

Equipped yet Reluctant: Comparing the Problem-Solving Skills across University Gen Z Students

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This study examines the differences in metacognition, decisional procrastination, affiliated comfort, and problem-solving skills among Generation Z students enrolled in public and private universities. A quantitative cross-sectional design was used. Data was collected from 288 university students (135 males, 153 females) in Lahore through purposive sampling. Participants completed the Metacognition Self-Assessment Scale, Melbourne Decision-Making Questionnaire, Positive Relations with Others subscale, and Problem-Solving Inventory. Hierarchical regression and independent samples t-test were used. Results revealed gender significantly predicted problem-solving skills, explaining 5% of the variance, while metacognition contributed a further 5.3% of variance ($\Delta R^2 = .053$), bringing total explained variance to 11.5% and private university students scored higher on the Problem-Solving Inventory as compared to public university students while no significant differences were found in metacognition, decisional procrastination, or affiliated comfort. Findings indicate that institutional social environment may play a role in shaping students' problem-solving skills and meta-cognitive skills. Future research should include broader geographical sample to enhance generalizability.

Keywords: metacognition; decisional procrastination; affiliated comfort; problem-solving skills; Generation Z

Generation Z (born 1997–2012) has grown up in an era dominated by rapid technological innovation and digital interconnectivity (Geiger, 2019). In contrast to previous generations, the learning, communication, and problem-solving activities of this generation are closely intertwined with smartphones, social media, and search engines.

While access facilitates speed and efficiency, it also gives rise to new psychological problems, such as increased stress, decision-making problems, and dependence on external validation (Mitchell & Mitchell, 2020). At the center of these issues are three interrelated constructs which are metacognition, decisional procrastination, and affiliated comfort. Metacognition, or “thinking about own mental capabilities” (Flavell, 1979), is the foundation for planning, problem-solving, and decision-making (Güner & Erbay, 2021).

However, the constant distraction and media multitasking could hinder Generation Z from reflecting and self-regulating (Buñag, 2024). On the contrary, decisional procrastination, explained as the deliberate delay of important decision-making (Li et al., 2024), continues to be spread because of stress and fear of the consequences. An additional factor is affiliated comfort, the comfort individuals get from social connections (Pyckyl & Sirois, 2016). Although social support is a safety factor against stress, overdependence on external validation can reinforce avoidance and impair independent problem-solving skills (Liu et al., 2023). Problem-solving skills, which are critical to academic, vocational, and personal development, are thus deeply connected with these constructs (Nezu & D'Zurilla, 2007).

To support this theoretical foundation, previous research provides evidence describing how these constructs function individually and jointly among Generation Z. Metacognition is defined as the awareness and understanding a person has about their own thoughts. Research proves that individuals who possess metacognitive abilities are better at managing tasks and solving problems, preparing them for competitive educational and social environments (Schraw & Dennison, 1994; Flavell, 1979). Research shows that maladaptive metacognitions instigate attentional bias and promote avoidant and overly analytical decision-making styles, but a person who is meta-aware of the problem will handle the repercussions better (Fernie et

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al., 2016). Research across diverse demographics highlights that strong metacognitive skills such as planning, self-monitoring, and self-regulation enhance problem-solving abilities and reduce decisional procrastination (Guner & Erbay, 2021).

Studies show that maladaptive metacognitive beliefs and poor self-control lead to procrastination and hinder effective decision-making (Tanwar & Kapoor, 2021). Furthermore, a supportive affiliative learning environment fosters confidence and higher-order thinking, suggesting that integrating metacognitive and social-emotional interventions, especially among Generation Z, can promote adaptive problem-solving and academic success (Aga, 2024).

Decisional procrastination is defined as the failure of making time-bound decisions because of fear, perfectionism, or lethargy (Ferrari, 1994). Research showcases that Gen Z feel pressured by the weight of decisions and thus delay decision-making in favor of perfectionism (Nimonkar & Nimonkar, 2023).

Research also shows that fear of failure drives indecisiveness, but Gen Z students are expected to break the cycle of procrastination. Overanalyzing oneself, especially amid digital overstimulation, can lead to analysis paralysis, decision fatigue, and procrastination. Procrastination comprises multiple sub-forms that explain its functional aspects.

Studies conceptualize decisional procrastination as a trait-like tendency to delay decision-making under stress, distinguishing it from task delay (Samayoa & Fazio, 2023). The tendency of Generation Z to procrastinate stems from intertwined cognitive deficits, poor executive functioning, low self-efficacy, and maladaptive perfectionistic thinking (Kaylin, 2023). Procrastination is strongly associated with poor self-regulation, exam-related anxiety, digital overexposure, and societal comparison. In academic contexts, procrastination undermines grades, academic satisfaction, and long-term progression. Genetically vulnerable individuals experience heightened reliance on emotional support, increasing the need for affiliation (Twenge et al., 2019).

