The Influence of AI on the Traditional Research Paper: Using Normalization Process Theory as a Framework for Ensuring Human Participation

Lori B. Doyle & Jill L. Swisher

Abstract

With the introduction of generative artificial intelligence (AI), the traditional research paper, as a standalone assessment measure, can no longer be trusted as the best or primary method for assessing whether students are meeting learning objectives. Educators are in the throes of rewriting, explaining, and upholding academic integrity policies while balancing the pros and cons associated with the realities of AI. The ease at which students can produce a generated paper on just about any topic must be considered at the onset and assignments should be developed with consideration regarding the level of AI susceptibility. Utilizing Normalization Process Theory (NPT) as an ecological process based on a grounded theory-to-practice methodology, the authors suggest alternative approaches to the research paper to ensure human participation in the learning process. The traditional research paper was deconstructed to determine skills, benefits, and goals of higher education assessment prior to reconstructing the process with the current AI reality in mind. The topic of AI permeation in education will continue to be an area for future research and the authors suggest some pathways for continuing the conversation along theoretical as well as practical avenues.

Keywords: *Normalization Process Theory, Assessment, Grounded Formal Approach, AI, Higher Education*

With the introduction of generative artificial intelligence (AI), the traditional research paper, as one single assignment, can no longer be trusted as the best or primary method for assessing whether students are meeting learning outcomes. The time to address this challenge is now given the easily accessible AI chatbots such as OpenAI's ChatGPT and Google's Gemini, and the prediction that Microsoft will soon add AI technology into its suite of products (Metz & Weise, 2023). Educators are wise to consider the elements of the normalization process theory when developing higher education writing assignments. The primary research question asks the following: Given the implications of AI on traditional research writing assignments, how can course developers reconstruct the traditional research paper to ensure human participation in learning and learning outcome mastery?

Grounded Formal Theory-to-Practice Methodology

A theory-to-practice methodology was the impetus regarding a pathway for answering the research question and addressing the problem space of academic integrity specific to AI and the traditional research paper as an assessment of content mastery prevalently used in higher education. When applying theory to practice, Reason and Kimball (2012) explained that "theory-to-practice models must assume the basic human ability to make meaning of new situations, take action, and reflect upon that action to develop a working model of the world moving forward" (p. 363). In that vein, this article takes NPT as a descriptive ecological model and adapts it as a prescriptive ecological process. Specifically, this paper is organized around the steps of a grounded formal approach for theory to practice including identifying a problem, selecting a relevant theory, translating theory into practice, formulating goals, designing an intervention based on those goals, and evaluating the intervention (Rodgers & Widick, 1980). With the aforementioned problem regarding the precarious state of the research paper in an age of AI, the following will describe Normalization Process Theory (NPT) as a relevant theory to translate into practice.

Normalization Process Theory

A theoretical framework based on tenets of the normalization process theory (NPT) will be discussed as a tool for protecting and maintaining human cooperation in higher education assessments, specifically, the traditional research paper. NPT elements of coherence, cognitive participation, collective action, and reflexive monitoring will direct discussion regarding the process of guarding against norming in the direction of an over-reliance on AI-generated content while also taking steps to sustain and promote creativity, critical thinking, and collaboration, three among many skills worth mentioning.

According to the seminal authors, "Normalization Process Theory explains how new technologies, ways of acting, and ways of working become routinely embedded in everyday practice" (May et al., 2009, p. 1). The theory originated as a result of empirical generalizations drawn from qualitative studies in healthcare. Referencing the original theorists, McNaughton et al. (2020) helpfully summarized NPT as a heuristic device to "engage with and think through issues around implementation (the way in which practices are actioned through social organization), embedding (the process of practices becoming routinised), and integration (the process of sustaining) of practices" (p. 220). Said differently, NPT "helps in understanding why some processes seem to lead to a practice becoming normalized while others do not" (May & Finch, 2009, p. 535). In a systematic review of studies using NPT, it was found to offer "a valuable set of conceptual tools to aid understanding of implementation as a dynamic process" (May et al., 2018, p. 1).

NPT proposes that "practices become routinely embedded in social contexts as a result of people working… to implement them" (May & Finch, 2009, p. 540) and that the work of implementation happens through four mechanisms. The first mechanism, coherence, refers to a practice being made possible by its perceived utility and persists via shared meaning and contexts (May & Finch, 2009). From this stems cognitive participation, the actual engagement in and later collective buy-in or commitment to a new practice (May & Finch, 2009). Then comes collective action, meaning that a new practice is purposive, goal-oriented, and takes collective effort (May & Finch, 2009). Lastly, reflexive monitoring, which happens both formally and informally, is an evaluative process by which participants make collective and individual judgements about outcomes of the practice thereby leading to attempts to modify or reconfigure the practice (May & Finch, 2009).

As a "replicable ecological framework" (May & Finch, 2009, p. 549), NPT can describe how generative AI has become normalized and how participants can utilize the mechanisms of NPT to reconstruct AI's normalization in a way that leverages its value while preserving the merit of the traditional research paper. It is evident that student users of generative AI have already established its coherence by seeing its perceived suitability for the task of writing (e.g., Hoover, 2024). Likewise, cognitive participation has also been evidenced by students participating in this new practice, whether legitimized or not. When it comes to collective action, that is, when "a practice is mediated and understood within the networks of people around it" (May & Finch, 2009, p. 544), there is room to differentiate its contextual integration. While *students* have already incorporated the use of AI within their contexts, *faculty* have not fully considered the ways AI will affect writing and the way writing and research skills are defined. This is where it is important to engage in the mechanism of reflexive monitoring. This means that the patterns of action – the student use of AI – and its outcomes must be continuously evaluated both formally and informally (May & Finch, 2009). These "formal patterns of monitoring...frame how things *ought* to be, rather than ...how things are worked out in practice" (p. 545). This appraisal then leads to the opportunity to reconfigure a practice, "feeding back into notions of coherence" (p. 546). The authors of the current paper intend to appraise and frame how things ought to be in order to reconfigure the practice of AI utilization in higher education research assignments to ensure human participation is necessary to meet learning outcomes.

Translating Theory into Practice

This paper focuses on NPT as "an empirically observable set of social processes that can be modelled (May & Finch, 2009, p. 548) and specifically hones in on "organizing agency of the implementation, embedding (or not), and continuing integration of material practices" (May & Finch, 2009, p. 549). Indeed, as shown in Table 1, May and Finch (2009) offered a framework for operationalizing normalization process theory.

Table 1. *Framework for Operationalizing Normalization Process Theory*
(May & Finch, 2009, p. 549)

	Coherence *What is the work?*	Cognitive Participation *Who does the work?*	Collective Action *How does the work get done?*	Reflexive Monitoring *How is the work understood?*
Systematic explanation of mechanics and components at work	Factors that promote or inhibit the mobilization of a practice	Factors that promote or inhibit participation in a practice	Factors that promote or inhibit enacting a practice	Factors that promote or inhibit the appraisal of a practice
Knowledge about the sources and operations of investments at work	Beliefs and behaviours that define and organize objects	Beliefs and behaviours that define and organize actors	Beliefs and behaviours that define and organize work	Beliefs and behaviours that define and organize understanding
Investigations of core questions that could include…	How is a practice conceptualized by participants?	How do participants come to engage with a practice? How do	How do participants enact a practice?	How do participants appraise a practice? What are its effects

	How does it hold together in action?	they decide on engagement and the purposes that it serves?	How are their activities structured and constrained?	of appraisal? How are they mediated?

With this understanding in mind, NPT as a robust descriptive ecological framework will be reframed as a prescriptive ecological process:

- Coherence: Understand the perceived utility of a practice within shared contexts
- Cognitive Participation: Engage in the new practice until collective buy-in is achieved
- Collective Action: Collectively describe the purpose and goals of a practice
- Reflexive Monitoring: Make judgments about the outcomes of the practice, thereby leading to modifications or reconfigurations of the practice

In considering the use of AI in research writing, the coherence step has ostensibly been completed considering that approximately 22 million student papers may have used generative AI in the past year (Hoover, 2024). Further, the use of generative AI has become so pervasive, even integrated in academically-acceptable tools such as Grammarly (Hoover, 2024), that it seems collective student buy-in for the use of AI in research writing has also been achieved. It is from this point forward that the authors of this paper propose that educators come together to describe the purpose and goals of the research paper in order to evaluate and reconfigure the practice to prevent or alter the normalization of AI in research writing. The following sections will describe these steps within the continued pattern of the grounded theory-to-practice methodology.

Formulating Goals: Using Collective Action for the Future of Research Writing

The next step in the theory-to-practice grounded methodology is to formulate goals prior to designing or evaluating any sort of intervention. One such goal for the higher education community, including ancillary faculty all the way to top-ranking administrators, should be to take collective action regarding the future of research writing as an assessment tool to determine learning outcome mastery. The influence of AI on writing cannot be denied and should not be ignored; therefore, the historical and traditional context of the research paper can be a catalyst when formulating new goals to provide assessment measures that recognize and even utilize AI as a tool rather than ignore and fight against AI as if it can be eliminated or conquered. The longstanding role and overarching goals of the traditional research paper will be discussed in terms of the benefits and skills for learners to achieve and develop. Indeed, Mollick and Mollick (2023) declared there are still skills necessary for today's learners to obtain regardless of ways AI has permeated the process. In the following sections, the traditional research paper will be deconstructed to protect the established skills and benefits prior to reconstructing the process all while acknowledging the influence of AI on the current learning landscape.

Collective Action Toward Deconstructing the Research Paper

Collective action is a purposive goal-orientation that may include reaffirmation or reinvention of a practice (May & Finch, 2009). The role and practice of the research paper can be decomposed into its benefits, skills, and goals. Prior to the digital age, research was necessarily chunked

into parts due to limited access to resources and challenges associated with finding, printing, and storing all of the information. Some suggest the information or digital age dates back to mid-twentieth century, yet the current authors ascribe to a secondary definition suggesting 1970 as the start of this era due to the introduction of the home computer (Brown & Duguid, 1996). The higher education assessment scene became more conducive to large-scale assessments due to the information age and ways for students to more easily access data and literature (Head & Eisenberg, 2009). During this time, students most frequently reported turning to class readings, internet searches, and even librarians as their primary sources for finding information (Head & Eisenberg, 2009). During the tail-end of the digital age, big-picture context is the way Head and Eisenberg (2009) described the goal of higher education students seeking to conduct research for class-related assessment purposes while working toward a degree.

Due to additional reasons related to credibility and honesty, the current authors suggest that the part-whole pendulum must swing back to smaller chunks or activities to achieve the goals of the traditional research paper rather than proceed with assessing learning outcomes by way of one final assessment (e.g., the traditional research paper). Based on evaluating the purpose and goals of the research paper within the NPT context of collective action, the traditional research paper as an assignment should be operationalized by being deconstructed into parts, a process that contributes to that which can be described as an exciting time in the history of higher education assessment. While some studies have shown that whole-task instructional approaches lead to better cognitive skill acquisition (e.g., Lim et al., 2009), "more literature leans toward part-task training as the more effective method for complex tasks" (Hillman, 2020, p. 28). The skills, goals, and outcomes need not change, yet the activities can be better designed to ensure human participation and allow for grading that is accurately linked to student learning. The big-picture or whole-task mindset is more difficult to instill in today's college students due to the immediacy of even the most narrow and focused topics that can be generated in minutes. Therefore, the entire configuration of the assessment measures should follow this lead and provide multiple opportunities for students to gain skills, reap benefits, and meet the goals associated with writing a research paper.

