

STUDENTS' INTELLECTUAL-HUMILITY AND COGNITIVE-FLEXIBILITY: THE ROLE OF MINDFULNESS AS A MEDIATOR

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Abstract. *The primary objective of this study was to explore the inter-connections among mindfulness, cognitive flexibility, and intellectual humility in adult's population. Additionally, the research aimed to investigate the mediating role of mindfulness in this association between cognitive flexibility and intellectual humility with different demographic differences (age, gender, and culture). Sample of 800 students selected from Hazara University, Mansehra (HU), and the University of AJK. The study employed a convenient sampling method. The results indicated a significant association between the study as well as demographics differences exists among study variables. In conclusion, this study contributes to our understanding of the connections between mindfulness, cognitive flexibility, and intellectual humility in a student context. The findings suggest that cultivating mindfulness may enhance cognitive flexibility and intellectual humility, with demographic factors playing a role in shaping these psychological attributes. This study has practical implications for enhanced academic performance, effective stress management, improved decision-making, life-long learning, personal well-being, critical thinking skills, adaptability in changing environments and positive interpersonal relationships.*

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Introduction

Mindfulness contributes to the extension of attention spans and assists students in maintaining engagement. Furthermore, it cultivates a student's capacity to concentrate. With sustained practice, mindfulness has the potential to enhance memory and boost mental performance, ultimately leading to improved academic achievement. It is a dire need of an hour to consider these variable for research regarding educational sectors. Mindfulness plays a beneficial role in education for

both teachers and students. Teachers can leverage mindfulness-based techniques to heighten responsiveness to students' needs, provide stress management support, and improve the overall classroom climate.

The fundamental essence of mindfulness entails observing the current moment, encompassing emotions without passing judgment. Students experiencing lower perceived stress and enhanced mindfulness demonstrated improved cognitive function and indicating a positive correlation between mindfulness and academic performance. An individual practicing mindfulness tends to be receptive to new experiences, observant of nuances, considerate of context, mindful of various perspectives, and concentrated on the current moment. Hence, the significance of mindfulness in educational settings is growing due to the considerable potential it holds for enhancing students' skills and competencies in education.

Mindfulness is additionally associated with individuals' perceptions of the surrounding world, including their awareness of available resources, which, in turn, is connected to academic advancement. Mindfulness fosters increased intellectual capacity and a receptiveness to diverse thinking style.

In the rapidly evolving landscape of the twenty-first century, marked by swift changes and heightened environmental complexities, cognitive flexibility (CF) has assumed greater significance. CF is indispensable for actively adapting to changes, navigating challenging situations, and resolving problems. This aspect of human cognition empowers individuals to adjust their beliefs and behaviors in response to shifting internal and external circumstances. Even in the face of new knowledge, individuals may cling to preconceived notions, and it takes more than analytical thinking or cognitive abilities to cultivate IH. In other words, it's a person's capability of changing their mind, and with changed sense of valuing others' perspectives.

In an era where information unfolds rapidly, maintaining mental flexibility becomes crucial. IH, the capacity to recognize cognitive limitations and comprehend information effectively, requires significant mental flexibility. While intellectually arrogant individuals may resist new information in favor of existing beliefs, intellectually humble individuals exhibit flexibility in their thinking.

Teachers are increasingly recognizing mindfulness as a crucial, yet often undervalued, skill that holds the potential to positively impact students' cognitive development to enhance their academic performance. Mindfulness cultivates heightened awareness and presence, encouraging individuals to engage mindfully with the present moment. It promotes empathetic acknowledgment of experiences and encourages a critical examination of personal biases without passing judgment (Birnie et al., 2010).

In the context of university education, where students often face high levels of anxiety and stress-related health issues, mindfulness is viewed as a valuable tool

for developing the mental and emotional resilience necessary for success in healthcare professions. Beyond stress reduction, mindfulness instruction offers a multitude of benefits for students, including increased focus, faster information processing, and improved academic performance (Hassed, 2016; Mrazek, 2013). It also contributes to heightened student self-awareness and engagement (Napoli & Bonifas, 2011).