Affiliation in psychology is defined as a social relationship motivated by liking or personal attachment. Research shows that high levels of affiliation support emotional regulation, decision-making, and problem-solving, while low levels lead to anxiety and avoidance. Positive and supportive relationships foster empathy, emotional stability, and stress management.

Social support acts as a buffer against stress and promotes adaptive coping (Sirois, 2023). Personality traits such as extraversion and agreeableness enhance affiliated comfort. Studies show that Generation Z rely heavily on digital connectivity for affiliation, which provides global connections but increases risks of comparison and loneliness. In collectivist cultures, strong family and peer networks support decision-making confidence and coping (Khalid & Mujtaba, 2021). Young adults lacking emotional grounding show higher procrastination, emphasizing the role of friendships in emotional well-being. Research shows that in collectivist cultures, Generation Z balances global online platforms with strong offline bonds of family and peers. Their demographic context fosters decision-making confidence and proactive coping through supportive social networks, but the absence of support systems could lead to maladaptive coping mechanisms like substance abuse or withdrawal (Sirois, 2023).

Problem-solving skills have become increasingly important due to technological, social, and global complexities (Adeoye & Jimoh, 2023). Strong problem-solving enhances adaptability, creativity, resilience, and mental health. Research emphasizes that Generation Z values problem-solving, but often lacks practical application skills due to technology-driven convenience (Adeoye & Jimoh, 2023). The growing dependence on AI and lack of metacognitive training have weakened their social and cognitive problem-solving abilities.

In Pakistan's collectivist society, familial expectations significantly shape students' metacognitive development and decision-making. Studies indicate that higher metacognitive awareness predicts reduced procrastination and improved academic outcomes (Siddiqui et al.,

2020). Low self-regulation, fear of judgment, and weak social affiliations contribute to decision avoidance, whereas strong support fosters problem-solving (Fayyaz et al., 2025). Thus, Pakistan's demographic context underscores the connections between metacognition, affiliated comfort, and decisional procrastination.

Based on the theoretical and empirical background, the present study aims to examine metacognition, decisional procrastination, affiliated comfort, and problem-solving skills among Generation Z and to explore whether these variables differ across public and private university types.

Method

A quantitative cross-sectional research design was used to examine differences between public and private university students in metacognition, decisional procrastination, affiliated comfort, and problem-solving skills. For this research, analyses focus on the comparison of these variables across university type using independent samples t-tests.

Data was collected from 288 undergraduate students (135 males, 153 females), aged between 18–28 years, enrolled in public and private universities in Lahore. Participants were enrolled in various disciplines, including Law, Business, Arts, Engineering, Technology, Social Sciences, and Health Sciences. Inclusion criteria required participants to be enrolled in an undergraduate program be, able to read and write English, and provide informed consent. Exclusion criteria included students above 28 years, enrolled in postgraduate programs, or reporting any psychological or physical disorders.

Assessment Measures

Metacognition Self-Assessment Scale

Metacognition was assessed using the Metacognition Self-Assessment Scale (MSAS; Pedone et al., 2017), an 18-item measure rated on a 5-point Likert scale. This scale measured five factors: Monitoring, Differentiation, Integration, Decentration, and Mastery. The tools overall internal consistency was (Cronbach's $\alpha = 0.87$).

Melbourne Decision-Making Questionnaire

Decisional procrastination was measured using the Procrastination subscale of Melbourne Decision-Making Questionnaire (MDMQ; Mann et al., 1998), consisting of 5 items rated on a 3-point scale (internal consistency = 0.81).

Psychological Well-being Scale

Affiliated comfort was measured using the Positive Relations with Others subscale of the Psychological Well-Being Scale (Ryff, 1989), comprising 14 items rated on a 6-point scale (internal consistency = 0.88).

Problem-Solving Inventory

Problem-solving skills were assessed using the Problem-Solving Inventory (PSI; Pretorius et al., 2023), a 20-item measure rated on a 6-point scale (Cronbach's $\alpha = 0.88$). The scale was reverse coded according to authors instructions.

A demographic form was developed to collect participants' basic information, including age, gender, undergraduate year, institute type, program department, and birth order.

