve their goals and desires by tailoring their approach to meet individual needs and interests. This should be the ultimate goal of our education system.

In the Indian context, gender can impact self-directed learning (SDL) due to societal and cultural factors (UNESCO, 2017), with women facing possible challenges like limited access to resources (Dynan *et al.* 2008), societal standards, and family expectations. Internalized gender biases(Corichi, 2022) and cultural background also play a role (Chaudhuri *et al.* 2018), affecting self-efficacy and learning opportunities. Younger students (11-14 years) may need more guidance and support in SDL, while older students (15-18 years) may be more independent in their learning. Students in higher grades (9-12) may be more aware or have a better understanding of their learning objectives and be more motivated to participate in SDL(Reio & Davis, 2005). Students from lower socio-economic backgrounds may face challenges in accessing resources and technology for SDL, while those from higher socio-economic backgrounds may have better access to resources and support. Students from government schools may have less access to SDL opportunities compared to those from private schools. Students from science and technology streams may be more likely to engage in online and technology-enabled SDL, while those from humanities and social sciences streams may prefer traditional methods. Overall, SDL among school-going children in India is influenced by a complex interplay of factors, including age, class, and stream of education. In recent decades, adult education has shifted its focus to developing self-directed learning skills, with increased international research and scholarship, and the introduction of new programs, practices, and resources to assist educators and learners. Hiemstra (1994) and Brookfield (1986) define self-directed learning as the process of learners planning, implementing, and evaluating their own learning to achieve pre-set goals (Administration M.Sc & Ph.D, n.d.). Knowles (1980) found that students without self-directed inquiry skills often experience anxiety, frustration, and failure in educational programs.

Previous studies show that students initially experience anxiety and fear about self-directed learning, expressing a need for formal instruction at the start of their courses (Williamson, 2007). Knowles (1975) posited that self-directed learners are proactive, taking initiative in learning, leading to more meaningful and purposeful experiences, increased motivation, and longer retention, and are more responsible. Some study found that students in higher education generally found their SDL experiences more positive than in secondary school, with "knowledgeable and organized teachers" and "promotion of active learning" being significantly associated with their satisfaction with SDL. Self-Directed Learning (SDL) in the Indian

context also influenced by various factors, including family structure, medium of instruction, number of siblings, locality, and abilities. Students from joint families may face challenges in finding quiet spaces for SDL, while those from nuclear families may have limited support. While we considering factor of medium of instruction, English-medium students may have an advantage in SDL due to global resources, while those taught in regional languages may face challenges. Factor considering those students with fewer siblings may receive more individualized attention and support for SDL, while students with many siblings may face challenges in accessing resources and finding quite space for SDL. Urban students may have greater access to resources, while rural students may face challenges. Students with disabilities may face barriers, but assistive technology and accommodations can support SDL. Overall, SDL in India is shaped by a complex interplay of factors, and understanding these factors can help promote inclusive and effective SDL practices. India faces the challenge of establishing a scientific and progressive society that is innovative and forward-looking, and has increased science's prominence in the school curriculum, acknowledging that building such a society begins with the young to work independently (*Self-Directed Learning | Educational Planning*, n.d.). Also, some studies found that students in higher education generally found their SDL experiences more positive than in secondary school, with "knowledgeable and organized teachers" and "promotion of active learning" being significantly associated with their satisfaction with SDL (Abeyrathne & Yatigammaa Ekanayake, 2019).

Objectives of this paper is to assess the level of Self directedness in learning among students at various academic level starting from school to university and its variability with classificatory variables.

METHODS

Participants

The study utilized a cross-sectional survey method to collect data from school-going students to undergraduate and postgraduate students. A sample size of 665 students was obtained through simple random sampling from Kolkata District of West Bengal. Data of school-going students were collected from three schools out of which one is co-educational, one is boys' and one is girls' school. Undergraduate and postgraduate student's data was collected from four colleges and universities in urban Kolkata. Baseline characteristics such as age, gender, number of siblings, locality, class, stream, family income, medium of instruction and social category of the participants were considered as independent variables and the score on Self-Directed Learning (SRSDL) scale was dependent variable. The participants include 109 from class 9; 121 from class 10; 85 from class 11; 97 from class 12; 92 from Undergraduate programme, and 161 from postgraduate programme.

Study Instrument

To assess the level of self-directedness in learning was done using the 65-items Self-Rating Scale of Self-Directed Learning (SRSSSDL) standardized questionnaire developed by Swapna Naskar Williamson in 2007, covering the five major domains, each containing 13 items. Namely, "Awareness" – understanding the factors that contribute to becoming self-directed in their learning process.; "Learning Strategy" – describe various strategies learners should adopt to become self-directed in their learning process; "Learning Activity" – Specify the necessary learning activities learners should actively engage in to become self-directed in their learning process; "Evaluation" – highlight learners' specific attributes to help monitor their learning activities; and "Interpersonal Skill" – pertain to learners' interpersonal relationship skill, which are essential for becoming self-directed learners.

