# Cognitive, Confirmation, and Communication Biases in Higher Education Classrooms: A Qualitative Study

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## Abstract

This qualitative study examines how communication bias, cognitive bias, and confirmation bias shape teaching and learning dynamics in higher education classrooms. Grounded in communication theory and cognitive psychology, the research draws on interviews, focus groups, classroom observations, and document analysis to explore how biases influence faculty-student interactions, perceptions of student ability, and classroom engagement. Findings reveal that communication biases are often rooted in linguistic and cultural mismatches. It limits student participation and clarity of instruction. Cognitive biases lead educators to rely on heuristics in assessing student performance, while confirmation bias reinforces pre-existing assumptions, particularly about students from marginalized or multilingual backgrounds. These biases frequently interact in recursive ways, compounding misjudgments and perpetuating inequities in academic outcomes.

In response, the study proposes a Bias-Aware Pedagogical Toolkit, offering practical strategies for inclusive communication, reflective assessment, and stereotype disruption. The research highlights the importance of bias-conscious pedagogy and institutional support in creating equitable and effective learning environments.

**Keywords:** Bias in Education, Higher Education Pedagogy, Cognitive Bias, Inclusive Teaching, Communication in Classrooms.

## Introduction

Effective teaching and learning in higher education depend on clear, inclusive, and responsive communication. Yet, in increasingly diverse academic environments, communication often falls prey to biases that hinder understanding and participation. These include 1) Communication Bias (Innis, 1949): barriers that distort message clarity, often rooted in language, cultural differences, or unequal power dynamics (Innis, 1993; Buhrman et al., 2007), 2) Cognitive Bias (Tversky and Kahneman, 1974): systematic errors in thinking that affect judgment and perception, influencing how information is processed (Bierema et al., 2021;

Swaryandini, et al., 2025), 3) Confirmation Bias (Klayman, 1995; Beattie and Baron,1988): a specific type of cognitive bias where individuals favor information that aligns with pre-existing beliefs, often disregarding disconfirming evidence.

Innis (1949, 1993) highlights the inherent "bias of communication," emphasizing how the medium and mode of message transmission shape, and sometimes distort, meaning. This insight is particularly important in diverse university classrooms where linguistic and cultural differences can lead to significant communication bias, impacting student engagement and comprehension.

Building on this, Buhrman et al. (2007) demonstrate that even small biases in communication can disproportionately affect information exchange and decision-making processes, underscoring the fragility of clear understanding in educational environments. Similarly, cognitive biases, systematic patterns of deviation from rational judgments, have been extensively studied (Caverni et al., 1990; and Tversky and Kahneman, 1974), revealing how heuristics simplify complex information processing but often lead to errors in perception and reasoning.

In higher education, these cognitive biases manifest as misinterpretations of student performance, participation, or potential, potentially leading educators to make skewed judgments. Bierema et al. (2021) quantify the presence of cognitive biases among educational researchers themselves, indicating that these biases permeate not only learners but also educators and administrators, thus influencing curriculum design, assessment, and pedagogy.

Confirmation bias, a subtype of cognitive bias where individuals preferentially seek or interpret information that confirms pre-existing beliefs (Klayman, 1995; Beattie and Baron, 1988), further compounds challenges in the academic environment. This bias can reinforce stereotypes about student capabilities, particularly in multicultural or multilingual classrooms, creating self-fulfilling prophecies that undermine equitable educational outcomes.

Recent systematic reviews (Swaryandini et al., 2025) reveal that educational interventions can mitigate cognitive biases, suggesting that higher education institutions have the potential to adopt strategies that foster critical reflection, promote bias awareness, and encourage inclusive communication practices.

These findings highlight that in higher education, the interplay of communication, cognitive, and confirmation biases can distort teacher-student interactions, hinder accurate assessment of student abilities, and perpetuate inequalities. Addressing these biases through targeted pedagogical approaches and institutional policies is essential for creating inclusive, equitable, and effective learning environments.

This study investigates how these biases manifest in real classroom environments, drawing on qualitative data from faculty and students in a higher education context. It aims to provide deeper insight into their effects on teaching and learning, and to identify strategies for bias-aware pedagogy.

**Theoretical background**

Effective communication is the cornerstone of successful teaching and learning processes in higher education. However, the complex dynamics of classroom interactions are frequently

influenced by various biases that can distort the transmission and reception of information, ultimately impacting academic outcomes. A robust body of literature from communication theory, cognitive psychology, and educational research elucidates how communication bias, cognitive bias, and confirmation bias collectively shape the educational experience.

