

A Worked Example of Faculty Blended Learning Adoption using Abductive Grounded Theory

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Abstract: This study applies Abductive Grounded Theory (AGT) to examine faculty adoption of blended learning (BL) in a developing country. Through a case study, the Faculty Blended Learning Adoption Model (FBLAM) was developed, emphasizing motivation as a core mediator in BL adoption decisions. Grounded in Herzberg's motivation-hygiene theory, the study revealed that intrinsic motivators, such as pedagogical identity, and extrinsic factors, like institutional support, significantly influence BL adoption. The iterative application of AGT enabled researchers to refine emerging insights about faculty motivation by engaging with both data and theory. Through open, axial, and selective coding, motivation emerged as the core theme mediating faculty adoption of BL. The study finds that faculty adoption is shaped by their pedagogical beliefs and the level of institutional support. It also introduces Pedagogical Identity (PI) as a key factor influencing faculty engagement with BL. FBLAM provides a framework to understand the complex interplay of motivational and institutional factors in BL adoption. This research demonstrates the utility of AGT in BL studies by iteratively combining empirical data with theoretical frameworks. It contributes to methodological discussions by offering a practical example of AGT application in technology adoption research. The findings underscore the practical relevance of AGT in developing mid-range theories and offer actionable insights for enhancing faculty motivation to adopt BL, thereby supporting the integration of technology-driven educational practices in developing contexts.

Keywords: Abductive grounded theory (AGT), Blended learning (BL), Faculty technology readiness, Pedagogy-Technology fit, Institutional hygiene readiness, Pedagogical identity (PI)

1. Introduction

Grounded Theory (GT) is a qualitative research methodology developed by Glaser and Strauss (1967). Unlike other methodologies, GT is designed to generate new theories from empirical data. As an inductive approach, it is particularly suitable for research areas where existing theories are insufficient or where little pre-existing theory exists or are non-existent. In this study, Abductive Grounded Theory (AGT) (Timmermans & Tavory, 2012) was applied to explore faculty adoption of Blended Learning (BL) in a developing country.

BL combines traditional in-person and online instructions with digital tools, offering the potential to enhance teaching and learning outcomes (Dziuban *et al.*, 2018). However, faculty adoption of BL has been inconsistent, especially in resource-limited settings. Existing models that could be applied to explain faculty adoption of BL include but not limited to Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) (Davis, Granić & Marangunić, 2024; Ujakpa & Heukelman, 2018). However these models fail to fully capture the complexity of the adoption process, particularly in developing countries contexts where technological infrastructure and institutional culture significantly impact adoption decisions (Bayaga & du Plessis, 2024). The above may be the case as a result of the said models emanating from data that came from elsewhere other than the developing countries and hence creating a gap (Ujakpa & Heukelman, 2020). To address this gap, the study aimed to generate context-specific insights using Abductive Grounded Theory (AGT).

The main objective of this paper is to provide a worked example of AGT applied to faculty adoption of BL. This study used emerging data to develop a Faculty Blended Learning Adoption Model (FBLAM), which brought forth motivation as a central factor influencing faculty BL adoption decision(s). Worked examples (illustrative case

studies) are often used in qualitative research to make abstract methods concrete and to guide readers through the research process. According to (Sbaraini *et al.*, 2011), providing a “worked example” of a grounded theory study helps connect theory to practice by showing each step (sampling, coding, analysis) in context. They argue that such examples “provide a model for practice” and “increase the quality” of grounded-theory research by making the methodology transparent (Sbaraini *et al.* 2011). Similarly, in technology-adoption research, using a detailed case, like Ghana Communication Technology University (GCTU) as a worked example can illustrate how conceptual models apply in a real institutional setting, revealing context-specific dynamics that might be missed in abstract models.

Ghana’s national policies strongly emphasize ICT integration and digital education. For example, the 2003 ICT4AD policy envisioned transforming Ghana into an “information-rich knowledge-based and technology-driven” society (wathi.org). The subsequent ICT in Education policy (2015) called for equipping all learners with ICT skills and “transforming teacher development and tertiary education through technology-based training” (moe.gov.gh). In 2018–2030 Ghana’s education strategic plan, digitalization is a cross-cutting reform, and the Ministry of Education explicitly “promote[s] the use of electronic and distance education and virtual learning” to expand access (ICT in Education policy, 2015). These reforms – alongside Ghana’s new national Education Technology (EdTech) strategy (2025–2030) under development – signal a strong governmental commitment to e-learning and blended approaches.

