Making Generative AI Expectations Visible: Extending the TILT Framework for Transparent Assignment Design

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Abstract
Instructor practices in higher education for setting assignment-level expectations have been meaningfully shaped by the Transparency in Learning and Teaching (TILT) Framework (Winkelmes, 2023a, 2023b) which encourages the development of clear guidance for students around each assignment's purpose, core tasks, and assessment criteria. The TILT Framework has been widely adopted by faculty and instructional support professionals (Winkelmes et al., n.d.) as a methodology that can align instructor expectations with student understanding and effort on a given assignment. The line of applied research contained in this article extends the existing TILT model to provide students with transparent genAI guidance. The authors introduce their TILTai Framework that is inclusive of instructors' intentions surrounding genAI use. They then describe a pilot faculty development model that was implemented using their TILTai Framework (Wiss et al., 2025). The authors introduce a new and preliminarily validated instrument for measuring student perceptions of a particular assignment's transparency related to genAI (the TILTai Scale) and describe a research study conducted across a series of graduate-level courses in which the instrument was piloted. This study also considered the influence that student perceptions of genAI transparency may have on commonly held concerns regarding genAI (Singer-Freeman et al., 2025). Results from the TILTai Scale, perceptions of genAI transparency as measured by the TILTai Scale, their influence on commonly held student concerns, and the efficacy and potential future applications of the TILTai Framework are discussed.

Keywords: TILTai Framework, genAI transparency, generative artificial intelligence, transparent assignment design, scale-based measurement

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Background

The role of generative artificial intelligence (genAI) in the teaching and learning process has rapidly become one of academia's most profound opportunities and challenges of the post-pandemic era. In response to the release and widespread adoption of publicly available large language models (LLMs) starting in late 2022, professionals across the education sector have wrestled with this technology's potential influence on student learning and attainment of educational goals and competencies. Several recent surveys have reported that university students' perceptions of genAI vary based on factors such as educational level of the student, topical area of a course, type of course activity being considered, student comfort with genAI tools, course learning objectives, and sequence of the course within the academic program (Chirikov et al., 2026., Watson & Rainie, 2026, Singer-Freeman et al., 2025). Of particular interest to the authors here is the shared finding that student views are strongly influenced by the types of guidance faculty provide regarding their incorporation or prohibition of genAI use for academic work.

Instructor practices in higher education for setting assignment-level expectations have been meaningfully shaped by the Transparency in Learning and Teaching (TILT) model (Winkelmes, 2023a, 2023b, n.d.) which encourages the development of clear guidance for students around each assignment's purpose, core tasks, and assessment criteria. The TILT Framework has been widely adopted by faculty and instructional support professionals as a methodology that can align instructor expectations with student understanding and effort on a given assignment.

In this study, the authors expand the TILT Framework to be inclusive of genAI's potential role in assignment completion and then describe a corresponding faculty development program based on this expanded framework. They also introduce, validate, and pilot a new instrument across several graduate courses to measure student perceptions of how transparently genAI related assignment guidelines were communicated. Finally, the authors explore how transparent expectations of genAI use may address common student concerns about this technology and its role in their coursework.

Review of Literature

As a foundational framework for instructional design, Anderson and Krathwohl (2001) classify learning objectives by intersecting types of knowledge with levels of cognitive complexity. This structure allows educators to scaffold learning progressively throughout a course of study, systematically building from foundational mechanics to the highest order of learning: creating. As students progress, foundational skills acquired at earlier stages support creative and evaluative work in later stages. The widespread availability of genAI tools in higher education challenges instructors to ensure these tools support, rather than disrupt, student development towards scholarly competence and the creation of new knowledge and solutions. Of particular concern to some faculty is the possibility that students will fail to develop foundational skills if they offload that work to genAI. This might result in impaired ability to tackle the creative and evaluative work required in advanced courses and career paths.

Nonetheless, when faculty apply thoughtful design principles to the inclusion of genAI into student assignments, genAI can encourage students to clarify reasoning, explore alternatives, and reflect on learning. One promising approach may be the application of collaborative learning principles to genAI-assisted assignments (Singer-Freeman, 2025; Singer-Freeman et al., 2026) An emerging body of research suggests that poorly designed genAI-assisted learning is associated with an illusion of competence (Barba, 2025) that can result in reductions in critical thinking (Gerlich, 2025) or creativity (Habib et al., 2024). Additionally, even the most thoughtfully designed assignments will only be effective if students follow the guidelines for genAI use and, where required, abstinence. There is some evidence that many students use genAI in ways that are not aligned with the intent of their faculty, leading to "overreliance on AI, diminished metacognitive engagement, and ethical dilemmas related to plagiarism and authorship" (Sanz-Tejeda et al., 2026, p. 1).

A recognized framework which may assist in navigating the integration of genAI is Transparency in Learning and Teaching (TILT). Developed in 2009, the TILT Framework is an evidence-based approach that aims to provide greater transparency in assignment design and instructions to foster higher education learning and equity (Winkelmes, 2023; Winkelmes et al., n.d.). A substantial body of research supports the efficacy of the TILT method to enhance educational equity and heighten metacognitive awareness (Brown, 2025; Brown et al., 2024; Winkelmes, 2023a; Winkelmes et al., 2016). The framework aims to provide clarity for students through three pillars of effective assignment design: the Purpose, the Task, and the Criteria.

The Purpose pillar provides a series of questions that guide instructors to clearly explain the assignment's learning objectives and how the assignment relates more broadly to the objectives of the course. When students read the purpose section of a TILT-influenced assignment, they will emerge with a clear idea of why they should engage in the work. The Task pillar supports faculty as they create a step-by-step outline of what the assignment entails, including recommended task sequence, opportunities for feedback, types of scaffolding, and moments for student reflection (when appropriate). When students read the Task section of a TILT assignment, they should understand clearly how to approach the work. Finally, the Criteria pillar provides metrics for evaluation and grading (ideally, a rubric and exemplary work samples), explicitly detailing how a student can succeed in the assignment.