Procedure

The Institutional Review Board (IRB) approval was obtained prior to data collection, and permissions from participating institutions were secured. Data was collected over four weeks on university campuses, where participants completed self-report questionnaires in the

presence of researchers. Completed questionnaires were screened for accuracy, and valid responses were entered into SPSS for statistical analysis. For this research, independent samples t-test was conducted to compare private and public university students on metacognition, decisional procrastination, affiliated comfort, and problem-solving skills. A hierarchical regression was conducted to evaluate the influence of demographics and independent variables on a dependent variable. All participants provided written informed consent. Anonymity and confidentiality were maintained by collecting only non-identifiable demographic data and securely storing all datasets. Participants were assured of their right to withdraw at any stage without penalty.

Results

Table 1

Pearson Correlation of Demographics, Metacognitions, Decisional Procrastination, Affiliated Comfort and Problem-Solving Skills

Sr#	Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7
1	Age	21.0	2.01	-	.122*	-.339**	.008	.026	-.141*	-.004
2	Gender	1.5	.500	-	-	-.294**	-.043	-.088	-.225**	-.042
3	University Type	1.5	.501	-	-	-	.018	.086	-.168**	-.060
4	MCS	63.6	9.26	-	-	-	-	-.187**	-.239**	.163**
5	MDM	4.9	2.33	-	-	-	-	-	-.064	-.260**
6	PSI	52.4	13.52	-	-	-	-	-	-	-.011
7	PRO	52.9	7.18	-	-	-	-	-	-	-

Note. MCS=Metacognition Self-Assessment Scale, MDM= Melbourne Decision-Making Questionnaire, PRO=Positive Relations with Others subscale, and PSI= Problem-Solving Inventory
 $p < 0.01$ **, $p < 0.001$ ***

According to Table 1, age had a positive correlation with PSI and a negative correlation with university type. Indicating demographic variations across variables, gender was positively associated with PSI and negatively associated with university type and MCS. PSI and university type had a negative correlation. MCS had a negative correlation with MDM and PSI, while it had a positive correlation with PRO, indicating that stronger problem-solving, and less procrastination were all associated with improved metacognitive skills. Additionally, there was a negative correlation between MDM and PRO.

Table 2

Hierarchical linear regression of variables

Variables	B	95% CI		S. E	β	R^2	ΔR^2
		Lower Bound	Upper Bound				
Step 1						.050	.050
Constant	-43.13	-38.188	-48.07	2.512			
Gender	-6.075	-3.003	-9.148	1.561	-.225		

Step 2					.062	.011
Constant	-49.03	-41.075	-56.99	4.04		
Gender	-5.196	-1.998	-8.395	1.63	-.19	
University Type	-3.014	6.207	-.180	1.62	.11	
Step 3					.115	.053
Constant	-70.69	-57.738	-83.65	6.58		
Gender	-4.943	-1.828	-8.058	1.58	-.18	
University Type	2.980	6.088	-.129	1.57	.11	
MCS	-.335	-.496	.174	.08	.23	
Step 4					.121	.007
Constant	-74.63	-60.682	-88.58	7.08		
Gender	-4.761	-1.644	-7.879	1.58	-.17	
University Type	2.821	5.929	-.288	1.57	.104	
MCS	-.359	-.522	-.195	.08	.24	
MDM	-.490	-1.141	.161	.33	.08	
Step 5					.135	.014
Constant	-73.75	-55.542	-91.97	9.253		
Gender	-4.779	-1.64	-7.912	1.591	-.177	
University Type	2.806	5.926	-.315	1.585	.104	
MCS	.360	.525	.195	.084	.247	
MDM	.478	1.149	-.194	.341	.083	
PRO	-.016	.200	-.233	.110	-.009	

Note. N= 288, B=Unstandardized Coefficient Beta, CI= Confidence Interval, LB= Lower Bound, UB= Upper Bound, SE= Standardized Error Beta, MCS=Metacognition Self-Assessment Scale, MDM= Melbourne Decision-Making Questionnaire PRO=Positive Relations with Others subscale, and PSI= Problem-Solving Inventory
p<0.01 **, *p*<0.001 **

According to Table 2, Gender (male/female) explained 5% of the variance and was a significant positive predictor of Problem-Solving Skills (PSI) in Model 1. The variance increased slightly to 6.2% when University Type was added in Model 2, but it was not a significant predictor. In Model 3, the explained variance increased to 11.5% as a result of Meta-Cognitions (MCS). MCS emerged as the strongest positive predictor indicating that individuals who score higher in metacognitive self-assessment demonstrate significantly greater problem-solving skills. Throughout the regression analysis it was seen that gender and university type negatively predicated problem-solving skills and metacognition positively predicted problem-solving skills. Positive relations did not significantly contribute to the model. In the final model (Step 5), metacognition emerged as the strongest positive predictor ($\beta = .247$), indicating that greater metacognitive self-assessment is significantly associated with higher problem-solving effectiveness.