Within this environment, GCTU has a uniquely strategic mandate. In 2021 Parliament converted the former Ghana Technology University College into the public Ghana Communication Technology University (GCTU), explicitly as an ICT-focused institutions (gctu.edu.gh). GCTU bills itself as a “*National ICT Centre of Excellence*,” prioritizing technology-based education, theory-practice integration, and international partnerships (gctu.edu.gh). Its official 2022–2030 strategic plan includes a dedicated goal to “create flexible learning opportunities” by providing resources for “effective online and blended teaching and learning” (gctu.edu.gh). The vice-chancellor has affirmed that GCTU will implement a blended approach (roughly 60% digital, 40% face-to-face instruction) to fulfill this ICT-driven mission (gctu.edu.gh). In fact, GCTU has already piloted blended courses (e.g. in its Computing Faculty) and has been the focus of recent BL studies (Antwi-boampong, 2023).

These factors – Ghana’s pro-ICT policies and GCTU’s legislative ICT mandate – make GCTU an ideal case study of blended learning adoption. It is explicitly charged with advancing digital learning in a low-resource setting and thus exemplifies the challenges and opportunities of BL in Ghana and similar developing-country contexts.

In BL adoption research, GT (Charmaz, 2015) has been increasingly adopted to explore complex educational phenomena, particularly where traditional positivist methods may not fully capture the intricacies involved (Jiang, 2024; Antwi-Boampong, 2023; Antwi-Boampong, 2022; Howard, 2021). Considering that BL environments involve dynamic, context-dependent factors that impact both faculty and student experiences (Cronje, 2020; Graham *et al.*, 2019; Smith & Hill, 2019), then the application of GT’s flexible methodological approach would allow for the emergence of a model that is deeply connected to the lived realities of stakeholders (Previtali & Scaroza, 2019; Martins & Baptista Nunes, 2016), and hence making it particularly suitable for understanding the adoption of BL in educational institutions, especially in developing countries. This is especially relevant in exploring how educators, administrators, and students interact with and adapt to new teaching practices, technology integration, and institutional support systems within BL frameworks (Anthony *et al.*, 2019; Antwi-boampong & Bokolo, 2021).

Notwithstanding the above, applying GT in BL adoption research presents some challenges and among these include considerations of the educational contexts diversity of, which could range from higher education institutions to corporate training environments: thus in development of a theory or model, these must be considered such that the developed theory or model is either abstract enough to be generalized or specific enough to be actionable to context or both (Morgan, 2020). Other factors that may be considered include institutional culture, technological readiness (Geng, Law & Niu, 2019), and pedagogical approaches of individual faculty members as these influence the adoption process and hence making it challenging to apply a one-size-fits-all theory or model (Zagouras *et al.*, 2022).

Additionally, BL research often relies on pre-existing educational frameworks, such as the Community of Inquiry (CoI) framework (Geng, Law & Niu, 2019; Anderson *et al.*, 2001), which outlines the cognitive, social, and teaching presence necessary for successful online learning environments). These pre-existing frameworks can sometimes make it difficult for researchers to fully embrace the inductive or abductive, theory-building approach that GT advocates. As a result, researchers often need to balance inductive and deductive reasoning, incorporating both emerging data and established educational theories (Charmaz, 2015).

Towards incorporating the said balance, many researchers (Morgan & Nica, 2020; Morgan, 2020; Kelly & Cordeiro, 2020) have incorporated abductive reasoning into GT, allowing for the iterative integration of existing theories with the data being collected (Timmermans & Tavory, 2012). Abduction, unlike inductive reasoning, allows researchers to return to the literature and existing frameworks during the analysis process, helping to frame new insights while staying grounded in the data. This iterative process is particularly valuable in BL adoption research, where factors such as technological infrastructure, faculty training, and student engagement must be considered (Porter et al., 2014; Antwi-Boampong, 2024). Abductive reasoning allows a researcher to navigate between data and existing body of knowledge and thereby enhances the practical applicability of the emergent theory(ies) (Jones, Gold & Claxton, 2022).

GT thus therefore offers a methodological choice for researchers looking to explore BL adoption in the educational contexts. The flexibility of GT, combined with abductive reasoning, provides a framework that can accommodate the complex, context-dependent nature of BL adoption while also offering the potential to generate new theory(ies) that reflect lived experiences of educators and students or other educational stakeholder(s) (Glaser, 2002 ; Corbin & Strauss, 1990). Methodologically, this is more appropriate for BL research in the educational settings, where the rapid technological advancements and evolving pedagogical paradigms demand adaptive and nuanced research methodologies.