The application of the TILT model to assignments that incorporate genAI has the potential to promote learning, reduce student anxiety, and increase faculty confidence. Work by Friberg-Fort and Giovagnoli (2026), Brown (2024) and Brown et al. (2025) suggests that the TILT Framework can be used by faculty members considering AI-enhanced assignments to provide "opportunities to connect concepts to real-world applications and to reflect on this educational process" (Brown et al., 2025, p.197). Conversely, both faculty and students have expressed emotional burden and uncertainty around appropriate uses of genAI in academic work (Corbin et al., 2025; Singer-Freeman et al., 2025). Gonsalves (2026) posits that as institutions create increasingly complicated rules around appropriate genAI use, students experience increasing uncertainty about how they should proceed. Along similar lines, Orfanidis (2025) notes that in many cases where instructors establish their own expectations and boundaries for AI use, students may encounter inconsistent policies, ethical perspectives, and enforcement

practices across a program. This may place students in the position of having to "interpret not only central policy but its multiple local instantiations, an ongoing act of translation that shifts the work of resolving contradiction onto those least equipped to do so" (Gonsalves, 2026, p.5). She argues that this creates an interpretive overload for students that makes effective academic learning more difficult. Gonsalves suggests that, to reduce this burden, faculty must consider the work that is required of students to understand and comply with rules for genAI use and treat clear communication about genAI use in assignments as an essential component of ethical assessment. She goes on to suggest that guidance should go beyond descriptions of permitted and forbidden uses of genAI to provide stage-based permissions in which the policies are attached directly to the expected workflow students will undertake. Similarly, Corbin et al. (2025) argue for eliminating ambiguity and increasing the clarity of assignment policies and expectations as they relate to student AI use. The TILT Framework's Task and Criteria pillars offer potentially useful ways to create assignments that will reduce students' interpretive load by explicitly linking policies to student workflow and grading criteria.

There is evidence that some educationally harmful student behaviors related to the use of genAI could be addressed through increased clarity around the purpose, task, and criteria in genAI-supported work. For example, Cotelli Kureth et al. (2025) found that students who reported incomplete disclosure of genAI use explained their decisions as stemming primarily from either a lack of clarity around the professor's expectations for disclosure or the belief that full disclosure was not important. These authors increased the completeness and quality of students' self-reported disclosure of genAI use by making this a part of the assignment grade. It is possible, however, that grading genAI disclosure may have increased false declarations of full disclosure rather than actual disclosure.

An alternate approach to the challenge of academic integrity violations may be improving assignment explanations of purpose and task. Explicitly defining the purpose of an assignment underscores the specific cognitive skills under development, which helps students understand exactly what intellectual growth they compromise by completely outsourcing their thinking to automated tools. Clarifying the structural steps of the task establishes definitive boundaries for permissible technological assistance, thereby reframing genAI as a supportive brainstorming or editing aid rather than an unauthorized shortcut. Supporting this possibility, Du and He (2026) reported that perceptions of fairness, teacher support, and organizational support were associated with increased willingness to disclose genAI use, but perceived uncertainty reduced full disclosure.

Without a coherent genAI policy, students are left to navigate genAI usage on their own, with students becoming increasingly comfortable doing so (Parker et al., 2026), which in turn can create unintentional sabotage of long-term personal development and success and the process of learning how to learn (Yee et al., 2025). Additionally, the use of genAI without clear policy articulation can create or contribute to a murky environment for academic integrity standards in higher education. Recent studies have explored the ways in which assignments, designed to provide guidance on AI usage, disclosure, and documentation, can lead to positive results in student learning (Lipuma et al., 2025). Calls for additional genAI use transparency from academic programs and instructors have been made by voices across the higher education space (Damm & Eaton, 2026), describing the need that "Transparency should be emphasized around

acceptable genAI use, with faculty encouraged to clearly communicate expectations in their syllabi" (Lewis Miller et al., 2025, p, 23).

The review of the literature indicated limited scholarship related to scale-based tools to measure genAI transparency. The strongest example is provided by Furze et al. (2024) and their AI Assessment Scale (AIAS). The AIAS is not a validated instrument but rather provides a five-level scale that faculty can use to establish and then communicate the level of acceptable AI use, from "No AI" to "Full AI" use (p. 5-6). Use of this scale was reported to improve integration of genAI in courses and was also reported to help reduce misuse. This scale's intended purpose aligns with the Task dimension of the TILT Framework. The authors were unable to locate a comprehensive tool, framework, or scale that fully addresses all three dimensions of TILT regarding AI use in the literature.

Methods

This study measured student perceptions of genAI transparency, and that transparency's corresponding influence on known student concerns with genAI, after exposure to a set of assignment instructions developed using the newly conceptualized TILTai Framework.

Research Questions

- RQ1: What are students' perceptions of genAI transparency after being given a specific set of assignment instructions that were informed by the TILTai Framework?

- RQ2: What is the relationship between students' levels of perceived genAI transparency and known factors relating to the emotional burden and uncertainty around appropriate uses of genAI in a particular assignment?

- RQ3: What differences in perceived genAI transparency might exist between different types of assignments informed by the TILTai Framework?

Introducing the TILTai Framework

In response to the challenges outlined in the review of literature, the authors have extended the Transparency in Teaching and Learning Framework to be inclusive of genAI considerations. Named the TILTai Framework (Wiss et al., 2025), this framework was designed to supplement overall assignment design and articulation, with a consideration for genAI's allowed and recommended usage (see Figure 1). Like the original TILT Framework, this adaptation utilizes the same three categories of Purpose, Task, and Criteria, but with an explicit focus on genAI within each.

Table 1

The TILTai Framework

TILTai Framework	General TILT Principles
Purpose •Provide clarity on AI's intended use and how it may support/detract from learning goals •Provide clarity on why AI's use is curtailed or prohibited	**Purpose** •Clearly explain *why* students are doing the assignment •Specifies how it connects to learning goals •Shines a light on real-world applications
Task •Provide specific guidance on use of AI to support application of knowledge and skills •Provide specific guidance on where it should be avoided	**Task** •Spell out *what* students are expected to do. •Where possible provide a workflow for successful completion •Provide formative feedback, scaffolds, and reflective opportunities where appropriate
Criteria •Define how AI use will be judged •Set expectations on if/how AI output should be integrated into my deliverable(s) for this assignment •Set policies on how AI use should be indicated in submitted work	**Criteria** •Make explicit *how* the work will be evaluated, •Consider providing a rubric •Consider providing access to successful exemplars

Note: Author's original Transparency in Teaching & Learning with genAI considerations and the TILT framework (Wiss et al., 2025, adapted from Winkelmes et al., n.d.

This TILTai Framework utilizes the same pillars as the original TILT model it is built upon. The Purpose pillar focuses on describing why genAI may help or hinder achievement of learning objectives. The Task pillar focuses on the specific ways in which genAI can be used, as well as areas in which it should be avoided. Finally, the Criteria pillar describes how AI use will be assessed and/or judged and provides expectations on citing AI or indicating its usage on the assignment in question.

Pilot Faculty Development Model

The TILTai Framework was used by the authors to create a pilot faculty development program intended to guide participants through the process of creating more transparent assignment-level guidance regarding genAI use within a large school of public health. The pilot program generated high levels of interest, with over 80 full and part-time faculty registrants. Over the course of two one-hour sessions, faculty were introduced to many of the challenges that students encounter with genAI in their coursework, introduced to the principles outlined in the TILTai Framework, and invited to critically evaluate the guidance they were currently providing their students regarding genAI at both the course and individual assignment level.

As an applied culminating activity, participants engaged in a scaffolded workshop activity where they enhanced the directions in an existing assignment to be more inclusive of

genAI's role in the Purpose, Task(s), and Criteria for success on that assignment. Each component of the TILTai Framework was demonstrated by workshop facilitators during the workshop activity, where they presented their own examples of TILTai-influenced assignment guidance.

The applied portions of this workshop took place in small group breakout rooms and culminated in a general report-out to all participants in the main session. Faculty participants were encouraged to continue this work after the two-part series and then deploy that assignment with enhanced genAI guidance in the following academic term. This study is anchored in a set of eight separate courses where faculty made these transparency updates to one or more assignments using the TILTai framework.

Initial Creation of the TILTai Scale

The authors note that an early version of the scale was shared as a part of the faculty workshop activity previously described as a general survey tool. Positive participant reaction to the prototype led the authors to engage in a full study to both explore the effects of the TILTai Framework on student perceptions of genAI's role on assignments, and to validate the TILTai Scale as a psychometric instrument that can be used to measure student perceptions of transparency.

Measurement

To measure students' perceptions of transparency related to AI's use on a particular assignment, a new multi-factor instrument was developed utilizing the previously described TILTai principles. This work was informed throughout by foundational work on assignment transparency by Winkelmes et al. (n.d.). Named the TILTai Scale, this instrument consists of 11 items mapped to the three distinct factors in the TILTai Framework, those being: Purpose, Task, and Criteria.

Scale-based items were extrapolated from the TILTai Framework (See Table 1) and its three pillars and treated as discrete factors. For example, the principle "Provide clarity on AI's intended use and how it may support/detract from learning goals" in the Purpose pillar was used to create two separate items in the TILTai Scale ("I understand how AI's intended use on this assignment could support my learning" and "I understand how AI's prohibited use could potentially detract from my learning") with expectations that it would load on the Purpose factor.

Content and Construct Validity

The newly developed TILTai Scale and its individual items were reviewed by a team of five scholarly practitioners who had received previous training on transparent assignment design and were designated as "Master Teachers" by their school's internal fellowship program. The review team provided comments on both item and construct validity. Input from this team was used to finalize the instrument before use in the study. ***Additional Non-Scale Based Items***

Additionally, the authors wished to understand the relationship between assignment transparency as described by TILTai and emotional burden and uncertainty regarding genAI use in academic work as described by Singer-Freeman et al. (2025). A set of eight Likert items were created based on findings from this work, asking participants to share their perceived levels of uncertainty and discomfort as compared to other assignments they had recently encountered. For

example, “Compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident my professor will be aware of my intended use(s) of AI.”

Instrumentation

All items in the TILTai Scale utilized a seven-point Likert scale and asked participants to rate their level of agreement with a series of items, where 1 = Strongly Disagree and 7 = Strongly Agree. The newly developed instrument contained a total of eleven items (Table 3).

The instrument was first administered online to students who chose to opt-in to the study. The online survey platform first captured general demographic details, including identifying the course and assignment the student participant was currently involved with. On a new screen, students were then asked to complete the 11-item TILTai Scale. On the following screen, students were asked to respond to the set of eight non-scale-based items. The final screen contained three open-ended and optional qualitative questions that captured additional student perceptions related to genAI’s use in academic coursework.

Procedure

Students were first presented with a set of assignment directions that had been modified using the TILTai Framework. Within one week of receiving the assignment, these same students received an email invitation to participate in a brief study regarding their perceptions of the assignment and its clarity regarding genAI use. Both the email invitation and the online survey tool indicated that participation was fully optional and would have no impact on grading or other evaluation of that student. This study was conducted under GW IRB# NCR203171.

Data Analysis and Results

Participants

Participants (N = 70) were students enrolled in one of eight separate master’s level public health and health administration courses. In all courses, the instructor had participated in the previously described TILTai-based faculty development program, and as a result, had offered an assignment that had been redesigned using the TILTai Framework. These assignments were classified into three types for the purposes of this study: Program Planning and Evaluation, Quantitative Skills, and Capstone Project. The number of participants from each course type is located in Table 2.

Exploratory Factor Analysis (EFA)

We began the EFA process with a Kaiser-Meyer-Olkin (KMO) test to determine the suitability of factor analysis. The KMO value of .70 indicated an acceptable sample. Further, the Bartlett’s Test of Sphericity was significant ($p < .001$), indicating significant correlations between the scale items.

Principal axis factoring with an Oblimin rotation identified three factors with eigenvalues greater than one, and which combined explained 74.52% of the variance. Factor 1 had an eigenvalue of 4.61 and explained 41.86% of the variance. Factor 2 had an eigenvalue of 2.27 and

explained 20.66% of the variance. Factor 3 had an eigenvalue of 1.32 and explained 11.99% of the variance. Factor loadings are in Table 4. Communalities ranged from .55 to .99, indicating the variance explained by the factors was acceptable.

The items did not load directly on the assumed factors of Purpose, Task, and Criteria as the authors intended when developing these three scales. After review of the factor analysis, it revealed that the items loaded on to three discrete factors that closely aligned with TILT principles.

Items 1 and 2 loaded onto a discrete factor that describes Purpose in the support of learning; we named this factor Purpose–Support Learning. Items 3, 4, and 5 also loaded onto the TILT concept of Purpose, this time measuring Purpose in terms of student understanding of future roles and acceptance of AI's role in the assignment; we named this factor Purpose–Role and Future Success. Finally, items 6 through 11 loaded together onto a single factor related to the TILT principles of both Task and Criteria; we named this factor Task Criteria. These items were combined into subscales for subsequent analysis. All items in the TILTai Scale loaded onto one of the three factors with factor loadings of .64 or greater.

We evaluated the reliability of the TILTai scale and its subscales. The full scale showed good reliability, $\alpha = .86$. Each subscale also showed acceptable-to-high reliability with Purpose–Support Learning, $\alpha = .70$, Purpose–Role and Future Success, $\alpha = .90$, and Task Criteria, $\alpha = .87$.

TILTai Scale Scores

The descriptive statistics for the TILTai scale can be found in Table 3. Participant average scores across all items ranged from slightly agree ($M = 4.93$, Item 10) to agree ($M = 6.01$, Item 7). No significant differences were found between the assignment category and the three TILTai Scale factors of Purpose–Support–Learning ($p = .93$), Purpose–Role–and Future Success ($p = .09$), and Task Criteria ($p = .37$).

Regression Analysis

We next explored the TILTai subscales as predictors of eight items intended to assess known concerns held by students related to use of genAI (Singer-Freeman et al., 2025). These eight items and their descriptive statistics can be found in Table 5. We conducted a series of eight linear regression analyses, where the three TILTai subscales were the predictor variables, and the individual genAI challenge items were the outcome variables. Seven of the eight models were significant, with the only genAI challenges item not significantly predicted by the TILTai subscales being "this assignment makes me interested in one or more specific applications of AI."

The model and predictor statistics can be found in Table 6. General results of note include that the Purpose–Role and Future Success subscale was a significant predictor in all but two of the models, those being for the genAI challenges items "this assignment makes me worry less that other students who use AI will have an unfair advantage," and "this assignment makes me worry less that I will be accused of plagiarism related to AI use." Task Criteria was also a significant predictor in all but two of the models, those being for the genAI challenges items "this assignment makes me interested in one or more specific applications of AI," and "this

assignment makes me better understand how AI might be used to support my learning going forward." Finally, the Purpose–Support Learning subscale was not a significant predictor in any of the models.

The strongest relationship was found between the genAI challenges item "compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident when it is acceptable to use AI," R^2=.52, F(3, 59)=21.05, p<.001. Both Purpose–Role and Future Success (β=.60, p<.001) and Task Criteria (β=.22, p=.03) were significant predictors, while Purpose–Support Learning (β=.03, p=.79) was not.

Another strong relationship included the genAI challenges item "compared to other assignments I have completed over the past three semesters, this assignment makes me worry less that other students who use AI will have an unfair advantage," R^2=.42, F(3, 59)=13.94, p<.001. Only Task Criteria was a significant predictor (β=.53, p<.001), while Purpose–Role and Future Success (β=.16, p=.17) and Purpose–Support Learning (β=.09, p=.41) were not.

A third strong relationship included the genAI challenges item "compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident that my efforts will result in the grade I expect on this assignment," R^2=.40, F(3, 59)=13.27, p<.001. Both Task Criteria (β=.26, p=.02) and Purpose–Role and Future Success (β=.51, p<.001) were significant predictors, while Purpose–Support Learning (β=-.03, p=.82) was not.

Table 2

Participants by Course Type

Course Type	N
Program Planning and Evaluation	31
Quantitative Skills	21
Capstone Project	18

Table 3

TILTai Scale Descriptive Statistics

Item #	Item	Mean	SD
1	I understand how AI's intended use on this assignment could support my learning	5.39	1.70
2	I understand how AI's prohibited use could potentially detract from my learning	5.59	1.62
3	I understand how this assignment—including any required or recommended use of AI—can prepare me for future success	5.40	1.51

4	I understand how this assignment—including any required or recommended use of AI—can prepare me to succeed in my future profession.	5.37	1.49
5	I am accepting of AI's recommended role in this assignment.	5.29	1.62
6	I understand what tools and technologies are allowed when completing this assignment.	5.93	1.49
7	I understand what tools and technologies are prohibited when completing this assignment.	6.01	1.25
8	I was provided specific guidance on how I should be using AI to support my work on this assignment.	5.44	1.70
9	It is clear how AI output should be integrated into my deliverable(s) for this assignment.	5.04	1.81
10	It is clear how I should indicate AI's use in my work on this assignment.	4.93	2.04
11	If I choose to use AI on this assignment, I understand how it will be judged.	5.04	1.88

