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Clarivate's New Generative AI Reading Engagement Platform: A Development Partnership Led by the University Library

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Clarivate's New Generative AI Reading Engagement Platform: A Development Partnership Led by the University Library

Those libraries that stay connected to the needs of their campus communities often lean into new technologies, not just as early adopters but as developers and partners in development

with vendors (Abram, 2022). According to Abram (2022) "Libraries and information vendors need to think about change and adaptation in a new way. It is not about adapting to a new normal. It is about creating the next normal for information organizations and the communities they serve" (pg. 29). The introduction of generative artificial intelligence (GenAI), which can produce information in various formats such as text, images, video, audio, and other data using generative language models, makes Abram's philosophy more important than ever. This is particularly significant due to GenAI's unprecedented growth and its impact on nearly every aspect of life (Feuerriegel et al., 2024). An even more important reason for libraries to develop GenAI applications is a perceived increase in the digital divide for those who do not have the resources or training to use them (Daeep & Counts, 2024). For Florida Gulf Coast University, the motivation to enter a development partnership with Clarivate was the potential of GenAI to improve student learning, including the most elusive threshold concepts within the information literacy framework. This chapter will explore the history of the development partnership between FGCU and Clarivate, including the library's role in leading the effort and the result of the first-year pilot.

Literature Review

In the rapidly growing landscape of higher education, GenAI technologies have quickly become vital components of teaching and learning strategies (Chan & Colloton, 2024). This literature review will examine existing research on the impact of technology integration on student success and self-efficacy related to student reading and comprehension. Understanding the student perspective is an essential part of our decision to integrate GenAI tools such as Clarivate's *Alethea Academic Coach* throughout the curriculum. Therefore, the first part of this literature review will focus on the current literacy challenges, including information literacy, present in higher education today, student's perceptions of using technology in their college

courses, the willingness of students to try new technology for learning purposes, and the best strategies when using surveys to gather feedback from students about these technologies. The second part of this literature review will focus on current literature highlighting the role of university libraries when introducing and incorporating generative AI technologies into the learning environment. There will also be a discussion on how libraries are leveraging new technologies to collaborate with faculty and become leaders of change and innovation within their respective institutions.

Current Literacy Challenges for College Students

To demonstrate the need for new technologies in the learning environment, it is important to understand the current literacy challenges college students face today. Current literature suggests that the most prominent challenges students face with college-level reading are the financial obligation of course materials, perceived lack of importance, lack of college readiness, lack of time, and lack of motivation (Harvey & Anderson, 2020; Kerr & Frese, 2017). These challenges alone are sufficient to influence student success and perceptions of earning a college degree. In fact, a study conducted by Becker et al. (2023) at a community college in the Southwest region of the United States examined the correlation between textbook costs and student success rates. After comparing student pass rates, the chi-square test indicated a statistically significant relationship between cost and success (Becker et al., 2023). Overcoming financial obstacles is a common theme in higher education literature. Marty and Teeman (2020) conducted a mixed-method study on students' perceptions of purchasing course reading materials. Twenty-four percent of students indicated that they only buy textbooks they can afford and often go without a textbook due to high costs. The sad reality is that college students today are missing out on their full learning potential because of the costs of textbooks (Marty &

Teeman, 2020). Therefore, leaders in higher education must find cost-effective solutions to fill learning gaps.

Reading Comprehension

With student comprehension at an all-time low, students are struggling with the transition from high school to college (National Center for Education Statistics, 2024). Faculty have indicated that students are entering college with low critical thinking, information literacy, and summarizing skills (Braten, et al., 2014; Fleck et al., 2017). Researchers also suggest that students are struggling to understand complex concepts, read charts and graphs, and memorize key topics, causing an academic lag and demotivating them from purchasing or reading course materials (Kerr & Frese, 2017). This lack of preparedness is a common obstacle in higher education today and contributes to the need for reform and adoption of effective teaching and learning strategies. A cross-sectional study analyzed the academic reading proficiency of 848 undergraduates to determine if there is a common issue of unpreparedness in college students today. The results determined that the average reading comprehension score was a 6 out of 10 (Gorzycki et al., 2016). This proportion signifies that undergraduates are struggling to read and interpret academic texts across the board. College readiness is an ever-evolving concept; as texts increase in depth and complexity throughout one's academic experience, the strategies and proficiency should evolve as well (Paulson & Holschuh, 2018). Therefore, the purpose of the mixed-method study included in this chapter is to identify effective ways to enhance the student learning experience when facing reading challenges.

Information Literacy Threshold Concepts

The ability to summarize and synthesize written text to develop a new idea is embedded in the threshold concept of "scholarship as conversation" within the Framework for Information Literacy filed by the Association of College & Research Libraries (ACRL) in 2015 (Association

of College & Research Libraries, 2015). This is essential for students to master their field of study. According to Olaniyi (2020), understanding the text's meaning and drawing inferences must happen if the student is to achieve a course's learning objectives. In their systematic review and meta-analysis of studies published between 2010 and 2021, de la Peña and Luque-Rojas (2021) endeavored to determine the proportion of students crossing this threshold. They found that only 22% of the college students in the review were able to perform tasks requiring them to make critical inferences from the text. This was consistent across disciplines, including social sciences, engineering, humanities, health sciences, and business (de la Peña & Luque-Rojas, 2021). Several studies suggest that reading comprehension is a barrier to student learning among college students in every discipline, especially at the level of mastering threshold concepts (Mason, 2018; Gomez et al., 2020; Kotzner et al., 2021). According to Francis (2017), threshold concepts are points at which the student finds the information extremely difficult to comprehend, requiring them to move beyond their current knowledge or abilities they do not have. By crossing the threshold, they gain the essential knowledge required of the discipline. Unfortunately, many students give up, willing to accept only what they already know, and often have negative opinions or feelings about the information, discipline, and their ability to learn (Francis, 2017).

Importance of Student Engagement with Text

In a world where students face economic obstacles and enter college underprepared, it is imperative for educators to keep students engaged with course reading material and emphasize the importance of engaging with the text. Recent studies indicate that students feel professors do not stress the importance of course reading, leading them to complete their assignments by skimming the text for answers (Marty & Teeman, 2020). From the student perspective, academic reading has become busy work, and students feel demotivated to read course material when it

does not specifically correlate to their interests or degree program (Mason & Warmington, 2024; Kerr & Frese, 2017). Content that is difficult to read and extensive makes reading a grudging task, and students have difficulties identifying main ideas or takeaways from the material (Mason & Warmington, 2024). Therefore, students need better reading tools and strategies to stay engaged in their courses and obtain knowledge of their degree program. This will take faculty engagement to make the text relatable and students to see the value in academic reading (Aldrige, 2019).

Student Willingness and Perceptions of Using Technology in The Classroom

The adoption and integration of new technologies in higher education institutions rely heavily on product end users, or student perceptions, as part of their learning experience (Karp & Fletcher, 2014; Office of Survey Research & Analysis, 2024). Strydom et al. (2017) advise the strategic introduction of new resources that promote innovation and efficiency in student learning, stating that it should be rooted in delivering academically engaging experiences. Many reasons contribute to the overall literacy struggles or poor performance faced by postsecondary students, including a lack of preparedness, time, motivation, and financial resources, which affect each other (Aldrige, 2019; Harvey & Anderson, 2020; Kerr & Frese, 2017; Marty & Teeman, 2020).

Student performance metrics elucidate a clear disconnect between the skill level required for postsecondary academic success and the current mitigating efforts implemented for smooth matriculation into most universities. As a result, many institutions have elected to integrate learning technologies into their program planning (Harvey & Anderson, 2020; Paulson & Holschuh, 2018). Instructional tools used to enhance student learning are indispensable as technology becomes increasingly embedded in everyday life and helps institutions address deficiencies (Henderson et al., 2017).