While several studies have applied established models of technology adoption, such as TAM (Ujakpa & Heukelman, 2020) and UTAUT (Ujakpa & Heukelman, 2020), these models often rely on predefined constructs such as perceived usefulness, perceived ease of use, and behavioral intention. These frameworks, although useful in specific contexts, may impose theoretical limitations by failing to account for the unique and emergent challenges experienced by faculty in BL environments, or even BL in other contexts. For instance, TAM and UTAUT assume largely, a linear relationship between perceived benefits and adoption, but they may not fully capture the complex interactions between institutional culture, professional identity, and pedagogical adaptability that influence BL adoption (Porter & Graham, 2016).

In this paper, the authors drew from a PhD thesis, which employed GT with an abductive approach, to provide a worked example of how AGT can be applied to study faculty adoption of BL in a developing country. The thesis investigated the complex, dynamic, and context-specific factors that influence faculty adoption of BL within educational institutions in a developing country. The research question that the study worked at answering is, how should AGT be used to generate context-specific and theory-driven insights into the factors influencing faculty adoption of BL in developing countries?

2. Theoretical Foundations of Technology Adoption

2.1 Blended Learning Adoption Theories

Blended learning adoption has been analyzed using classic technology-acceptance theories. The Technology Acceptance Model (TAM) (Davis, 1989) posits that users' perceived usefulness and ease of use of technology drive their adoption. The Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003) extends this by adding factors like social influence and facilitating conditions. These models are very common: a systematic review of 94 blended-learning studies found that TAM and UTAUT (along with IS Success and Diffusion of Innovations) were the "mostly employed theories" in BL adoption research (Anthony *et al.*, 2022).

However, these quantitative models have limits. They tend to omit institutional and cultural dimensions that are critical in education. For instance, a health-IT review notes that TAM/UTAUT often ignore cultural diversity, trust, and domain-specific issues (Lee, Ramasamy & Subbarao, 2025). In higher-education BL contexts, researchers have therefore included additional constructs (e.g. trust, pedagogy, course design) to tailor these models (Ali & Georgiou, 2024). Recent work in developing countries, for example, have extended TAM/UTAUT with factors like social norms and resource availability (Rouidi *et al.*, 2022). While TAM and UTAUT provide a useful starting point, researchers (Antwi-Boampong, 2024; Brenya, 2024) acknowledge that no single model captures all factors in faculty and institutional adoption of blended learning.

2.2 Faculty Technology Adoption Factors

Adoption theories must also account for faculty-specific factors. Studies of faculty (as opposed to student) adoption bring to the fore the role of motivation, skills, and support systems. One qualitative model proposes a faculty "technology adoption cycle" in which time commitment to integrating technology sits at the core, constrained by all other duties (Moser, 2007). This time investment depends on both institutional incentives (extrinsic motivation) and personal drive (intrinsic motivation) – faculty will only devote time if rewarded by

rewards or by their own belief in professional growth (Moser, 2007). Similarly, teacher-oriented studies find that self-efficacy and social influences are key. For example, (Valtonen *et al.*, 2022) showed that pre-service teachers' intentions to use ICT were driven most strongly by their confidence (efficacy) and peer expectations (Hamad, Shehata & Al Hosni, 2024). In practice, this means that supportive administration, training, and relevant incentives are as important as the technology itself.

2.3 Gaps in Literature and Recent Developments

The literature on blended learning adoption shows several gaps that this study addresses. First, most BL studies focus on student outcomes or institutional readiness, with limited attention to faculty perspectives in developing countries. For example, only a handful of Ghanaian studies examine BL (mostly from the student side), and studies show the dearth of research on faculty adoption in Ghanaian universities (Antwi-Boampong, 2021). Second, while adoption models are widely applied, their assumptions (e.g. linear rational choice) may not hold in low-resource settings. Recent critiques argue that TAM/UTAUT need contextual adaptation – for instance, a UTAUT study in South Africa found that only three constructs (performance expectancy, social influence, facilitating conditions) significantly predicted faculty intention (Bayaga & du Plessis, 2024), suggesting other factors may be at play. Similarly, country-specific research (e.g. Oman) finds that while students generally have positive attitudes toward BL, demographic and infrastructural factors strongly influence adoption and should be included in models (Bayaga & du Plessis, 2024).

In terms of methodology, there has been very little qualitative, theory-building research on faculty BL adoption in Africa. The most recent systematic reviews (Anthony, Kamaludin & Romli, 2023) observe that many blended learning studies rely on ad-hoc combinations of existing models and often neglect lecturers and administrators (Anthony, Kamaludin & Romli, 2023). Only a few recent papers (2022–2024) have begun to fill these gaps by extending models or applying new methods. For instance, Hamad *et al.* (2024) used the Theory of Planned Behavior to explore student BL uptake in Oman, finding generally positive attitudes but emphasizing the need to study curriculum and support issues. Bayaga and du Plessis (2024) applied UTAUT to African academics, confirming some standard predictors (e.g. performance expectancy) but also implying that local conditions must be accounted for. However, no prior study has used grounded theory or abductive qualitative modeling to examine faculty blended learning adoption in Ghana. By combining recent empirical insights with an AGT approach, the present study explicitly addresses these gaps: it will generate context-rich theory of faculty BL adoption that reflects Ghana's unique institutional and cultural setting.