Educators are placing a growing emphasis on mindfulness as a skill that goes beyond stress management, recognizing its potential to enhance various aspects of students' well-being. Mindfulness is not only a state-like quality but also a trait-like attribute inherent to individuals to varying degrees. Moreover, it encompasses a set of skills that can be acquired through formal instruction and practice. Being mindful involves awareness of both external surroundings and internal states. Through the practice of observing thoughts, feelings, and momentary experiences without immediate reactions, individuals can steer clear of harmful or automatic behavioral patterns (American Psychological Association [APA], 2019).

Students are grappling with substantial stress and anxiety, negatively impacting both their academic performance and mental well-being. The essence of mindfulness lies in fostering a clear understanding, aligning with the overarching goal of improving clarity, responding adeptly to life's challenges, and making well-informed decisions (Shapiro, 2020). The results of the study propose that the incorporation of mindful pedagogy and curriculum has the potential to transform education for sustainable development. This transformative approach prompts students to reevaluate their position in their respective environment, which engender in him the sense of reflection and innovation. They then try to integrate these in their life effectively with the aim to tackle the challenges they face and make such feelings sustainable (Hensley, 2020).

In the rapidly changing landscape of the twenty-first century, characterized by swift environmental demands, CF becomes increasingly crucial. CF involves one's flexibility to change accordingly (Armbruster et al., 2012; Canas et al., 2003; Dajani & Uddin, 2015). Positioned within executive function, CF plays a vital role in effective social communication (Martin & Anderson, 1998) and the critical examination of problematic concepts. Academic humility entails being open to alternative ideas, thoughts, and achievements. Some academics may prioritize advancing their theories over others and even criticize findings that differ from their own. Academic achievement correlates positively with IH. Philosophical investigations into these matters can enrich psychologists' understanding of how to conceptualize IH (Ballantyne, 2021; Miller, 2021).

Intellectual humility is characterized by an individual's awareness, which is non-threatening in nature, that they have fallible intellectual capability. This sense leads one to a separate intellect from ego and that this sense is healthy in nature

(Krumrei-Mancuso & Rouse, 2016). Previous research suggests that IH is linked to how individuals assess themselves about knowing. Making excessive claims of knowledge is linked to an inflated self-perception of knowledge, regardless of the actual level of knowledge, indicating intellectual hubris (Atir et al., 2015).

Understanding how children reason, particularly in discussions involving sensitive topics like evolution and creationism, is crucial. Successful classroom argumentation requires students to possess knowledge of warrants and IH. In both theoretical and empirical investigations of students' justifications for their arguments, it was noted that students frequently reiterated evidence without offering logical reasoning. The implementation of IH, which emphasizes the precise assessment of one's belief or argument, is not consistent with a lack of coherence in an individual's argumentation (Godfrey & Erduran, 2021).

Need for Cognition (NFC) is linked to a reduced level of certainty about information (Kardash & Scholes, 1996), potentially fostering IH. IH linked to the urge to know more new and heightened information-seeking behavior (Porter & Schumann, 2018). Public perception associate individuals with IH with characteristics such as a thirst for knowledge, inquisitiveness, and curiosity (Samuelson et al., 2015). IH includes a person's desire of acquiring not only new knowledge but is also accompanied by and a readiness to teach and communicate (Haggard et al., 2018). Furthermore, IH has been found to have relationship with improved tolerance, responsiveness, empathy, kindness, and reduced power-seeking (Krumrei-Mancuso & Rouse, 2017). Evaluating the value of IH necessitates considering both the trait itself and the context in which it is expressed or employed (Ng & Tay, 2020; Wright et al., 2021).

The application of virtues, including IH, must be contextually appropriate (Fowers et al., 2021). Therefore, assessing IH across various situations requires considering the motivation for its expression in each scenario. While IH and open-mindedness are theoretically and empirically connected, the state of being open-minded doesn't always entail recognizing the limitations of one's own knowledge or beliefs (Bowes et al., 2020).

Mindfulness and Cognitive Flexibility

Numerous studies, including Gurpınar and İkiz (2022) and Sinnott et al. (2020), have established a positive association between mindfulness and CF. Zou et al. (2020) specifically asserted that mindfulness training contributes to the improvement of CF. Moore and Malinowski (2009) further supported this connection, emphasizing that the positive correlation between mindfulness and CF is linked to reduced emotional distress. Recent research also suggests the effectiveness of Mindfulness-Based Interventions (MBIs) in enhancing CF.

The importance of mindfulness in contemporary society is underscored by a variety of studies linking increased mindfulness and reduced distractions to

heightened productivity, improved cognitive function, and decreased stress. Mindfulness, with its goal of promoting awareness of mental, emotional, and physical processes, has gained popularity in response to the growing impact of constant distractions in both workplace and educational settings (Chiang & Sumell, 2019). While the conceptual simplicity of mindfulness may seem straightforward, a closer examination reveals its multifaceted components, all contributing positively to individuals. By focusing on attention, emotion, and cognition central to conscious awareness, mindfulness practices, as highlighted by Malinowski (2013), offer a holistic approach.

The study conducted by Sinnott et al. (2020) reinforces the interconnection between mindfulness and CF. The prevailing notion suggests that directing attention to the present moment, rather than dwelling on the past or future, promotes environmental awareness. Feng et al.'s (2021) study specifically learners' flexibility in applying concepts impacted their acquisition of rules. The results demonstrated that the high flexibility group exhibited superior rule acquisition and significantly higher accuracy in their respective post-learning as compared to the group with the lower flexibility.

Mindfulness and Intellectual Humility

In this respect Wrench et al. (2020) empirically found that mindfulness contributes to the enhancement of IH. By directing individuals' attention to the present moment, mindfulness aids in translating thoughts into action while fostering intellectual humility. Additionally, mindfulness is associated with an increased intellectual level, encouraging individuals to actively seek alternative perspectives. The practice of mindfulness promotes non-attachment, fostering greater receptivity to new ideas within the framework of IH (Levinson et al., 2014). A student equipped with strong mindfulness and flexibility skills can adeptly navigate and adapt to changes in the daily schedule within the classroom.

Cognitive Flexibility and Intellectual Humility

CF refers to the ability of individuals to incorporate new information into existing assumptions, shaping their interpretation of reality based on the processing of external stimuli and previously acquired knowledge. Cognitive strategies that facilitate the adjustment of one's thoughts in response to new information are crucial for effective adaptation. This adaptability allows individuals to manage and tailor their responses to align with specific situations (Romero-Ferreiro et al., 2022). It encompasses cognitive and behavioral flexibility, enabling optimal adjustment of thoughts and behaviors in the face of changing environmental demands. Various studies, such as Uddin (2021), have explored the enhancement of flexibility through cognitive training.

CF, by definition, is a property of human executive function, facilitating mental flexibility between tasks, tactics, and rules. Gunduz (2013) underscores CF as a critical aspect of human cognition, enabling the adaptation of ideas and behaviors to changing internal and external conditions. Research by Kercood et al. (2017) establishes a relationship between CF and academic success, revealing that CF predicts academic achievement, and improvements in subjective CF correlate with increased reading comprehension. Lower-level learning processes, such as stimulus-response correlations, play a role in conditioning CF, as demonstrated by recent studies focusing on environmental cues and triggers (Braem & Egner, 2018). This ability enhanced by CF training and cause to establish new neural connections in the brain, that culminates in diversity in thinking and innovation in problem solving. This capacity to generate fresh ideas and make creative connections is essential for creativity and contributes to academic and professional skill development, particularly in problem-solving.

The concept of IH is associated with improved recognition and more people details (Alfano et al., 2017). Some previous studies like Davis et al. (2016) and Leary et al. (2017) have found link between intellectual humility with cognitive qualities. IH is also connected to improve cognitive function tests and a reduction in cognitive capacity overestimation. It is hypothesized that IH serves as a predictor of higher-level thinking, fostering skepticism and preventing the uncritical acceptance of one's current perspective. Intellectual humility is associated with engaging in challenging cognitive tasks and is likely to enhance knowledge acquisition.