The Readiness for Technology Adoption Framework (RTAF) addresses an institution's capacity and best practices in implementing new technologies to the student populations as the process relates to various stakeholders (Karp & Fletcher, 2014). For successful implementation phases, both students and key stakeholders in the learning process should possess a high level of awareness of their current standing and desired outcomes for smooth adoptions. This theme of accountability is echoed in an article by Harvey and Anderson (2020), which explores educational IT standards designed to help students and staff on their journeys to technologically enhanced learning. This means that both take ownership of their experiences, seeking adequate task completion and performance reflection. Similarly, Perusall, a learning technology platform investigated by Benjamin (2023), was designed to hold students accountable for reading course materials outside of class with faculty-designed questions and tasks.

Students are more likely to use new technologies if they understand the void the intervention fills (Karp & Fletcher, 2014). The literature on this topic alludes to the advantages technology has for younger generations, who have higher levels of comfort and expertise with technology integration in other aspects of their lives (Gray et al., 2021; Jazlin et al., 2017). Students successfully adopt and incorporate technologies if the benefits, including enhancing their academic experience, are clear and specific (Jazlin et al., 2022; Karp & Fletcher, 2014). Complex and repetitive exposure to educational technology further supports student success by helping them revive and reimagine the pathways to completing tasks they felt burdened with, bored of, or ill-equipped to execute (Henderson et al., 2017; Jazlin et al., 2022; Karp & Fletcher, 2014). Studies following the experiences of medical, architecture, and digital natives in other disciplines show benefits from the use of learning technology (Gray et al., 2021; Jazlin et al., 2017). A student's willingness to interact with new educational technologies parallels their perception of the academic content assigned by faculty (Henderson et al., 2017; Jazlin et al.,

2017). Strydom et al. (2017) advise that the strategic introduction of new resources that promote innovation and efficiency in student learning should be rooted in academically engaging experiences. A study on the perceptions of learning technologies by students from two universities found that 46% agreed educational technology helped them meet deadline expectations, 30% found it promoted flexibility, access, and convenience, and 26% said the course supplement made assignments easier (Henderson et al., 2017)."

Getting Student Feedback Through Surveys

Incentivized student surveys have evolved as key solutions to low response rates experienced by postsecondary education researchers (Laguilles et al., 2011; Royal & Flammer, 2017; Standish et al., 2018). Gathering student data and evaluative information on engagement, quality, and faculty performance has presented institution stakeholders with vital information needed to assess planning efforts, performance improvement, and other components relevant to campus and student experiences (Cole et al., 2015; Laguilles et al., 2011; Standish et al., 2018). Incentives serve to improve student response rates, which have undergone a steady decrease; these incentives include lotteries, pre-paid, post-paid, and participatory rewards (Cole et al., 2015). Royal and Flammer (2017) found that an impactful incentive to consider in the administration of student surveys is the effective communication of the reasons for data collection. Assuring students of the value of their participation can greatly improve their approach to providing feedback. Dedicating class time to submitting surveys lessens the burden on students, who may feel that taking surveys does not provide a valuable return for their time (Standish et al., 2018). The authors also discovered that improvements in student response rates were found with mobile device survey compatibility. The length of responses, however, heavily depended on the type of device used during surveying; the presence of a full keyboard resulted in

responses over 60% longer than those retrieved from a smartphone or tablet (Standish et al., 2018).

Libraries Leading Change

In a literature review of library innovation spanning 30 years, Brundy (2015) determined that a flatter organizational structure or one that eliminated silos and promoted greater shared decision-making led to more innovation in academic libraries. In a more recent literature review of library innovation, Llewellyn (2019) identifies themes where innovative libraries aligned their efforts with the mission of the parent institution, led efforts towards digital transformation, and utilized new technologies and approaches to support teaching, learning, and research. According to Llewellyn, the literature identified innovative libraries as those demonstrating their value through measurable influence on student success, increasing impact and funding of university research, and elevating the profile of the institution through community engagement. Khalil and Khalil (2023) and Brundy (2015) suggest that innovation is a matter of survival for academic libraries, as most library budgets have not kept pace with institutional expenditures over the past two decades, indicating a decline in senior leadership's view of the return on investment in the library. Library innovation is intrinsically linked with innovations in technology and management strategies (Brundy, 2015; Khalil & Khalil, 2023). The research findings of Khalil and Khalil (2023) suggest that libraries innovating new service delivery and knowledge management techniques were significantly influenced by the library’s development and use of new technologies, new management strategies, and new organizational structures. They imply that those academic libraries that operate under traditional management and organizational paradigms, or lack the ability to adopt new technologies, will not be able to effectively respond to the evolving needs of their users and, therefore, will diminish in value to their campus community (Khalil & Khalil, 2023).

Academic Libraries' Response to Generative AI

In interviews with 33 library directors, Cox et al. (2019) found that only a few academic library leaders viewed AI as having a significant impact on library service delivery and knowledge management. Four years later, Huang et al. (2023) studied the library strategic planning documents of the top 25 universities in both the UK and China and found little mention of AI utilization as a strategy. Hussain and Ahmad (2023) conducted a bibliometric review utilizing Scopus, examining publications that focused on AI in academic libraries from 2002 to 2022. They found that in 2022, corresponding with the launch of ChatGPT, there was a significant spike in publications, with 64 out of a total of 373 publications produced that year (Hussain & Ahmad, 2023). This dramatic increase may suggest that academic libraries are realizing the implications and potential of GenAI in transforming library services and resource delivery. Cox (2022) presents multiple conceptual frameworks for future research on the impact of AI on the profession of academic librarianship. Cox includes a framework in which librarianship as a profession, grounded in research, scholarship, and management, could lead to a transformation where AI enhances academic library endeavors rather than replaces them (Cox, 2022).

Library as a Development Partner with Private Industry

Cox (2022) suggests that if early adopters of artificial intelligence technologies are made visible, including those working with the commercial sector, they may position the academic library as a transformational leader on campus. This could convince campus leadership to invest in the efforts of their library (Cox, 2022). Collins et al. (2014) describe a development partnership between North Carolina State University (NCSU) and EBSCO. According to the authors, successful development partnerships have negotiated terms with clear expectations from the vendor on deliverables and timelines. They emphasize that library staff should be

experimental, accepting significant trial and error and potential disruptions in workflow or system failures during the development process (Collins et al., 2014).

Piloting Alethea at FGCU

The FGCU Library has a history of development partnerships with Clarivate, including the piloting of Rialto, the company's advanced acquisition and selection companion tool to Alma. The partnership began when the library was approached by Clarivate to participate in a pilot launch. FGCU joined others under a legal agreement to pilot the application and provide feedback for improvements. Later, the library became one of the first adopters. This type of partnership, while time-consuming, provided dividends including: allowing for consensus among all members of the library staff and faculty on the decision to implement, an easy transition to the new system, and the ability to assist peer institutions with their adoption of the product. The FGCU University Library is preparing to pilot a couple of new products from Clarivate in fall 2024.

However, the partnership with Alethea began very differently. The dean of the library was approached by a former colleague from the library technology industry who was working with an ed tech start-up company, Pangea. The dean was convinced to preview the product and invited her colleague, the director of digital learning, to the product demonstration. After previewing Alethea, they were both convinced the tool was compelling and could address some of the student success barriers many FGCU students face, including interpreting and articulating the main ideas from complex texts required as course readings.