The application of any delineated and prescribed GT in BL research presents some challenges. The diverse and complex nature of BL, which bridges traditional and digital learning environments, may necessitate a more structured, step-by-step procedure for generating theory or model or framework from empirical data rather than strict adherence to the original principles of classic GT the traditional positivist frameworks approach as commonly applied in educational research.

Proponents of GT in the broader social sciences (Jørgensen, 2001; Walker & Myrick, 2006; Hewitt-Taylor, 2001) have advocated for researchers to adapt the methodology to fit their unique research contexts. BL researchers must therefore balance the evolving technological landscape with the pedagogical and cultural implications of blending face-to-face and online modalities. In consonance with this, Charmaz and Thornberg (2021) argue that researchers need to be familiar with GT Method, in all its major forms, in order to be able to effectively adapt it for use or review it into new forms and variations. This adaptability is particularly relevant for BL research, where variations in context, institutional structures, and student demographics necessitate modifications to the original GT process.

Walker and Myrick (2006) view is in consonance with this, as their view postulates that a theoretical perspective grounded in the methodology of GT can effectively guide research in fields like BL, where the intersection of different learning modalities and technologies creates unique research challenges. However, this creative flexibility can also lead to overcomplication, as the breadth of BL research covers diverse educational technologies, learning environments, and pedagogical strategies (Corbin & Strauss, 2014). Orton (1997) and Timonen, Foley and Conlon (2018) emphasized that the research context and data sources in BL should guide the application of GT, as standardized procedures may not fully capture the nuances of how blended environments impact learning experiences.

Recent attempts to remodel GT for use in organization and management studies (Fendt & Sachs, 2008) can provide valuable insights into BL research. For example, adapting GT to BL involves recognizing the interplay between digital tools and traditional teaching methods. Preselecting theoretical codes to frame his inquiry, BL

researchers may also develop theoretical frameworks around key constructs such as student engagement, digital literacy, and instructional design before data collection begins (Partington, Duckworth & Gurbutt, 2019). However, this should be done with caution, as preconception risks imposing external frameworks that may not align with the emergent concerns of the research participants, a challenge that Baturina (2015), Chametzky, (2024) and Hadley and Hadley (2024) critiques in their work in varied ways.

2.4 The Research Paradigm

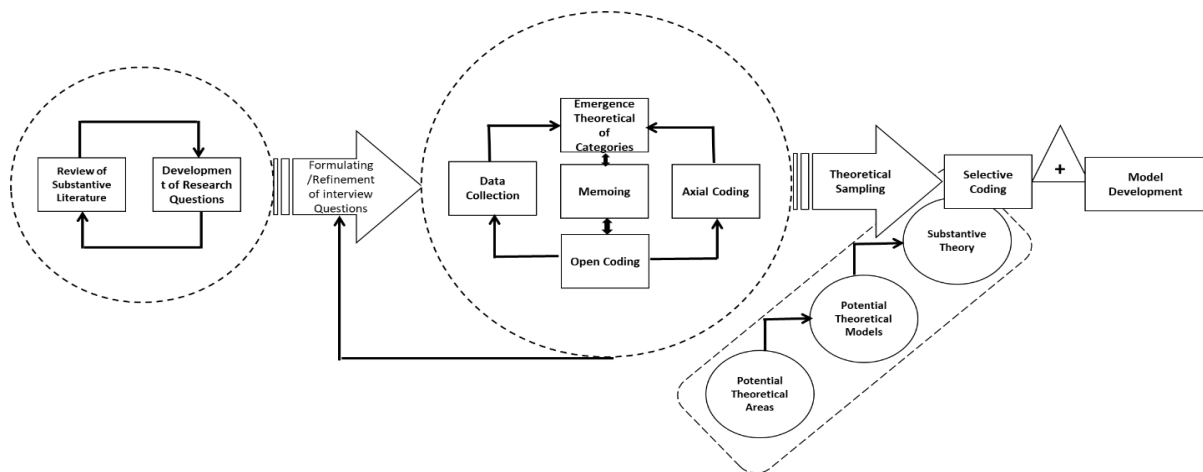
A research paradigm refers to the philosophical dimensions that guide how researchers perceive and study the world, shaping the underlying assumptions and beliefs that drive their methodology and interpretation of findings (Guba, Egon & