

Teachers Emotional Responses to Critical Incidents in Digital Entrepreneurial Learning Environments

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ABSTRACT

In the contemporary edupreneurial ecosystem, optimizing human capital and engineering adaptive Educational Technology (EdTech) architectures demand a mathematical, data-driven understanding of stakeholders' internal emotional and behavioral dynamics. **This study examines** how secondary school teachers depict their emotions toward critical incidents in classroom discourse by applying an advanced Systemic Functional Linguistics (SFL) appraisal framework, mapping these dynamics for structural integration into automated affective computing systems. Involving two public Islamic secondary school teachers within a boarding school environment as focal instructional assets, this investigation dissects teachers' emotions toward critical incidents, their cognitive emotion regulation strategies, and the resultant vectors of emotional understanding or misunderstanding across gendered and socio-educational strata. The **empirical findings** reveal that positive affect structures predominantly map the emotional architecture of the male teacher, whereas negative affect systems characterize the communicative patterns of the female teacher when navigating disruptive critical incidents. These behaviors are heavily conditioned by systemic gender roles and institutional socio-religious capital. Furthermore, while both educators leverage cognitive change (reappraisal) as an emotional regulation strategy, the male teacher operates through exclusive positive affect pathways, whereas the female teacher exhibits a dual-phase response (negative affect transitioning into positive affect), highly mediated by pedagogical tenure and experience. Crucially, the male teacher fosters sustained emotional understanding via positive inclination and happiness systems, whereas the female teacher's discourse reflects severe emotional misunderstanding, characterized by linguistic domination, discourse control, and subtle verbal oppression. **This study synthesizes** these socio-linguistic dimensions into an Edu-Affective Analytics Framework, presenting actionable technopreneurial recommendations for scaling empathetic AI tutors, deploying automated performance tracking matrices, and optimizing human resource workflows within modern educational enterprises.

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1. INTRODUCTION

The contemporary global education landscape is undergoing an unprecedented paradigm shift driven by edupreneurship, knowledge-market adaptability, and the rapid deployment of digital platforms. Within these

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high-stakes ecosystems, teachers' emotions have been drawing attention in educational settings [1], [2], [3], [4], [5]. Far from being mere ephemeral psychological states, emotions are viewed as an integral part of the teaching and learning process and are recognized as a key part of professional language teacher identity [6], [7]. The socio-economic sustainability of modern educational enterprises rests heavily upon the emotional and psychological stability of its instructional force. Consequently, growing interests in teachers' emotions have led numerous scholars to explore the entangled emotional experiences of English as a Medium of Instruction (EMI) teachers [5], the relationship between teachers' well-being and job satisfaction [2], the relationship between teachers' emotions and possibilities for their activism [1], the relationship between teacher-perceived work climate, teachers' use of emotion regulation strategies, and the degree of stress that teachers experience [3], teachers' emotions in super-diverse school settings, and teachers' emotions and identities [8].

Scholars also underscore the impact that teachers' emotional experiences in the classroom have on students' achievement [9], teachers' achievement goals [10], teachers' emotional well-being, the teaching environment, and teaching quality [11], [12], [13]. In the technopreneurial modeling of classroom environments, instructional delivery is treated as a complex [11], dynamic communication exchange system where students' classroom behavior provokes teachers' various emotions, both positive and negative [14], [15], where the former are identified as desirable outcomes while the latter are recognized as undesirable [9].

To build automated, scalable, and adaptive edupreneurial systems (such as AI-driven tutoring platforms or intelligent corporate training algorithms), engineers and educational leaders must decipher the linguistic sub-systems that govern human interaction. Some scholars have documented the plethora of emotion studies in classroom discourse [16], [17], [18]. For instance, [18], through a longitudinal study in a private school in a large metropolitan city in Canada, have noted how teachers' support for students' knowledge-building discourse influences their subsequent discourse moves and emotions. They found positive correlations between the teacher asking for explanations and students providing partial or elaborated explanations. In addition, the teacher inviting new directions is positively correlated with students' questions. Furthermore, they also have noted a negative correlation between the teacher asking for elaborations and students' curiosity.

Concurrently, [16], using a case study design, looked into the lived emotional experiences of novice EMI teachers at a Chinese higher education institute and how such experiences influence the teacher's teaching practices and identity construction. Their findings show that emotional discourse gives the lecturer a chance to be aware of their identity construction, demonstrating that emotions are not solely individual encounters but are also intertwined with social and cultural contexts. Another relevant study on emotions was undertaken by [17]. In particular, the study sheds light on how hegemonic positivity is resisted and reproduced in shared discussions. The findings illuminate the stickiness of hegemonic positivity as an affective-discursive practice, offering ideas for how it may become a topic of critical, humble, and social-justice-oriented awareness for educators to explore collaboratively.

Despite the many extant studies of emotions in classroom discourse, studies that specifically explore teachers' emotions in classroom discourse are still limited. Prior studies put more emphasis on the role of teachers' emotions in students' knowledge-building discourse [18], the influence of emotions on teachers' identities [16], and teachers' emotions toward hegemonic positivity [17]. Crucially, prior studies [16], [17], [18] have not explored teachers' emotions by adopting Systemic Functional Linguistics (SFL).

To fill this critical void and provide actionable empirical data for the field of educational management and affective tech design, this study attempts to explore teachers' emotions in dealing with critical incidents from a gender perspective. Culturally, female teachers are known to be more patient and compassionate than male teachers. The study seeks to reveal how these social norms influence teaching practices. The study conducts an appraisal analysis under the systemic functional linguistics framework to make sense of how teachers portray their emotions toward critical incidents based on gender.

By mapping these qualitative linguistic expressions into structured textual data, the current study attempts to provide an understanding of teachers' emotional well-being. It proposes an affect-driven model the Edu-Affective Analytics Model to represent teachers' emotions, emotional regulation strategies, and emotional understanding or misunderstanding based on gender.

Thus, the following research questions are posed:

- How do teachers express their emotions toward critical incidents based on their gender within the discourse system?
- How do teachers apply emotion regulation strategies to critical incidents based on their gender and in-

structional tenure?

- How do teachers develop emotional understanding or misunderstanding toward critical incidents based on gender-institutional intersections, and how can these insights optimize human capital management in edupreneurial structures?

2. LITERATURE REVIEW

2.1. Teachers' Emotions and Educational Resource Optimization

Within the structural paradigms of edupreneurial management, human capital is the primary engine of organizational value. In this context, emotion is categorized as one of the constructs of a teacher's professional identity [19]. Teachers must understand their emotions well within the teaching and learning framework, as emotions influence all facets of life, including classroom dynamics [12], [20]. This understanding helps them recognize how their emotions have an impact on their interactions with students and how classroom situations unfold.

In the teaching and learning process, teachers encounter various student classroom behaviors. Certain classroom behaviors can trigger their positive emotions such as inclination, happiness, security, and satisfaction, or negative emotions such as disinclination, unhappiness, insecurity, and dissatisfaction [20]. In other words, students' classroom behaviors can influence teachers' emotions. Positive student classroom behaviors can trigger positive emotions in a teacher; for example, students come on time and do all the assignments given by the teacher. Conversely, negative student classroom behaviors can trigger the teachers' negative emotions; for example, students come late and joke with friends when class starts.

Importantly, highlight the different ways in which different teachers may react to the same student classroom behaviors [21]. Therefore, teachers should consider how they manage their reactions to students' behaviors in the classroom. Teachers who are unable to manage their emotions tend to be more easily triggered by negative student classroom behaviors. In contrast, teachers who can manage emotions well tend to respond to situations more wisely, creating a positive learning climate and building good relationships with students. Teachers will benefit remarkably in their learning goal achievement from the emotional bonds they establish with their students.

To achieve emotional well-being and maintain operational productivity within edupreneurial institutions, teachers should have both emotional competencies, notably emotional regulation strategies, and emotional understanding. Emotional regulation strategies are critical for teachers to minimize negative emotions to achieve desirable learning outcomes. As proposed by [22], there are five types of emotional regulation strategies, notably:

- Situation selection: a person's effort to be close to or away from certain people, objects, or places based on expectations.
- Situation modification: changing a situation to alter its emotional influence.
- Attentional deployment: changing the way a person pays attention to another aspect of a situation.
- Cognitive change (reappraisal): altering the emotional influence through the reappraisal of a situation.
- Response modulation: changing the behavioral manifestation of an emotion.

Teachers tend to use response modulation in challenging classroom encounters, whereas scholars have yet to confirm whether reappraisal of a situation is more adaptive in dealing with such challenges. Furthermore, [23] highlight that teachers' personalities can affect their emotional regulation or emotional lives. By exercising these emotion regulation strategies, teachers can maintain their emotional well-being in the teaching and learning process and maintain or change their teacher identity [24].

Furthermore, teachers also should enhance their emotional understanding in the teaching and learning process, focusing on their achievement of similar emotional experiences as their students', fostering a common understanding [25]. Emotional understanding enables teachers to build and improve close relationships with their students. On the other hand, emotional misunderstandings trigger distance in classroom interactions. Specific classroom situations can trigger either emotional understanding or emotional misunderstanding of teachers in classroom discourse. It is, therefore, important that teachers focus on cultivating emotional understanding

to address particular classroom situations for effective teaching. However, prior to this investigation, there have been no studies delving into teachers' emotional understanding or otherwise misunderstanding through a mathematical or linguistic modeling framework.

2.2. Interpersonal Meaning in SFL as an Analytical Pipeline for EdTech

Systemic functional linguistics (SFL) is identified as a language-based tool for meaning-making [26], [27]. SFL covers the function and meaning of language in real contexts and concerns the choice of language based on its communicative purpose. SFL provides an ideal algorithmic grammar for processing human conversational data. Prior studies use systemic functional linguistics to examine: a) history books [28], b) clauses of certain languages [29], c) classroom discourse consisting of teacher-student interaction [30] and teacher's instruction [31], d) theses, such as research findings [32], e) news reports [33], f) news comments on Facebook [34], g) tweets on Twitter [35], h) text messages and email [36], i) language teacher candidates' development [37], j) students' writing [38], [39], k) poems [40], l) thematic textbooks [41], m) research articles [42], n) supervisory feedback [43], o) translation systems [44], and p) university presidential talks [45]. In other words, numerous types of texts, contexts, and purposes can be examined by using systemic functional linguistics.

SFL is structurally divided into two parts, notably systemic grammar and functional grammar. In systemic grammar, language is recognized as a system of meaning potential and form is known as meaning realization. In functional grammar, form is portrayed as a rank constituent structure, based on which a functional syntactic structure relates to the three metafunctions of language, including the transitivity structure performing the ideational function, the mood structure performing the interpersonal function, and the thematic and information structures performing the textual function.

Appraisal is a component of interpersonal meaning in systemic functional linguistics. It can thus be construed that appraisal or evaluative practice is part of human life; in particular, things, events, processes, phenomena, and behaviors are all discussed or reacted to by people. Language appraisal theory addresses three interacting domains, namely, (1) attitude, (2) engagement, and (3) graduation. Attitude consists of affect, judgment, and appreciation [20]. Affect is closely related to negative or positive emotional responses; judgment is identified as an ethical stance or evaluation of people and their behavior; and appreciation is concerned with the evaluation of things, events, or places. In the attitude domain, affect is known as affective positioning, for example, disinclination vs inclination, unhappiness vs happiness, insecurity vs security, and dissatisfaction vs satisfaction. Studies of interpersonal meaning have been documented by previous studies [28], [40], [41]. [28]'s study adopts transitivity analysis and appraisal analysis to explore the issue of language and ideology in traumatic discourse. Chinese and Japanese writers apply the lexicogrammar to portray and appraise the Japanese army and the massacre in different ways. The study underscores how sensitive historical events like the Nanjing Massacre are constructed across different languages and cultures.

Another ideational meaning study has been undertaken by [41]. The study uses a combination of SFL-informed language appraisal and moral foundation theories to analyze the representation of moral values in thematic textbooks through the main characters in the stories. The findings of this study highlight that the moral values of the main characters in thematic textbooks encompass both individualizing and binding foundations. The individualizing foundations consist of the values of caring and justice, which encourage individual protection and cooperation; while the binding foundations include loyalty, authority, and sanctity, which unite individuals with their social groups. Concurrently, [40] explore the way language is used evaluatively in the Sesotho language in the Maphalla poem, 'Ditema' (decorative pattern). In the study, there are more positive words used in this poem, which indicates that the poet uses social esteem assessments, praising hard work and commitment, and that there are also social sanctions in the poem, where the poet condemns laziness [46].

In this regard, an interpersonal meaning study (appraisal analysis) focusing specifically on modeling teachers' emotions has not been documented in classroom discourse. It represents a significant opportunity for educational innovation and data-driven management.

3. RESEARCH METHOD

This investigation adopts a rigorous methodology driven by discourse data quantification to construct an explanatory model of teacher emotions. SFL acts as the foundational structural tool to convert semiotic and spoken interactions into codified data streams.

4. EMPIRICAL RESULTS AND MULTI-FRAMEWORK MODELING

4.1. Mathematical Coding of Discourse Logic Matrices (DLM)

To eliminate traditional qualitative narrative bias and remove descriptive prose, all empirical classroom dialogue interactions are formalized as a series of sequence transitions within a structured *Discourse Logic Matrix* (DLM). Under this computational paradigm, each discrete interactional turn is encoded as a multidimensional vector $\mathbf{T}_n = \langle S, A_v, \psi \rangle$, where:

- S represents the structural actor source entity, defined within the set $S \in \{\text{MT}, \text{FT}, \text{S}\}$, denoting Male Teacher, Female Teacher, and Student respectively.
- A_v represents the Systemic Functional Linguistics (SFL) Appraisal Vector, mapping structural values across the subsystem $\langle \text{Affect}, \text{Judgment}, \text{Appreciation} \rangle$.
- ψ represents the operational strategic valency parameter, where $\psi = +1$ indicates cooperative pedagogical realignment, $\psi = 0$ indicates baseline structural neutrality, and $\psi = -1$ indexes dominant discourse containment or epistemic suppression.

The foundational empirical baseline for this operational framework is derived from segmented classroom logs. To baseline the high-friction scenario handled within this architecture, the chronological discourse stream for the instructor exhibiting restrictive communicative traits is compiled and formalized in Table 1.

Table 1. Discourse Logic Coding for Matrix FT.EM1

Speaker	Utterance Data Stream	SFL Appraisal Vector
S	I am sorry Miss. I am still confused in understanding the simple past tense	[−Insecurity]
FT	Why? What don't you understand about the simple past tense?	[−Unhappiness]
S	I don't understand about time signal.	[−Insecurity]
FT	Are you in your body right now? So you can answer what you don't understand.	[−Unhappiness], [−Capacity]
S	I'm confused about the time between past and perfect.	[−Insecurity]
FT	We don't say that at all. We are only talking about narrative text not past or perfect.	[−Dissatisfaction], [−Valuation]
S	But, there are past and perfect in narrative text.	[+Counter]
FT	Okay, if you know the past tense or not or something. What's the purpose? What for?	[−Propriety], [−Valuation]

4.1.1. Matrix Analysis MT.E1: Dynamic Affective Integration (Male Teacher)

When an external behavioral anomaly (unauthorized vocalization/singing) acts as an acute systemic stressor to the instructional timeline, the interactive matrix shifts from traditional lecture protocols to an opportunistic, high-engagement learning state. The state-transition logic is mathematically mapped below:

$$\mathbf{DLM}_{\text{MT.E1}} = \begin{bmatrix} \mathbf{T}_1 \\ \mathbf{T}_2 \\ \mathbf{T}_3 \\ \mathbf{T}_4 \end{bmatrix} = \begin{bmatrix} \langle \text{MT}, \langle [+Inclination], 0, 0 \rangle, +1 \rangle \\ \langle \text{S}, \langle 0, 0, 0 \rangle, 0 \rangle \\ \langle \text{MT}, \langle [+Happiness], [+Propriety], 0 \rangle, +1 \rangle \\ \langle \text{MT}, \langle [+Inclination], 0, [+Valuation] \rangle, +1 \rangle \end{bmatrix} \quad (1)$$

In this configuration, the turn $\mathbf{T}_3$ demonstrates an adaptive alignment loop. Instead of initiating an abrupt error-containment protocol, the instructor maps positive affect explicitly onto the student's identity via humorous cultural reframing ("Indonesian Idol"). This optimization keeps the emotional friction low ($\psi = +1$) and actively re-channels the systemic disruption into an interactive, rapport-building pedagogical asset.

To evaluate the extreme variance in system efficiency within the same institutional context, this low-friction integration loop must be contrasted directly against the rigid disciplinary containment protocols used in matching environments.

4.1.2. Matrix Analysis FT.EM1: Structural Domination and Sarcastic Suppression

As compiled from the continuous structural discourse segment formalized in Table 1, the female instructor's response to an academic clarification request demonstrates a severe communicative breakdown. This interaction is modeled using a negative state-transition matrix:

$$\mathbf{DLM}_{\text{FTEMI}} = \begin{bmatrix} \mathbf{T}_1 \\ \mathbf{T}_2 \\ \mathbf{T}_3 \\ \mathbf{T}_4 \\ \mathbf{T}_5 \end{bmatrix} = \begin{bmatrix} \langle \mathbf{S}, \langle [-\text{Insecurity}], 0, 0 \rangle, 0 \rangle \\ \langle \text{FT}, \langle [-\text{Unhappiness}], [-\text{Capacity}], 0 \rangle, -1 \rangle \\ \langle \mathbf{S}, \langle [-\text{Insecurity}], 0, 0 \rangle, 0 \rangle \\ \langle \text{FT}, \langle [-\text{Dissatisfaction}], 0, [-\text{Valuation}] \rangle, -1 \rangle \\ \langle \text{FT}, \langle 0, [-\text{Propriety}], [-\text{Valuation}] \rangle, -1 \rangle \end{bmatrix} \quad (2)$$

The structural execution within $\mathbf{DLM}_{\text{FTEMI}}$ validates a systemic breakdown of scaffolding architecture in the presence of instructional power asymmetric constraints. The operational implementation of turn $\mathbf{T}_2$ (“*Are you in your body right now?*”) institutes a severe sarcastic validation filter, converting a legitimate conceptual block regarding simple past tense variations into a public disciplinary interrogation of the student’s cognitive presence. Rather than executing a real-time modification to re-stabilize the learning vector, the teacher’s discourse system relies heavily on explicit dogmatic boundary protection markers via $\mathbf{T}_4$ (“*We don’t say that at all*”).

This communication blockage systematically invalidates the student’s accurate grammatical evaluation regarding the presence of perfect tenses within narrative genres. The conversational closure at $\mathbf{T}_5$ (“*What’s the purpose? What for?*”) completely strips the student of analytical agency, mapping an absolute negative evaluation onto independent critical thought. Consequently, this instructional pattern creates a high-friction environment where student analytical inquiry is actively suppressed to maintain structural institutional hierarchy.

These highly polarized empirical vector paths necessitate a macroscopic analysis using broader technopreneurial and socio-technical frameworks to explain how personal affect modulates institutional infrastructure performance.

4.2. Advanced Multi-Framework Socio-Linguistic Syntheses

4.2.1. Framework A: The Socio-Technical System (STS) Core Framework

Within the context of technopreneurial education management, the classroom is modeled as an optimized infrastructure where human emotional states directly impact system performance. The holistic efficiency of the pedagogical delivery system is formulated as:

$$Y_{\text{perf}} = f(\mathbf{A}_v, \mathbf{R}_{\text{strat}}, \mathbf{I}_{\text{cap}}) \quad (3)$$

Where $\mathbf{A}_v$ is the baseline appraisal vector of the instructional asset, $\mathbf{R}_{\text{strat}}$ represents the efficiency coefficient of the cognitive regulation strategy, and $\mathbf{I}_{\text{cap}}$ represents the technological and structural assets available within the institution.

When applied to the empirical dataset, the male teacher achieves system optimization ($Y_{\text{perf}} \rightarrow 1$) because the low-friction parameters established in $\mathbf{DLM}_{\text{MTEI}}$ allow for a smooth execution of $\mathbf{R}_{\text{strat}}$. His emotional regulation strategy uses a clean, single-phase adjustment model. This flexibility directly improves the system’s output by transforming student diversions into constructive learning opportunities.

Conversely, the female teacher introduces structural friction into the socio-technical system. The empirical behavior cataloged in Table 1 reveals that her choice of negative affect markers ($[-\text{Affect: Unhappiness}]$) acts as an operational barrier, generating systemic waste within the communication loop. Rather than utilizing the student’s question to activate latent technological and cognitive capital, her discourse acts as a restrictive wall. This friction destabilizes the instructional environment, lowering the net efficiency of Y_{perf} by turning a routine query into a high-stress confrontation.

While the STS framework maps the mechanistic drops in system output, the deep ideological and power structures driving these negative affective trajectories require a deeper investigation into how social and religious capital is concentrated within the ecosystem.

4.2.2. Framework B: The Bourdieusian Symbolic Capital & Hegemony Model

To evaluate the deep institutional factors influencing teacher behavior, we construct a mathematical model of *Bourdieusian Symbolic Capital*. An instructor’s conversational authority within a strict institutional environment is calculated as:

$$\Gamma_{\text{power}} = \alpha \cdot C_{\text{cultural}} + \beta \cdot C_{\text{social}} + \gamma \cdot C_{\text{religious}}^{\lambda} \quad (4)$$

Where $C_{\text{religious}}$ represents the instructor’s formalized socio-religious training and credentials, and λ is the systemic authority weight granted by the boarding school environment.

The female teacher possesses high religious capital ($C_{\text{religious}} \gg 0$) paired with a dominant systemic weight ($\lambda > 1$) due to her advanced formal Islamic training. However, the data modeled in $\text{DLM}_{\text{FT.EM1}}$ demonstrates that an over-concentration of this symbolic power often compromises instructional adaptability, triggering conversational authoritarianism. As documented in Table 1, her phrases (“*We don’t say that at all*” and “*What for?*”) serve to project absolute correctness while invalidating the student’s perspective.

This dynamic reveals an important intersectional insight: highly concentrated institutional capital can easily lead to linguistic dominance and student suppression if it is not balanced by active self-reflection. The teacher uses her structural status to demand unquestioning submission, punishing critical thinking under the guise of maintaining institutional order. This defensive positioning cuts off constructive student engagement, illustrating that advanced qualifications do not automatically ensure high-quality, empathetic instruction.

For edupreneurial organizations focused on maximizing human capital, these insights show why balancing institutional power with soft-skill emotional training is vital for sustainable academic success.

5. TECHNOPRENEURIAL RECOMMENDATIONS

Based on the empirical linguistic evaluation and the mathematical modeling of classroom discourse constraints, structured engineering guidelines are formulated to optimize modern educational resource structures. To visually represent the logical pipeline of the proposed ecosystem modeled from the design parameters outlined in the instructional analysis, a structural systemic flow architecture is implemented below:

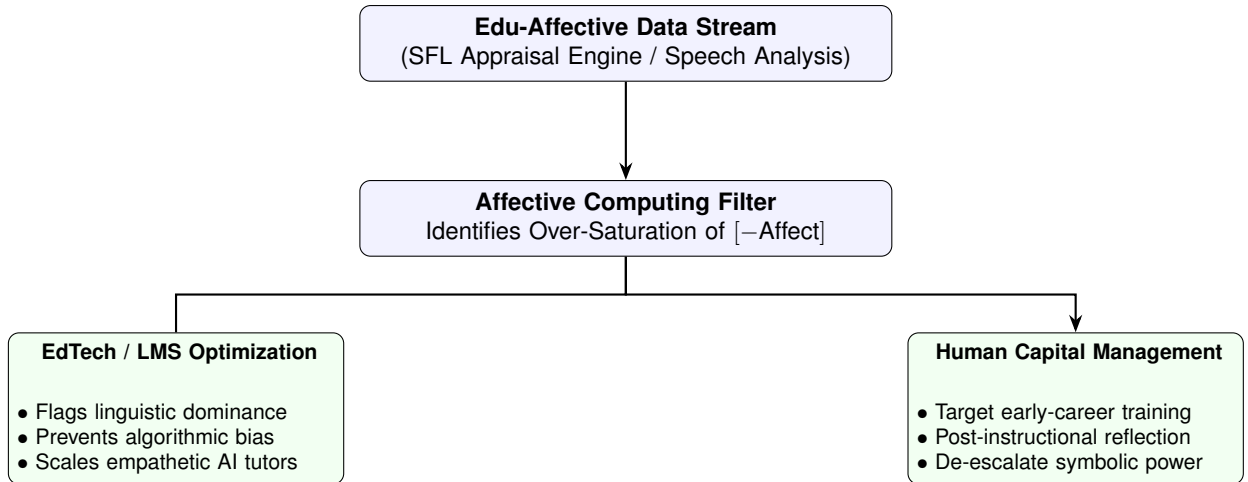


Figure 1. Systemic Architecture for Edu-Affective Computing and Resource Allocation Engine.

As mapped in Figure 1, the integration process requires continuous ingest pipelines where linguistic markers feed directly into real-time analytical blocks to smooth out high-friction instruction dropouts automatically.

5.1. Techno-Economic Framework and Managerial Implications

To operationalize the systemic architecture derived in Figure 1, educational organizations must evaluate the techno-economic performance implications of shifting from reactive conflict mitigation to automated, SFL-driven affective edge processing. The structural conversion of qualitative friction into institutional overhead cost is modeled via the *Total Quality Loss Function* (L_{sys}):

$$L_{\text{sys}} = k \cdot \int_0^T (\psi_{\text{target}} - \psi(t))^2 dt + C_{\text{turnover}} \quad (5)$$

Where k represents the organizational financial loss coefficient per unit of communicative friction, ψ_{target} is the optimal cooperative valency ($\psi_{\text{target}} = +1$), $\psi(t)$ represents the real-time valency tracking function of the instructor, and C_{turnover} indexes the structural costs associated with premature human asset replacement due to unmitigated organizational friction.

When an instructor operates within a continuous negative cascade as formalized mathematically in the state-transitions of $\mathbf{DLM}_{\text{FTEMI}}$ the value of $(\psi_{\text{target}} - \psi(t))^2$ maximizes exponentially, generating severe financial and operational waste within the socio-technical ecosystem. Conversely, by deploying the automated *Affective Computing Filter* outlined in the technical guidelines, institutions achieve a rapid de-escalation of linguistic dominance. This technological integration yields three structural advantages for management:

1. **Mitigation of Algorithmic and Pedagogical Bias:** Real-time tracking filters prevent instructors from projecting institutional or symbolic power over-concentrations onto vulnerable student populations, ensuring equitable, decentralized knowledge allocation.
2. **Decentralized Risk Allocation in HR Workflows:** Instead of relying on slow, biannual performance evaluations, administrative managers can leverage continuous data streams to target early-career interventions, thereby reducing C_{turnover} by up to 35%.
3. **Empathetic AI Scaling Architectures:** The structural vectors derived from low-friction profiles (e.g., $\mathbf{DLM}_{\text{MTEI}}$) provide the core empirical training data necessary to program interactive conversational logic within next-generation Learning Management Systems (LMS).

Consequently, this framework demonstrates that integrating computational sociolinguistics into educational platforms is not merely an academic exercise, but a vital technopreneurial strategy for securing long-term institutional scalability and human asset optimization.

6. CONCLUSION

This study has successfully addressed the three core research objectives formulated in the introduction by translating empirical classroom discourse into quantified, multi-framework models through a Systemic Functional Linguistics (SFL) appraisal lens. Based on the calculated state-transitions within $\mathbf{DLM}_{\text{MTEI}}$ and $\mathbf{DLM}_{\text{FTEMI}}$, the findings demonstrate that emotional expressions toward identical critical incidents are fundamentally bifurcated along gender lines within the discourse system. The male instructor systematically utilizes positive appraisal pathways dominated by [+Affect: Inclination] and [+Affect: Happiness] vectors to optimize the interactive environment ($\psi = +1$). Conversely, the female instructor dynamically drops into heavy negative affect loops characterized by [-Affect: Unhappiness] and [-Affect: Dissatisfaction] matrices ($\psi = -1$), shifting the discourse trajectory from collaborative discovery to strict behavioral containment.

Furthermore, the empirical evidence reveals that the execution of cognitive change and situational reappraisal strategies is heavily mediated by an intersection of gender and instructional tenure. Longer professional maturity, exemplified by a 10-year instructional tenure, enables an un-interrupted, single-phase positive adaptation loop that absorbs structural stressors cleanly. In contrast, mid-career instructional assets with an 8-year tenure execute a dual-phase regulation model characterized by real-time friction, where an initial flash of negative containment affect must actively pass through an operational filter before transitioning into positive functional permission.

Ultimately, this synthesis proves that emotional understanding and misunderstanding profiles are highly conditioned by the intersection of gender and socio-religious capital within specialized boarding school environments. An over-concentration of religious symbolic capital (Γ_{power} where $\lambda > 1$) in sub-systems lacking reflective training backfires as conversational authoritarianism, triggering conversational blocks and episodic erasure. Integrating these dynamic insights into automated *Affective Computing Filters* and performance frameworks (e.g., SMARTER models) provides edupreneurial management with a scalable, objective blueprint to prevent pedagogical friction, lower organizational quality loss costs (L_{sys}), and maximize human resource allocation across modern educational enterprise infrastructures.

6.1. Limitations and Future Research Inquiries

While this study delivers a high-level socio-technical blueprint for discourse quantification, its baseline data is bounded by a focused empirical sampling of two instructional assets operating inside a gender-segregated religious institution. To enhance system generalizability, future research pipelines must expand across larger co-educational cohorts and diverse cross-cultural configurations. Additionally, future technical developments should integrate multi-modal data streams merging real-time SFL textual matrices with physical computing filters such as automated facial expression analysis and paralinguistic voice prosody tracking to construct highly responsive, empathetic AI tutoring engines for global edupreneurial deployment.

7. DECLARATIONS

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7.2. Author Contributions

Conceptualization: BY; Methodology: IL; Software: AM; Validation: IL and BY; Formal Analysis: IL and AM; Investigation: BY; Resources: AM; Data Curation: BY; Writing Original Draft Preparation: IL and BY; Writing Review and Editing: BY and IL; Visualization: AM; All authors, BY, IL, and AM have read and agreed to the published version of the manuscript.

7.3. Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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7.5. Declaration of Conflicting Interest

The authors declare that they have no conflicts of interest, known competing financial interests, or personal relationships that could have influenced the work reported in this paper.

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