The internal consistency of the test was determined using Cronbach's coefficient alpha of the original SRSSDL (English Version), with the results of the reliability test indicating that the internal consistency was acceptable and satisfactory, with a score of over 0.70 ((Nolan and Nolan 1997. Nunnally 1978; de Vaus 1991). The original English version of SRSSDL demonstrated acceptable internal consistency, with a Cronbach's alpha coefficient for each dimension were respectively Awareness: 0.79; Learning Strategy: 0.73; Learning Activities: 0.71; Evaluation: 0.71; and Interpersonal Skill: 0.71. Similarly, The Bengali version of the SRSSDL questionnaire showed high internal consistency with a Cronbach's alpha coefficient of 0.928. The

sub-dimensions also demonstrated good reliability: Awareness (0.710), Learning Strategy (0.766), Learning Activities (0.754), Evaluation (0.801), and Interpersonal Skill (0.740). These values indicate a reliable measurement.

Data Collection Procedure

The 65-item SRSSDL questionnaire was administered to all 665 participants from Adolescent (n = 412) to Adults (n = 253). Data were also collected on the socio-demographic profile of the students. The whole data collection process was administered on school-working days from 3 schools in Kolkata district and given consent for obtaining data from their students. Total 485 data collected through physical mode and rest of 182 data collected through online Google Forms for convenience, easy and rapid access.

Responses to each item are rated on a five-point Likert Scale: 5 = Always, 4 = Often. 3 = Sometimes, 2 = Seldom, and 1 = Never. This scale allows for the calculation criteria (Williamson, 2007):

- **60 to 140:** Low level of self-directed learning. Teacher guidance is needed, and specific changes for improvement should be identified, potentially necessitating a restructuring of learning methods.
- **141 to 220:** Moderate level of self-directed learning. This indicates partial progress towards becoming a self-directed learner. Areas for improvement should be identified and evaluated, with strategies adopted and teacher guidance provided as needed.
- **221 to 300:** High level of self-directed learning. This reflects effective self-directed learning. The goal is to maintain progress by identifying strengths and methods for consolidating the student's effective self-directed learning.

Data Analysis

The collected data were analysed using Microsoft Excel 2021 and IBM SPSS version 20 software, from which valid conclusions were drawn. Descriptive statistics included mean and standard deviation or median and interquartile range for continuous variables, and proportions or percentages for categorical variables. The Mann-Whitney U-test was used for inferential statistics, with a p-value of 0.05 considered statistically significant.

RESULTS

Results of Independent samples t-test showed that negligible mean difference was found between female and male where female students (m = 228.78, sd = 32.60) have high level of self-directedness in learning than male students (m = 220.13, sd = 30.93). But the mean differences were not statistically significant [t = (3.50) =.871] at p >.05 level. Also, result showed that female students (Awareness: m = 43.79, sd = 7.10; Learning Strategy: m = 47.06, sd = 7.40; Learning Activity: m = 46.00, sd = 8.08; Evaluation: m = 45.65, sd = 7.68; and Interpersonal Skill: m = 46.28, sd = 8.06) scored high in the sub-dimensions of self-directedness in learning than male students (Awareness: m = 43.09, sd = 6.31; Learning Strategy: m = 44.28, sd = 7.17; Learning Activity: m = 44.19, sd = 7.37; Evaluation: 44.30, sd = 7.59; and Interpersonal Skill: m = 44.27, sd = 7.42) and the mean differences were not statistically significant [Awareness: {t = (1.34) = .235, p > 0.05}; Learning Strategy: {t = (4.91) = .920, p > 0.05}; Learning Activity: {t = (3.00) = .641, p > 0.05}; Evaluation: {t = (2.28) = .902, p > 0.05}; and Interpersonal Skill: {t = (3.32) =.927, p > 0.05].

An independent samples t-test was computed taking the mean value of differently abled (n = 607) and differently not abled (n = 58) students in terms of their overall level of self-directedness in learning score and of their level of sub-dimension of self-directedness in learning score. Results showed that negligible mean difference was found between differently abled and differently not abled students where differently not abled students (m = 224.88, sd = 30.83) have high level of self-directedness in learning than differently abled students (m = 223.36, sd = 43.53). And the mean differences were statistically significant [t = (0.343) =.000] at p > .05 level. Also, result showed that differently not abled students (Awareness: m = 43.47, sd = 6.54; Learning Strategy: m = 45.80, sd = 7.21; Learning Activity: m = 45.20, sd = 7.54; Evaluation: m = 45.01, sd = 7.46; and Interpersonal Skill: m = 45.39, sd = 7.65) have high level of the sub-dimension of level of self-directedness in learning than differently abled students (Awareness: m = 43.34, sd = 8.72; Learning Strategy: m = 45.38, sd = 9.44; Learning Activity: m = 44.71, sd = 10.24; Evaluation: 45.08, sd = 9.63; and Interpersonal Skill: m = 44.84, sd = 9.56) and mean differences were statistically significant [Awareness: {t = (0.109) = .022, p > 0.05}; Learning Strategy: {t

Table 1: Two-Tailed Independent Sample t-Test & Analysis of Variance for SDL By Different Variable