Table 3

Independent Sample T-test Comparing Private and Public University Students on Metacognitions, Decisional Procrastination, Affiliated Comfort and Problem-Solving Skills Scales (N=288)

Variables	Private (N=141)		Public (N=147)		<i>t</i>	<i>P</i>	95% CI		Cohens d
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			Lower Bound	Upper Bound	
MCS	63.49	8.803	63.83	9.710	-.311	.756	-2.493	1.812	-.037
MDM	4.70	2.357	5.10	2.312	-1.45	.147	-.942	.141	-.171
PSI	54.74	11.851	50.22	14.64	2.869	.004	1.421	7.629	.339
PRO	53.40	7.463	52.54	6.900	1.016	.310	-.806	2.526	.120

Note. MCS=Metacognition Self-Assessment Scale, MDM= Melbourne Decision-Making Questionnaire, PRO=Positive Relations with Others subscale, and PSI= Problem-Solving Inventory
 $p < 0.01^{**}$, $p < 0.001^{***}$

According to Table 3 Statistically 'The t-test results confirm a significant difference in problem-solving skills between private and public university students, with data emphasizing on private university students showing significant scores of $M = 54.7$, $SD = 11.85$. The result is crucial indicator of that private and public university students differ significantly in problem-solving skills.

Discussion

The study's fundamental finding is a considerable edge in problem-solving skills among private university student which points directly to the differences in institutional ecologies between private and public universities. This variation is unlikely to reflect innate capability, but rather the overall effect of didactic and resourcing contexts. Private universities frequently use application-based learning, case studies, and project-based curriculum that require incremental evaluation and solution production, is consistent with training problem-solving muscles (Aga, 2024). In contrast, the traditional approaches and bigger class numbers found in public institutes may provide fewer formal opportunities for such practical skill development. Furthermore, the superior infrastructure and technology resources found at private institutes offer students with the essential tools they need to effectively excavate complicated challenges, transforming daily academic life into a constant training ground for these crucial abilities (Aga, 2024).

The absence of major differences in metacognition, decisional procrastination, and comfort is an intriguing finding that turns the explanatory focus away from institutions towards the individual and culture. This pattern indicates that these categories are more deeply established in personality traits, familial upbringing, or the broader socio-cultural milieu shared by Gen Z students in Lahore (Güner & Erbay, 2021). Decisional procrastination, for example, may be more closely related to individual attributes such as perfectionism or fear of failure, which are developed over time. Similarly, metacognitive awareness may not be overtly taught to a distinguishing degree in either context, relying instead on personal habits established earlier in life. The commonality of affiliated comfort reveals the inherent demand for social connection and the anxieties of managing university life. Thus, revealing that these are mutual obstacles faced by Gen-Z extend beyond educational encasing (Twenge et al., 2019).

These findings can be efficiently synthesized utilizing the "Bioecological Model of Human Development." According to this theory, development is influenced by interactions between many environmental systems (Bronfenbrenner & Morris, 2006). Here, the university serves as the immediate microsystem (Güner & Erbay, 2021). The findings show that the

private university microsystem encourages problem-solving more effectively by incorporating richer proximal processes such as teamwork and immersive education (Güner & Erbay, 2021). However, characteristics such as metacognition and decisional procrastination appear to be influenced by broader systems, such as the mesosystem (interactions between family and school) and the macrosystem (the broader Pakistani cultural context), which are more consistent across the student sample, resulting in non-significant differences (Twenge et al., 2019).

These findings have important implications for educators and policymakers. Public universities may benefit from targeted interventions, such as problem-solving workshops, collaborative projects, and mentoring programs, to enhance students' practical problem-solving abilities. Furthermore, integrating strategies that develop metacognition and social comfort could support overall academic performance, even if they do not differ by institution. Interventions should be specifically designed to bridge the problem-solving gap without requiring massive infrastructural overhaul such as: Integrating problem-solving assessments, facilitative critique from course instructors and extra-curricular hubs, clubs, drama contests and debate forums for students to re-shape their view of problem-solving in the broader horizon. Future research should examine additional factors that might explain institutional differences, such as teaching quality, curriculum design, and student engagement. Expanding the sample to include multiple cities and university settings would also improve generalizability.

Finally, this study sheds light on an important aspect of Generation Z's capability development. The particular type of institution functions as a selected filter in lieu of a blanket influencer, most powerfully strengthening specific, flexible skills such as problem-solving that are directly reinforced by the pedagogical environment. Meanwhile, other, more deeply rooted emotional characteristics stay relatively intact, molded by influences outside the campus vicinity. This emphasizes both the potential and limitations of higher education institutions, as well as the importance of purposeful, institution-specific reforms to create a more cognitively fluid graduate workforce.

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