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The Digital Tug-of-War: Self-Regulated Learning as a Buffer against Digital Distractions for University Students in Pakistan

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Abstract

Higher education Digital transformation has become a universal problem: how to keep students focused in the face of overwhelming digital distractions. This paper explores the perceived levels of Self-Regulated Learning (SRL), Digital Distractions (DD), and Academic Performance (AP) in the poorly studied setting of Pakistani universities. The survey was a descriptive quantitative survey conducted on a sample of undergraduate students at the University of Sargodha, Pakistan, where 297 valid responses were analyzed. Although students have reported high rates of digital distractions (e.g., more than 80 per cent of them admitted using social media when studying), their levels of SRL use (Means 3.49-3.92), and academic performance (Means 3.69-3.94 were also moderately high. These results indicate that SRL strategies could be utilized as an imperative buffer because they allow students to continue to maintain their academic performance despite the ubiquitous distractions of digital devices. The research ends with some practical suggestions that can be undertaken to include SRL training in educational curricula to promote academic resilience in technology-driven learning experiences.

Keywords: Self-Regulated Learning (SRL), Digital Distractions (DD), Academic Performance (AP)

Introduction

University students' study in an environment that uses numerous digital tools. As a result, the teaching methods that have never been seen before are now in practice. However, certain problems have been brought about by digital tools. Since they have access to smartphones, social media, streaming services, and messaging services, students approach education differently, which is adjustable and

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interactive and based on the technology. The first reason is that researchers have been more worried that excessive time on these devices may distract learners, make them unable to manage their time, and negatively affect their academic performance (Wang et al., 2021; Smith et al., 2023). Distractions such as mobile phone messages, social media posts, and playing games online are likely to disrupt a student and make them take time to accomplish assignments, and the standard of their learning and academic performance decreases. In college, lack of concentration is a very critical issue because students must be accountable to what they study themselves (Murdock et al., 2021; Kuss & Griffiths, 2020).

To overcome these difficulties, researchers suppose that self-regulated learning (SRL) may contribute to academic success to a great extent. Based on the cyclical model of SRL as described by Zimmerman, planning, self-monitoring, and self-reflection, the current study focuses on goal setting, search for useful strategies, self-monitoring, and self-assessment of students (Zimmerman, 2020; Schunk & Greene, 2019). SRL is especially relevant in the digital setting, where it prepares students to be capable of self-controlling the learning processes, avoiding distractions, and focusing on the matter. It has been repeatedly found that students using SRL techniques feel more motivated about learning, manage their tasks better, and achieve better academic results (Zeperda & Laskin, 2021; Park et al., 2022).

Nevertheless, despite the international support of the protective role of SRL, there is a gap in the knowledge about whether this correlation is true in a developing country as Pakistan. The discrepancy is not only that Pakistan has not been researched, but that we are not aware whether the protective effect of SRL found in Western settings also extends to an environment where the fast adoption of digital technologies may be more rapid than official training on digital literacy. Universities in Pakistan are not entirely integrated with digital learning, which means that the students tend to receive minimal formal training in managing digital technology, and this may increase the dangers of digital distractions. It results in a significant gap in the research on the perceived SRL, and perceived distraction by digital devices is not studied to its full extent in Pakistani institutions, which makes this research an important test of the generalizability of a theory.

Consequently, the research would aim at investigating how self-regulated learning would protect Pakistani university students against the adverse impact of digital distractions on their academic results. The aim of bridging this gap is to provide the

students, educators, and policymakers with information and appropriate recommendations to ensure they come up with improved learning strategies in our technology-dependent schools.

Review of the Literature

In literature, there are three themes that are interrelated in this study.

- **Digital distractions and their effects on human cognition and behavior**

Digital technologies offer unprecedented access to resources and a lot of disruption at the same time. Social media and messaging app notifications disrupt attention, resulting in fragmented learning and greater procrastination and low academic productivity (Wang et al., 2021; Kushlev et al., 2022). This crisis of digital attention is a phenomenon that is well-documented and exists globally in the sphere of higher education (Smith et al., 2023).

- **Self-regulated Learning Theories and Evidence**

SRL has become an important competency to address these challenges. Based on the social cognitive theory, SRL models such as the one developed by Zimmerman assume that successful learners take control of their learning in advance by using forethought, performance control, and self-reflection. Empirical research always demonstrates that students who have good SRL ability are more motivated, time managers and better performers (Pintrich, 2004; Dignath and Veenman, 2021).

- **Interaction of DD, SRL, and AP**

Although the negative correlation between DD and AP has been proven by many studies (e.g., Wang et al., 2021; Zhang et al., 2023), the increasing number of studies indicates that SRL is a factor that can mitigate the association. As an example, Gaeta Gonzalez et al. (2023) discovered that online academic success depends on digital competence and SRL. It implies that the SRL strategies can equip students with the metacognitive skills to regulate their attention and withstand digital distractions to preserve performance.

Methodology

The study objective was to undertake research on the perception of university students on self-regulated learning, digital distraction, and academic performance. This section tells us about research design, population and sampling techniques, the instrumentation, the validity and reliability, the data collection techniques, as well as the data analysis techniques.

❖ Research Design

The research design used in this study was a descriptive survey research design that employed a quantitative method of research. The descriptive design is suitable to describe the traits, behaviors or beliefs of a population at a given point in time accurately (Creswell & Creswell, 2018). This method was considered the best to accomplish the objectives that aimed at establishing the perceived degree of Self-Regulated Learning (SRL), determining the prevalent degree of Digital Distractions (DD), and identifying the acquired levels of academic performance (AP), among undergraduate students.

❖ Population and Sampling

The targeted population in the current research was the undergraduate students attending the universities in the Punjab Province in Pakistan. The accessible population to be taken was the undergraduate students at the University of Sargodha, Sargodha. To sample out a representative sample, 320 undergraduate students were selected on the basis of a multistage sampling (two-stage sampling) method. The four selected faculties of the University of Sargodha were randomly chosen as one of the strata in the first stage and included them as faculties, e.g. Social Sciences, Sciences, Arts and Humanities and Computing and Information Technology. These strata were selected in the second stage, and 320 undergraduate students were selected on this basis using a stratified sampling technique.

❖ Instrumentation

The research instrument used in this study was a structured questionnaire, which was developed based on the already available research instruments, as well as a keen analysis of the available literature. Three major scales were incorporated into the questionnaire, that is: The Self-Regulated Learning Scale (SRL), Digital Distractions Scale (DD), and Academic Performance Scale (AP). With regard to the 45 items included in the instrument, 15 were allocated to every construct. Each item was rated

on a 5-point Likert scale with Strongly Disagree (1) and Strongly Agree (5). The demographic part comprised the necessary background data, such as the gender, department, semester, faculty, residence, and the current GPA/CGPA.

The Self-Regulated Learning (SRL) Scale was developed to determine the strategies students use in the university to regulate and take charge of their learning processes. The Digital Distractions (DD) Scale was created with the aim of monitoring the vulnerability of students to digital technology distractions, e.g., social media, messaging applications, and online information. Moreover, a 15-item, 5-point Likert scale instrument of Academic Performance (AP) was developed to identify their academic achievement and their study outcomes.

- **Validity and Reliability**

The questionnaire was reviewed by nine academic experts who had educational backgrounds in assessment, instructional design, and educational psychology. Their input involving criticism was necessary in improving the language and content of the items and the clarity, because there was a need to ensure that every construct was well and adequately represented. The questionnaire was assessed by its content validity, wording, cultural and conformity to study objectives. According to experts' feedback, some of these items were changed to be more readable and conceptually accurate, which increased the overall validity of the instrument.

After review by the experts, the sample used in the pilot study was picked by convenience sampling among 50 undergraduate students at the University of Sargodha, Sargodha. Nonetheless, such people were not included in the final data collection. The pilot test was aimed at checking the reliability and internal consistency of the questionnaire. The instrument had a high reliability based on the outcomes of the pilot study, and the overall Cronbach's alpha coefficient of the instrument was 0.856. All the scales performed satisfactorily, and the Self-Regulated Learning Scale, the Digital Distractions Scale, and the Academic Performance Scale had scores of 0.867, 0.890, and 0.819, respectively. These coefficients prove that the instrument will be consistent and reliable in the primary study involving a larger group of students and will provide greater validity as the coefficients exceed the generally accepted cutoff of 0.70 (Nunnally and Bernstein, 1994).

Data Collection and Data Analysis

The data were collected using a Google Form and through face-to-face data collection when the research instrument was developed. The researchers appointed associates to help in the collection of the data, and the questionnaire was later given to the sample that was selected. A web link was also created and sent to the participants through WhatsApp groups and emails so that a larger number of people can be reached.

The data collection was followed by data screening, where twenty-three responses were dropped because they were incomplete or invalid, and finally, a dataset of 297 students was put in the statistical analysis. A quantitative analysis of the data was done through IBM SPSS Statistics (Version 26). Self-Regulated Learning (SRL), Digital Distractions (DD), and Academic Performance (AP) were the constructs of interest in which the perceptions of the undergraduate students were studied in a comprehensive manner by utilizing the descriptive statistics, including frequencies, means, standard deviations, percentages and rankings. Also, the demographic variables of the participants were included.

Results and Findings

The following were the results and conclusions of the study:

- **Demographics**

The 297 undergraduate students from various University of Sargodha faculties in Sargodha, Pakistan, made up the research data. It was discovered that there were more female students (59.9%) than male students (40.1%), suggesting that more women were seeking higher education. However, according to their residential background, most of the respondents (59.9%) belonged to the urban population, whereas 40.1% belonged to the rural population. Most of the participants (64.0%) were from the social sciences faculty, with the next group being from the arts and humanities faculty (22.6%), and 7.7% were from the sciences faculty, and 5.7% were from the computer and information technology faculty. Based on the semester distribution, 24.9% of the students were in their fourth semester, 18.5% in their third semester, 14.5% in their eighth semester, 13.1% in their fifth semester, 6.7% in their seventh semester, and 4% in their second semester. This varied sample provided a detailed study of self-regulated learning, digital distraction, and academic

performance of students in a variety of demographic settings that ensured adequate representation of students in terms of their gender, academic fields, and study level.

❖ Frequency Analysis of Self-Regulating Learning (SRL)

The following is the frequency analysis of Self-Regulating Learning:

Table 1
Frequency Analysis of Students' Responses about Self-Regulated Learning

Sr#	Statements	Disagreement Zone		Total Disagreement	N	Agreement Zone		Total Agreement	Result
		SDA	DA			A	SA		
	Self-Regulated Learning (SRL)								
	Cognitive Strategy Use (CSU)								
1	I make notes while reading to help me remember important details.	37 (12.5%)	41 (13.8%)	78 (26.3%)	19 (6.4%)	140 (47.1%)	60 (20.2%)	219 (73.7%)	Agreement
2	I use different materials (like charts or diagrams) to organize information.	20 (6.7%)	41 (13.8%)	61 (20.5%)	30 (10.1%)	140 (47.1%)	66 (22.2%)	236 (79.4%)	Agreement
3	I try to connect new topics with what I already know.	20 (6.7%)	20 (6.7%)	40 (13.4%)	39 (13.1%)	141 (47.5%)	77 (25.9%)	257 (86.5%)	Agreement

4	I focus on understanding concepts instead of just memorizing facts.	15 (5.1%)	19 (6.4)	34 (11.5%)	29 (9.8%)	147 (49.5%)	87 (29.3%)	263 (88.6%)	Agreement
5	I plan how much time I will spend on each subject before studying.	16 (5.4%)	31 (10.5%)	47 (15.9%)	53 (18.0%)	128 (43.4%)	67 (22.7%)	248 (84.1%)	Agreement
	Metacognitive Strategy Use								
6	I check my understanding of the material after studying it.	27 (9.1)	23 (7.7%)	50 (16.8%)	20 (6.7%)	161 (54.2%)	66 (22.2%)	247 (83.1%)	Agreement
7	I change my study methods if I find they are not effective.	17 (5.7%)	33 (11.1%)	50 (16.8%)	33 (11.1%)	153 (51.5%)	61 (20.5%)	247 (83.1%)	Agreement
8	I think about ways to improve my learning after completing a task.	13 (4.4%)	26 (8.8%)	39 (13.2%)	40 (13.5%)	147 (49.5%)	71 (23.9%)	258 (86.9%)	Agreement
9	I look for feedback to understand where I can improve.	20 (6.7%)	26 (8.8%)	46 (14.5%)	29 (9.8%)	151 (51.0%)	70 (23.6%)	250 (84.4%)	Agreement
	Motivational Strategy Use (MSU)								
10	I remind myself of the benefits of studying for my future.	22 (7.4%)	21 (7.1%)	43 (14.5%)	28 (9.4%)	139 (46.8%)	87 (29.3%)	254 (85.5%)	Agreement

11	I set clear goals for what I want to achieve in my studies.	17 (5.7%)	30 (10.1%)	47 (15.8%)	38 (12.8%)	136 (45.8%)	76 (25.6%)	250 (84.2%)	Agreement
12	I actively find ways to stay motivated during tough study periods.	17 (5.7%)	27 (9.1%)	44 (14.8%)	33 (11.1%)	142 (47.8%)	78 (26.3%)	253 (85.2%)	Agreement
	Behavioral Strategy Use (BSU)								
13	I plan my study sessions in advance.	15 (5.1%)	39 (13.1%)	54 (18.2%)	34 (11.4%)	149 (50.2%)	60 (20.2%)	243 (81.8%)	Agreement
14	I ensure a distraction-free environment for studying.	18 (6.1%)	27 (9.1%)	45 (15.2%)	33 (11.1%)	143 (48.1%)	76 (25.6%)	252 (84.8%)	Agreement
15	I participate in study groups or peer discussions to improve understanding.	12 (4.0%)	34 (11.4%)	46 (15.4%)	27 (9.1%)	153 (51.5%)	71 (23.9%)	251 (84.5%)	Agreement

As can be seen in Table 1, a large majority of students actively implement self-regulated learning (SRL) strategies in the domains of behavioral, motivational, metacognitive and cognitive learning. Academic engagement high scores were noted with most students in most cases using effective cognitive strategies, e.g. organizing information (79.4%) and combining previous experience (86.5%). The students who evaluated their learning and modified the method of learning displayed a high level of self-awareness in the metacognitive category (83.1%-86.9%). The huge usage of motivational techniques is evidenced by the fact that over 85 per cent of them have been motivated and focused. The majority (81.8%-84.8) of the students planned their study sessions and avoided distractions. Altogether, the research indicates that the SRL strategies are frequently applied by students and they facilitate better academic achievements by means of motivation, self-discipline, active planning, and reflection.

❖ Frequency Analysis of Digital Distractions

The frequency analysis of digital distractions is as follows:

Table 2
Frequency Analysis of Students' Responses about Digital Distractions

Sr#	Statements	Disagreement Zone		Total Disagreement	N	Agreement Zone		Total Agreement	Result
		SDA	DA			A	SA		
	Digital Distractions (DD)								
	Social Media Distractions (SMD)								
16	I check social media during study sessions.	16 (5.4%)	35 (11.8%)	51 (17.2%)	26 (8.8%)	147 (49.5%)	73 (24.6%)	246 (82.9%)	Agreement
17	Social media notifications disturb my concentration.	12 (4.0%)	29 (9.8%)	41 (13.8%)	36 (12.1%)	136 (45.8%)	84 (28.3%)	256 (86.2%)	Agreement
18	I spend more time on social media than I plan to during study time.	23 (7.7%)	46 (15.5%)	69 (23.2%)	37 (12.5%)	131 (44.1%)	60 (20.2%)	228 (76.8%)	Agreement
19	Social media reduces the time I have for studying.	25 (8.4%)	24 (8.1)	49 (16.5%)	35 (11.8%)	136 (45.8%)	77 (25.9%)	248 (83.5%)	Agreement
20	Using social media during study hours affects my academic performance.	19 (6.4%)	36 (12.1%)	55 (18.5%)	31 (10.4%)	136 (45.8%)	75 (25.3%)	242 (81.5%)	Agreement
	Messaging Apps Distractions (MAD)								

21	I stopped studying to reply to messages on my phone.	16 (5.4%)	42 (14.1%)	58 (19.5%)	38 (12.8%)	138 (46.5%)	63 (21.2%)	239 (80.5%)	Agreement
22	Notifications from the messaging application disturb my study routine.	15 (5.1%)	18 (6.1%)	33 (11.2%)	36 (12.1%)	153 (51.5%)	75 (25.3%)	264 (88.9%)	Agreement
23	I use messaging applications to talk about non-academic topics during study time.	19 (6.4%)	38 (12.8%)	57 (19.2%)	47 (15.8%)	139 (46.8%)	54 (18.2%)	240 (80.8%)	Agreement
24	I find it difficult to ignore messages while studying.	13 (4.4%)	40 (13.5%)	53 (17.9%)	37 (12.5%)	144 (48.5%)	63 (21.2%)	244 (82.2%)	Agreement
25	I often lose focus because of the messaging application.	13 (4.4%)	33 (11.1%)	46 (15.5%)	44 (14.8%)	137 (46.1%)	70 (23.6%)	251 (84.5%)	Agreement
	Online Content Distractions (OCD)								
26	I browse non-academic websites during study time.	20 (6.7%)	40 (13.5%)	60 (20.2%)	42 (14.1%)	135 (45.5%)	60 (20.2%)	237 (79.8%)	Agreement
27	Online entertainment (like videos or games) takes up my study time.	14 (4.7%)	34 (11.4%)	48 (16.1%)	44 (14.8%)	138 (46.5%)	78 (22.6%)	260 (83.9%)	Agreement
28	I often click on links that distract me from studying.	20 (6.7%)	43 (14.5%)	63 (21.1%)	33 (11.1%)	129 (43.4%)	72 (24.2%)	234 (78.7%)	Agreement

29	I watch videos unrelated to my studies while preparing for exams.	23 (7.7%)	32 (10.8%)	55 (18.5%)	37 (12.5%)	137 (46.1%)	68 (22.9%)	242 (81.5%)	Agreement
30	News or updates on websites distract me during study sessions.	21 (7.1%)	43 (14.5%)	64 (21.6%)	32 (10.8%)	137 (46.1%)	64 (21.5%)	233 (78.4%)	Agreement

Table 2 shows that university students are prone to digital distraction, and it largely affects their ability to concentrate and perform in the classroom. The agreement of the three dimensions of social media distractions (SMD), messaging app distractions (MAD), and online content distractions (OCD) is high, which proves the level of pervasiveness of the distractions in the daily lives of students. Amazingly, more than 86 per cent of the students said that notifications of SMS and social media distracted their learning session. Similarly, over 80% also confessed to the use of irrelevant sites when taking tests. These tendencies indicate that it is a significant problem to remain focused in the classroom. The findings show the level of urgency with which colleges should encourage self-regulated learning strategies that will help students to resist the allure of digital distractions and effectively spend their time to achieve better academic results.

❖ Frequency Analysis of Academic Performance

The following was the frequency analysis of Academic Performance:

Table 3
Frequency Analysis of Students' Responses about Academic Performance

Sr#	Statements	Disagreement Zone		Total Disagreement	N	Agreement Zone		Total Agreement	Result
		SDA	DA			A	SA		
	Academic Performance (AP)								
	Academic Achievement (AA)								

31	I meet the academic goals I set for myself each semester.	23 (7.7%)	34 (11.4%)	57 (19.1%)	34 (11.4%)	127 (42.8%)	79 (26.6%)	240 (80.8%)	Agreement
32	I submit assignments and projects on time.	14 (4.7%)	22 (7.4%)	36 (12.1%)	25 (8.4%)	144 (48.5%)	92 (31.0%)	261 (87.9%)	Agreement
33	I feel satisfied with my performance in quizzes and exams.	23 (7.7%)	23 (7.7%)	46 (15.4%)	32 (10.8%)	141 (47.5%)	78 (26.3%)	251 (84.6%)	Agreement
34	My grades reflect my effort and understanding of the material.	14 (4.7%)	24 (8.1%)	34 (11.5%)	29 (9.8%)	155 (52.2%)	75 (25.3%)	263 (88.6%)	Agreement
35	In my course, I achieve the grades I aim for.	20 (6.7%)	26 (8.8%)	46 (15.5%)	29 (9.8%)	153 (51.5%)	69 (23.2%)	251 (84.5%)	Agreement
	Academic Engagement (AE)								
36	I participate actively in lectures and class discussions.	12 (4.0%)	28 (9.4%)	40 (13.4%)	38 (12.8%)	132 (44.4%)	87 (29.3%)	257 (86.5%)	Agreement
37	I regularly review course materials outside of class.	13 (4.4%)	28 (9.4%)	41 (13.8%)	43 (14.5%)	135 (45.5%)	78 (26.3%)	256 (86.3%)	Agreement
38	I collaborate with classmates on academic projects.	16 (5.4%)	26 (8.8%)	42 (14.2%)	36 (12.1%)	140 (47.1%)	79 (26.6%)	255 (85.8%)	Agreement
39	I take part in group discussions to improve my understanding of topics.	10 (3.4%)	31 (10.4%)	41 (13.8%)	27 (9.1%)	147 (49.5%)	82 (27.6%)	256 (86.2%)	Agreement
40	I attend all my classes and academic sessions on time.	14 (4.7%)	23 (7.7%)	37 (12.4%)	36 (12.1%)	157 (52.9%)	67 (22.6%)	260 (87.6%)	Agreement
	Academic Motivation (AM)								

41	I work hard because I know education is important for my career.	17 (5.7%)	22 (7.4%)	39 (13.1%)	33 (11.1%)	138 (46.5%)	87 (29.3%)	258 (86.9%)	Agreement
42	I stay committed to my studies even when I face distractions.	14 (4.7%)	28 (9.4%)	42 (14.1%)	34 (11.4%)	146 (49.2%)	75 (25.3%)	255 (85.9%)	Agreement
43	I feel proud of the progress I have made in my academic journey.	16 (5.4%)	20 (6.7%)	36 (12.1%)	41 (13.8%)	144 (48.5%)	76 (25.6%)	261 (87.9%)	Agreement
44	I set specific goals for every semester and work to achieve them.	14 (4.7%)	28 (9.4%)	42 (14.1%)	42 (14.1%)	138 (46.5%)	75 (25.3%)	255 (85.9%)	Agreement
45	I enjoy learning new things and applying them in my studies.	21 (7.1%)	17 (5.7%)	38 (12.8%)	24 (8.1%)	147 (49.5%)	88 (29.9%)	259 (87.5%)	Agreement

Table 3 indicates that university students are constantly performing well in school, and this is propelled by good performance, involvement, and motivation. The vast majority who have reported being able to do assignments on time (87.9%) and meet their goals (80.8%) demonstrated a strong sense of achievement. Good behavioral involvement is indicated through regular study (more than 86% and excellent class attendance. Another area where the students were highly motivated was in their academic success and the appreciation of education for professional success, with more than 88% of students enjoying academic success. Based on these findings, students are resilient and have a proactive attitude towards learning through being academically engaged, motivated, and committed even in the presence of outside distractions.

❖ Means and Standard Deviations of Self-Regulated Learning (SRL)

The following are the means and standard deviations of Self-Regulated Learning (SRL):

Table 4
Means and Standard Deviations of Self-Regulated Learning (SRL)

Sr#	Statements	N	Mean	Std. Deviation	Ranking	Interpretation
1	I focus on understanding concepts instead of just memorizing facts.	297	3.92	1.048	1st	Moderately High
2	I remind myself of the benefits of studying for my future.	297	3.84	1.146	2nd	Moderately High
3	I think about ways to improve my learning after completing a task.	297	3.8	1.04	3rd	Moderately High
4	I actively find ways to stay motivated during tough study periods.	297	3.8	1.103	4th	Moderately High
5	I participate in study groups or peer discussions to improve understanding.	297	3.8	1.056	5th	Moderately High
6	I try to connect new topics with what I already know.	297	3.79	1.107	6th	Moderately High
7	I ensure a distraction-free environment for studying.	297	3.78	1.11	7th	Moderately High
8	I look for feedback to understand where I can improve.	297	3.76	1.114	8th	Moderately High
9	I set clear goals for what I want to achieve in my studies.	297	3.75	1.117	9th	Moderately High
10	I check my understanding of the material after studying it.	297	3.73	1.161	10th	Moderately High
11	I change my study methods if I find they are not effective.	297	3.7	1.091	11th	Moderately High

12	I plan how much time I will spend on each subject before studying.	297	3.67	1.102	12th	Moderately High
13	I plan my study sessions in advance.	297	3.67	1.093	13th	Moderately High
14	I use different materials (like charts or diagrams) to organize information.	297	3.64	1.166	14th	Moderately High
15	I make notes while reading to help me remember important details.	297	3.49	1.297	15th	Moderately High

Table 4 shows the statistics describing how SRL strategies are used by university students. All items on the scale suggest a moderately high degree of self-regulated learning based on the mean scores of 3.49 to 3.92. Students who scored best in this survey, by saying, "I focus on understanding concepts instead of just memorizing facts" (M = 3.92, SD = 1.048), reveal that students prefer studying in-depth rather than just memorizing information. Besides thinking positively, other effective behaviors include remembering how studying or practicing will pay off and reflecting on the things you learned after finishing an assignment (M = 3.84 and M = 3.80). Other tips were using self-motivation, partnering with peers, and connecting something to what was known from previous lessons. Still, note-taking is not used as often by the students, for "I make notes while reading to help me remember important details" (M = 3.49, SD = 1.297), indicating that note-taking is relatively less practiced among the students. Overall, students use all types of SRL tactics widely, although their use of note-making and time management is less than their use of cognitive and motivational strategies

- **Means and Standard Deviations of Digital Distractions**

The following are the means and standard deviations of Digital Distractions:

Table 5
Means and Standard Deviations of Digital Distractions

Sr#		N	Mean	Std. Deviation	Ranking	Interpretation
16	Notifications from the messaging application disturb my study routine.	297	3.86	1.027	1st	Moderately High
17	Social media notifications disturb my concentration.	297	3.85	1.067	2nd	Moderately High
18	I check social media during study sessions.	297	3.76	1.112	3rd	Moderately High
19	Social media reduces the time I have for studying.	297	3.73	1.178	4th	Moderately High
20	I often lose focus because of the messaging application.	297	3.73	1.075	5th	Moderately High
21	Using social media during study hours affects my academic performance.	297	3.71	1.158	6th	Moderately High
22	Online entertainment (like videos or games) takes up my study time.	297	3.71	1.084	7th	Moderately High
23	I find it difficult to ignore messages while studying.	297	3.69	1.084	8th	Moderately High
24	I watch videos unrelated to my studies while preparing for exams.	297	3.66	1.170	9th	Moderately High
25	I often click on links that distract me from studying.	297	3.64	1.189	10th	Moderately High
26	I stopped studying to reply to messages on my phone.	297	3.64	1.125	11th	Moderately High
27	News or updates on websites distract me during study sessions.	297	3.61	1.178	12th	Moderately High
28	I browse non-academic websites during study time.	297	3.59	1.151	13th	Moderately High
29	I use a messaging application to talk about	297	3.58	1.119	14th	Moderately High

	non-academic topics during study time.					
30	I spend more time on social media than I plan to during study time.	297	3.54	1.197	15th	Moderately High

Table 5 shows that statistics describe digital distractions for university students. The scores between 3.54 and 3.86 on the 5-point scale suggest that there are many distractions from digital gadgets when students are studying. The top-ranking comment, "Notifications from messaging application disturb my study routine" (M = 3.86, SD = 1.027), reveals that real-time alerts from messaging apps are a significant source of disruption. In addition, the rating means "Social media notifications break my focus" (M = 3.85) and "I check social media during study sessions" (M = 3.76). Show that social media takes up much of their attention during studies. Additionally, many items with increased mean values reveal the effects of messaging apps, entertainment found online, and people's difficulty staying away from temptations on the internet. "I spend more time on social media than I plan during study time" (M = 3.54, SD = 1.197), although still moderately high, suggests some students may attempt to regulate their time but still face challenges with self-control. All things considered, the data reveal that distractions prompted by digital devices are common on messaging, social media, and entertainment sites, and they regularly affect students' ability to concentrate and get work done.

❖ Means and Standard Deviations of Academic Performance

The following are the means and standard deviations of Academic Performance:

Table 6
Means and Standard Deviations of Academic Performance

Sr#	Statements	N	Mean	Std. Deviation	Ranking	Interpretation
31	I submit assignments and projects on time.	297	3.94	1.056	1st	Moderately High
32	I enjoy learning new things and applying them in my studies.	297	3.89	1.111	2nd	Moderately High
33	I take part in group discussions to improve my understanding.	297	3.88	1.037	3rd	Moderately High
34	I work hard because I know education is important for my career.	297	3.86	1.096	4th	Moderately High

35	I participate actively in lectures and class discussions.	297	3.86	1.070	5th	Moderately High
36	My grades reflect my effort and understanding of the material.	297	3.85	1.039	6th	Moderately High
37	I feel proud of the progress I have made in my academic journey.	297	3.82	1.058	7th	Moderately High
38	I stay committed to my studies even when I face distractions.	297	3.81	1.066	8th	Moderately High
39	I attend all my classes and academic sessions on time.	297	3.81	1.023	9th	Moderately High
40	I collaborate with classmates on academic projects.	297	3.81	1.091	10th	Moderately High
41	I regularly review course materials outside of class.	297	3.80	1.068	11th	Moderately High
42	I feel satisfied with my performance in quizzes and exams.	297	3.77	1.152	12th	Moderately High
43	I set specific goals for every semester and work to achieve them.	297	3.78	1.073	13th	Moderately High
44	In my course, I achieve the grades I aim for.	297	3.76	1.110	14th	Moderately High
45	I meet the academic goals I set for myself each semester.	297	3.69	1.202	15th	Moderately High

Table 6 shows that descriptive statistics for academic performance, the sample of 297 university students exhibits a generally high degree of academic engagement and achievement. All of the Academic Performance (AP) section's components have mean scores that are in the "Moderately High" range, which shows that students consistently put their all into their academics and behave well in the classroom. "I submit assignments and projects on time" (Mean = 3.94, SD = 1.056). The item with the highest mean score indicates that students have a strong sense of accountability and timeliness. "I enjoy learning new things and applying them in my studies" (Mean = 3.89, SD = 1.111), which follows, demonstrating that students are enjoying the learning process in addition to achieving the fundamental needs of their academic assignments. Other statements, like I work hard because I know that education is important to my career (Mean = 3.86, SD = 1.096) and I participate in group discussions to enhance my understanding (Mean = 3.88, SD = 1.037), indicate that students are generally involved in collaborative learning and are driven by the prospects of their future career. It is also shown in the statement how actively students are involved in the classroom, "I am actively engaged in lectures and

classroom discussions (Mean = 3.86, SD = 1.070). Although students normally work hard to achieve their academic objectives, there can be an improvement in the aspect of achieving their objectives on a regular basis. The lowest mean in this area is attributed to "I meet the academic goals I establish myself every semester" (Mean = 3.69, SD = 1.202). Based on the findings in Table 6, students are mostly very committed to their academic processes. Some good qualities of theirs include their participation in educational events, overall motivation in their studies and their timeliness. Nevertheless, the achievement of certain academic objectives can become the priority of future development.

Discussion

The results showed that students exhibited a modest level of self-regulated learning, particularly in the domains of behavior, motivation, metacognition, and cognition. However, the data also revealed that students were greatly distracted by digital media, particularly social media, messaging apps, and online entertainment. Despite the pervasiveness of digital distractions, students reported rather decent academic achievement. This implied that self-control could act as a shield against the negative consequences of digital media.

Students are greatly distracted by the data on digital media, particularly social media, messaging apps, and online entertainment. According to Rosen et al. (2013), even brief exposure to digital media can disrupt concentration and learning outcomes, which is in line with the ubiquity of digital disturbance in academic life. Thoughtfully, the messaging app notifications were recognized as the most disruptive element, as modern society addresses the issues with the culture of always being connected, facilitated by smartphones and instant messaging apps (Zhang et al., 2023).

Although the prevalence of digital interference is widespread, students said that their success in education was moderately good, which implies that good self-regulation can be a shield against the adverse impact of digital media. Previous studies have confirmed this moderating potential of SRL (Hadwin et al., 2018; Gaeta Gonzalez et al., 2023): it was established that students with high SRL skills can deal with competing demands more efficiently and focus on academic work.

It is worth noting that there existed significant differences among academic faculties. Students in the arts and humanities reported the highest levels of SRL, digital distractions, and academic performance, whereas students in the computing and information technology fields reported the lowest levels. These findings might be in different ways of education, types of assessment, or even disciplinary differences in digital involvement. Humanities and arts programs, such as, typically focus on reflexive and self-regulated learning, and this may assist students in acquiring SRL skills. But, students of computing and information technology can have more frequent digital tools used in their studies, which is ironically a source of more distractions (Junco, 2012; Ellis et al., 2020).

On the whole, the results show that more independent students can sustain their academic achievements even when they have many digital distractions. Herein lies the importance of the need to ensure that universities incorporate SRL in their curriculum, which may be in the form of workshops, digital literacy drives, or individualized teaching plans. Meta-analytic research on the impact of SRL-enhancing treatments on academic achievement is increasingly supporting these tactics (Theobald, 2020; Dignath & Veenman, 2021).

According to the study's conclusions, self-regulated learning is a crucial academic ability in the digital age. Strong SRL practices can be utilized to counteract the negative effects of digital distractions on academic achievement, despite the alarmingly large percentage of college students who are prone to them. These findings should be taken into consideration by educators, legislators, and curriculum designers as they work to build academic resilience in the digitally advanced world.

Conclusions

This study comes to the conclusion that, in the contemporary university setting, self-regulated learning (SRL), digital distractions (DD), and academic performance (AP) have a complicated and contradictory relationship based on a thorough review of data gathered from 297 undergraduate students.

First of all, digital distractions are a widespread and serious problem, especially from messaging apps and social media. Students reported being very susceptible to online content and notifications, which regularly interfere with their study routines and

ability to concentrate. This demonstrates that, in line with worldwide trends, the "digital tug-of-war" is a fundamental aspect of the modern Pakistani student experience.

Second, students reported moderately high levels of self-regulated learning in the behavioral, cognitive, metacognitive, and motivational domains despite this high level of digital distraction. They actively regulate their learning by using techniques including self-motivation, conceptual comprehension, and reflection.

Thirdly, and maybe most importantly, students concurrently reported somewhat high levels of motivation, engagement, and academic success. The main finding is that self-regulated learning probably acts as a crucial buffer or protective factor when high DD and high self-reported AP coexist with strong SRL. It gives pupils the ability to retain their academic performance while reducing the negative impacts of digital distractions. This implies that having good SRL abilities is a crucial distinction between kids who succeed academically in a digital world and others who find it difficult.

Lastly, the differences noted amongst faculties suggest that SRL, DD, and AP do not interact consistently. How students control their learning and engage with digital technologies seems to be influenced by disciplinary cultures and the nature of academic work.

The study basically comes to the conclusion that although digital distractions are unavoidable, they are not an insurmountable obstacle to academic success. A key tactic for building academic resilience and empowering students to successfully negotiate the difficulties of technology-rich learning environments is the development of self-regulated learning competencies.

Recommendations

The following recommendations and suggestions are proposed for students, teachers, and legislators to enhance academic outcomes in the digital age, based on the study's findings.

❖ Recommendations for Educational Institutions and Instructors

Universities must stop presuming that students are proficient in SRL. First-year experience courses, discipline-specific modules, and orientation programs should all incorporate explicit SRL instruction. Workshops on goal-setting, time management, metacognitive techniques (such as keeping a self-reflection journal), and developing efficient study plans could fall under this category.

To promote digital well-being, organizations should launch initiatives that go beyond technical proficiency. This includes teaching students how multitasking affects their cognitive abilities, how to handle notifications, and how to set aside time for concentrated "deep work" sessions free from digital distractions.

Teachers can create exercises and tests that naturally call for and reward SRL. Scaffolded projects, peer feedback cycles, and reflective tasks, for instance, can promote planning, monitoring, and adaptation, essential elements of SRL.

❖ Recommendations for Students

Enhancing their learning skills should be a personal duty of the students. This entails deliberately creating study plans, establishing clear academic objectives for every study session, actively seeking feedback, and routinely evaluating the efficacy of their study techniques.

It is advised that students use behavioral SRL tactics, like as employing website blockers for social media, blocking off unnecessary phone notifications during study sessions, and setting aside a particular, neat area for academic work.

Regular self-evaluations of their comprehension of the course material and a willingness to modify their methods are essential. After finishing an assignment or test, thinking back on the tactics that worked and those that didn't might help students continue to enhance their learning.

❖ Recommendations for Future Research

Use Longitudinal and Causal Designs: In order to monitor how SRL, DD, and AP change over the course of a semester or academic year, future research should use

longitudinal studies. Establishing causal links and confirming SRL's significance as a mitigating factor requires experimental or quasi-experimental settings where SRL interventions are used.

Incorporate Objective and Mixed Methods: Future research should triangulate results with objective measures like real GPA, learning analytics from LMS systems, and screen-time tracking data in order to overcome the constraints of self-report data. Deeper, qualitative insights into students' lived experiences and the "how" and "why" behind their actions may be obtained through a mixed-methods approach that includes focus groups or interviews.

Extend the Scope and Sample: Future studies should incorporate a more varied sample from several public and private universities in various parts of Pakistan in order to improve generalizability. To create a more complex model of academic performance in the digital age, research might also examine the function of potential mediating and moderating variables, such as digital literacy, self-efficacy, and personality traits.

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