The library dean informed the provost of the application, who agreed that students who were not successful in gateway courses in economics, chemistry, finance, and biology were likely struggling with reading comprehension. He mentioned that he had visited a class that was experiencing a 40% fail rate, almost exclusively among students required to take the course to

progress in their degree program. The faculty were convinced that the students were unprepared for the math required in the course, but the provost was convinced that the problem was reading comprehension, especially the threshold concepts within the discipline of the course (M. Rieger, personal communication, March 2023).

Alethea and the Alethea Academic Coach

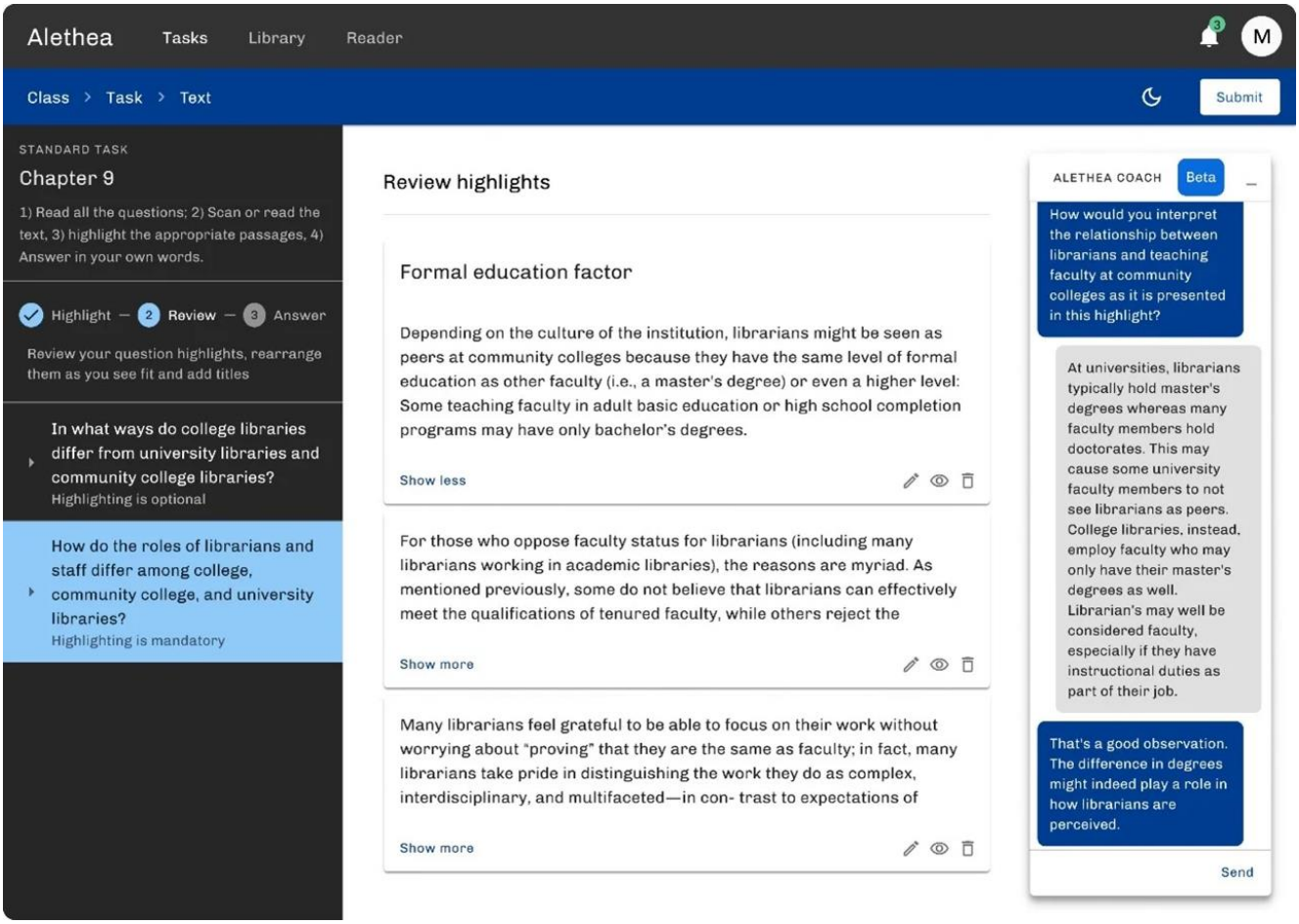
Eran Segal, founder of Alethea and now the director of Alethea product development at Clarivate, created Alethea to assist students struggling with comprehensive reading. As a college philosophy student, Segal found it difficult to focus while reading required course materials and was in search of a solution (E. Segal, personal communication, March 8, 2023). According to Segal, reading comprehension methodologies such as SQ3R (Survey, Question, Read, Recite, Review) and SOAR (Select, Organize, Associate, Regulate) were integrated into Alethea to engage students in a metacognitive process while reading, increasing their reading efficacy. Numerous studies suggest that metacognition is enhanced through SQ3R and SOAR in all disciplines, including science, technology, engineering, and math (STEM), leading to enhanced comprehension, including threshold concepts (Jairam, 2014; Barzililai & Ka'adan, 2016; Suherman, 2020; Davis & Ritchie, 2023). There are three steps for instructors creating reading tasks in Alethea, upload required course reading, devise questions that stimulate metacognitive processing, and highlight the sections in the text that answer the questions. Instructors have features such as scoring each question, limiting the amount of text highlighted by the students, the type of answers required, and more. The students have five recommended steps to complete the reading tasks, review the questions, scan the text for headings and organization, highlight the section of the text that contains the answer, organize each highlight as an annotation, answer the question in their own words.

The Academic Coach

While Alethea was already being piloted by several faculty at universities such as Johns Hopkins, Tel Aviv, and Yale, Segal and his development team were able to integrate GenAI with the release of GPT-4 during the initial pilot. The chatbot is referred to as the Academic Coach. Students can activate the coach when they need assistance with formulating answers in their own words (E. Segal, personal communication, March 8, 2023). The Academic Coach engages the students in a chat session. Figure 1 provides a view of the Academic Coach feature in action.

Figure 1

Screen Capture of Student Engaging with the Alethea Academic Coach



Recruiting faculty to the pilot

Convinced of the application's potential to improve student academic success, the library dean and the director of digital learning developed a plan to determine interest in Alethea. MIT's Justin Reich (2023) presents a framework for implementing innovative practices in educational settings. Reich suggests that inviting faculty to experiment with new technologies, engaging in the scholarship of teaching and learning within their disciplines using the products, and gaining experience in best practices is an effective way to implement new technologies for teaching and learning.

Therefore, with the provost's blessing, the pilot began with an open forum in which the CEO of Pangea and the founder of Alethea visited the campus and presented his product in April of 2022. To compel faculty to attend the presentation, they were emailed a digital flyer with a provocative title (see Figure 2). Lunch was served to the first 30 who registered for the in-person presentation in our faculty development center, the co-sponsor of the event, and the remaining were provided a Zoom link. Over 80 faculty attended, the highest attendance for any event sponsored by the faculty development center. During the forum, five faculty were identified to participate in the summer and fall pilot. These faculty members were teaching courses in education, biology, sociology, business, and physical therapy. Each faculty member identified one section of their course to integrate Alethea. Three of the faculty were department chairs, and one had recently been selected as the provost's faculty fellow for artificial intelligence. The final faculty member was the Dean of the University Library and a professor in the College of Education. The strategic decision to include these faculty was based on the influence they would have on their peers. These were the faculty champions.

Figure 2

Flyer emailed to faculty for Introduction to Alethea

Note: The flyer was emailed with a link to register for the presentation.

The Pilot

The first implementation of Alethea was in Summer B classes, the second 8 weeks of the summer 2022 semester. The courses were an interdisciplinary sociology class and a business strategies capstone course. The sociology class required the library to negotiate unlimited downloading of the book used for the class which has already been added to the library's collection as part of the library's textbook affordability program. The business strategies course chose three business cases from the Sage Business Cases collection, also licensed by the library. Subject librarians worked with each faculty to secure copyright-compliant texts including library purchased, OER, or open access reading materials. Before the classes began, the faculty, librarians, instructional designers and the coordinator of the writing center met with Alethea

developers to discuss strategies for implementing Alethea. During the 2-hour session, they were given access to a sandbox of courses and sample assignments called reading tasks. The Alethea team walked the attendees through the student and instructor sides of the application. The rest of the time was set aside for strategy, including a discussion of how each faculty member would implement the tool, and the efficacy research they were interested in exploring. It was incredibly helpful to have both the librarians and the instructional designers engaged in the discussion. These individuals provided insight into the potential barriers students may have using the system and allowed the group to brainstorm possible solutions. These sessions were repeated multiple times throughout the year as more faculty joined the pilot.

Expanding the Pilot

During the fall of 2023, faculty using Alethea were invited to take part in a teaching and learning with AI workshop series. During the panel presentation, faculty were once again invited to join the pilot. By spring, 18 faculty members were onboarded from 12 different disciplines. The onboarding process was made more accessible by integrating Alethea into the university's LMS, Canvas. However, not every faculty member was successful in launching Alethea in time for full integration into their spring courses. Full integration requires a significant investment in time, including selecting appropriate reading materials and developing metacognitive questions for each text. Several faculty members, therefore, only utilized Alethea for one of their assignments or had to forgo utilization until the next semester.

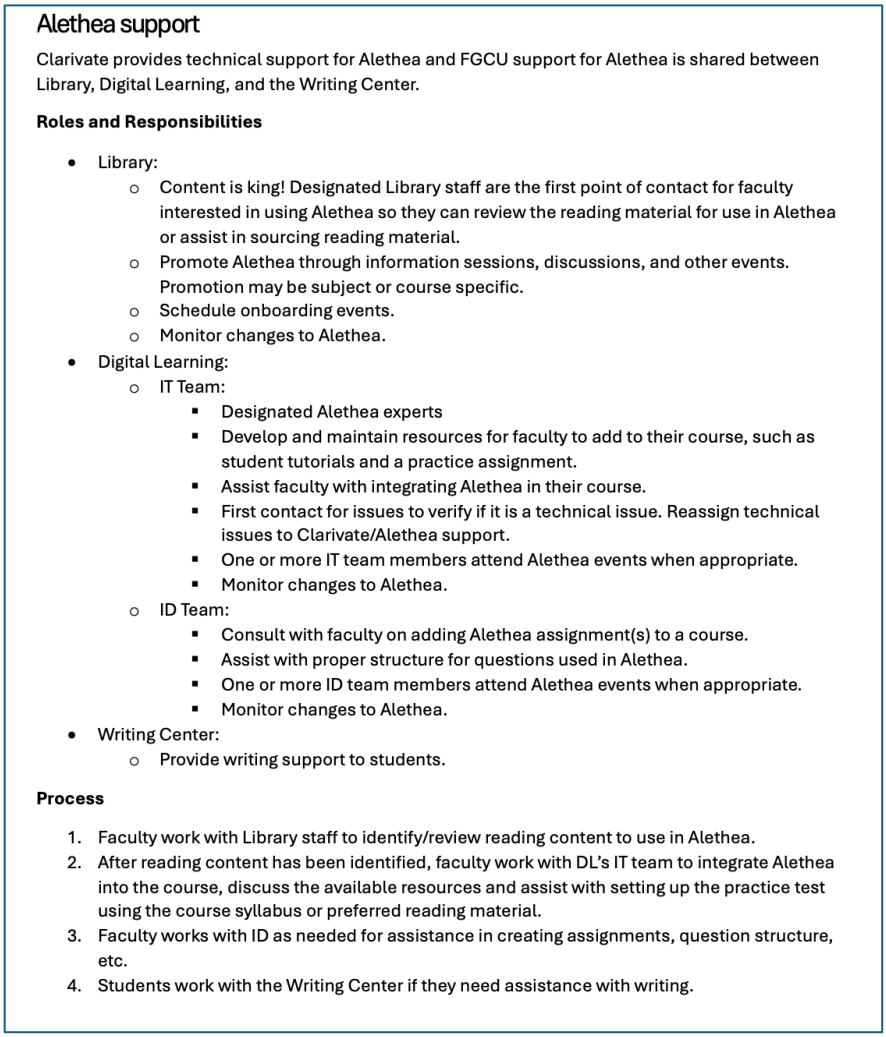
Many of the issues encountered were related to the reading materials. For some, the issue was potential copyright infringement, particularly with textbook publishers. FGCU librarians were unsuccessful in securing copyright permissions from any of the textbook publishers, requiring them to look for alternative reading materials, including open educational resources (OER) and library-licensed content allowing unlimited downloads. One faculty member needed

more time to prepare course lecture transcripts for OCR recognition and better engagement with the GenAI feature.

All these issues were instrumental in discovering the most effective process for onboarding faculty as first-time users of Alethea. FGCU has established an onboarding process that includes having each faculty member meet with a librarian first. The digital learning instructional design team has created a Canvas course, similar to ones they have created for other products integrated into Canvas, such as Kaltura and Respondus. After a meeting between the three entities supporting Alethea: university library, digital learning, and writing center; an agreement was established for supporting faculty and students (see Figure 3)

Figure 3

Internal Agreement Between FGCU Departments Supporting Alethea Course Integration



Alethea support

Clarivate provides technical support for Alethea and FGCU support for Alethea is shared between Library, Digital Learning, and the Writing Center.

Roles and Responsibilities

- Library:
  - Content is king! Designated Library staff are the first point of contact for faculty interested in using Alethea so they can review the reading material for use in Alethea or assist in sourcing reading material.
  - Promote Alethea through information sessions, discussions, and other events. Promotion may be subject or course specific.
  - Schedule onboarding events.
  - Monitor changes to Alethea.
- Digital Learning:
  - IT Team:
    - Designated Alethea experts
    - Develop and maintain resources for faculty to add to their course, such as student tutorials and a practice assignment.
    - Assist faculty with integrating Alethea in their course.
    - First contact for issues to verify if it is a technical issue. Reassign technical issues to Clarivate/Alethea support.
    - One or more IT team members attend Alethea events when appropriate.
    - Monitor changes to Alethea.
  - ID Team:
    - Consult with faculty on adding Alethea assignment(s) to a course.
    - Assist with proper structure for questions used in Alethea.
    - One or more ID team members attend Alethea events when appropriate.
    - Monitor changes to Alethea.
- Writing Center:
  - Provide writing support to students.

Process

1. Faculty work with Library staff to identify/review reading content to use in Alethea.
2. After reading content has been identified, faculty work with DL's IT team to integrate Alethea into the course, discuss the available resources and assist with setting up the practice test using the course syllabus or preferred reading material.
3. Faculty works with ID as needed for assistance in creating assignments, question structure, etc.
4. Students work with the Writing Center if they need assistance with writing.

Note: This agreement established the Alethea support team at FGCU. While digital learning was reluctant to establish a team lead since this is not a standard practice, the library and writing center identified lead contacts for faculty interested in learning more about Alethea.

The Faculty Experience Using Alethea

Faculty members who have utilized Alethea have all reported increased student learning. Every instructor who has used Alethea has continued to do so. One of the professors engaged in the pilot from the very beginning has embedded it in three courses. Furthermore, every faculty member is involved in at least one research project, and several are creating OER, believing that student access to course readings is essential to their success. In these cases, faculty reported that

the more their students engaged with the required course readings, the more they realized that the readings initially chosen for the course, fell short of the learning objectives. This realization motivated them to create course readings that were better aligned with the course learning objectives and the financial needs of their students

Alethea Use Cases

The college of business had the most faculty members utilizing Alethea during the spring pilot, primarily to analyze business case studies. Alethea is currently being used in two courses in the business management degree program taught by six different faculty members. These faculty all agreed to deploy Alethea in the same way. All case studies and questions were standardized to eliminate the instructor as a potential confounding variable when determining efficacy.

One of the most astounding potential impacts of Alethea during that spring semester, was related to a long-running group assignment in one of the courses. Every semester, the students compete in a national business strategies game. This year, two FGCU teams tied for first place, and one tied for second place. The first FGCU team to win “overall best team” was taught by one of the first faculty members to use Alethea in the summer of 2023. The students reported that Alethea was instrumental in their preparation for the competition.

In most use cases, the faculty have utilized Alethea to create a flipped classroom. The faculty could hold class discussions knowing that their students had read the materials and engaged with the readings by answering the assigned questions. Alethea allows the faculty to show a heat map of which sections of the text students highlighted and their anonymized answers. This provides a unique opportunity to discuss which answers were correct or incorrect. There was only one instructor who utilized Alethea in a fully asynchronous online course. The

instructor simulated this discussion by creating a video announcement and asking students to comment.

In all but the business courses mentioned above, each instructor utilized Alethea differently. This was the reason many of the faculty attended brainstorming sessions with Clarivate's Alethea development team: to hear about the various ways their peers were implementing the tool in their courses. At each of these meetings, subject librarians were at the table to brainstorm potential reading materials that were appropriate for the learning objectives of the courses.

Technical issues

As expected when engaging in a development partnership (Collins et al., 2014), FGCU faculty and students encountered technical issues. However, also typical of these partnerships, the vendor support teams were extremely responsive, and issues were quickly remedied. Several features were added to Alethea as a result of FGCU faculty and student feedback. In fact, technical issues encountered during the development partnership lead to essential improvements in the product (Collins et al., 2014).

The Scholarship of Teaching and Learning

It was mentioned earlier in the chapter that the FGCU faculty involved with Alethea have all engaged in at least one research study on the platform's efficacy. However, many have multiple studies underway. One faculty member is leading the comparison study within the two business courses. That same faculty member, in collaboration with the director of digital learning, is also studying the anonymized transcripts of the student chat interactions with the GenAI Coach. This work has been incredibly illuminating. By studying the transcripts, they can determine whether the coach was instrumental in helping students formulate answers using their own words rather than paraphrasing or directly quoting. The researchers found that the Academic

Coach provides gentle nudging to make the students question why they highlighted certain passages and asks them why they didn't think other passages were relevant. While this is incredibly helpful to many students, it helps explain why some students say the GenAI makes it too easy to formulate answers. This study, although not yet published, has challenged the Alethea development team to consider different levels of assistance based on either the instructor's or the student's choice.

The faculty members who have successfully implemented Alethea in their courses continue to provide evidence of improved learning. For example, one faculty member began tracking the academic performance of the students who took her course in which Alethea was utilized, in other more advanced courses. In every case, the students who took the Alethea-integrated course outperformed as a cohort compared to the cohort of students who had not taken the Alethea-integrated course. The Alethea faculty user group at FGCU presents at conferences, is being interviewed by the media, and is publishing their findings, including this chapter. They are steeped in the scholarship of teaching and learning and have contributed to a preliminary framework for determining the efficacy of other GenAI-integrated learning tools, which will be tested this summer by faculty and graduate student interns and published in a whitepaper that will be presented to the provost.

Alethea Student Interns

As the pilot expanded, student involvement and feedback became essential. The library dean was approached by two former master's degree students requesting an internship. One of the students had experience with Alethea in the dean's fall course, while the other had taken the same course the previous fall without the benefit of Alethea. They were recruited as the "Alethea Interns" and introduced to the Alethea development team, the FGCU Alethea support team, and several faculty members participating in the spring pilot. The interns were instrumental in

capturing the student experience. They completed half of the literature review for this chapter and developed, administered, and analyzed the student survey. The original plan for the interns was to create a whitepaper regarding the efficacy of Alethea and recommendations for further integration across the curriculum. This whitepaper will now be completed by summer interns.

The Student Experience Using Alethea

Throughout the pilot, the student feedback about Alethea was captured through focus groups, class reflection exercises, conversations during class visits by Alethea's staff and the library dean, and comments included by some students on the university deployed evaluation of instruction. It was important to gather feedback on the student experiences and challenges students faced. Prior to this case study, however, there was no systematic method used to capture the student experience with new teaching and learning tools. The university needed to be able to compare the student experience across the different courses to be able to determine the extent to which the instructor, materials, or how Alethea was integrated into the course, made a difference in how students viewed the platform. This feedback was essential, allowing leaders within FGCU to make educated and calculated decisions on whether A.I. learning tools such as Alethea, should be regularly implemented into the learning environment. According to Creswell and Plano-Clark (2018), mixed methods studies can contribute to learning intervention implementation research in educational settings, by providing information about what core components were adopted and by whom, and how to implement based upon the teaching modality and the resources available to faculty and students. To complete the study, the Alethea interns and the dean of the library deployed a survey instrument.

The Research Plan

Creswell and Plano-Clark (2018) suggest that researchers trying to identify unknown variables and hoping to determine the generalizability of their sample results to the population

should consider an exploratory mixed-methods research design. Since monetary incentives or extra-credit or would not be included in the survey, the researchers were unsure of the potential response rate. The population included all students enrolled in courses using Alethea for more than one reading assignment. By including open-ended questions in the survey, the qualitative component allowed the researchers to identify trends within the quantitative results, even if participation fell below the desired confidence level (Creswell & Plano-Clark, 2018). When the survey was administered, 295 students (N=295) were enrolled in the courses meeting the criteria. For a population of 295, to achieve the desired confidence level of 95% ($Z = 1.96$), a proportion estimate of 0.05, and a margin of error of 5%, the calculated sample size would need to be n=59. There were three factors that may have created a low participation rate: whether the students would be interested in participating in the survey without a monetary incentive or gift, whether the faculty would encourage them to participate, and the limited timeframe while waiting for IRB approval and the end of the semester looming. The survey was administered through the university learning management system (LMS) as a "blueprint course." The course included an assignment worth no points. Faculty would have to accept the blueprint course to overlay the course in which they were using Alethea. The assignment due date was set to allow the students one week to take the survey. If accepted by the faculty member, the survey would show up in their assignment task list. The survey was closed when the sample size reached n=100. The researchers believed the number of participants was achieved by stating the purpose of the survey in the informed consent. According to Royal and Flammer (2017), including how the data collected will be used, students can determine whether the return on the investment of their time is warranted. In this case, the researchers informed the students that their feedback would impact the decision to fully implement Alethea throughout the curriculum and how to do so effectively.

Creating the Survey

Creating a new survey requires several steps to ensure the validity and reliability of the data collected (Creswell & Guetterman, 2019). To improve validity, researchers engaged the faculty and Alethea support staff, the content experts, to review the questions to establish content validity (Creswell & Guetterman, 2019). The researchers measured the Cronbach's alpha (α) of the survey, which according to Creswell and Guetterman, a value of 0.7 or higher generally indicates good internal consistency. The score for this survey was α=.87, which is considered good reliability (Creswell & Guetterman, 2019).

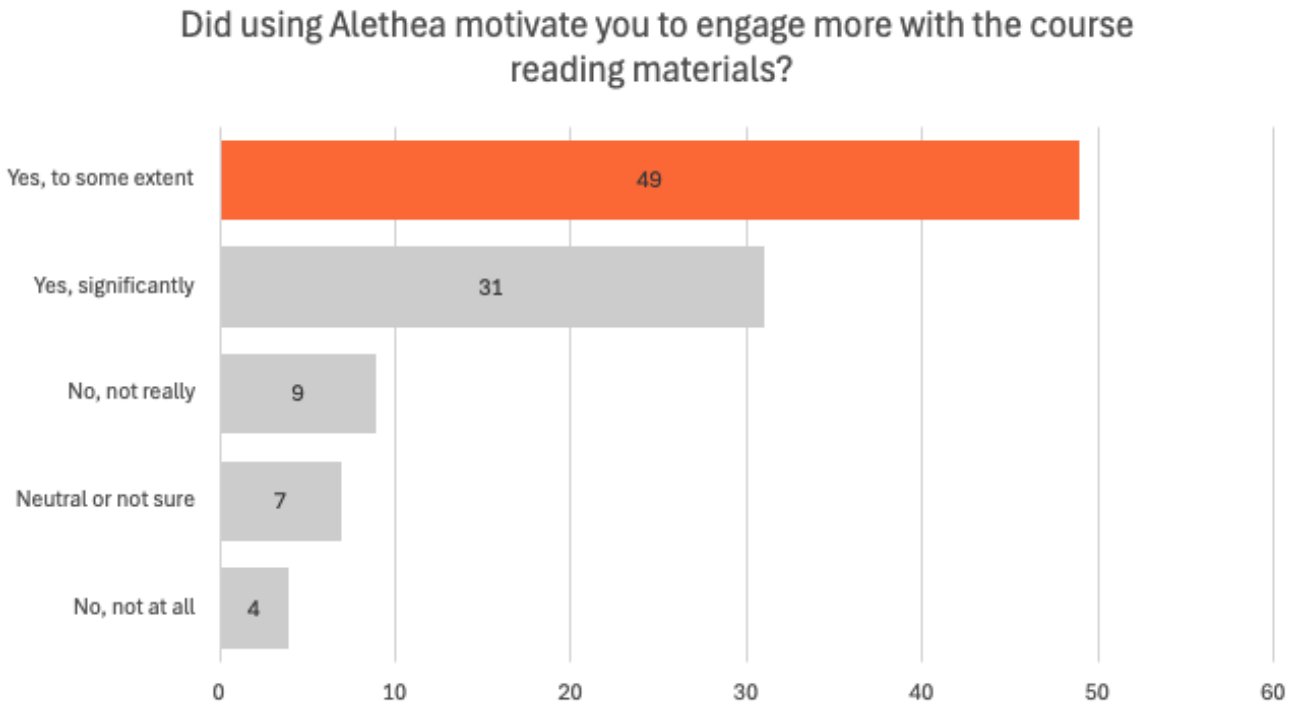
Results

Quantitative Results

Overwhelmingly, students who completed the survey indicated that Alethea and the Alethea Academic Coach (the GenAI chatbot) were instrumental in their learning. A one-way analysis of variance (ANOVA) was used to determine whether the course the student was enrolled in had any significant effect on students' answers. According to Creswell and Guetterman (2019), a one-way ANOVA is a parametric test used to compare the means of three or more independent groups to determine whether there are statistically significant differences between them. The p-value of the ANOVA was 0.43531, which is greater than 0.05, suggesting that there is no statistically significant difference in the student answers across different courses at the 5% significance level. Figures 4 through 9 chart the frequencies of student answers to each question using a 5-point Likert scale

Figure 4

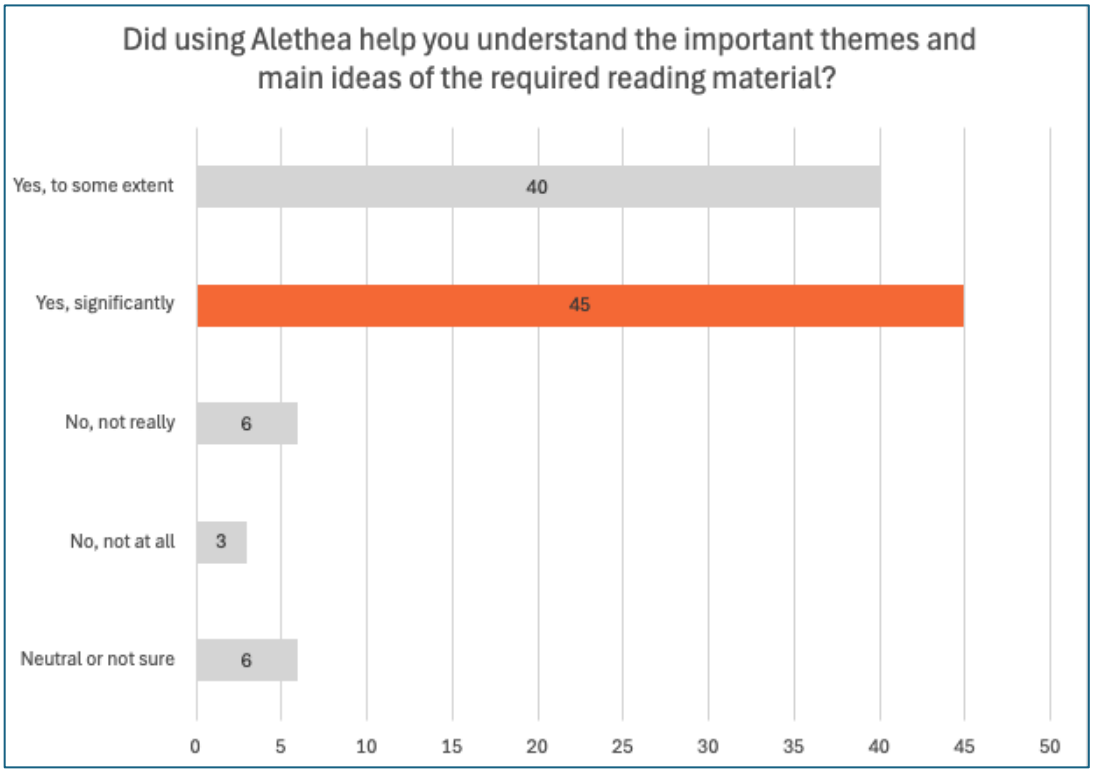
Question 1 Answer Frequencies: Course Material Engagement



Note: 80% of the students agreed that Alethea motivated them to engage more with the course reading materials.

Figure 5

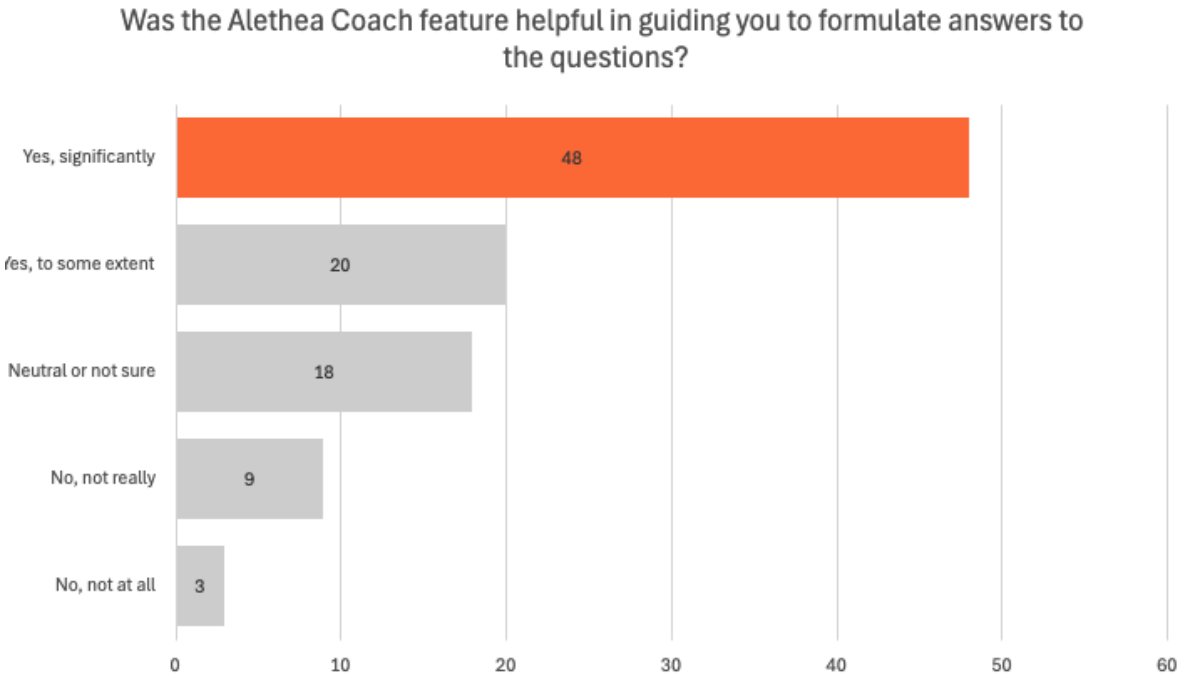
Question 2 Answer Frequencies: Reading Comprehension



Note: 85% of students agreed that Alethea helped them understand the important themes of the required reading materials.

Figure 6

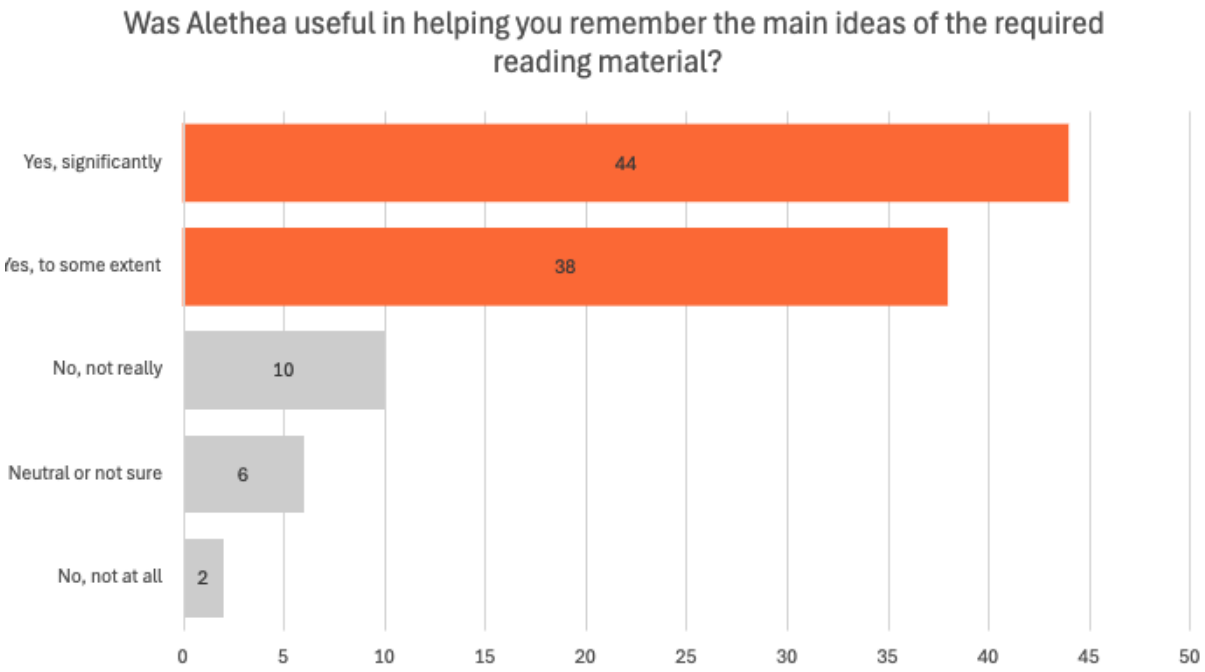
Question 3 Answer Frequencies: The Alethea Academic Coach Chatbot



Note: 68% of students agreed that the Alethea Academic Coach GenAI feature was helpful in formulating the answers in their own words.

Figure 7

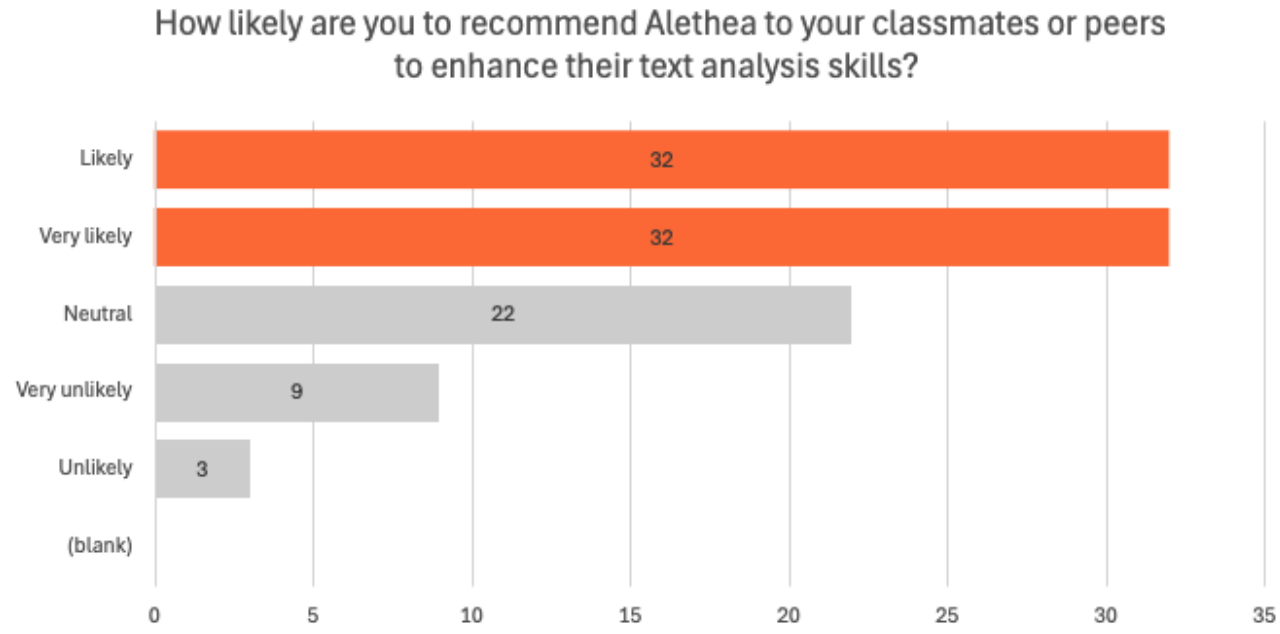
Question 4 Answer Frequencies: Remembering the Main Ideas



Note: 86% of the students agreed that Alethea helped them remember the main ideas within the reading materials.

Figure 8

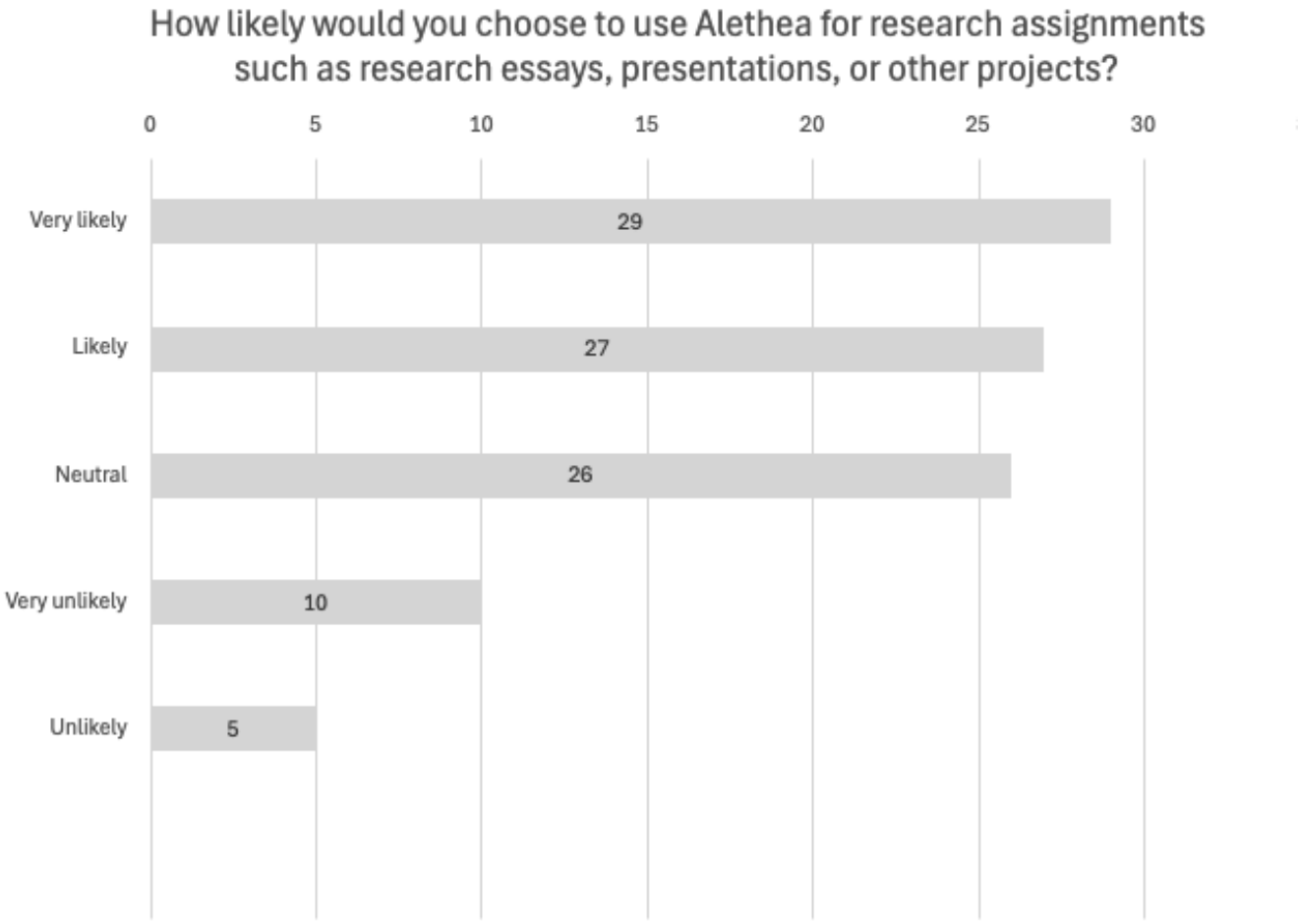
Question 5 Answer Frequencies: Recommending Alethea to Peers



Note: 64% of the students agreed that they would recommend Alethea to their peers to enhance their text analysis skills.

Figure 9

Question 6 Answer Frequencies: Using Alethea for Research Assignments



Note: 56% of students envision using Alethea to complete research assignments. Alethea is currently not designed for this purpose. However, this may suggest that students were interested in using a product like Alethea, such as a GenAI research assistant, when working on research assignments.

Qualitative Survey Results

According to Morgan (2023), ChatGPT can be a viable alternative to hand-coding data as it does well at producing descriptive themes. Therefore, a combination of two GenAI platforms was enlisted including ChatGPT GPT-4 and Microsoft Bing's Copilot. Both systems were asked to "Categorize the following answers based on the question." Answers were also hand-coded to ensure nuances were not missed (Morgan, 2023).

The themes identified below helped the researchers and faculty better understand the answers students provided to the Likert-scale questions. For example, when students indicated that Alethea did not help them understand the main ideas of the text (12%), some also indicated in their open-ended responses that they found the materials easy to understand, so they did not feel they needed assistance interpreting the main ideas. Another connection was made using the GenAI Academic Coach (chatbot); several students who did not find the GenAI feature helpful (11%) also indicated that they felt the chatbot should challenge them more. A student suggested that they should have to write the answer themselves and then have the chatbot critique their answers. This insightful feedback is being incorporated into the platform, aligning with the chatbot transcript study recently completed by the faculty. The following are a few of the themes that either confirm or negate the research questions of the study.

Ease of Use and Convenience: Focus and Organization

*"*I liked Alethea because it was all in one place, which made it easier to see what I had to do."

"It helped me stay up to date on my studying for each chapter."

"I really like Alethea because she helped me put my ideas in order and helped me answer the questions in an easier, faster, and more effective way."

Educational Support: Threshold Concepts

"I found Alethea to be very helpful as it helped to guide me by helping me put my thoughts into my writing and also helped lead me towards the key points of the material."

"For example, in our class, dissecting pieces of literature written by Ernest Hemingway has been super helpful in the analysis process."

"For the most part, Alethia was a great experience using to better understand the readings in the class."

"Talking to the bot feature and having an actual conversation about the material is significantly helpful and should be kept."

"Out of all the external websites I used in my four years of college I believe this one helped me the most. Highlighting, asking questions and then answering was very helpful."

Differing Abilities: Suggesting Levels of Difficulty

"To improve student learning, I think students should be tasked with fully writing the response, however Alethea should be there to provide feedback and act as a devil's advocate to students."

"I really like the concept, maybe after the highlighting section the AI can give more personal responses rather than just a broad pat on the shoulder kind of response."

Conclusion

Based upon both the qualitative and quantitative data from the student survey, researchers were able to confirm three of the four research hypotheses: H_1 - Students engaged more with the course readings because of Alethea, H_2 - Students report that Alethea helped them learn the course content and H_3 - Students prefer using Alethea in future courses. However, results of the one-way ANOVA suggested there were no significant differences in student answers based on the course they were enrolled in, or the instructor teaching the course, which was the final hypothesis H_4 - Student responses differed based on course content, instructor, course material, or how Alethea was integrated into the course.

These results also align with the early results of faculty studies on the efficacy of Althea and the GenAI Alethea Academic Coach in student learning gains. The desire of students and faculty to continue investing in Alethea beyond the pilot was confirmed. The next steps will be to complete a whitepaper comparing the efficacy of Alethea with other GenAI learning tools, which the authors have not found, so far, as effective in engaging students in the metacognitive processing of the required course reading materials. Therefore, the recommendation to continue with Alethea in the fall of 2024 was assured. As with any case study, there is difficulty generalizing findings from this study to other settings (Hirose & Creswell, 2023). Hirose and Creswell also warn that there is a risk of bias, as the researchers' personal opinions and preferences may influence the research. They claim the best way to address these limitations is by replicating the study among other use cases (Hirose & Creswell, 2023). Therefore, along with the authors of this chapter, FGCU faculty and administrators involved with the Alethea pilot encourage other institutions to join in the development of Alethea. This will not only allow for comparison of results among multiple institutions, suggesting this FGCU case study is not an outlier, but also because the more the platform is used, the more it can be refined and meet the needs of all students, regardless of their academic preparation for college.

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