The context for this research considers a review of literature on the role, benefits, outcomes, and assessments most tied to the traditional research paper specific to higher education course work. Zhai (2022) asked ChatGPT to write an academic paper and described the output as a "coherent, (partially) accurate, informative, and systematic" paper (p. 1). Based on this description of a generated research paper, one might see why the output of ten minutes of effort, albeit partially accurate yet still coherent and organized, would be very tempting to college students who land at any point on a continuum between extremely lazy and incredibly busy. Before any application of NPT by way of suggestions and implications, the long-established role of the traditional research paper will be discussed.

Role of the Research Paper

With the goal of retaining the merits of the research paper in an age of AI, the authors will deconstruct the traditional research paper, specific to use in higher education, as an existing and well-established method for assessing student learning. To begin, the benefits and skills associated with requiring students to complete a research paper will be discussed for the eventual purpose of reconstructing with the reality of AI normalization in mind. In similar fashion, discussing some recognized goals associated with this traditional form of assessment will provide a pathway to reconstructing the research paper to protect and ensure the goals are being met through human

participation rather than via generated content. The current authors posit that the role and purpose of the traditional research paper can be maintained and even strengthened when the current learning landscape is considered rather than dismissed.

Benefits and Skills

Before contemplating ways to assess student learning in higher education, the benefits associated with different methods should be explored in order to adapt rather than replicate forms of assessment, one being the traditional research paper. Regarding the benefits of assessment measures, Cotton et al. (2024) listed knowledge, skills, and attitudes as elements of concern regarding that which any assessment reveals. Traditionally, all three of these key elements could be determined based on a student's written output; however, the infiltration of AI has brought all three into question. Using the same three benefits, curriculum developers can infuse assessments with alternate ways of unlocking what students know, what skills they have obtained, and how they feel about their newfound understanding. It is important that students still know how to generate and answer research questions, synthesize others' work and attribute credit, collect and analyze data, and clearly communicate their ideas.

When discussing benefits and skills associated with assessment measures, there are some to mention specific to the traditional research paper itself. The University of Maryland Global Campus (2022) described some key skills for professors to assess through a traditional college research paper: 1) finding and understanding data and information, 2) formulating informed opinions, 3) adding to the academic conversation of other writers and scholars in the field, and 4) learning how to attribute credit to sources. All of these skills are at risk if a student chooses to submit a generated paper; therefore, it is incumbent on curriculum developers and professors to use alternate methods of assessment to ensure the same skills are being achieved and are therefore able to be accurately assessed.

Cotton et al. (2024) discussed another benefit associated with forms of assessment, that being the way in which students learn through taking on a challenge. If the challenge of writing a traditional research paper is alleviated due to the ease at which students can get away with overusing chatbots to generate portions or even all of their paper, then one of the substantive benefits of this form of assessment is brought into question. Lastly, a glimpse into the true level of a student's understanding is a benefit the traditional research paper used to produce (Cotton et al., 2024). When synthesized, the benefits of the traditional research paper that should be considered and reproduced need to provide a pathway to assessing knowledge, skills, and attitudes, taking on and overcoming a challenge, and providing a clear indication of a student's true level of overall understanding.

Assessment Goals

The goal of assessments in higher education has been and will continue to be a topic of interest and concern for higher education professionals (Rawlusyk, 2018). The introduction of AI to the scene can be described as another fork in an otherwise long and winding road rather than completely unfamiliar territory. Carless (2015) argued against losing sight of the direct link necessary between the goal of assessment and the methods for getting there. There is danger in describing the end goal of assessment as the feedback or even the grade when the goal can be the entire assessment process. A more active approach to assessment widens the goal post which in

turn enlarges the scope of the conversation (McGinnis, 2018). The traditional research paper has always been about the process of learning that the student engages in along the way. Prior to the introduction of AI to the higher education scene, the traditional essay or paper was described as a means of active learning for students (Brown et al., 2013). A modern argument for active learning is still at play, yet AI has altered the concept of what is or is not active learning. By extrapolating the goals associated with requiring students to write a research paper, higher education curriculum developers, program directors, and instructors can take a multi-level approach regarding the influence of AI on higher education assessment measures. Carless (2015) suggested a minimum of two goals, assessment of a student's level of learning and assessment regarding a student's actual ability, and that measures overlap between formative and summative opportunities. If the part-whole continuum is applied regarding the goals of the traditional research paper, it seems a drastic swing toward a focus on parts is in order. No longer can the final and entire output of the traditional research paper be that which reveals or determines goal completion. Rather, the strategic parts of the process that lead to the end output become the goals that take into account benefits that still apply regarding summative assessment and allow students to showcase understanding and instructors to confidently assign a grade, or perhaps grades along the way, based on the assumption of human interaction rather than AI generation.

Designing an Intervention

The grounded formal approach (Rodgers & Widick, 1980) is a process model that provides action steps to blend theory into practice within a particular context. At this point in translating NPT into practice, the action step for developing goals has been completed and the step for applying or designing a practice is next. The following describes how the reflexive monitoring mechanism of the NPT theory will be applied in practice by reconstructing the research paper to ensure human participation in learning while still meeting traditional learning outcomes, skills, benefits, and goals as previously described.

Reflexive Monitoring Toward Reconstructing the Research Paper

While there is no perfect replacement for the traditional research paper, the concept of reflexive monitoring is that the outcomes of collective action are continuously evaluated and that the appraisal of a given practice may lead to that practice being reconfigured or reconstructed (May & Finch, 2009). Given the goal-orientation of collective action being the retention of the benefits and goals of the research paper in a part-versus-whole format, the following section considers practical opportunities for human participation in learning.

Many are predicting the end of the traditional paper as a form of reliable assessment (Cotton et al., 2024). The following statement from Baidoo-Anu & Ansah (2023) is a call to action regarding changes to transitional forms of assessment:

> One area that has garnered more attention and become topical is students' assessment. It is too soon to conclude but very soon educators may need to rethink how students are assessed. They may have to change how assessment is currently done to more innovative assessments. (p. 59)

Innovative assessments are key to a learner-centered approach, but these must take AI into consideration (Rasul et al., 2023). Indeed, "while essays as assessments are regarded as threatened by ChatGPT, therein lies the very opportunity for educators to introduce innovative assessments" (Rudolph et al., 2023, p. 353).

The authors of this paper used Google's Gemini AI to generate some suggestions regarding the ways in which assignments can be crafted to make it challenging for a chatbot to respond. The following questions were asked:

- When a student is asked to display understanding, what skills can you (AI) not replicate?
- Are there any kinds of student assignments with which you can't help?
- How should teachers create an assignment in which AI can't help?

The following are some of several strategies Gemini (Google, 2024) provided that teachers can use to create assignments that minimize the advantage AI tools might give students: focus on higher-order thinking skills (e.g., open-ended questions, case studies and real-world problems, debate and discussion), incorporate creativity and originality (e.g., creative simulations, student-driven data collection), emphasize process and reflection (e.g., portfolios and self-reflection prompts), and utilize non-written formats (e.g., presentations, in-class activities). Gemini pointed out that while chatbots can assist in understanding a prompt, brainstorming or researching a topic, and proofreading, it does not have the ability to reflect on the student's own learning process (metacognition) or wrestle with a problem to arrive at solutions through the student's own reasoning.

The traditional research paper has long served as a catalyst for assessing a human's ability to convey meaning and share content-specific learning for the purposes of meeting learning outcomes in higher education. A literature review to determine a set of expected skills, benefits, and goals associated with the traditional research paper as well as suggestions from Gemini (Google, 2024) made clear the importance of maintaining human interaction in the learning process. To protect against the ways in which AI-generated papers have the potential of disrupting outcome measurement, human participation in the process must be pointedly and specifically integrated into the assignment from the onset (Mollick & Mollick, 2023; Cardona et al., 2023). Students have been found to prefer projects with clear requirements, guidelines, and feedback to help them determine when or if outcomes were met (Cliburn & Miller, 2008; Schoepp et al., 2019) and the entrance of AI on the scene does not negate this consideration. The current authors suggest taking an approach that chunks the research paper assignment based on the skills, goals, and benefits widely accepted as those which students should obtain as a result of completing a research paper and couple this with the notion that such an approach to assessment is actually more in line with the ways in which students process and learn. The following section will provide some general considerations for reducing the whole-paper, one-assessment, one-rubric tradition into smaller parts that integrate human participation components and will provide rationale as well as examples for taking this approach.

Annotation

One approach that discourages AI misuse—and encourages careful reading—is to ask students to annotate what they read, either with hand-written comments on printed paper or

> through tools such as Hypothesi.is and Perusall. Watkins described this as adding "friction" to the learning process. (McMurtrie, 2024, para. 9)

While it is tempting to jump all the way to putting a line through skills that are more easily replaced with AI, a strong argument can be made against this mindset. Evidence has shown that literacy levels can impact employability as well as overall life opportunities (Zywica & Gomez, 2008); therefore, the normalization toward AI use should be approached in such a way as to protect the skills associated with literacy levels. One such skill is annotation, which not only aids in overall literacy but contributes to content-specific learning (Zywica & Gomez, 2008), which is exactly the type of learning that has been the focus of the traditional research paper. One specific assignment suggestion would be to ask students to annotate a content-specific text in two directions: positively skewed viewpoints as well as those considered negatively skewed (Wolfe, 2000). In an age of AI infiltration, the skill of determining bias as well as directionality of a text will be paramount for determining credibility and the process of annotating can further embed content for the sake of deep learning. Lepik (2023) highlighted verification of content as integral to welcoming AI onto the education scene; therefore, assignments such as annotating, and even more specifically, narrowly focused annotating, could prove fruitful in the quest to protect human interaction in the processes of gathering data and doing research for higher education assessment purposes.

Reflection

Mollick and Mollick (2023) mentioned both known and unknown risks associated with AI to include responses filled with errors either ignored or unrecognized by the student, perpetuation of unreliable outputs, and the challenges that accompany using an imperfect tool. For these and many other reasons, students must be called upon to reflect along the way, not only on their personal level of understanding, but on whether or not they are avoiding or multiplying the risks associated with generated content. Asking for the integration of unique ideas, insights, and perspectives helps to ensure there is a human at the helm (Mollick & Mollick, 2023). One way to mitigate the risks of non-human outputs is to force the human back into the content by way of reflection. Perhaps students need to submit a one-page reflection sharing how their perspectives differ or align with generated outputs. Or, students record a collaborative conversation where they review the content submitted by others and ask follow-up questions in order to reflect on the topics together. In an article focused on ways to promote human reflection in an age of AI, Lepik (2023) provided a short list of ten questions to encourage students in this direction (e.g., "How did the AI-generated content affect your thoughts?, To what degree is this paper your writing?, and Do you expect a reader would notice text produced by the artificial intelligence versus your own – what would help her in this case?") (p. 4). While these are just a few ways to inject reflection into the process of writing a research paper, the point is that it can be a tool to infuse human conversation and contemplation in order to minimize some of the risks associated with AI use.

Collaborative Writing

In considering the ways to integrate human participation in learning, collaborative writing is one area that naturally engenders participation. Collaborative writing processes include the generation of ideas, language deliberations, collective scaffolding, co-construction, and recursive approaches to brainstorming, writing, and reading (Storch, 2005). Collaborative writing is a positive

experience for students that allows opportunity for active participation (Dobao & Blum, 2013). Additional features of collaborative writing include interaction and negotiation, as well as affective elements such as humor or conflict, that lead to development of writing and social skills (Fung, 2010).