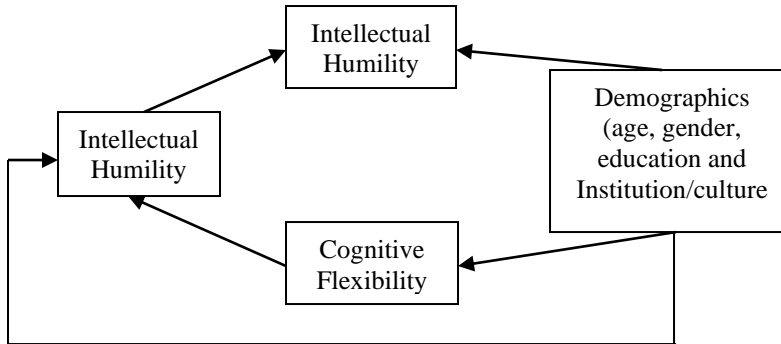
The study explores the mediating role of mindfulness between CF and IH, as well as investigating gender differences in mindfulness, CF, and IH, and examining the association of age with these variables. While existing literature has separately explored mindfulness, CF, and IH with diverse samples, cultures, and variables, this study uniquely addresses these three variables simultaneously in the context of Pakistani culture, especially among students. The aim is to contribute to the existing knowledge by filling a gap in the field and providing insights into the relationships among mindfulness, CF, and IH in a specific cultural context.

Hypotheses

- i. Positive associations are anticipated between mindfulness and both CF and IH, and a positive association is expected between CF and IH.
- ii. The hypothesis suggests that mindfulness will act as a mediating factor in the relationship between CF and IH.
- iii. Age is predicted to show a positive correlation with mindfulness and IH, while demonstrating a negative correlation with CF.
- iv. CF is expected to be higher among male students, whereas mindfulness and IH are expected to score higher among female students.
- v. Cultural and institutional differences are expected to result in significant

variations in mindfulness, CF, and IH among students.

Theoretical Framework



Methodology

Sampling procedure

A sample of 800 adults was chosen from HU & UAJ&K, utilizing a convenient sampling technique. The respondents were having different categories of education from both institutions. After getting permission from the higher authorities and briefing the significance of study, distributed 1000 questionnaires among students in both universities.

Table 1 *Statistics Regarding Demographics of the Sample Participants (N = 800)*

Variable s	Clas s	N	Percent
Age	18-45 years	800	100%
Gender	Male	400	50%
	Female	400	50%
Institution	AJ&K	400	50%
	HU	400	50%
Education level	Graduate	500	62%
	Doctoral	300	37%

Questionnaire and tools

For data collection, three scales, a demographic questionnaire with informed consent form were utilized.

Analysis of Data

Data analyzed by SPSS-26 Version (Statistical Packages for Social Sciences).

Result

Table 2 *Scale Reliability and Correlation Coefficients among variables and with Age (N=800)*

Variables	1	2	3	4
Mindfulness	0.92	0.05**	0.09**	0.04**
Cognitive Flexibility	0.81	-	0.36**	-0.06**
Intellectual Humility	0.86	-	-	0.05**
Age	-	-	-	-

** $p < .01$.

The results presented in Table 2 indicates that all scales have excellent reliabilities and significant correlation among variables as well as with age.

Table 3 *Mediating Role of Mindfulness among CF & IH of the Students (N = 800)*

Total effect	SE	T	P	LLCI	ULCI
0.26	0.02	10	0.00	0.22	0.31
Direct effect	SE	T	P	LLCI	ULCI
0.27	.03	11	0.00	0.22	0.32
Indirect effect	SE	Range			
0.001	0.003	-0.04 - 0.004			

Table 4 *Descriptive Statistics of the Sample*

Variables	Boys		Girls		<i>T</i> (798)	<i>P</i>	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
M	63.43	14.72	67.43	15.21	0.384	0.001	0.26
CF	94.26	13.58	90.14	16.26	0.518	0.000	0.27
IH	70.97	11.33	73.45	14.01	0.502	0.004	0.19

* $p < .05$

Table 5 depicted notable gender differences on study variables. These findings suggest that female students exhibited higher scores on mindfulness compared to males. On the other hand, male students scored higher on CF than females. Furthermore, female students demonstrated higher scores on IH compared to males.