This study is grounded in an interdisciplinary theoretical framework that integrates communication theory, cognitive psychology, and educational research to investigate how biases shape teaching and learning in higher education. Specifically, it focuses on three interconnected types of bias: Communication Bias, Cognitive Bias, and Confirmation Bias. These biases are conceptualized as both independent and interactive mechanisms that influence the behavior, interpretation, and engagement of educators and students in classroom settings.

**Communication Bias (Innis, 1949, 1993),** Innis's theory of "bias communication" communication bias as the distortion or filtering of meaning due to the medium, context, or cultural-linguistic barriers in academic environments. Communication bias emerges when language diversity leads to misunderstandings or misinterpretations, cultural norms influence communication styles or expectations, or institutional power dynamics create asymmetries in who speaks and who is heard. Communication bias affects the clarity, inclusivity, and equity of interactions, which directly shape classroom engagement and student participation.

**Cognitive Bias (Tversky and Kahneman, 1974; Caverni et al., 1990)** refers to the systematic deviations from rational judgment that result from mental shortcuts or heuristics. In educational settings, cognitive biases influence how faculty and students process information about one another (e.g., overgeneralizing based on past behavior), make decisions (e.g., grading or interpreting participation), and construct knowledge (e.g., through biased curricular framing). Cognitive bias shapes how individuals perceive, interpret, and respond to classroom interactions. It impacts both teaching practices and student learning outcomes.

**Confirmation Bias (Klayman, 1995; Beattie and Baron, 1988)** as a subtypes of cognitive bias, it refers to the tendency to seek or favor information that aligns with pre-existing beliefs and to discount contradictory evidence, in classrooms, this manifests in 1) reinforcement of stereotypes or deficit-based thinking about certain student groups, 2) biased assessments of student ability based on preconceived notions, 3) selective attention to behaviors or comments that validate existing expectations. Confirmation bias reinforces and perpetuates prejudicial assumptions, particularly in multicultural or multilingual contexts, affecting fairness and equity in learning environments.

*Interrelationship of the biases*

These three biases do not function in isolation. Instead, they are interdependent. Communication bias can trigger or reinforce cognitive and confirmation biases, especially when messages are unclear or misinterpreted. Cognitive biases influence how communicative acts are perceived and judged, which may result in inaccurate or biased responses. Confirmation bias can amplify communication bias by filtering or misinterpreting messages to align with prior assumptions, further obstructing mutual understanding.

***Theoretical assumptions***

1. Biases are inevitable but not immutable; while these biases are deeply embedded in human cognition and communication, they can be recognized, interrogated, and mitigated through intentional pedagogical and institutional strategies.

2. Biases operate across roles; faculty, students, and administrators are all susceptible to these biases, and each group's actions influence the others.
3. Biases affect equity and inclusion; left unaddressed, these biases contribute to systemic inequalities in higher education, particularly affecting marginalized student populations.

This theoretical framework guides the study in three key ways. 1) Design of research questions, which informs inquiry into how biases manifest in real classroom scenarios. 2) Data collection and analysis provide conceptual lenses for interpreting faculty and student narratives, classroom observations, and institutional documents. 3) Development of recommendations it support the formulation of bias-aware pedagogical strategies and institutional practices aimed at promoting inclusive, reflective, and equitable learning environments.

**Methodological alignment with the theoretical framework**

The theoretical framework, grounded in communication theory, cognitive psychology, and educational research, serves as the analytical lens through which this study examines biases in higher education classrooms. The framework not only shapes the research questions and data collection strategies but also guides coding, analysis, and interpretation of findings.

*Qualitative methodological approach*

A qualitative research design is employed to explore the nuanced and often subconscious ways that communication, cognitive, and confirmation biases manifest in everyday classroom interactions. This approach is appropriate given the study's focus on subjective experiences of educators and students, contextualized classroom dynamics, and the interpretive nature of bias and meaning-making.

*Data collection methods*

To ensure triangulation and depth, the following data sources were used such as semi-structured interviews with faculty and students, focus groups involving diverse student cohorts, classroom observations (with field notes and transcripts), and document analysis (e.g., syllabi, board of studies excerpts). Each data source was chosen to reveal different dimensions of bias: interviews and focus groups for perceptions and experiences; observations for behavioral evidence of bias in interaction; and documents for institutional and linguistic patterns of communication.

*Framework-driven data analysis and interpretation*

The analysis followed a thematic coding process informed by the theoretical frame. Initial open coding was conducted to identify emergent themes, followed by deductive coding aligned with the three core biases.

**Table 1: Analytical categories derived from the framework**

| Bias type | Operational definition in analysis | Sample codes/themes identified |
|---|---|---|
| Communication Bias | Barriers in message delivery and understanding, linked to language, cultural norms, or power structures | Language exclusion, classroom silencing, cultural misalignment, and faculty jargon |

| | | |
|---|---|---|
| Cognitive Bias | Systematic misjudgments in perception, evaluation, and reasoning | Misinterpretation of participation, stereotype-informed grading, and implicit expectations |
| Confirmation Bias | Selective attention to data that supports prior beliefs or stereotypes | Reinforcement of low expectations, biased framing of 'good student,' and echo chambers |

*Resource: Literature*

*Coding-process*

a) First-cycle coding: Descriptive and in-vivo codes surfaced key experiences and language.
b) Second-cycle coding: Thematic and pattern codes were developed using the framework categories.
c) Framework matrix: A cross-case matrix organizes findings by bias type, role (student vs. faculty), and classroom context.

**Application to findings**

*Communication Bias in Multilingual Classrooms*
Faculty interviews revealed that many unintentionally use disciplinary jargon or culturally specific references that confuse non-native English speakers. Observations confirmed that such students often withdrew from participation.

*Student Focus Group: "Sometimes I just zone out when I don't understand what the professor is saying. They move on so fast, I can't ask questions."*

This aligns with Innis's theory that the medium of communication (e.g., academic English, lecture format) inherently privileges certain groups, creating access barriers for others.

*Cognitive Bias in Performance Evaluation*
Several faculty members acknowledged relying on "gut feeling" when evaluating student engagement. Students noted being judged based on silence or accents, rather than understanding.

*Faculty Interview*
*"I think he is not interested because he never speaks, but maybe that is just how he is."*

Consistent with Tversky and Kahneman's heuristics model, these quick judgments reflect cognitive biases where inductive inference disengagement occurs based on limited, superficial cues.

*Confirmation Bias and Stereotyped Expectations*
Both faculty and students cited experiences where low expectations for students from certain backgrounds were subtly reinforced over time.

*Student Interview*
*"They assume I am not good at this subject because of where I am from."*
*Faculty Interview*

*"It is hard not to assume things when you have taught for years."*

This demonstrates confirmation bias in action: initial stereotypes are reinforced by selectively attending to behavior that fits the narrative, while ignoring contradictory evidence.

Across all data sources, the biases were found to be mutually reinforcing. Communication bias (e.g., unclear language) led to student silence, faculty misjudged it as disengagement (cognitive bias), reinforthe ced belief that the student was underprepared (confirmation bias).

This recursive loop supports the theoretical model proposed, illustrating how biased communication and perception can compound over time and produce inequitable educational outcomes.

**Implications for Bias-Aware Pedagogy**

The findings highlight the urgent need for bias-conscious teaching practices and institutional reflection. Specifically, they point to the importance of linguistically inclusive communication. The value of structured reflection tools to reduce cognitive biases. And the role of critical pedagogy in challenging confirmation biases.

This study demonstrates how a theoretically grounded approach can illuminate the often invisible ways bias shapes learning environments, and suggests actionable pathways toward more equitable higher education.

To support instructors in creating inclusive, equitable, and critically reflective learning environments by reducing the impact of communication, cognitive, and confirmation biases.

**Table 2: Addressing Communication Bias (Focus: Language clarity, cultural accessibility, and power dynamics)**

| Practice | Description | Implementation Example |
|---|---|---|
| Linguistic accessibility audit | Simplify and clarify lecture language, instructions, and assessment criteria. | Replace jargon with plain English; provide glossaries for technical terms. |
| Cultural relevance check | Adapt references, examples, and case studies to reflect student diversity. | Use international examples in economics or science; invite student examples. |
| Multimodal communication | Deliver content through varied channels (text, audio, visuals) to support different learning needs. | Combine slides, readings, recorded lectures, and infographics. |
| Transparent participation norms | Clearly define and validate multiple modes of participation. | Allow written contributions in class forums or use polling tools for shy students. |

*Resource: Literature*

*Basic check prompts for Educators*

a. Is my language equally accessible to native and non-native English speakers?
b. Are my cultural references inclusive or alienating?
c. Who is most likely to be excluded by my current mode of instruction?

**Table 3: Mitigating Cognitive Bias (Focus: Instructor heuristics, mental shortcuts, and decision-making patterns)**

| Practice | Description | Implementation Example |
|---|---|---|
| Structured Assessment Rubrics | Use clear, standardized rubrics to reduce subjective grading. | Share rubrics with students ahead of time; co-create them if possible |
| Show Thinking Techniques | Encourage reflective rather than impulsive decision-making in evaluation. | Revisit initial grades after a break; use double-marking when possible. |
| Bias Reflection Journals | Maintain teaching journals to log and interrogate moments of snap judgments. | Write weekly entries reviewing teaching decisions and assumptions |
| Blind Review Practices | Where possible, anonymize student work during grading. | Remove names from essays or peer reviews. |

*Resource: Literature*

*Bias check prompts for Educators*

a. Did I make a quick judgment about this student's ability based on limited data?
b. Am I interpreting participation differently across cultural or personality lines?
c. How consistent am I in applying grading standards?