Creativity

Zhai (2022) proposed that educators hone in on creativity and critical thinking skills by utilizing AI-incorporated learning tasks to engage students in solving problems. Indeed, Livingston (2010) advocated for injecting creativity into higher education and suggested that "practicing problem solving as a team game should be part of every student's experience" (p. 61). In addition, it is known that creativity increases when group members are diverse (Simonton, 2012). Furthemore, Rudolph et al. (2023) suggested that assessments should be designed with creativity in mind, such as performances, videos, learning experiences that foster intrinsic motivation, or writing about topics that genuinely interest the students. The ability for the student's own voice to shine through is a common denominator in creative pursuits and can be facilitated by giving students permission to brainstorm ideas no matter how inappropriate or foolish (Brinkman, 2010). One example of a task that combines the benefits of creativity with the understanding that students are using AI would be to have students generate main topics or headings using AI and then creatively represent those main ideas in either a graphic organizer, poster, or visual model.

Oral Presentations

While oral presentations have an assortment of pedagogic objectives, one of those is the ability to share information from research (Amirian & Tavakoli, 2016). One of the advantages of oral tasks is that they can enhance skills related to critical thinking and problem solving (Makena & Feni, 2023). Likewise, it has been found that oral presentations have the capability to produce learning opportunities (Sundrarajun & Kiely, 2009). Further, students appreciate the oral presentation as both a learning tool and as an assessment for learning outcomes (Thalluri & Penman, 2013). Whether conducted live or recorded with embedded audio/video elements, oral presentations teach students to deliver a persuasive argument (Grieve et al., 2021). AI capabilities are continuing to expand and become more intrusive to include human voice replication (Hughes, 2024). For this reason, requiring the human learner to be physically present or physically appear on screen has great benefit to ensuring participation in the process. Perhaps the added requirement of memorization would be another tactic for encouraging deeper content connections. Many of the strategies that are suggested by higher education curriculum developers reflect a swing back to education methods used decades ago such as recitation, rote memorization, oral presentations, and debate.

Action-Based Learning

As the pendulum in education is always in motion (Preus, 2007), it can be helpful to reach back in time to identify effective teaching methods from the past. In teaching the rhetorical organization of research papers, Hill et al. (1982) suggested giving groups of students misordered sections of a research paper without headings and have them attempt to order them correctly. Like-

wise, having students pair up to conduct peer-editing of one another's drafts has been recommended as a way to teach students to self-edit (Ferris, 1995). Other suggested class activities for learning to develop research papers is to collect data from the class as a group and have them compare their results with published data, or to have them conduct a pre- and post-test of the class to gauge the effectiveness of a teaching method (Hill et al., 1982). Similarly, students could be asked to develop an analysis based on an in-class discussion or a very recent event, neither of which could be well-generated by a chatbot (Rudolph et al., 2023). An effective method for teaching synthesis and summarization is to provide students with a particular text and have them create a graphic organizer (Anderson & Hidi, 1988). Joseph and Konrad (2009) advised that writing performance should be evaluated in an ongoing manner throughout the learning process to determine student progress and to identify gaps that may need continued development. Having baseline data would also help teachers pick up on changes that could be attributed to the use of generative AI. These are some of the various methods that have been used prior to the influence of technology on writing. Of course, AI technology helps with accessibility and inclusion for those who have communication disabilities (Hemsley et al., 2023), so it is important to consider accommodations when implementing any strategies that shy away from it.

Purposeful AI-Integration

One important caveat in reconsidering the ways that AI can be normalized is that students are known to engage with AI as "philosophers of technology" (Higgs & Stornaiuolo, 2024, p. 2). A recent study found that young people do have ethical concerns about writing with chatbots and that they desire support in deepening their critical thinking about using AI for writing and in everyday practice—"not in a punitive or simplistic way (e.g., don't use AI) but through deep, sustained, and balanced inquiry" (Higgs & Stornaiuolo, 2024, p. 15). Incorporating AI and assignments related to the ethics of AI will continue to be valuable and new, ever-evolving resources for the constructive use of AI in the classroom continue to become available, such as The AI Pedagogy Project run by the metaLAB at Harvard (McMurtrie, 2024). As OpenAI recently launched ChatGPT Edu for colleges and universities, it is becoming more evident that "students will need AI skills for workforce success" (Ascione, 2024, para. 1). Of course, chatbots should never replace the human instructor or jeopardize the benefits of relational rather than transactional learning (Rasul et al., 2023).

Metacognition

The normalization toward AI integration and acceptance must not replace the human ability to think, and this should include the human capability for metacognition, which is, broadly, to think about how one thinks. There are two forms of metacognition. Metacognitive knowledge is the awareness of how one learns and metacognitive control describes how one uses that information to regulate future learning methods and opportunities (Fleur et al., 2021). The current authors posit that an overreliance on AI has the potential to lead to lower levels of metacognitive control because the chatbot is essentially replacing the need to regulate the learning process. Fleur et al. (2021) suggested learners be required to make retrospective metacognitive judgments on learning elements such as confidence levels, any discovered biases, and overall sensitivity levels regarding the ability to decipher their own correct or incorrect decisions along the way. An assignment for curriculum developers and instructors to consider building into the traditional research

paper assessment would be to require a mid- and post-reflection asking students to provide some metacognitive judgments focused primarily on knowledge but that can, in turn, affect and protect metacognitive control. Ojeda-Ramirez et al. (2023) extended this idea to suggest that AI-literacy be another aspect that learners be asked to reflect upon in order to determine their ability to correctly utilize generated information as well as their comfort level doing so and pushed for the importance of this in an age when AI is both replacing and creating new employment opportunities and career options. Järvelä et al. (2021) also pushed for adding a collaborative component to the reflection process in order to provide the added benefit of learning to process about learning for the sake of the collective good. Yang and Xia (2023) called for the integration of AI technology and metacognitive abilities as a promising conceptual model for further research and investigation while stating that the tenets of metacognition must not be thrown out in the name of AI advancements.