Dimension → **Variable ↓**		**Awareness**			**Learning Strategy**			**Learning Activity**			**Evaluation**			**Interpersonal Skill**			**Total SDL**		
		M	**SD**	**Test Result**	**M**	**SD**	**Test Result**	**M**	**SD**	**Test Result**	**M**	**SD**	**Test Result**	**M**	**SD**	**Test Result**	**M**	**SD**	**Test Result**
Gender	*F (355)*	*43.79*	*7.10*	t_{663}=1.34	*47.06*	*7.40*	$t_{663=4.91}$	*46.00*	*8.08*	$t_{663=3.00}$	*45.65*	*7.68*	$t_{663=2.28}$	*46.28*	*8.06*	$t_{663=3.32}$	*228.78*	*32.60*	$t_{663=3.50}$
	M(310)	43.09	6.31		44.28	7.17		44.19	7.37		44.30	7.59		44.27	7.42		220.13	30.93	
Differently Abled	*No(607)*	43.47	6.54	t_{663}=.109*	45.80	7.21	$t_{663=.334*}$	45.20	7.54	$t_{663=.355*}$	45.01	7.46	$t_{663=.057*}$	45.39	7.65	$t_{663=.425*}$	224.88	30.83	$t_{663=.343*}$
	Yes (58)	43.34	8.72		45.38	9.44		44.71	10.24		45.08	9.63		44.84	9.56		223.36	43.53	
Family Type	*N(452)*	43.79	6.85	t_{662}=1.82	46.07	7.35	$t_{662=1.50}$	45.38	7.99	$t_{662=1.08}$	45.27	7.87	$t_{662=1.17}$	45.77	7.91	$t_{662=1.99}$	226.28	32.70	$t_{662=1.75}$
	J (212)	42.77	6.49		45.15	7.56		44.68	7.41		44.52	7.18		44.48	7.59		221.60	30.64	
School Type	Pvt (35)	42.74	6.99	t_{663}=.647	45.43	7.96	$t_{663=.277}$	44.17	8.88	$t_{663=.764}$	43.34	8.04	$t_{663=1.33}$	44.09	8.72	$t_{663=.978}$	219.77	36.28	$t_{663=.942}$
	Govt. (630)	43.50	6.74		45.79	7.40		45.21	7.74		45.11	7.64		44.42	7.78		225.02	31.86	
Medium	Bng(635)	43.43	6.81	t_{662}=.575	45.76	7.49	$t_{662=.343}$	44.11	7.88	$t_{662=.693}$	45.10	7.71	$t_{662=1.25}$	45.42	7.89	$t_{662=1.35}$	224.82	32.44	$t_{662=.259}$
	Eng (29)	32.17	5.43		46.24	5.80		46.14	6.17		43.28	6.67		43.41	6.01		223.24	24.61	
Class	IX (109)	43.41	7.24	F (5,659) = 2.87*	46.03	6.74	F (5,659) = 2.04	44.63	6.99	F (5,659) = 2.73*	45.77	6.99	F (5,659) = 2.64*	46.60	6.25	F (5,659) = 4.30*	226.44	27.77	F (5,659) = 3.40*
	X (121)	43.80	5.88		45.36	5.69		45.14	6.53		44.75	7.27		45.55	6.99		224.60	25.77	
	XI (85)	43.36	6.06		44.67	6.50		44.41	6.74		44.92	7.43		44.28	7.51		221.65	29.74	
	XII (97)	41.48	5.20		44.41	7.38		43.47	8.15		43.33	7.66		42.64	7.56		215.34	30.66	
	UG (92)	45.11	7.33		47.00	8.00		47.30	8.55		47.08	7.59		47.15	7.90		233.64	34.64	
	PG (161)	43.54	7.59		46.59	8.87		45.69	8.80		44.60	8.32		45.50	9.15		225.93	37.94	
Stream	NA (229)	43.65	6.55	F (5,659) = 1.09	45.74	6.15	F (5,659) = 2.09	44.91	6.75	F (5,659) = 1.12	45.25	7.15	F (5,659) = 2.05	46.06	6.67	F (5,659) = 2.53*	225.61	26.67	F (5,659) = 2.05
	Arts (246)	43.64	7.83		45.94	8.91		45.48	9.12		45.13	8.43		45.59	8.55		225.78	38.47	
	Sc (131)	43.14	5.26		45.38	6.40		45.22	7.45		44.76	7.63		43.99	8.52		222.50	29.02	
	Com (45)	43.61	5.00		47.50	6.68		45.54	5.78		45.50	5.95		45.57	6.37		227.72	25.87	
	Engg (13)	49.62	6.33		44.69	7.42		41.15	7.60		39.69	5.30		40.92	7.83		202.08	31.40	
Locality	Rur(229)	43.55	6.99	F (2,662) = 1.21	46.14	7.91	F (2,662) = 3.49*	45.21	8.76	F (2,662) = 5.35*	44.83	7.90	F (2,662) = 1.32	45.15	8.71	F (2,662) = 2.67	224.88	35.12	F (2,662) = 3.47*
	Surb(105)	42.53	7.20		44.01	8.34		42.97	8.60		44.10	7.86		43.89	7.84		217.51	35.98	
	Urb (331)	43.69	6.42		46.06	6.67		45.81	6.66		45.44	7.44		45.94	7.10		226.95	28.14	
Siblings	S(321)	43.12	6.47	F (2,662) = 0.858	45.16	7.04	F (2,662) = 2.09	44.38	7.59	F (2,662) = 3.34*	44.55	7.91	F (2,662) = 1.14	44.67	8.02	F (2,662) = 2.86	221.89	30.99	F (2,662) = 2.51
	T (238)	43.68	7.12		46.28	7.93		46.08	7.96		45.43	7.62		46.27	9.93		227.74	33.86	
	M (106)	44.00	6.71		46.44	7.28		45.43	7.91		45.49	7.96		45.31	6.80		226.68	30.88	
Family Status	*VP (104)*	41.63	7.34	F (4,660) = 2.487*	44.94	8.91	F (4,660) = 1.572	43.24	8.06	F (4,660) = 2.338	43.25	8.39	F (4,660) = 3.466*	45.55	9.39	F (4,660) = 1.665	218.62	36.48	F (4,660) = 2.241
	P (178)	43.83	6.79		46.75	7.18		46.01	7.70		45.85	7.35		46.19	7.11		228.63	30.36	
	LMC(199)	44.07	6.30		45.74	6.61		45.51	6.67		45.89	7.28		45.59	7.40		226.80	29.31	
	MC (151)	43.54	6.96		45.58	7.65		45.20	9.08		44.60	7.82		44.11	8.25		223.03	34.86	
	UMC (33)	43.18	5.49		44.06	6.92		44.21	6.88		42.72	7.29		44.33	6.18		218.52	26.51	

Note: *"*" is used to indicates a statistically significant result.*

= (0.334) = .031, $p > 0.05$}; Learning Activity: {t = (0.355) = .001, $p > 0.05$}; Evaluation: {t = (0.057) = .001 $p > 0.05$}; and Interpersonal Skill: {t = (0.425) = .000, $p > 0.05$].

An independent samples t-test was computed taking the mean value of students who belong to nuclear family (n = 452) and joint family (n = 212) in terms of their overall level of self-directedness in learning score and of their level of sub-dimension of self-directedness in learning score. The results of the independent sample t-test indicated that the mean difference was statistically significant among students who belong to nuclear family and joint family where belongs to nuclear family's students (m = 226.28, sd = 32.70) have high level of self-directedness in learning than belongs to joint family's students (m = 221.60, sd = 30.64). But the mean differences were not statistically significant [t = (1.75) = .504] at $p > .05$ level. Also, result showed that belongs to nuclear family's students (Awareness: m = 43.79, sd = 6.85; Learning Strategy: m = 46.07, sd = 7.35; Learning Activity: m = 45.38, sd = 7.99; Evaluation: m = 45.27, sd = 7.87; and Interpersonal Skill: m = 45.77, sd = 7.91) have high level of the sub-dimension of level of self-directedness in learning than belongs to joint family's students (Awareness: m = 42.77, sd = 6.49; Learning Strategy: m = 45.15, sd = 7.56; Learning Activity: m = 45.68, sd = 7.41; Evaluation:44.52, sd = 7.18; and Interpersonal Skill: m = 44.48, sd = 7.59) and mean differences were not statistically not significant [Awareness: {t = (1.82) = .608, $p > 0.05$}; Learning Strategy: {t = (1.50) = .296, $p > 0.05$}; Learning Activity: {t = (1.08) = .732, $p > 0.05$}; Evaluation: {t = (1.17) = .288, $p > 0.05$}; and Interpersonal Skill: {t = (1.99) = .732, $p > 0.05$].

An independent samples t-test was computed taking the mean value of private school (n = 35) and govt. school (n = 630) students in terms of their overall level of self-directedness in learning score and of their level of sub-dimension of self-directedness in learning score. Results showed that negligible mean difference was found between private school and govt. school students where govt. school students (m = 225.02, sd = 31.86) have high level of self-directedness in learning than private school students (m = 219.77, sd = 36.28). But the mean differences were not statistically significant [t = (0.942) = .105] at $p >.05$ level. Also, result showed that govt. school students (Awareness: m = 43.50, sd = 6.74; Learning Strategy: m = 45.79, sd = 7.40; Learning Activity: m = 45.21, sd = 7.74; Evaluation: m = 45.11, sd = 7.64; and Interpersonal Skill: m = 44.42, sd = 7.78) have high level of the sub-dimension of level of self-directedness in learning than private school students (Awareness: m = 42.74, sd = 6.99; Learning Strategy: m = 45.43, sd = 7.96; Learning Activity: m = 44.17, sd = 8.88; Evaluation:43.34, sd = 8.04; and Interpersonal Skill: m = 44.09, sd = 8.72) and mean differences were not statistically not significant [Awareness: {t = (0.647) = .692, $p > 0.05$}; Learning Strategy: {t = (0.277) = .555, $p > 0.05$}; Learning Activity: {t = (0.764) = .144, $p > 0.05$}; Evaluation: {t = (1.33) = .283, p>0.05}; and Interpersonal Skill: {t = (0.978) = .119, $p > 0.05$].

An independent samples t-test was calculated using the mean value of Bengali medium (n = 635) and English medium (n = 630) students in terms of their overall level of self-directedness in learning score and of their level of sub-dimension of self-directedness in learning score. Results showed that negligible mean difference was found between Bengali medium and English medium students where Bengali medium students (m = 224.02, sd = 32.44) have high level of self-directedness in learning than English medium students (m = 223.24, sd = 24.61). But the mean differences were not statistically significant [t = (0.259) =.080] at $p >$ .05 level. Also, result showed that Bengali medium students (Awareness: m = 43.43, sd = 6.81; Learning Strategy: m = 45.76, sd = 7.49; Learning Activity: m = 45.11, sd = 7.88; Evaluation: m = 45.10, sd = 7.71; and Interpersonal Skill: m = 45.42, sd = 7.89) have high level of the sub-dimension of level of self-directedness in learning than English medium students (Awareness: m = 42.17, sd = 5.43; Learning Strategy: m = 46.24, sd = 5.80; Learning Activity: m = 46.14, sd = 6.17; Evaluation:43.28, sd = 6.67; and Interpersonal Skill: m = 43.41, sd = 6.01) and mean differences were not statistically not significant [Awareness: {t = (0.575) = .366, $p > 0.05$}; Learning Strategy: {t = (0.343) = .142, $p > 0.05$}; Learning Activity: {t = (0.693) = .120, $p > 0.05$}; Evaluation: {t = (1.25) = .165, $p > 0.05$}; and Interpersonal Skill: {t = (1.35) = .106, $p > 0.05$].

The ANOVA results showed significant differences in self-directed learning (SDL) across various categories. In the class of students, overall SDL (F5, 659 =3.40, p = .005) and its sub-dimensions, including Awareness (F5, 659 = 2.87, p = .014), Learning Activity

(F5, 659 = 2.73, p = .019), Evaluation (F5, 659 = 2.64, p = .023), and Interpersonal Skill (F5, 659 = 4.30, p = .001), were significant, except for Learning Strategy (F5, 659 = 2.04, p = .071). When stream of students is concerned, only Interpersonal Skill (F5, 659 = 2.53, p = .028) was significant, while overall SDL (F5, 659 = 2.05, p = .069) and other sub-dimensions were not. For locality of student's variable, overall SDL (F2, 662 = 3.47, p = .032), Learning Strategy (F2, 662 = 3.49, p = .031), and Learning Activity (F2, 662 = 5.35, p = .005) were significant, while Awareness (F2, 662 = 1.21, p = .299), Evaluation (F2, 662 = 1.32, p = .267), and Interpersonal Skill (F2, 662 = 2.67, p = .057) were not. Finally, among students with different numbers of siblings, only Learning Activity (F2, 662 = 3.34, p = .036) was significant, while overall SDL (F2, 662 = 2.51, p = .082) and other sub-dimensions were not.

Table 2: Levels of SDL* Cross tabulation on basis of different variables

		Levels of SDL		
		High	**Moderate**	**Low**
Gender	Female (355)	64.8%	33.2%	2.0%
	Male (310)	54.5%	44.2%	1.3%
Differently Abled	No (607)	59.8%	38.9%	1.3%
	Yes (58)	62.1%	32.8%	5.2%
Family Type	Nuclear (452)	63.1%	35.2%	1.8%
	Joint (212)	53.8%	44.8%	1.4%
School Type	Private (35)	51.4%	45.7%	2.9%
	Govt. (630)	60.5%	37.9%	1.6%
Medium	Bengali (635)	60.3%	38.0%	1.7%
	English (29)	51.7%	48.3%	0.0%
Class	IX (109)	60.65	39.4%	0.0%
	X (121)	58.7%	41.3%	0.0%
	XI (85)	55.3%	44.7%	0.0%
	XII (97)	45.4%	44.6%	0.0%
	UG (92)	71.7%	26.1%	2.2%
	PG (161)	65.2%	29.2%	5.6%
Stream	NA (229)	54.8%	40.2%	0.0%
	Arts (246)	62.3%	33.6%	4.1%
	Science (131)	58.8%	41.2%	0.0%
	Commerce (45)	61.7%	38.3%	0.0%
	Engineering (13)	28.6%	64.3%	7.1%
Locality	Rural (229)	61.1%	36.2%	2.6%
	Semi-urban (105)	54.3%	41.0%	4.8%
	Urban (331)	61.05	39.0%	0.0%
Siblings	No Siblings (321)	55.5%	43.9%	0.6%
	One Sibling (238)	62.6%	34.9%	2.5%
	More than Two Siblings (106)	67.9%	29.2%	2.8%
Family Status	Very Poor (104)	54.8%	41.3%	3.8%
	Poor(178)	63.5%	36.0%	0.6%
	Lower Middle Class (199)	63.3%	35.7%	1.0%
	Middle Class (151)	58.3%	39.1%	2.6%
	Upper Middle Class (33)	45.5%	54.5%	0.0%

Gender Variable – The gender wise analysis of levels of SDL score shown in table 2 in indicates that out of 310 male students under study, 54.5% have high level of self-directedness in learning while out of 355 female students have 64.8%.

Differently Abled Variable - Among the total 665 students examined, 59.8% (n = 607) students have high level self-directedness in learning who are not differently abled. On the other hand, 62.1% (n = 58) students have high level self-directedness in learning who are categorised in differently abled.

Family Type Variable – When we considered the variable family type result shows that 63.1% (n = 452) students who belong from nuclear family and 53.8% (n = 212) students who belong from joint family have high level of self-directedness in learning.

School Type Variable – In the case of school type out of 665 students 51.4% (n = 35) who comes from private school and 60.5% (n = 630) who comes from govt. school have high level of self-directedness in learning.

Medium of Instruction Variable – Results indicates that out of 665 students, 60.3% (n = 635) students who attend Bengali medium schools and 51.7% (n = 29) students who attend English medium schools exhibited high level of self-directedness in learning.

Class Variable – When we considered the variable class table 2 indicates that there is distinctive differences between school going children and higher studies students in levels of SDL. Out of 665 students, class IX – 60.65% (n = 109), class X – 58.7% (n = 121), class XI – 55.3% (n = 85), class XII

– 45.4% (*n* = 97), UG – 71.7% (92), and PG – 65.2% (161) students have high level of self-directedness in learning.

Stream of education Variable – Considering the stream of education out of 665 students result shows that there are distinctive differences between NA (Not Applicable means that those students who are studying under class IX and X only therefore they have no stream of education till now), Arts, Science, Commerce, and Engineering. Table 2 indicates that NA - 54.8% (*n* = 229), Arts – 62.35 (*n* = 246), Science – 58.8% (*n* = 131), Commerce –61.7% (*n* = 45), and Engineering – 28.6% (*n* = 13) students have high level of self-directedness in learning.

Locality Variable – In relation to the locality of the students Urban, Semi-urban and Rural, out of total students who belong from rural area 61.1% (*n* = 229), Semi-urban 54.3% (*n* = 105) and Urban 61.05% (*n* = 331) students have high level of self-directedness in learning.

Siblings Variable – For number of siblings, out of total students, Single Child 55.5 % (*n* = 321), One Sibling 62.65 (*n* = 238) and More than two Siblings 67.9% (*n* = 106) students have high level of self-directedness in learning.

Family Status Variable – In relation to family type out of 665 students, Very Poor 54.8% (*n* = 104), Poor 63.5% (*n* = 178), Lower Middle Class 63.3% (*n* = 199), Middle Class 58.3% (*n* = 151) and Upper Middle Class 45.5% (33) family's students have high level of self-directedness in learning.

The Table 3 shows that a statistically significant interaction was found between gender, number of siblings, locality, class and stream of students for the level of self-directed in learning. Consequently, null hypothesis regarding gender $\{\chi^2(2) = 8.55, p>.05\}$, number of siblings $\{\chi^2(4) = 12.16, p>.05\}$, locality $\{\chi^2(4) = 14.06, p>.05\}$, class $\{\chi^2(10) = 43.76, p>.05\}$, stream $\{\chi^2(10) = 29.03, p>.05\}$ were rejected and it may be concluded that there is significant difference in levels of self-directed learning with gender, number of siblings, locality, class and stream of the students.

The Table 3 indicated that no statistically interaction was found between differently abled $\{\chi^2(2) = 5.32, p>.05\}$, family type $\{\chi^2(4) = 7.28, p>.05\}$, family status $\{\chi^2(10) = 11.86, p>.05\}$, school type $\{\chi^2(2) = 1.30, p>.05\}$ and medium of instructions $\{\chi^2(2) = 1.61, p>.05\}$ of students for the level of self-directed in learning. Consequently, therefore the researcher failed to reject the null hypothesis. Hence, it is concluded that there is no significant difference in levels of self-directed learning with differently abled, family type, family status, school type and medium of instructions among students.

Table 3: Levels of SDL * Chi-square Test on the basis of Different Variables

Variable Interaction	χ^2	*df*	*p*	Remarks
SDL Level * Gender	*8.55*	2	*0.14*	Significant
SDL Level * Differently Abled	*5.32*	2	*.070*	Not Significant
SDL Level * Family Type	*7.28*	4	*.122*	Not Significant
SDL Level * School Type	*1.30*	2	*.522*	Not Significant
SDL Level * Medium	*1.61*	2	*.446*	Not Significant
SDL Level * Class	*43.76*	10	*.000*	Significant
SDL Level * Stream	*29.03*	10	*.001*	Significant
SDL Level * Locality	*14.06*	4	*.007*	Significant
SDL Level * Sibling	*12.16*	4	*.016*	Significant
SDL Level * Family Status	*11.86*	10	*.158*	Not Significant

DISCUSSION

Self-directed learning (SDL) is associated with the student who is capable of integrating their attitudes, enthusiasm and actions in a way that aligns their personal and academic lives, and who is able to take responsibility for the quality of their own learning (Du Toit-Brits & Van Zyl, 2017). The importance of developing students' skills in self-directed learning (SDL) in higher education is becoming increasingly recognised, and it is therefore a crucial objective to achieve academic success (Bolhuis, 2003). Students had rated their SDL experiences in college more positively than in school, on four factors of SDL experiences. One study showed that "knowledgeable and organised teachers" and "promotion of active learning" correlated significantly with students' current satisfaction with SDL in college (Yeoh *et al.* 2017). A comprehensive study on Self-Determination Learning (SDL) in higher education revealed that students who experienced personalized and collaborative learning approaches, such as problem-based learning (PBL), showed improved knowledge, skills, and attitudes compared to traditional methods (Akulwar-Tajane & Varghese, n.d.). Two 'thinking models', one concerning PBL tutorial work and one the

relationship between tutorial work and self-study, are introduced (Silén & Uhlin, 2008). The unifying idea behind the reasoning is to emphasise the essence of providing opportunities for, as well as stimulating, the students' inquiring approach and responsibility. SDL can be as effective as traditional teaching methods in health professions education (Murad *et al.* 2010), and its implementation can be enhanced by promoting a structured learning environment, stimulating students' inquiring approach, and encouraging responsibility (Bhandari *et al.* 2020). This was a global phenomenon as children approached adolescence, and during the adolescent years (Vedder-Weiss & Fortus, 2012), there was a notable decline in their intrinsic motivations to learn science (Osborne *et al.* 2003).

For the referenced students results showed that there is no significant difference when we taking as a score of SDL with gender. That means girls are equally treated or there such no discrimination in terms of parental and institutional supports. Also, we see in this context of West Bengal, govt. is the providing as so many opportunities and taking initiatives for the girls to study. But when we considered dimensions or categories of SDL rather than taking as score their found statistically significant relation in between gender and levels of SDL, where we see female students have high levels of SDL rather than male students.

The results of our study reveal that there is no significant difference in Self-Directed Learning (SDL) scores between male and female students, indicating that girls receive equal treatment and support from parents and institutions. This suggests that gender discrimination is not a factor in self-directed learning. Furthermore, the government of West Bengal has implemented various initiatives such as "*Kanyashree Prakalpa*", "*Sabuj Sathi*", "*Bangla Shiksha Yojana*" to promotegirls' education, providing numerous opportunities for them to pursue their studies. However, when we examined the dimensions of SDL, we found a statistically significant relationship between gender and SDL levels, with female students exhibiting higher levels of SDL compared to their male counterparts. This finding indicates that he government's efforts to promote girls' education are paying off, as female students are exhibiting higher levels of SDL in certain dimensions. Such initiatives may have contributed to the narrowing of the gender gap in SDL.

Non-disabled students abled to more opportunities to develop SDL skills due to greater access to resources, support, and inclusive learning environments. Alternatively, disabled students face additional barriers that hinder their ability to develop SDL skills, such as lack of accessibility or accommodations. And our study found that non-disabled students exhibited higher levels of Self-Directed Learning (SDL) compared to disabled students which is statically significant also. But when we examined the dimensions of SDL using a chi-square test, we found there is no significant difference with differently abled students. This suggests that while non-disabled students may demonstrate higher overall SDL scores, disabled students may demonstrate proficiency in specific aspects of SDL, such as Awareness, Learning Strategy, Learning Activity, Evaluation, and Interpersonal Skill. For this phenomenon is that disabled students often face unique challenges and barriers in their learning journey. As a result, they may develop stronger self-advocacy skills, resilience, and resourcefulness, which are essential components of SDL. Additionally, disabled students may have to rely more heavily on technology or other accommodations to access learning materials, which can foster a greater sense of autonomy and independence in their learning. This, in turn, can lead to a higher level of SDL. Moreover, disabled students may have to navigate complex support systems and services, which can help them develop strong organizational and time management skills, also critical for SDL.

Interestingly, we found that students from nuclear families exhibited higher levels of SDL compared to those from joint families. Nuclear families typically have fewer distractions and more individualized attention, allowing students to focus more on their learning and develop stronger SDL skills. In contrast, joint families often have more members and responsibilities, which may divide students' attention and hinder their ability to develop SDL skills. But this difference was statistically not significant, suggesting that family structure not plays a crucial role in shaping students' SDL skills. Although the chi-square test results did not show a significant association between family structure and

SDL level, suggesting that family structure may not be a significant predictor of SDL skills.

SDL skills are more influenced by individual factors, like individual's instincts motivation, engagement, access to resources and technology. In this context of West Bengal, as private school are often perceived as providing more resource and opportunities for students rather than govt. school are not. But surprisingly, govt. school students demonstrate higher levels of SDL despite facing numerous challenges and limited opportunities but result was not statistically significant. One would expect that the lack of resources, outdated teaching methods, and poor infrastructure would hinder SDL skill development, remarkable resilience and adaptability. Additionally, the challenges faced by individuals driving them to take ownership of their learning, seeking out alternative sources of knowledge and support. This could include seeking help from their friends, family members, or community leaders.

Language is often perceived as a significant barrier to developing Self-Directed Learning (SDL) skills. However, this assumption may not entirely be true. While language proficiency can certainly facilitate learning, it is not the only determinant of SDL skills. Result of this study indicates that language barriers can sometimes even foster SDL skills, as students may need to rely more heavily on themselves and their own resources to learn. Additionally, technology can bridge the language gap, providing access to Online resources and tutorials; Language translation tools and Virtual learning communities.

Children have their own curiosity. They always search for mew things and innate tendency to learn by self so as they grow up but the formal education system tries to put knowledge from external world and trying to make that the child discipline and always tells them what to do or not to do that means there is no purpose of dealing self. Only, follow what is told. That means kills the innate tendencies of curiosity is to be done. With increasing knowledge and experience the child identifies his or her thirst area what she/he likes. What she/he finds interesting and then channelized or motivates himself or herself towards that. The finding that UG and Class X students exhibit a higher level of Self-Directed Learning (SDL) across all dimensions, including Awareness, Learning Strategy, Learning Activity, Evaluation, and Interpersonal Skill, is striking. This suggests that students in these stages of their academic journey are more likely to take ownership of their learning, possibly due to transition to higher education (UG) requiring greater autonomy and self-motivation or awareness Class X being a critical juncture before board exams, prompting increased self-directed learning and the increased independence and self-exploration in adolescence (Class X) and young adulthood (UG). In contrast, Class IX, XI, and XII students may be in a state of academic transition or facing exam pressures, potentially reducing their inclination towards SDL. PG students, being in a specialized post-graduate environment, may have different learning priorities.

SDL skills can be developed across disciplines with appropriate support and opportunities. Results showed that engineering and commerce background students exhibit a higher level of Self-Directed Learning (SDL) compared to arts and science students but this is not ultimatums.

The significant association between urban students and high levels of Self-Directed Learning (SDL) suggests that urbanicity plays a role in fostering SDL skills. Urban students' greater access to resources, diverse learning environments, and exposure to technology may contribute to this difference. Moreover, they are more likely to take ownership to their learning, using a range of strategies and activities to achieve their goals. In contrast, rural and suburban students may face challenges like limited resources and fewer educational opportunities.

The finding that students with multiple siblings exhibit a higher level of Self-Directed Learning (SDL) in the Learning Activities dimension is noteworthy, despite the overall statistical result being insignificant. This suggests that growing up in a multi-sibling household may foster a collaborative learning environment, where shared resources, knowledge, and perspectives encourage diverse learning activities. However, this does not necessarily mean that to enhanced learning strategies, self-motivation, or self-monitoring skills or other dimensions of SDL.

When we considered the family status of the students results indicates that Lower Middle-class

students exhibit a higher level of Self-Directed Learning (SDL) in the Awareness and Evaluation dimensions is notable, despite the overall statistical insignificance. This suggests that students from Lower Middle-class backgrounds driven to take control of their learning due to their socio-economic circumstances, fostering awareness of their learning needs and evaluation of their progress. This self-reliance may be prompted by limited access to resources, a strong desire for upward mobility, and increased motivation to overcome socio-economic challenges. However, the lack of significance in other SDL dimensions and the chi-square result indicates a complex relationship, potentially influenced by factors like parental education, family support, and resource access.

CONCLUSION

So, if a teacher can understand how their students' learning is influenced by factors like age, gender, caste, language, school, and social environment, they can determine how much self-direction is needed for each student. Then, they can help students achieve their goals and desires by tailoring their approach to meet individual needs and interests which should be the guiding practice in our education system. The potential benefits of inclusive education and the importance of providing supportive learning environments that foster SDL for all students. By recognizing and building on the strengths of disabled students, educators can create more effective learning strategies that benefit everyone. Educators should adapt their teaching strategies to accommodate students from diverse family backgrounds, such as joint families, who may require more structured learning environments and additional support for SDL skills development. Parents and caregivers should also be aware of the impact of family structure on students' SDL skills, as providing appropriate support and resources can help foster SDL skills in children. It's essential to recognize that these students are not just recipients of education but also active agents in their learning process. By understanding the factors contributing to their SDL development, we can work to create more supportive and inclusive learning environments that foster SDL skills for all students, regardless of their background or circumstances. It's important to recognize that SDL skills are not solely dependent on language proficiency. By acknowledging and addressing individual learning needs, we can create more inclusive and supportive learning environments that foster SDL skills for all students, regardless of their language background and all academic levels.

RECOMMENDATIONS

To promote gender equality in SDL, it's essential to provide equal access to resources, challenge biases, encourage family support, and foster inclusive learning environments, addressing cultural and educational disparities to create a more equitable environment for all individuals to take ownership of their learning. By promoting gender equality in SDL, we can create a more inclusive and equitable environment that supports the learning and empowerment of all individuals, regardless of gender or background.

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