Table 5 *Descriptives Statistics for Cultural Differences on MAAS, CFI, and CIHS.*

Variables	KPK(HU)		KASHMIR (UAJK)		<i>t</i> (798)	<i>P</i>	Cohen's <i>D</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
M	62.20	14.97	69.74	14.41	0.974	0.000	0.49
CF	89.80	17.76	92.81	13.38	0.731	0.004	0.19
IH	70.43	12.70	74.65	11.60	0.265	0.001	0.34

* $p < .05$

Table 6 depicted significant cultural differences on study variables. These findings indicated that students from AJKU scored higher on mindfulness compared to HU. Additionally, AJKU students exhibited higher scores on cognitive flexibility than HU. Furthermore, AJKU students demonstrated higher scores on intellectual humility compared to HU.

Discussion

The present study revealed positive correlations among mindfulness, CF, and IH. The outcomes of this study are in line with prior research, such as the positive association between mindfulness and CF documented by Gurpınar and İkiz (2022) and Sinnott et al. (2020). The connection between mindfulness and intellectual capacity suggests a greater willingness among individuals to consider alternative points of view. The association between mindfulness and non-attachment indicates that intellectually robust individuals are more open to new ideas, reflecting intellectual humility (Levinson et al., 2014). Tingaz (2020) also found a significant positive association between CF and IH, supporting the current study's findings. The study's outcomes robustly uphold the first hypothesis, affirming a strong positive correlation between CF and IH.

The findings of the study strongly support second hypothesis, indicating a significant positive correlation between age and mindfulness as well as IH, while revealing a negative correlation with CF, these results are in harmony with prior research that has demonstrated a positive association between mindfulness and age (Roshgadol, 2022). Boekel and Hsieh (2018) also reported a positive relationship between mindfulness and age, and Fiocco and Meisner (2020) found that higher levels of mindfulness were significantly linked positive to aging. Additionally, older students have more mindfulness than younger (Shook et al., 2017). The positive association between IH and age is consistent with the findings of Farhan (2021) and Valero et al. (2018). However, Magnusson and Brim (2014) suggested a negative association between aging and CF. Developmental research indicates that adaptability fosters academic performance, and as individuals age, flexibility may alleviate the impact of cognitive decline (Burke et al., 2019).

The present research delves into the mediation role of student mindfulness in the relationship between IH and CF. The study found a favorable and significant association between mindfulness and CF, with mindfulness reducing IPB. Additionally, the study suggests that the relationship between irrational performance beliefs and CF is mediated by mindfulness (Tingaz, 2020). Mindfulness exhibits a positive association with CF. These results are in line with the findings of the past research undertaken by Li et al. (2018) and Wielgosz et al. (2019) and is interrelated with IH which are in line with the findings of Verhaeghen and Aikman (2022). The current study concludes that the testified

change in CF effect on IH is entirely mediated by the proposed mediating variable, mindfulness, which positively mediates the relationship.

The fourth hypothesis in the current study posited that male students would exhibit higher scores in CF, while female students would score higher in mindfulness and IH. The findings of the study align with this hypothesis, indicating significant differences between male and female students in terms of mindfulness, CF, and IH. Female adults tend to score higher in mindfulness compared to their male counterparts (Thirumaran et al., 2020). Research by Fuentes et al. (2022) also suggests that women generally exhibit a greater tendency toward mindfulness than men. Krumrei-Mancuso et al. (2020) reported significant gender differences in IH, with females scoring higher than males, while males demonstrated better CF than females (Wang et al., 2022). Studies like that of Ghosh and Halder (2021) have shown that male students generally perform better in CF than their female counterparts. Additionally, a study examining the predictive factors of psychological adjustment among university students found that gender played a role in reducing stress and enhancing emotional well-being, with higher scores on specific mindfulness activities associated with better outcomes (Kingery et al., 2020). Understanding the factors influencing student stress is crucial, and research has demonstrated that when a person is mindful, resilient and their needs are satisfied that person suffers from lower perceived stress (Neufeld et al., 2020). Mindfulness interventions have the potential to reduce stress and anxiety, fostering overall well-being and compassion in students (Schwind et al., 2022).

Fifth hypothesis of the current study stated that there is significant difference between cultures of both institutions on mindfulness, CF and IH. Ketay, Aron, and Hedden (2009) proposed that "culture might influence the way the brain processes even highly abstract stimuli and could impact the characteristics of the environment individuals focus on. Additionally, Thomas (2006) recognized mindfulness as a crucial element of cultural intelligence, serving as a connection between behavioral capability and knowledge. IH can manifest differently within multicultural contexts due to variations in cultural norms, values, and communication styles. The acknowledgment and acceptance of diverse perspectives may play a crucial role in shaping IH across cultures. For instance, a study by Leung and Chiu (2010) suggests that cultures emphasizing collectivism and interdependence may foster a more humble approach to knowledge, valuing collaborative learning and shared wisdom. Humility is frequently demonstrated through a disposition of quietude and attentiveness, allowing individuals to listen to others and glean insights from their wisdom and strengths. Exploring how these cultural expressions, characterized by silence and observation, may contribute to variations in IH behavior across contexts is an intriguing consideration (Steven et al., 2023). Research suggests that CF, or the ability to adapt and adjust thinking according to different situational demands, may vary across cultures. Cultural factors can influence cognitive processes and the extent to which individuals

exhibit CF. However, it's important to note that cultural diversity is vast, and findings may not be universally applicable to all cultural groups. According to Cho, Tadmor, and Morris (2018), CF is influenced by cultural values and practices. In collectivist cultures, where group harmony is emphasized, individuals may show a different pattern of CF compared to those in individualistic cultures that prioritize personal autonomy (Imada & Carlson, 2015). Positive academic achievement correlates with a high level of IH. Students demonstrating elevated IH scores tend to display self-awareness and mastery behaviors, including actively seeking challenges and persisting in the face of failure (Porter et al., 2020).

A person may be rigid in adhering to their cultural values for various reasons, and these reasons can be complex and multifaceted. Some potential factors include: Cultural Identity and Belonging, Social Pressure, Fear of Change, Cultural Upbringing, Lack of Exposure, Cultural Conservatism, In-group Favoritism and Fear of Judgment. It's important to note that these factors can interact and influence each other, and individuals may have unique reasons for their rigidity in adhering to cultural values. Cultural psychology and sociology offer valuable insights into understanding the dynamics of cultural identity and behavior.

Suggestions and Future Implication

To enhance the mental well-being of students, psychoeducation programs focusing on CF and mindfulness can be developed. Strong cognitive flexibility enables individuals to effectively balance various tasks, seamlessly adapt to new challenges, and swiftly acquire new concepts and skills without feeling overwhelmed. In the context of Pakistan, there is a crucial need to cultivate university students who possess multitasking abilities, embrace change, and are open to acquiring new information to enhance their cognitive capabilities without exhibiting rigidity.

Many students often struggle with decision-making, problem-solving, and adapting to new challenges, underscoring the importance of fostering flexibility and humility. This emphasis on personal and professional growth is vital for both students and educators within educational settings. Developing adaptability, creativity, focus, decision-making, and multitasking skills is essential for individuals aspiring to contribute effectively to the educational system or any workplace. This cultivation of adaptability not only fosters personal growth but also contributes to a more productive and dynamic society.

Students who enhance their intellectual capacity, flexibility, and focus are likely to exhibit increased enthusiasm, collaboration, morale, and creativity. This improvement in their skill set can positively impact their management abilities, fostering a conducive environment for innovation. Moreover, students who are open to change and possess strong cognitive skills may experience broader

interaction and exposure, leading to vast personal and professional development. Providing students with opportunities to refine their capabilities can result in increased flexibility, a willingness to accept innovations, and heightened awareness of their surroundings. As a result, students may become more adaptable and better equipped to navigate the complexities of an ever-changing world.

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