Evaluating the Intervention: Future Research

It is widely agreed upon that theory-to-practice models must involve evaluation of a practice and some would go so far as to say a feedback loop is necessary to assess practice for the purpose of informing theory (Reason & Kimball, 2012). The reconstruction of the normalization process regarding research writing within the context of AI has provided many suggestions for practice. Because the authors of this paper have not themselves tested these in practice, a formal evaluation cannot be described. However, the following offers a discussion regarding the potential for future research regarding these efforts.

While this paper is limited in its scope specific to rethinking AI's influence on the research paper, AI will continue to become normalized as the technology expands. Google's DeepMind researchers have indicated that AI's potential to be a deeply integrated and impactful technology will "radically alter the nature of work [and] education" (p. 1). Future research requires new methodologies that focus on the societal effects of AI (Google DeepMind, 2024) and "the choices we make today, as researchers, developers, policymakers and members of the public will guide how this technology develops and is deployed across society" (Gabriel & Manzini, 2024, para. 21). It is in this deployment where NPT can be a player for guiding the normalization of this technology. Utilizing NPT as an ecological process will provide parameters for developers and policymakers in guiding this work. This will be especially important to guard against AI's dangerous capabilities, whether unintended or malicious. While today's society seems to agree on the perceived utility of AI, researchers and developers should continue to engage in the NPT mechanism of collective action, whereby the purpose and goals of AI are described, and ultimately in reflexive monitoring, in which outcomes of the practice are continually reassessed for the purpose of modifying or reconfiguring the practice to adhere to its agreed upon purpose. For example, since AI threatens to foster loneliness, perhaps its goal should move away from efficiency and toward interpersonalization and connections between instructors and students (Morris, 2024).

While NPT is a highly cited and utilized implementation theory, other implementation science approaches are increasing (Dalkin et al., 2021). For example, a systematic review by Kirk et al. (2016) found over 400 research articles across a wide range of topics using the Consolidated Framework for Implementation Research. Therefore, it will be important to consider the appropriate theoretical frameworks and conceptual approaches regarding implementation. Likewise, there may be more robust or efficacious theory-to-practice methodologies to examine.

Besides these alternative frameworks to consider, suggestions for future educational research should consider qualitative research questions worth investigating regarding empirical data as well as perceptions of the role of writing assignments in higher education. Quantitative surveys could provide opportunities to study differences between student populations from universities that take proactive versus reactive approaches to AI influence considering a range of variables (e.g., motivation, determination, confidence, etc.). Qualitative methods would allow for results specific to student perceptions of learning when they do or do not submit an AI-generated paper.

Conclusions

Rooted in the normalization process framework, the authors of this paper focused on strategies to protect traditional research paper learning outcomes from extinction. The current authors suggested that a general swing back toward teaching and assessment strategies employed in education prior to the digital age should be revisited. Some examples mentioned in this paper are collaboration, oral presentations and discussions, creative displays of concepts, chunked learning tasks rather than one form of assessment, activities that require reflection to include metacognitive reflection on the actual process of learning, and in general, human engagement that requires physical motion, cooperation, or action on the part of the learner. Additional and specific examples for each of these categories or suggestions were provided as jumping off points for thinking beyond the traditional research paper of the digital age which typically entailed one assignment rubric, one submission due date, and one completed paper graded by an instructor as the sole determining evidence that the course learning outcomes were met. The outcomes, in the form of research and paper-writing skills, benefits, and goals need not be thrown out or disregarded; rather, they can be reconstructed with an understanding that AI infiltration on the learning landscape is the current and future reality. Future researchers and policymakers are encouraged to consider utilizing NPT or other implementation theories to continually define and reevaluate AI's goals in and for education.

References

Amirian, S. M. R., & Tavakoli, E. (2016). Academic oral presentation self-efficacy: A cross-sectional interdisciplinary comparative study. *Higher Education Research & Development, 35*(6), 1095–1110. https://doi.org/10.1080/07294360.2016.1160874

Anderson, V., & Hidi, S. (1988). Teaching students to summarize. *Educational Leadership, 46*(4), 26-28. https://eric.ed.gov/?id=EJ387009

Ascione, L. (2024, June 21). *OpenAI launches ChatGPT Edu for universities*. eCampusNews: Today's Innovations in Education. https://www.ecampusnews.com/teaching-learning/2024/06/21/openai-announces-chatgpt-edu-for-universities/

Baidoo-Anu, D., & Ansah, L. O. (2023). Education in the era of generative artificial intelligence (AI): Understanding the potential benefits of ChatGPT in promoting teaching and learning. *Journal of AI, 7*(1), 52-62. https://dergipark.org.tr/en/download/article-file/3307311

Brinkman, D. J. (2010). Teaching creatively and teaching for creativity. *Arts Education Policy Review, 111*(2), 48–50. https://doi.org/10.1080/10632910903455785

Brown, G. A., Bull, J., & Pendlebury, M. (2013). *Assessing student learning in higher education*. Routledge.

Brown, J. S., & Duguid, P. (1996). Universities in the digital age. *Change: The Magazine of Higher*