Table 4

TILT-AI Factor Loadings

Factor Name	Item #	Item	Factor 1	Factor 2	Factor 3
Purpose - Support Learning	1	I understand how AI's intended use on this assignment could support my learning	.33	.53	.67
	2	I understand how AI's prohibited use could potentially detract from my learning	.23	.12	.74
Purpose - Role and Future Success	3	I understand how this assignment—including any required or recommended use of AI—can prepare me for future success	.20	.87	.18
	4	I understand how this assignment - including any required or recommended use of AI - can prepare me to succeed in my future profession.	.18	.99	.11
	5	I am accepting of AI's recommended role in this assignment.	.42	.73	.26
Task Criteria	6	I understand what tools and technologies are allowed when completing this assignment.	.64	-.07	.51
	7	I understand what tools and technologies are prohibited when completing this assignment.	.64	.04	.60

	8	I was provided specific guidance on how I should be using AI to support my work on this assignment.	.78	.16	.27
	9	It is clear how AI output should be integrated into my deliverable(s) for this assignment.	.81	.28	.20
	10	It is clear how I should indicate AI's use in my work on this assignment.	.77	.22	.26
	11	If I choose to use AI on this assignment, I understand how it will be judged.	.78	.22	.27

Table 5

Participant Self-Reported GenAI Concerns Descriptive Statistics

Self-Reported Confidence	Mean	SD
Compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident when it is acceptable to use AI	4.95	1.53
Compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident my professor will be aware of my intended use(s) of AI	4.90	1.65
Compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident my professor will approve of my intended use(s) of AI for this assignment	4.84	1.70
Compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident that my efforts will result in the grade I expect on this assignment	5.03	1.45
Compared to other assignments I have completed over the past three semesters, this assignment makes me worry less that other students who use AI will have an unfair advantage	4.29	1.79
Compared to other assignments I have completed over the past three semesters, this assignment makes me worry less that I will be accused of plagiarism related to AI use	4.38	1.71
Compared to other assignments I have completed over the past three semesters, this assignment makes me interested in one or more specific applications of AI	4.57	1.77
Compared to other assignments I have completed over the past three semesters, this assignment makes me better understand how AI might be used to support my learning going forward	5.19	1.56

Table 6

Multiple Regression Analyses, TILTai Subscales as Predictors of Concern Items

Outcome	Model R^2	Model sig.	Predictor	Standard-ized β	Predictor sig.
Compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident when it is acceptable to use AI	.52	<.001	Purpose–Support Learning	.03	.79
			Purpose–Role and Future Success	.60	<.001
			Task Criteria	.22	.03
Compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident my professor will be aware of my intended use(s) of AI	.37	<.001	Purpose–Support Learning	.14	.27
			Purpose–Role and Future Success	.25	.04
			Task Criteria	.39	.001
Compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident my professor will approve of my intended use(s) of AI for this assignment	.37	<.001	Purpose–Support Learning	.14	.44
			Purpose–Role and Future Success	.37	.003
			Task Criteria	.31	.008
Compared to other assignments I have completed over the past three semesters, this assignment makes me feel more confident that my efforts will result in the grade I expect on this assignment	.40	<.001	Purpose–Support Learning	-.03	.82
			Purpose–Role and Future Success	.51	<.001
			Task Criteria	.26	.02
Compared to other assignments I have completed over the past three semesters, this assignment makes me worry less that other students who use AI will have an unfair advantage	.42	<.001	Purpose–Support Learning	.09	.41
			Purpose–Role and Future Success	.16	.17
			Task Criteria	.53	<.001
Compared to other assignments I have completed over the past three semesters, this assignment makes me worry less that I will be accused of plagiarism related to AI use	.18	.007	Purpose–Support Learning	-.05	.74
			Purpose–Role and Future Success	.19	.16
			Task Criteria	.35	.01

Compared to other assignments I have completed over the past three semesters, this assignment makes me interested in one or more specific applications of AI	.09	.12	Purpose–Support Learning	-.03	.82
			Purpose–Role and Future Success	.33	.02
			Task Criteria	-.04	.78
Compared to other assignments I have completed over the past three semesters, this assignment makes me better understand how AI might be used to support my learning going forward	.21	.003	Purpose–Support Learning	.08	.57
			Purpose–Role and Future Success	.44	.001
			Task Criteria	-.09	.49

Qualitative Procedures

The qualitative data comprised participant responses to three open-ended survey questions, which asked 1) what students had learned about AI that they could apply to their future work, 2) what additional guidance from the instructor would have helped them understand AI's role in the assignment, and 3) what worries they still held about AI's use. In total, 38 sets of participant responses were analyzed. These responses were analyzed using a categorical coding approach (Maxwell, 2009). This approach was chosen to foreground internal validity and contextual understanding where possible in the data (Huberman & Miles, 2002). The qualitative analysis below was conducted independently of the quantitative results. Participant responses were examined one item at a time and coded using an open coding approach to assign meaningful categories to groupings of participant responses, with related responses grouped before a categorical cluster was assigned to identify patterns (Saldaña, 2011). Throughout, the intent was to base each resulting category on the specific responses and participant voices. From these clusters coalesced relevant patterns of shared participant perspectives and overarching themes presented below (Richards & Morse, 2012).

Qualitative Results

Participant responses converged into three themes related to the three areas the open-ended items addressed: 1) whether and how students learned from the assignment; 2) the adequacy and direction of the guidance received; and 3) the concerns that remained even when expectations were explicit. Within each theme, responses were grouped into specific shared perspectives. The table below outlines these results with participant quotes drawn from the survey responses, and the prose that follows summarizes each theme in turn.