**Table 4: Disrupting Confirmation Bias (Focus: Pre-existing beliefs, selective attention, and stereotype reinforcement)**

| Practice | Description | Implementation example |
|---|---|---|
| Counter-stereotype exposure | Actively seek and highlight examples that challenge dominant assumptions. | Showcase successful first-gen or international scholars in your field. |
| Prospective-taking Exercises | Include student-led storytelling or auto-ethnographic reflection in coursework. | Assign reflective essays on personal academic journeys or challenges. |
| Double-loop Feedback | Go beyond performance, ask students how classroom environments shape their engagement. | Use anonymous feedback tools that ask, "What helped or hindered learning this week?" |
| Inclusive Peer Evaluation | Design group assessments that incorporate peer feedback to challenge instructor-only perspectives. | Use tools like CATME or structured peer review rubrics. |

*Resource: Literature*

*Bias check prompts for Educators*

a. What assumptions am I making about this student's capability?
b. Am I only noticing behaviors that confirm what I already believe?
c. Whose success or struggle am I overlooking?

Institutional support and accountability to organize Bias Literacy Workshops (ongoing training for faculty on cognitive, communication, and confirmation biases), Equity Review Boards (Peer groups that review syllabi and course materials for inclusion), and Feedback Loops with Students (Structured feedback channels that let students flag experiences of marginalization or misunderstanding).

**Table 5: Self-assessment: Educator Bias Awareness Inventory**

| Statement | Agree | Somewhat | Disagree |
|---|---|---|---|
| I regularly reflect on how my own background shapes how I interpret student behavior. | | | |

| | | | |
|---|---|---|---|
| I design assessments to minimize subjectivity and promote fairness. | | | |
| I actively seek to include diverse voices and perspectives in my course materials. | | | |
| I solicit and act on student feedback regarding communication clarity and classroom inclusivity. | | | |

*Resource: Literature*

**Optional tools and resources for Educators**

- Harvard Project Implicit: Take self-assessment tests on unconscious bias.
- "Whistling Vivaldi" by Claude Steele: Understand stereotype threat in academic settings.

*Rubric for Bias-Inclusive Syllabus Design*

This toolkit is not a checklist to "complete" but a continuous practice of self-reflection, learner-centered design, and equity-driven decision-making. Addressing bias in the classroom is about noticing the unnoticed, questioning the taken-for-granted, and fostering spaces where every student has the opportunity to thrive.

## References

Innis, H. A. (1949). The bias of communication. *Canadian Journal of Economics and Political Science,* 15(4), 457-476. https://doi.org/10.2307/138041

Innis, H. (1993). The bias of communication//Review. *The Canadian Historical Review*, *74*(3), 437-442

Buhrman, H., Vereshchagin, N., & de Wolf, R. (2007, June). On computation and communication with small bias. In *Twenty-Second Annual IEEE Conference on Computational Complexity (CCC'07)* (pp. 24-32). IEEE. https://doi.org/10.1109/CCC.2007.18

Caverni, J. P., Fabre, J. M., & Gonzalez, M. (Eds.). (1990). *Cognitive biases* (Vol. 68). Elsevier.

Tversky, A., & Kahneman, D. (1974). Judgment under Uncertainty: Heuristics and Biases: Biases in judgments reveal some heuristics of thinking under uncertainty. *Science*, *185*(4157), 1124-1131. https://doi.org/10.1126/science.185.4157.1124

Bierema, A., Hoskinson, A. M., Moscarella, R., Lyford, A., Haudek, K., Merrill, J., & Urban-Lurain, M. (2021). Quantifying cognitive bias in educational researchers. *International Journal of Research & Method in Education*, *44*(4), 395-413. https://doi.org/10.1080/1743727X.2020.1804541

Swaryandini, G., Graham, J., Griffith, S., Grilo, V., Ruzzante, F., Zhang, X., & Noetel, M. (2025). Systematic review and meta-analysis of educational approaches to reduce cognitive biases among students. *Nature Human Behaviour*, 1-29. https://doi.org/10.1038/s41562-025-02253-y

Klayman, J. (1995). Varieties of confirmation bias. *Psychology of learning and motivation*, *32*, 385-418. https://doi.org/10.1016/S0079-7421(08)60315-1

Beattie, J., & Baron, J. (1988). Confirmation and matching biases in hypothesis testing. *The Quarterly Journal of Experimental Psychology*, *40*(2), 269-297. https://doi.org/10.1080/02724988843000122