# Defining Student Success, Artificially: How Generative AI Constructs Success Narratives in Engineering Education

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## Abstract

Student success is a central but contested concept in higher education, shaped by competing institutional priorities, scholarly frameworks, and student experiences. As generative artificial intelligence (AI) systems become increasingly embedded in advising, teaching, and policy work, they are beginning to participate in how student success is defined and communicated. Despite this growing influence, little research has examined how these systems construct meaning around complex and value-laden concepts such as student success, or what assumptions and patterns are embedded in their explanations. This study uses grounded theory methods to analyze qualitative interview data generated by five large language models in order to examine patterns across AI-produced narratives. The findings indicate that while all models draw from a shared discourse that frames student success as holistic human development, they vary in how they emphasize structural conditions, individual agency, and the role of traditional academic metrics. Across responses, success is consistently described as a multidimensional and developmental process that integrates academic learning with personal growth, well-being, belonging, purpose, and adaptability. The resulting grounded theory explains this construction as shaped by the interaction of dominant higher education discourse, contemporary institutional contexts, interpretive filters from training data, and rhetorical strategies that emphasize relational support and institutional responsibility. In doing so, generative AI systems act not as neutral interpreters but as narrative participants that synthesize and stabilize particular definitions of student success. As these systems become more embedded in educational practice, their representations may influence how success is conceptualized in advising, curricular design, and student support, particularly in structured fields such as engineering education. This study contributes an empirically grounded account of how AI constructs student success and highlights the need for critical engagement with AI-generated narratives in higher education.


## 1 Introduction

In the three years since ChatGPT was publicly released, generative AI systems have moved with notable speed from novelty to widespread presence in everyday life. They now appear across a growing range of technologies, including search engines, productivity software, mobile phones, automobiles, and a steadily expanding assortment of digital tools. It is becoming increasingly common to encounter devices that not only connect to the internet but also generate text, suggestions, or responses in ways that feel unexpectedly fluent, and occasionally a bit uncanny. What

began as an experimental capability has, in a relatively short period, become a routine feature of the digital environment. This rapid shift has occurred with little of the gradual adjustment that typically accompanies technological change, leaving institutions to make sense of systems that are already in regular use and still not entirely understood.

Higher education has not adopted generative AI in a uniform or straightforward way, and its response has often been marked by a mixture of curiosity, caution, and, at times, outright resistance. Early reactions to these systems frequently centered on concerns about academic integrity, appropriate use, and the broader implications for teaching and learning. In many cases, institutions moved more slowly than other sectors, working through questions of policy and practice even as the technology continued to advance. At the same time, generative AI tools have steadily found their way into academic settings as students, staff, and faculty are using them to support coursework, assist with instructional design, draft communications, and contribute to policy discussions. As these tools become more visible in everyday academic work, they begin to influence not only what tasks are completed but also how ideas are expressed and understood, particularly in discussions of student success, a concept that remains widely used yet difficult to define with precision.

Despite the growing presence of generative AI in academic contexts, relatively little research has examined how these systems themselves construct meaning around complex concepts such as student success. When asked to explain what student success entails, what influences it, or how it should be measured, generative AI models tend to produce responses that are coherent, confident, and often persuasive in a way that invites acceptance. At the same time, these responses reflect patterns and assumptions drawn from the data on which the models were trained, which are not always immediately visible and are rarely neutral. This study takes the approach of treating generative AI not simply as a tool, but as a source of qualitative data that can be examined in its own right. Using grounded theory methods, it analyzes how large language models define student success, describe the factors that shape it, and reveal tensions or inconsistencies within their explanations.

## 2 Literature Review

For the past several decades, student success has occupied a central place in higher education research, policy, and practice, though what exactly it means has remained surprisingly unsettled. Institutions, policymakers, and researchers invoke it constantly, often treating it as a central marker of quality, effectiveness, accountability, and accreditation.[1] Yet the term has never been especially tidy. Its meaning has been shaped by broader social, political, and institutional forces, and higher education itself has long served the dual role of expanding opportunity while also preserving social and economic privilege.[2,3] In that respect, student success has often functioned less as a single idea than as a gathering place for many competing priorities.

Different actors within higher education, not surprisingly, tend to emphasize different parts of the concept. Faculty priorities are often influenced by research expectations and funding structures,[4,5] while academic advising has developed in response to institution-specific concerns tied to persistence and progression.[3] Even so, much of the literature proceeds as though everyone is discussing roughly the same thing. Weatherton and Schusslers 2021 review suggests otherwise, finding that many studies do not define student success explicitly at all, and that those which do often rely on narrow quantitative indicators such as GPA or exam performance.[6] Students, meanwhile, tend to

describe success in broader and more developmental terms. This mismatch is a useful reminder that the meaning of student success is not fixed simply because the phrase is familiar.

In response to the limitations of metric-driven definitions, a substantial body of scholarship has proposed more holistic and human-centered models of student success. These approaches shift attention away from isolated academic outcomes and toward learning, development, and persistence over time. Foundational frameworks by Tinto, Astin, and Kuh emphasize engagement, integration, and the cumulative nature of the collegiate experience.[7–9] More recent work continues in much the same direction. Sundararaman et al., for example, found that students understand success as a personal and transformative journey that includes well-being, tenacity, community contribution, and career preparation alongside academic achievement.[10] Holistic models also extend success beyond the academic and into cognitive, emotional, social, physical, and even spiritual dimensions of student life.[11] What emerges from this literature is a view of student success as layered, developmental, and distinctly human, which helps explain why AI-generated definitions often lean toward growth, balance, and long-term development rather than simple outcomes.

Within these holistic models, belonging, well-being, and identity development appear with notable regularity. Research consistently shows that students sense of belonging is strongly associated with motivation, engagement, enjoyment of learning, and persistence.[12] Students who feel connected to peers, faculty, and their institution are more likely to remain enrolled and to experience positive academic outcomes. Related work on mental health makes a similar point from another angle, showing that psychological, emotional, and physical well-being are not peripheral to success but foundational to it. Reyes-Walsh et al., for instance, propose a multidimensional self-care framework that links internal conditions such as psychological and intellectual health with external conditions such as financial and sociocultural stability.[13] Identity development scholarship adds yet another dimension, positioning college as a critical period for self-authorship, purpose formation, and personal agency. Taken together, these strands of research align closely with the grounded theory findings, in which AI models repeatedly framed success as relational, developmental, and inseparable from lived experience.

At the same time, these broader understandings of success coexist somewhat uneasily with institutional systems that still prefer what can be counted neatly and reported efficiently. Performance funding models, rankings, and accountability structures continue to prioritize measures such as retention, graduation, and post-graduation employment. Sundararaman et al. describe a clear disconnect between how institutions measure success and how students define it, noting that students emphasize growth, well-being, and community engagement while institutions emphasize quantifiable indicators.[10] This is not simply a technical disagreement over measurement. It has important equity implications, because narrow metrics can obscure structural barriers and uneven access to resources. The tension between developmental aims and metric-driven accountability provides important context for understanding why AI models surfaced contradictions in their explanations of student success.

Student success can also be understood as a narrative, shaped not only by outcomes but by the language institutions use to describe those outcomes. Organizational narratives matter because they influence priorities, decision-making, and the distribution of resources. Studies of multidimensional academic performance show that demographic, psychological, societal, and lifestyle factors interact in ways that resist tidy categorization.[14] Once that is acknowledged, language becomes

more than a vehicle for describing success and starts to look like one of the places where success itself is constructed. This provides a useful conceptual foundation for grounded theory analysis of AI-generated text, since model outputs can be read as synthesized narratives drawn from existing discourse rather than neutral reflections of reality.

As generative AI becomes more prevalent in higher education, its role in producing and circulating narratives about teaching, learning, and success has expanded as well. Recent studies document the use of tools such as ChatGPT for advising support, instructional design, administrative communication, and institutional analysis.[15] In these contexts, AI systems increasingly operate as sense-making tools, summarizing research, generating recommendations, and framing complex issues for users. That is no small development, particularly in institutions where the wording of a recommendation, a policy statement, or an advising prompt can shape how a problem is understood in the first place. Yet systematic reviews of AI in higher education research suggest that much of the literature has focused on learning behavior, accuracy, and affect, while giving far less attention to how AI systems shape conceptual understandings or values.[16] This gap matters because AI does not merely transmit information; it organizes and presents it in ways that can make certain interpretations feel natural and others less visible.

Critical scholarship has therefore cautioned against treating AI systems as neutral. These systems inherit assumptions, biases, and omissions from their training data, which often reflect dominant voices and historical inequities.[17] Once rendered as polished technical outputs, such biases can become difficult to detect and easy to accept as authoritative. In educational settings, this may reinforce patterns tied to unequal access, socioeconomic disparities, and institutional stratification.[18] AI tools undoubtedly offer benefits, including efficiency and personalization, but they also introduce risks related to reliability, bias, and ethical use.[19] For that reason, understanding the assumptions embedded in AI-generated narratives becomes especially important when those narratives begin to influence advising, assessment, or policy decisions.

Taken together, the literature suggests that student success is multifaceted, value-laden, and shaped by competing institutional and human priorities. A good deal is known about how students, educators, and institutions define success, but much less is known about how generative AI systems do so. To date, no known studies have applied grounded theory methods to analyze AI-generated narratives of student success. The present study addresses that gap by examining how multiple AI models define and explain student success, identifying the assumptions and values embedded in their narratives, and developing a theoretical model of how these constructions emerge. In doing so, it helps connect student success research with critical studies of educational technology and offers insight into how AI may shape future understandings of success in engineering higher education contexts, where such tools are becoming steadily more embedded in teaching, advising, and institutional decision-making.

## 3 Methods

### 3.1 Study Design

This study adopts an exploratory grounded theory approach to examine how generative AI systems construct meaning around the concept of student success. Grounded theory was selected because

it allows conceptual patterns to emerge inductively from qualitative data rather than imposing a predefined framework. In this case, the goal was not to evaluate the accuracy of AI-generated responses, but to examine how those responses are constructed, what assumptions they draw upon, and how they may reflect broader educational discourse. Generative AI models were therefore treated as qualitative informants, and their outputs were analyzed as narrative data rather than as correct or incorrect answers. This approach shifts attention toward meaning-making processes and allows the analysis to focus on how definitions of student success are articulated rather than whether they align with any single accepted definition.

The study is intentionally scoped as an initial exploration of how generative AI systems respond to broad conceptual prompts. Rather than testing hypotheses or attempting to achieve theoretical saturation, the design focuses on capturing baseline patterns in how these systems describe student success when given minimal direction. This framing is particularly useful in a rapidly evolving technological context, where the ways in which AI systems construct meaning may be as important as the content of their responses. While the study is situated broadly within higher education, it is especially relevant to engineering education contexts, where structured curricula, prerequisite sequencing, and persistence challenges make definitions of student success particularly consequential for advising, assessment, and program design.

## 3.2 Data Collection

Data were collected through a series of structured interviews with five generative AI models: Copilot, Claude, ChatGPT, Gemini, and Grok. Each model was asked the same seven open-ended questions, resulting in a total of 35 responses that were treated as qualitative transcripts. Questions were intentionally broad and not domain-constrained in order to elicit the models default conceptualizations of student success rather than responses shaped by specific disciplinary cues. This design choice allowed the study to capture widely circulating narratives embedded in the models training data, even if it also resulted in convergence toward familiar themes.

The seven questions were designed to move from definition to interpretation and reflection. Early questions asked models to define student success and identify influential factors, while later questions probed underlying values, institutional influences, and the role of training data in shaping responses. Additional questions invited models to reflect on contradictions or tensions within their own explanations and to speculate on how definitions of student success may evolve. Interviews were conducted in controlled browsing environments using free versions of each model, with prompts standardized to request paragraph-length responses and no additional contextual guidance provided. This consistency in prompting was intended to support comparability across models while preserving the natural structure of their responses.

## 3.3 Data Analysis

Analysis followed the iterative procedures of grounded theory, moving through open, axial, and selective coding. During open coding, each response was examined line by line, and descriptive codes were assigned to specific excerpts of text. This process generated a large set of initial codes capturing recurring ideas such as holistic development, belonging, agency, well-being, institutional responsibility, structural barriers, and metric-based definitions of success. Analytic memos were

Table 1: Interview questions and their analytic purpose

| **Question focus** | **Purpose in grounded theory analysis** |
|---|---|
| Definition of student success | Establishes the models baseline conceptualization of success |
| Influential factors | Identifies causal and contextual conditions shaping success |
| Values and assumptions | Surfaces normative and ideological frameworks underlying definitions |
| Institutional influence | Examines structural and organizational context |
| Training data influence | Reveals intervening conditions and interpretive filters |
| Contradictions or tensions | Highlights internal inconsistencies and unresolved dynamics |
| Future change | Extends the theory beyond present conditions and anticipates evolution |

written throughout this stage to document emerging interpretations, note patterns across responses, and identify potential relationships among codes. These memos served as an ongoing record of analytic decisions and helped guide subsequent stages of coding.

During axial coding, related codes were grouped into broader categories and examined through constant comparison across models. This process revealed several recurring patterns, including the framing of student success as a multidimensional and developmental process, the interplay between individual agency and institutional responsibility, and tensions between measurable outcomes and broader human-centered definitions of success. At the same time, variation across models was also observed. Some models emphasized institutional structures and equity considerations more explicitly, while others focused more heavily on individual growth, transformation, or career outcomes. Instances that did not align with dominant patterns were examined as negative cases and used to refine category boundaries and clarify conceptual distinctions.

Selective coding was used to integrate these categories into a coherent theoretical account centered on student success as a holistic and relational process shaped by both individual and structural factors. Rather than presenting a single uniform definition, the analysis highlights a strong recurring pattern across models alongside meaningful differences in emphasis, tone, and framing. To support cross-model comparison, responses were examined side by side to identify similarities and differences in thematic emphasis and language use, and these comparisons informed the development of the final categories. While the study is limited by its use of a single set of prompts and one interaction per model, it provides a structured and transparent account of how generative AI systems construct narratives of student success, offering a foundation for future work that may extend this analysis through iterative sampling or domain-specific prompting.

*Note.* H = high emphasis; M = moderate emphasis; L = low emphasis.

Table 2: Cross-model comparison of student success narratives

| Model | Core framing | Main emphasis | Metrics | Standout trait |
|---|---|---|---|---|
| Copilot | Holistic | Balance | Limited | Mainstream higher education framing |
| Claude | Holistic + structural | Equity, systems | Critiques metrics | Most reflexive and critical |
| ChatGPT | Holistic | Achievement + engagement | Balanced use | Most neutral/generalized |
| Gemini | Theory-informed | Persistence, integration | Included in broader frame | Closest to established literature |
| Grok | Transformational | Growth, purpose, agency | De-emphasized | Strongest focus on flourishing |

Table 3: Relative emphasis across models

| Model | Equity/structure | Agency/growth | Metrics | Theory alignment |
|---|---|---|---|---|
| Copilot | M | M | M | M |
| Claude | H | M | L | M |
| ChatGPT | M | M | M | M |
| Gemini | M | M | M | H |
| Grok | L | H | L | M |

# 4 Results

## 4.1 Core Finding: Student Success as Holistic Human Development

Across all five interviews, a strong recurring pattern emerged in how the AI models defined student success. Rather than describing success as a single outcome such as grades or degree completion, the models consistently framed it as a multidimensional and developmental process. Their responses emphasized a combination of academic learning, personal growth, well-being, belonging, purpose, agency, and the ability to adapt to changing circumstances. One model summarized this perspective by describing student success as a multifaceted process that includes personal growth, belonging, resilience, academic learning, and the ability to navigate challenges (ChatGPT, Q1). Taken together, these responses suggest that generative AI systems draw heavily from a widely circulating discourse in higher education that positions success as holistic and evolving over time.

At the same time, this shared framing did not result in uniform responses. As shown in Table 2, the models differed in how they emphasized key dimensions of success, including the role of institutional structures, the importance of individual agency, and the relevance of traditional metrics. Some models, such as Claude, placed greater emphasis on structural conditions and equity, while others, such as Grok, foregrounded personal transformation and long-term development. ChatGPT and Copilot tended to present more balanced and generalized accounts, while Gemini aligned closely with established theoretical frameworks in higher education. These differences were not contradictions so much as variations in emphasis, suggesting that while the models draw from a shared conceptual foundation, they reproduce that foundation through slightly different interpretive lenses.

Overall, the findings indicate that generative AI models do not generate entirely novel definitions of student success, but instead synthesize and restate dominant narratives already present in higher education research and practice. The consistency of the holistic framing, combined with variation in emphasis across models, suggests that these systems function as aggregators of existing discourse rather than independent theorists. This has important implications for how AI-generated explanations may influence educational thinking, particularly in fields such as engineering education where definitions of success shape advising practices, curricular design, and student support systems.

## 4.2 Variation Across AI Models

Although all five models drew from a shared understanding of student success as holistic human development, their responses varied in emphasis, tone, and conceptual framing. As summarized in Table 2, these differences appeared not as direct contradictions but as shifts in what aspects of success were foregrounded, how responsibility was distributed, and how strongly models engaged with underlying tensions in higher education discourse.

One dimension of variation involved the relative emphasis on structural conditions versus individual development. Claude more explicitly foregrounded institutional context, equity, and systemic constraints, often framing student success as shaped by access to resources, institutional design, and broader social conditions. In contrast, Grok placed greater emphasis on individual transformation, agency, and purpose, describing success in terms of growth, adaptability, and long-term development. These models illustrate a spectrum within the data, ranging from structurally oriented explanations to more individually centered narratives.

A second area of difference involved how models treated traditional academic metrics such as grades, retention, and graduation. While all models acknowledged these indicators, their significance varied. Gemini and Copilot tended to integrate metrics within broader institutional frameworks, presenting them as useful but incomplete measures of success. Claude was more likely to critique metric-driven definitions directly, while Grok largely de-emphasized them in favor of developmental and experiential outcomes. ChatGPT occupied a middle position, incorporating both quantitative and qualitative indicators without strongly privileging one over the other.

Variation was also evident in the degree to which models aligned with established academic theory or adopted more interpretive or reflective tones. Geminis responses closely mirrored existing student success frameworks, referencing persistence, engagement, and integration. ChatGPT and Copilot presented more generalized and balanced summaries of these ideas, while Claude demonstrated greater meta-awareness by reflecting on the assumptions and discourse shaping its responses. Grok, by comparison, was more willing to surface tensions and inconsistencies, including the difficulty of reconciling holistic ideals with institutional reliance on measurable outcomes. Taken together, these differences reinforce the interpretation that AI-generated narratives are not uniform, but instead represent patterned variations within a shared discourse of student success.

## 4.3 Causal and Contextual Influences

Across interviews, the models frequently referenced broader higher education contexts in shaping their definitions of student success. Concepts such as belonging, equity, resilience, and transformation appeared repeatedly, suggesting that these themes are well represented in the text corpora from which the models draw. At the same time, the models reflected widely circulating cultural values, including individual agency, meritocratic assumptions, and humanistic approaches to learning, which influenced both the tone and logic of their explanations.

The phenomenon was also situated within contemporary institutional conditions. The models described student success in relation to mental health concerns, financial stress, increasing diversity of student backgrounds, and pressures associated with accountability systems. These contextual features shaped how success was imagined in practice. For example, one model noted that financial stability and access to adequate aid often determine a student's ability to persist (Gemini, Q2). While these themes appeared across models, their emphasis varied, with some models foregrounding structural constraints more explicitly and others focusing more on individual experience and adaptation.

Across interviews, the models also assumed structured institutional roles, describing students, faculty, advisors, and administrators operating within systems of curriculum, support services, and policy. Several models referenced technology-mediated learning environments, including online or hybrid formats and the growing presence of AI in academic life, as part of the conditions shaping what success requires.

## 4.4 Intervening Conditions and Interpretive Filters

Each model acknowledged that its own training data shaped its explanations, and several explicitly noted limitations in their perspectives. The models recognized that their responses were influenced by Western educational frameworks, scholarship from research-intensive institutions, and student development literature. One model described its framing

as shaped by the biases and blind spots of the textual world I was trained on (Grok, Q5). In addition to these explicit reflections, the interviews revealed consistent genre patterns in AI-generated explanations. These included a balanced and measured tone, normative framing of educational goals, and an implicit assumption that institutional systems can be improved through intervention. Together, these features narrowed the range of interpretations available, reinforcing dominant narratives of student success while muting perspectives that may be less visible in mainstream academic and policy discourse.

## 4.5 Strategies Used to Construct the Concept

Across interviews, the models relied on a shared set of meaning-making strategies, though with differences in emphasis. They defined student success in broad, multidimensional terms and repeatedly centered belonging, connection, and psychological safety. Success was framed as individualized and purpose-driven, with the models emphasizing that students arrive with different backgrounds, goals, and needs. At the same time, the models placed responsibility on institutions to create supportive environments through advising, mentoring, financial support, mental health resources, inclusive pedagogy, and meaningful learning opportunities. As one model stated, Relationships with mentors, peers, and instructors shape whether students feel capable and supported (Claude, Q2). The models also surfaced tensions, particularly between institutional metrics and holistic ideals, and between student agency and structural barriers. In several cases, the models reflected on how their own training data shaped their reasoning, adding a meta-layer to their explanations of success. This reflexive element was not uniform across models but appeared often enough to suggest that awareness of interpretive limits is itself part of how AI systems construct meaning.

## 4.6 Consequences of These Constructions

Taken together, the models produced a narrative of student success that is expansive, inclusive, and oriented toward development and flourishing. This narrative aligns closely with mainstream academic discourse, particularly frameworks emphasizing belonging, engagement, and holistic development. At the same time, the models incorporated elements of critique by acknowledging contradictions and structural inequities that shape student experiences. One model captured this tension by noting that it critiques narrow credentialist definitions while still relying on graduation and employment outcomes as evidence (Grok, Q6). Although such tensions were recognized, the models generally treated them as challenges that institutions could address, rather than as deeply embedded structural features. This tendency suggests that AI-generated narratives may soften or stabilize tensions that are more contested in human discourse.

Overall, the findings suggest that generative AI systems do not simply describe student success but participate in shaping how it is understood. By synthesizing dominant narratives and presenting them in coherent and accessible forms, these systems may influence how success is conceptualized in practice. This is particularly relevant in fields such as engineering education, where definitions of success inform advising decisions, curricular structures, and student support strategies.

# Grounded Theory

The final grounded theory explains how generative AI models construct the meaning of student success. Generative AI constructs student success as holistic human development shaped by the interaction of dominant higher education discourse, contemporary institutional contexts, interpretive filters from training data, and rhetorical strategies that emphasize multidimensional growth, belonging, purpose, and institutional responsibility. This construction reflects many strengths of holistic student success literature, but it also inherits related blind spots. The models reproduce familiar tensions in higher education, including the difficulty of balancing structural pressures with developmental ideals and reconciling individual agency with persistent inequities. These tensions appear not as contradictions to be resolved, but as conditions to be managed within existing institutional frameworks.

The theory also suggests that generative AI models are not neutral interpreters of educational concepts. Instead, they act as narrative participants that synthesize and stabilize particular definitions of success based on patterns embedded

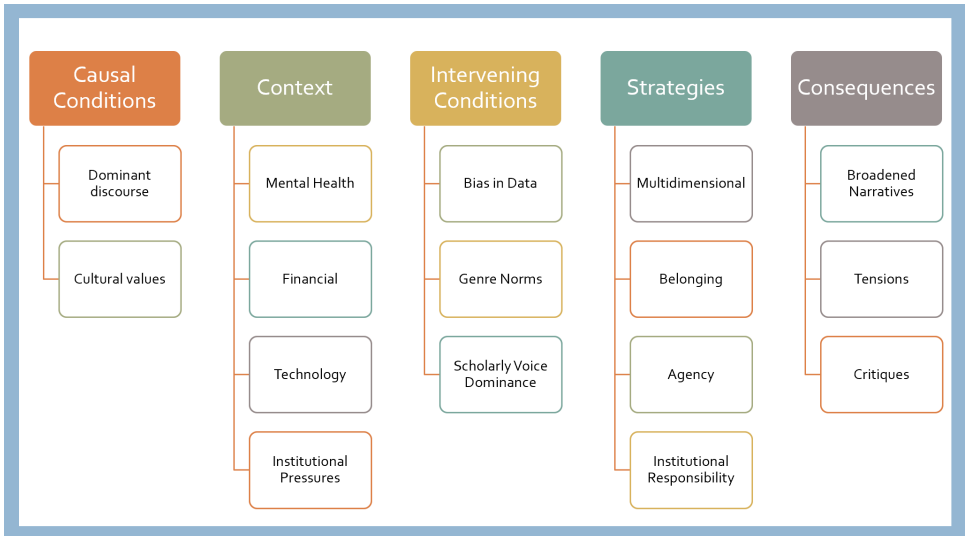


Figure 1: Axial coding framework depicting the analytic categories used to organize relationships among conditions, actions, and consequences in generative AI narratives of student success.

in their training data. As these systems become more embedded in advising, teaching, and policy work, their representations of student success may influence how institutions define success and how students understand their own academic trajectories.

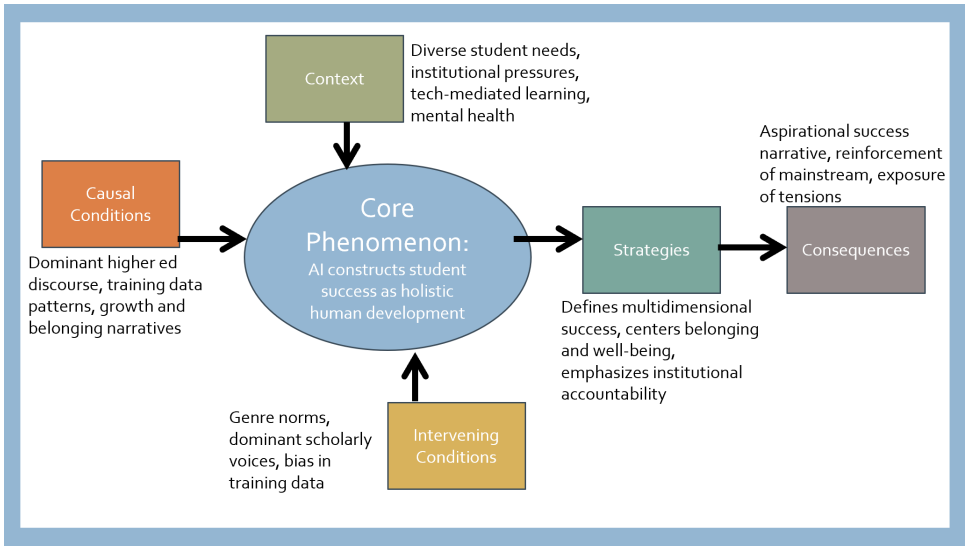


Figure 2: Integrated grounded theory model showing how axial categories converge around the core phenomenon of generative AI constructing student success as holistic human development.

## 5 Implications

The implications of this study extend across higher education practice, research, and the design of AI-enabled educational technologies. In practice, the findings suggest that AI-driven advising and planning tools are likely to reinforce a holistic framing of student success that emphasizes belonging, well-being, purpose, and personal development. This may be beneficial in contexts where success has historically been defined narrowly through academic performance or

labor-market outcomes. At the same time, the results indicate that these narratives often balance individual growth with only partial attention to structural constraints. As a result, institutions that adopt AI-generated explanations without critical reflection may unintentionally amplify messages of resilience and agency while underemphasizing systemic barriers that shape student outcomes.

These dynamics are particularly relevant for engineering education, where definitions of student success are closely tied to structured curricula, prerequisite sequencing, and measurable outcomes such as retention, progression, and degree completion. The findings suggest that AI-generated narratives may introduce broader developmental language into these contexts, potentially reshaping how success is discussed in advising, curricular planning, and student support. However, they may also create tension between holistic definitions of success and the highly structured and outcome-driven nature of many engineering programs. This highlights the need for careful integration of AI tools in ways that acknowledge both developmental and structural dimensions of student success.

For researchers, the study suggests that generative AI may increasingly participate in shaping scholarly language as it becomes integrated into writing, synthesis, and analysis processes. Because AI models synthesize dominant discourse rather than generating entirely new conceptual frameworks, their outputs may reinforce prevailing assumptions while making alternative perspectives less visible. Understanding how AI constructs concepts like student success can help researchers remain attentive to which ideas are being amplified, which are being simplified, and which may be omitted altogether.

For policymakers and developers, the findings highlight the importance of transparency and intentional design in AI systems used in educational contexts. Training data and model design influence how concepts such as student success are framed, and these framings may in turn shape institutional messaging and decision-making. The results suggest that AI systems function not only as tools for generating information, but as participants in meaning-making processes. Designing systems that surface multiple perspectives, acknowledge uncertainty, and make underlying assumptions more visible may help mitigate the risk of reinforcing narrow or incomplete narratives of success.

## 6 Conclusions

This study examined how generative AI models construct the meaning of student success in higher education using grounded theory methods. Across five interviews, a strong recurring pattern emerged in which models framed student success as holistic human development, emphasizing growth, belonging, purpose, and adaptability. At the same time, the analysis revealed meaningful variation in how models emphasized structural conditions, individual agency, and the role of traditional academic metrics. These findings suggest that AI-generated definitions of student success are not uniform, but instead reflect patterned variations within a shared higher education discourse. The grounded theory developed in this study explains this process as one in which generative AI constructs student success through the interaction of dominant discourse, institutional context, training data, and rhetorical strategies. In doing so, AI systems act less as neutral interpreters and more as narrative participants that synthesize and stabilize particular understandings of success. This construction reflects both the strengths and limitations of existing student success frameworks, reproducing their emphasis on holistic development while also inheriting their tensions and blind spots.

As generative AI becomes more embedded in advising, teaching, and policy processes, these narrative patterns may influence how institutions define success and how students interpret their own academic trajectories. This is especially relevant in engineering education, where definitions of success shape curricular pathways, advising decisions, and persistence outcomes. The findings suggest that AI has the potential to both broaden and constrain how success is conceptualized, depending on how its outputs are interpreted and applied. Continued research is needed to examine how AI-generated narratives interact with human decision-making and how these interactions may shape future understandings of student success in practice.

## References


[1] National commission for academic accreditation amp; assessment standards for quality assurance and accreditation of higher education institutions. 2015.

[2] David F Labaree. *A perfect mess: The unlikely ascendancy of American higher education*. University of Chicago Press, 2020.

[3] Janet Schulenberg et al. What is student success and who is responsible? *The Mentor: Innovative Scholarship on Academic Advising*, 25:2–15, 2023.

[4] Roger L Geiger. *To advance knowledge: The growth of American research universities, 1900-1940*. Routledge, 2017.

[5] Jonathan Zimmerman. *The amateur hour: A history of college teaching in America*. Johns Hopkins University Press, 2020.

[6] Maryrose Weatherton and Elisabeth E Schussler. Success for all? a call to re-examine how student success is defined in higher education. *CBELife Sciences Education*, 20(1):es3, 2021.

[7] Vincent Tinto. *Leaving college: Rethinking the causes and cures of student attrition*. University of Chicago press, 2012.

[8] George D Kuh, Ty M Cruce, Rick Shoup, Jillian Kinzie, and Robert M Gonyea. Unmasking the effects of student engagement on first-year college grades and persistence. *The journal of higher education*, 79(5):540–563, 2008.

[9] Alexander W Astin. Student involvement: A developmental theory for higher education. In *College student development and academic life*, pages 251–262. Routledge, 2014.

[10] Anjali Sundararaman, Kathy Baek, Matthew Gee, Audrey Weber, Monica A Corzo, Jacob Dinardi, Cara J Connor, Kathryn Nesbit, Elaine Musselman, Linda M Platas, et al. More than grades: How students define holistic student success. *Journal of Postsecondary Student Success*, 4(2):24–47, 2025.

[11] Dhafar Basim Ali and Parveenbanu M Malek. Holistic learning: Exploring the role of emotional intelligence in student success. *International Journal of Education Humanities and Social Science*, 08:53–61, 01 2025.

[12] Megan Louise Pedler, Royce Willis, and Johanna Elizabeth Nieuwoudt. A sense of belonging at university: Student retention, motivation and enjoyment. *Journal of further and Higher Education*, 46(3):397–408, 2022.

[13] Lisa M Reyes-Walsh, Megan Lee, Susan Dyess, Rachel E Myers, Susan Beidler, Jennifer Willet, Alexis Whiddon, Maureen Garringer, and Kandice Porter. Harmonizing perspectives: An interdisciplinary approach to developing a multidimensional theoretical framework of self-care for student success. *Journal of Higher Education Theory & Practice*, 24(11), 2024.

[14] Zakaria Alj and Anas Bouayad. Multidimensional determinants of academic performance: Insights from undergraduate students in moroccan universities. *JOTSE: Journal of Technology and Science Education*, 14(2):607–621, 2024.

[15] Juan Dempere, Kennedy Modugu, Allam Hesham, and Lakshmana Kumar Ramasamy. The impact of chatgpt on higher education. In *Frontiers in Education*, volume 8, page 1206936. Frontiers Media SA, 2023.

[16] Hui-Chun Chu, Gwo-Haur Hwang, Yun-Fang Tu, and Kai-Hsiang Yang. Roles and research trends of artificial intelligence in higher education: A systematic review of the top 50 most-cited articles. *Australasian Journal of Educational Technology*, 38(3):22–42, 2022.

[17] Inara Scott. Rising to meet the challenge of generative ai. *Journal of Legal Studies Education*, 41(1), 2024.

[18] Hamid Mattiello, Diana Mattiello, and Volker Wittberg. Driving sex-gender equity and ethical integration in edu x. 0: Harnessing genai for human-centric innovation, responsibility, and industry x. 0 (when x. 0= 5.0). In *2025 IEEE Global Engineering Education Conference (EDUCON)*, pages 1–10. IEEE, 2025.

[19] Mohammed Hasan Ali Al-Abyadh and Hani Abdel Hafeez Abdel Azeem. Academic achievement: Influences of university students self-management and perceived self-efficacy. *Journal of Intelligence*, 10(3):55, 2022.