Table 7

Categories of Themes and Shared Participant Perspectives

Theme	Shared perspective	Participant quotes
Learning about AI from the assignment	Where students did learn about AI from the assignment, they described learning about AI as a tool.	"AI is a tool for streamlining tasks. Should be used as an aid to learn and increase productivity. Autonomy should still remain and critical thinking within ourselves. It is inevitable for everyone to use it. Job structuring and demands will change so career outlook I should be concerned of. Will I have a decent paying job in the near future that relates to my field of study, Public health/health informatics" "AI is great at providing basic level research/information (similar to a Wikipedia page) for gaining background knowledge"; "It's a good research tool." "I learned how to use it to debug code." "Using AI to organize research and compile ideas." "I learn AI tools can help to improve my grammar and spelling and research some articles database." "That AI can help me study for exams and grouping articles into categories or themes." "Organization of data"; "How to use ideas to help generate own ideas"; "Using AI to help debug code"
Learning about AI from the assignment	Some students perceived that AI was prohibited or they are resistant to using AI.	"Nothing, we were told not to use AI and only databases" "All my classes generally prohibit, so I don't use it" "I don't use AI"; "I do not like using AI, so it is hard for me to find it to be reliable"
Diverging perspectives on guidance	A prevalent group of students felt the guidance was sufficient or nothing more was needed.	"No, all instructions were clear"; "No, it was clear what was and was not acceptable"; "No - it was clear"; "No, this was the most clear guidance on AI that I have received."
Diverging perspectives on guidance	Some students wanted guidance to be more concrete and clearer demonstrations of AI use.	"Professor should clearly outline tips and tricks for formatting using AI and when it's not appropriate to use AI. Display how academic individuals would appropriately leverage AI in academic work. This helps to set a good example as we know how we could use

		the tool if the instructor themselves can demonstrate their understanding of AI” “There should be live examples to teach how to properly prompt an AI tool before applying it to their work”
Diverging perspectives on guidance	Other students noted potential challenges with implementing further guidance.	“I think maybe specify less of what you can use since there are so many AI opportunities out there. I know it says only Copilot but sometimes people do not listen.” “This is difficult considering the rapidly changing capabilities of AI. I think if I was adept at using it, there are probably capabilities to assist with organization that would help. However, due to the (understandable) restrictions regarding its use, I am hesitant and do not have the opportunity to use it for academia”
Student fears and concerns regarding AI	Students feared being wrongfully accused that their own, self-created/honest work would be flagged as AI generated.	“My main concern is that when I paraphrase or summarize the sources in my assignment—even though I'm using my own words and including in-text citations—it still gets flagged as AI-generated during proofreading.” “I always have the worry at the back of my head that I will be accused of using AI when I did not, which is why I try to cite so vigorously.” “Perhaps an instructor is using an AI detection tool that hallucinates or incorrectly flags an assignment as AI-generated, even when AI was only used as instructed. This raises concerns about the validity of a student’s work and the complications surrounding how much AI was used to help draft a paper versus how much reflects the student's actual effort and understanding”
Student fears and concerns regarding AI	Some students expressed deeper concern/harm due to AI use	“Without proper illustration, both students and teachers will be harmed and distrust between the two widens” “I'm always concerned about accuracy of AI results and suggestions. I still worry that using it, even while following the provided guidelines, is a form of cheating”
Student fears and concerns	In group work, students worried that their grade depended	“Since most of it is group work, we have to rely that other students are not overusing AI. ... our grade’s reliance on other's contribution is concerning”

regarding AI	on peers whose AI use they could not see/control.	"I can also tell when my group partners in other assignments/classes use AI to write and it is quite frustrating because I am putting in the effort to be a strong writer while others are just copying and pasting"

Learning About AI from the Assignment

Describing what they learned about AI from the assignment, students primarily fell into two categories: those who were resistant to using AI and those who learned about its use as a tool. Regarding the former, some had chosen not to use AI for various broader concerns outside the assignment itself, with one stating, "I do not like using AI, so it is hard for me to find it to be reliable." Other students described learning about its varied use as a tool. One described it as reference material, "great at providing basic level research/information (similar to a Wikipedia page) for gaining background knowledge." Other students noted specific tasks, such as learning to "debug code," to "organize research and compile ideas," or that AI "can help me study for exams and grouping articles into categories or themes."

Diverging Perspectives on Guidance

Students were somewhat divided on the nature and sufficiency of the guidance provided, and their perspectives fell into three categories. Primarily, most students felt nothing further was needed because the TILTai-based guidance was already clear. For example, one student described the assignment guidance as "the most clear guidance on AI that I have received." Another set of students wanted the guidance to be made more concrete and/or demonstrated, asking that the instructor provide "specific examples" to show how the tools should be used, and some wanted clearer expectations about how AI use "should be cited." Finally, yet another smaller set of students expressed that more restrictions could be problematic if implemented, with one student suggesting the instructor "specify less of what you can use" and another predicting that further guidance would be "difficult considering the rapidly changing capabilities of AI."

Student Fears and Concerns Regarding AI

Regardless of the clarity of the guidance provided, some students expressed worries that this clearer guidance may not have directly resolved. Generally, a number of students reported no concerns at all. One concern that recurred in several instances in student comments was a fear of being wrongly accused of using AI inappropriately. For instance, one participant explained that even when they used their own words and included citations, "it still gets flagged as AI-generated during proofreading," and another described trying to "cite so vigorously" out of fear of being accused. Others worried about being "monitored 24/7" or felt that, without demonstration, "distrust between the two widens" between students and teachers. A further possible concern arose specifically in group work, where a student described how "our grade's reliance on other's contribution is concerning" when peers' AI use could not be seen or controlled.

Discussion

The TILTai Framework

This study's population of master's level students who encountered TILTai-influenced assignment guidance showed moderately positive to positive levels regarding overall perception of assignment transparency across all three factors measured by the TILTai Scale. This indicated to the authors that the pilot faculty development program supporting the development of AI guidance using the TILTai Framework was generally successful. In analyzing the results from the TILTai Scale, we observed no significant differences between the assignment types included in this study in terms of perceived transparency of assignment guidance. This suggests a broad applicability of the TILTai Framework to different types of academic coursework and assignment guidance. The authors make the general recommendation that TILTai Framework be considered for inclusion in faculty development programming related to transparent assignment design, as the TILTai Framework was designed to be a natural extension of the successful transparent design principles outlined by TILT (Winkelmes et al., n.d.).

TILTai Scale: Future Use

The TILTai Scale was found to be a preliminarily valid and reliable tool to measure student perceptions of assignment transparency as it relates to genAI use. Educators and researchers alike with interest in examining curriculum design in the context of genAI may find this scale an appropriate tool for measuring student perception of genAI transparency within their own scholarship and institutions.

Influence of TILTai

Regression analysis indicated a wealth of relationships between the three factors measured by the TILTai Scale (Purpose-Support Learning, Purpose-Role and Future Success, and Task Criteria) and the ongoing concerns held by students regarding genAI's role in their academic work. The study's strongest overarching finding was that greater transparency in assignment guidance was associated with lower levels of student concern about specific issues related to the academic use of genAI (see Table 5). This suggests that the TILTai Framework as a foundation for assignment design and faculty development can positively move the needle in terms of documented student fears related to genAI in academic work (Singer-Freeman et al., 2025). These general sentiments were echoed in the qualitative comments from students who highlighted the clarity of the TILTai-based assignment guidance compared to other previous assignments they had encountered.

TILTai-based guidance on an assignment's purpose and its role in their future success had a meaningful impact on students' comfort with acceptable AI use. Similarly, student concerns about unfair academic advantage being provided to users of AI also decreased as transparency of task and criteria increased. Finally, student confidence in meeting instructor expectations and receiving a corresponding grade was positively influenced by higher level of transparency regarding the assignment's purpose, specifically regarding AI's role on the assignment and how it could shape future success. These three pronounced examples from the larger set of significant relationships uncovered by the regression analysis further confirm the benefits of TILTai-influenced assignment guidance in addressing a wide range of commonly held student concerns regarding AI's role on individual assignments.

Continued Tensions: Instructor Transparency and Academic Integrity

Beneath the surface of these positive scale scores emerged a qualitative theme and unsettled tension that, even with more robust assignment guidance, students feared potential accusations of academic integrity violations related to genAI use, even in cases where they are attempting to be good actors operating within the assignment parameters. This provides some further insight into the lowest but still positively scored item in the TILTai Scale being clarity on "how to indicate AI's use." A similar tension arose regarding group work, where students worried that peer use of genAI could affect the quality of the group product and its evaluation. In these respects, students appeared less worried about their own genAI use, focused instead on what they cannot control individually.

Given this context, the authors believe that the TILTai Framework can be a useful component in leading a larger mindset and culture shift in higher education that can help to control the impulse to immediately distrust genAI tools and their use. Transparency at all levels, starting with each individual assignment and radiating out to the institutional level, can help create the conditions for organizational change.

Limitations and Recommendations for Further Research

This study was limited to master's-level students, who likely possessed foundational research and writing skills and/or greater exposure to academic writing prior to the widespread introduction of genAI in the academic space. Future studies focusing on the dimensions of TILTai and commonly held student concerns related to genAI use may wish to widen their aperture to include a broader spectrum of students and degree levels and also consider levels of student experience using genAI tools both inside and outside of academic settings. Along similar lines, the authors also note the modest sample size of 70 graduate-level participants from a single academic program as a limitation and encourage further scholarship using this framework and instrument in a wider range of academic settings.

The authors encountered two specific challenges regarding the population for this study. First, participants came from eight different academic courses and therefore encountered one of eight different sets of TILTai-influenced assignment guidance. While no significant differences were found between the categories of assignment, future studies would benefit from a larger pool of participants or engaging with a single TILTai-influenced assignment. Additionally, approximately half of participants in this study chose not to provide substantive qualitative responses to the open-ended questions, which limited the insights gained from this component of the study.

This study was conducted after the introduction of TILTai-influenced assignment guidance, and future studies would be strengthened by utilizing a pre-post design where measurement of student perceptions of transparency takes place before and then after exposure to that TILTai influenced guidance. Additionally, examination of informal instructor guidance, including in-class discussion and commentary, could be considered for additional study.

The authors also recommend further research into students' perception of control as it relates to student team member behaviors with genAI, the use of computer-based tools for genAI detection, and institutional acceptance of genAI use in academic work. This recommendation is made in the context of students who displayed positive perceptions of transparency at the

assignment level but continued to have broader concerns that cannot be addressed by a single assignment and its transparency.

Declarations

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Declaration of AI and AI-Assisted Technologies
During the preparation of this work, the authors used OpenAI's ChatGPT 5.5 Thinking Mode to assist with literature review and organizing literature. After using this tool, the authors reviewed and verified the accuracy, completeness, and originality of all source citations, and take full responsibility for the content of this publication.

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References

Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Longman.

Barba, L. A. (2025). Experience embracing genAI in an engineering computations course: What went wrong and what next. https://doi.org/10.1109/MC.2025.3572654

Brown, E. A., Kronenburg, M., Steeley, A., & Tagbor, D. (2025). A case study using the transparency framework and artificial intelligence to promote effective writing and student success in a writing-intensive course. *Journal of Health Administration Education*, *41*(2), 183–210.

Brown, E. A. (2024, March). Using the transparency framework and artificial intelligence to promote effective writing and student success in a writing-intensive course [Conference presentation]. 2024 ASPPH Annual Meeting for Academic Public Health, Arlington, VA, United States.

Chirikov, I., Smirnov, I., & Kizilcec, R. F. (2026). Generative AI use and misuse call for assessment reform in higher education. *Science*, *392*(6800), 818–820.