Learning, 28(4), 11-19. https://johnseelybrown.com/DigitalU.pdf
Cardona, M. A., Rodríguez, R. J., & Ishmael, K. (2023). Artificial intelligence and the future of teaching and learning: Insights and recommendations. *Policy Commons*. https://policycommons.net/artifacts/3854312/ai-report/4660267/
Carless, D. (2015). *Excellence in university assessment: Learning from award-winning teaching.* Abington: Routledge.
Cliburn, D. C., & Miller, S. (2008, March 12-15). Games, stories, or something more traditional: The types of assignments college students prefer. In *Proceedings of the 39th SIGCSE Technical Symposium on Computer Science Education* (pp. 138-142). https://dl.acm.org/doi/proceedings/10.1145/1352135
Cotton, D. R., Cotton, P. A., & Shipway, J. R. (2024). Chatting and cheating: Ensuring academic integrity in the era of ChatGPT. *Innovations in education and teaching international, 61*(2), 228-239. https://doi.org/10.1080/14703297.2023.2190148
Dalkin, S. M., Hardwick, R. J., Haighton, C. A., & Finch, T. L. (2021). Combining realist approaches and normalization process theory to understand implementation: A systematic review. *Implementation Science Communications, 2*(68), 1-13. https://doi.org/10.1186/s43058-021-00172-3
Dobao, A. F., & Blum, A. (2013). Collaborative writing in pairs and small groups: Learners' attitudes and perceptions. *System, 41*(2), 365-378. https://doi.org/10.1016/j.system.2013.02.002
Ferris, D. (1995). Teaching students to self-edit. *TESOL Journal, 4*(4), 18-22. https://eric.ed.gov/?id=EJ510199
Fleur, D. S., Bredeweg, B., & van den Bos, W. (2021). Metacognition: ideas and insights from neuro-and educational sciences. *npj Science of Learning*, *6*(1), 13. https://www.nature.com/articles/s41539-021-00089-5
Fung, Y. M. (2010). Collaborative Writing Features. *RELC Journal, 41*(1), 18-30. https://doi.org/10.1177/0033688210362610
Gabriel, I., & Manzini, A. (2024, April 19). *The ethics of advanced AI assistants*. Google DeepMind Blog. https://deepmind.google/discover/blog/the-ethics-of-advanced-ai-assistants/
Google. (2024). *Gemini AI* (June 18 version) [Large language model]. https://gemini.google.com
Google DeepMind. (2024, April 19). *The ethics of advanced AI assistants*. Google DeepMind. https://storage.googleapis.com/deepmind-media/DeepMind.com/Blog/ethics-of-advanced-ai-assistants/the-ethics-of-advanced-ai-assistants-2024-i.pdf
Grieve, R., Woodley, J., Hunt, S. E., & McKay, A. (2021). Student fears of oral presentations and public speaking in higher education: A qualitative survey. *Journal of Further and Higher Education, 45*(9), 1281–1293. https://doi.org/10.1080/0309877X.2021.1948509
Head, A., & Eisenberg, M. (2009). Lessons learned: How college students seek information in the digital age. *Available at SSRN 2281478*.
Hemsley, B., Power, E., & Given, F. (2023, January 18). *Will AI tech like ChatGPT improve inclusion for people with communication disability?* The Conversation. https://theconversation.com/will-ai-tech-like-chatgpt-improve-inclusion-for-people-with-communication-disability-196481
Higgs, J. M., & Stornaiuolo, A. (2024). Being human in the age of generative AI: Young people's ethical concerns about writing and living with machines. *Reading Research Quarterly, 0*(0), 1-19. https://doi.org/10.1002/rrq.552

Hill, S. S., Soppelsa, B. F., & West, G. K. (1982). Teaching ESL students to read and write experimental-research papers. *TESOL Quarterly, 16*(3), 333-347. https://www.jstor.org/stable/pdf/3586633.pdf

Hillman, K. (2020). *Part-task training versus whole-task training for simple versus complex tasks* [Master's thesis, Middle Tennessee State University]. James E. Walker Library Digital Repository. https://jewlscholar.mtsu.edu/

Hoover, A. (2024, April 9). *Students are likely writing millions of papers with AI.* Wired. https://www.wired.com/story/student-papers-generative-ai-turnitin/

Hughes, O. (2024). AI speech generator 'reaches human parity' - but it's too dangerous to release, scientists say. *LiveScience.* https://www.livescience.com/technology/artificial-intelligence/ai-speech-generator-reaches-human-parity-but-its-too-dangerous-to-release-scientists-say

Järvelä, S., Malmberg, J., Sobocinski, M., & Kirschner, P. A. (2021). Metacognition in collaborative learning. *International handbook of computer-supported collaborative learning*, 281-294. https://oulurepo.oulu.fi/bitstream/handle/10024/29507/nbnfi-fe2021120759392.pdf?sequence=1

Joseph, L. M., & Konrad, M. (2009). Teaching students with intellectual or developmental disabilities to write: A review of the literature. *Research in Developmental Disabilities, 30*(1), 1-19. http://dx.doi.org/10.1016/j.ridd.2008.01.001

Kirk, M. A., Kelley, C., Yankey, N., Birken, S. A., Abadie, B., & Damschroder, L. (2016). A systematic review of the use of the Consolidated Framework for Implementation Research. *Implementation Science, 11*(72), 1-13. https://doi.org/10.1186/s13012-016-0437-z

Lepik, K. (2023, October). Trust, but Verify: Students' Reflections on Using Artificial Intelligence in Written Assignments. In *European Conference on Information Literacy* (pp. 27-38). Cham: Springer Nature Switzerland. https://inlitas.org/wp-content/uploads/2023/12/2023_ECIL-Krista-Lepik.pdf

Lim, J., Reiser, R. A., & Olina, Z. (2009). The effects of part-task and whole-task instructional approaches on acquisition and transfer of a complex cognitive skill. *Educational Technology Research and Development, 57*, 61–77. https://doi.org/10.1007/s11423-007-9085-y

Livingston, L. (2010). Teaching creativity in higher education. *Arts Education Policy Review, 111*(2), 59-62. https://doi.org/10.1080/10632910903455884

Makena, B., & Feni, V. L. (2023). Teachers' perspectives on the efficacy of oral presentation tasks toward promoted linguistic acquisition. *Research in Social Sciences and Technology, 8*(4), 125-134. https://doi.org/10.46303/ressat.2023.36

May, C., & Finch, T. (2009). Implementing, embedding, and integrating practices: An outline of normalization process theory. *Sociology, 43*(3), 535-554. https://doi.org/10.1177/0038038509103208

May, C. R., Cummings, A., Girling, M., Bracher, M., Mair, F. S., May, C. M., Murray, E., Myall, M., Rapley, T., & Finch, T. (2018). Using normalization process theory in feasibility studies and process evaluations of complex healthcare interventions: A systematic review. *Implementation Science, 13*(80), 1-27. https://doi.org/10.1186/s13012-018-0758-1