Cotelli Kureth, S., Paliot, E., & Zink, S. (2025). Fostering transparency: a critical introduction of generative AI in students' assignments. *Language Learning in Higher Education, 15(1),* 63–85. https://doi.org/10.1515/cercles-2024-0105

Corbin, T., Dawson, P., Nicola-Richmond, K., & Partridge, H. (2025). "Where's the line? It's an absurd line": Towards a framework for acceptable uses of AI in assessment. *Assessment & Evaluation in Higher Education, 50*(5), 705–717. https://doi.org/10.1080/02602938.2025.2456207

Damm, C., & Eaton, L. (2026, March 18). *From prompt to practice: A framework for transparent GenAI use in higher education*. EDUCAUSE Review. https://er.educause.edu/articles/2026/3/from-prompt-to-practice-a-framework-for-transparent-genAI-use-in-higher-education

Du, Y., & He, H. (2026). Enabling and inhibitory pathways of university students' willingness to disclose AI use: A cognition-affect-conation perspective. arXiv preprint. https://arxiv.org/pdf/2604.21733

Friberg-Fort, J. C., & Giovagnoli, D. (2026). Radical transparency as an antidote to unclear expectations for generative AI use. In N. Pritts (Ed.), *Empowering educational development and faculty growth with AI* (pp. 273–288). IGI Global Scientific Publishing. https://doi.org/10.4018/979-8-3373-4129-3.ch010

Furze, L., Perkins, M., Roe, J., & MacVaugh, J. (2024). The AI Assessment Scale (AIAS) in action: A pilot implementation of GenAI-supported assessment. *Australasian Journal of Educational Technology, 40*(4), 38–55. https://doi.org/10.14742/ajet.9434

Gerlich, M. (2025). AI tools in society: Impacts on cognitive offloading and the future of critical thinking. *Societies, 15*(1), 6. https://doi.org/10.3390/soc15010006

Gonsalves, C. (2026). The transparency trap: Generative AI and the rise of interpretive load. *Review of Education*, 14, e70139. https://doi.org/10.1002/rev3.70139

Habib, S., Vogel, T., Anli, X., & Thorne, E. (2024). How does generative artificial intelligence impact student creativity? *Journal of Creativity*, 34 (1). https://doi.org/10.1016/j.yjoc.2023.100072

Huberman, M., & Miles, M. B. (2002). *The qualitative researcher's companion*. Sage.

Lewis Miller, C., Barth, D., Gay, K., Scherer, F., & Herron, J. (2025). *Faculty development and GenAI playbook: Evidence-based best practices*. Online Learning Consortium. https://onlinelearningconsortium.org/publication/2025/playbook/faculty-development-genAI-playbook/

Lipuma, J., Leon, C. & Meng, Y. (2025). From digital natives to AI-natives: Rethinking assessment and instructional design in the age of autonomous AI tools. *STEM for Success Resources*. 121. https://digitalcommons.njit.edu/stemresources/121

Maxwell, J. A. (2009). Designing a qualitative study. In L. Bickman & D. J. Rog (Eds.), The SAGE handbook of applied social research methods (2nd ed., pp. 214–253). Sage. https://doi.org/10.4135/9781483348858.n7

Orfanidis, C. (2025). Moral diversity in institutional policies governing the student usage of generative AI: An international comparison. *Higher Education Quarterly, 79(4)*, e70051. https://doi.org/10.1111/hequ.70051

Parker, L., Loper, A. J., Carter, C., Hayes, J., & Karakas, A. (2026). Longitudinal insights into AI in education: Usage, ethics, and policy development in higher education. *Computers and Education Open*, 100329.

Richards, L., & Morse, J. M. (2012). *README FIRST for a User' s Guide to Qualitative Methods*. Sage.

Saldaña, J. (2011). *Fundamentals of qualitative research*. Oxford University Press.

Sanz-Tejeda A, Domínguez-Oller JC, Baldaquí-Escandell JM, Gómez-Díaz R and García-Rodríguez A (2026) The impact of generative AI on academic reading and writing: a synthesis of recent evidence (2023–2025). *Front. Educ. 10*:1711718. https://doi.org/10.3389/feduc.2025.1711718

Singer-Freeman, K. E. (2025). Structuring effective learning with GenAI: Lessons from group work. *The National Teaching and Learning Forum*. https://doi.org/10.1002/ntlf.30607

Singer-Freeman, K., E., Verbeke, K., & Barre, B. (2025). Generative AI usage among university students depends on academic level and task. *Higher Learning Research Communications. 15(2),* 1–24. https://doi.org/10.18870/hlrc.v15i2.1616

Singer-Freeman, K. E., Payne, C., & Zimmerman, S. C. (2026). Applying collaborative learning principles to teaching with GenAI: A pre-calculus assignment example. *International Journal of Education in Mathematics, Science and Technology (IJEMST),* 14(3), 971-985. https://doi.org/10.46328/ijemst.5542

Watson, C. E., & Rainie, L. (2026). The AI Challenge: How College Faculty Assess the Present and Future of Higher Education in the Age of AI. American Association of Colleges and Universities. https://www.aacu.org/research/the-ai-challenge

Winkelmes, M.A. (2023a). Introduction: The story of TILT and its emerging uses in high er education. In M.A. Winkelmes, A. Boye, & S. Tapp (Eds.), *Transparent design in higher education teaching and leadership: A guide to implementing the transparency framework institution-wide to improve learning and retention* (pp. 1–14). Routledge. https://doi.org/10.4324/9781003448396-1

Winkelmes, M.A. (2023b). Introduction to transparency in learning and teaching. *Perspectives In Learning, 20*(1). https://csuepress.columbusstate.edu/pil/vol20/iss1/2

Winkelmes, M. A., Bernacki, M., Butler, J., Zochowski, M., Golanics, J., & Harriss Weavil, K. (2016). A teaching intervention that increases underserved college students' success. *Peer Review*, *18*(1/2), 31–36. https://www.proquest.com/docview/1805184428?sourcetype=Scholarly%20Journals

Winkelmes, M. A., Christopher, K., Copeland, D., Gravett, E., LaFleur, J., Palmer, M., … Yong, D. (n.d.). TILT Higher Ed examples and resources. www.TILTHigherEd.org

Wiss, A., Singer-Freeman, K., Thorpe, J. H., Heminger, C., Quinlan, S., & Pattershall-Geide, J. (2025, November 19). Supporting learning-centered usage of GenAI tools: Adapting the Transparency in Learning and Teaching (TILT) framework [Conference presentation]. OLC Accelerate 2025, Orlando, FL, United States.

Yee, K., Uttich, L., Giltner, L., & Bojanowski, A. (2025). Coach for the approach: The educator's new role in the age of AI. UCF Created OER Works.