May, C. R., Mair, F., Finch, T., MacFarlane, A., Dowrick, C., Treweek, S., Rapley, T., Ballini, L., Ong, B. N., Rogers, A., Murray, E., Elwyn, G., Légaré, F., Gunn, J., & Montori, V. M. (2009). Development of a theory of implementation and integration: Normalization Process Theory. *Implementation Science, 4*(29), 1-9. https://doi.org/10.1186/1748-5908-4-29

McGinnis, A. M. (2018). *A middle school co-teaching program evaluation in one suburban mid-western school district: Perceptions from regular education co-teachers, special education co-teachers, and building administrators* [Doctoral dissertation]. University of Missouri-Columbia. https://library.missouri.edu/guides/dissertations/

McMurtrie, B. (2024, June 20). Teaching: Are you drowning in an ocean of AI? *The Chronicle of Higher Education*. https://www.chronicle.com/newsletter/teaching/2024-06-20

McNaughton, R. J., Steven, A., & Shucksmith, J. (2020). Using normalization process theory as a practical tool across the life course of a qualitative research project. *Qualitative Health Research, 30*(2), 217-227. https://doi.org/10.1177/1049732319863420

Metz, C., & Weise, K. (2023, January 12). Microsoft bets big on the creator of ChatGPT in race to dominate A.I. *The New York Times.* https://www.nytimes.com/2023/01/12/technology/microsoft-openai-chatgpt.html

Mollick, E., & Mollick, L. (2023). Assigning AI: Seven approaches for students, with prompts. *arXiv preprint arXiv:2306.10052*. https://arxiv.org/pdf/2306.10052

Morris, S. M. (2024, July 2). *AI promises to deliver education its holy grail–as it turns out, we're on the wrong quest*. eCampusNews: Today's Innovations in Education. https://www.ecampusnews.com/teaching-learning/2024/07/02/generative-ai-students-higher-education/

Ojeda-Ramirez, S., Rismanchian, S., & Doroudi, S. (2023). Learning about AI to learn about learning: Artificial intelligence as a tool for metacognitive reflection. https://osf.io/preprints/edarxiv/64ekv

Preus, B. (2007). Educational trends in China and the United States: Proverbial pendulum or potential for balance? *Phi Delta Kappan, 89*(2), 115-118. https://doi.org/10.1177/003172170708900207

Rasul, T., Nair, S., Kalendra, D., Robin, M., de Oliveira Santini, F., Ladeira, W. J., Sun, M., Day, I., Rather, R. A., & Heathcote, L. (2023). The role of ChatGPT in higher education: Benefits, challenges, and future research directions. *Journal of Applied Learning and Teaching,* 6(1). https://doi.org/10.37074/jalt.2023.6.1.29

Rawlusyk, P. E. (2018). Assessment in higher education and student learning. *Journal of Instructional Pedagogies, 21*, 1-34. https://files.eric.ed.gov/fulltext/EJ1194243.pdf

Reason, R. D., & Kimball, E. W. (2012). A new theory-to-practice model for student affairs: Integrating scholarship, context, and reflection. *Journal of Student Affairs Research and Practice, 49*, 359–376. https://doi.org/10.1515/jsarp-2012-6436

Rodgers, R. F., & Widick, C. (1980). Theory to practice: Uniting concepts, logic, and creativity. In F. B. Newton & K. L. Ender (Eds.), *Student Development Practices: Strategies for Making a Difference* (pp. 3–25). Springfield, IL: Charles C Thomas Publisher.

Rudolph, J., Tan, S., & Tan, S. (2023). ChatGPT: Bullshit spewer or the end of traditional assessments in higher education? *Journal of Applied Learning and Teaching*, *6*(1), 342-363. https://doi.org/10.37074/jalt.2023.6.1.9

Schoepp, K., Danaher, M., & Ater Kranov, A. (2019). An effective rubric norming process. *Practical Assessment, Research, and Evaluation, 23*(11), 1-12. https://doi.org/10.7275/z3gm-fp34

Simonton, D. K. (2012). Teaching creativity: Current findings, trends, and controversies in the psychology of creativity. *Teaching of Psychology, 39*(3), 217–222. https://doi.org/10.1177/0098628312450444

Storch, N. (2005). Collaborative writing: Product, process, and students' reflections. *Journal of Second Language Writing, 14*(3), 153-173. https://doi.org/10.1016/j.jslw.2005.05.002

Sundrarajun, C., & Kiely, R. (2009). The oral presentation as a context for learning and assessment. *Innovation in Language Learning and Teaching, 4*(2), 101–117. https://doi.org/10.1080/17501220903125021

Thalluri, J., & Penman, J. (2013). Case scenario oral presentations as a learning and assessment Tool. *Journal of the World Universities Forum, 5*(3), 51-62. http://dx.doi.org/10.18848/1835-2030/CGP/v05i03/56803

University of Maryland Global Campus. (2022). *The Research Assignment.* https://www.umgc.edu/current-students/learning-resources/writing-center/online-guide-

Wolfe, J. L. (2000, June). Effects of annotations on student readers and writers. In *Proceedings of the fifth ACM conference on Digital libraries* (pp. 19-26). https://dl.acm.org/doi/pdf/10.1145/336597.336620

Yang, Y., & Xia, N. (2023). Enhancing Students' Metacognition via AI-Driven Educational Support Systems. *International Journal of Emerging Technologies in Learning (Online), 18*(24), 133. https://doi.org/10.3991/ijet.v18i24.45647

Zhai, X. (2022). ChatGPT user experience: Implications for education. *Available at SSRN 4312418*. http://dx.doi.org/10.2139/ssrn.4312418

Zywica, J., & Gomez, K. (2008). Annotating to support learning in the content areas: Teaching and learning science. *Journal of Adolescent & Adult Literacy*, *52*(2), 155-165. https://doi.org/10.1598/JAAL.52.2.6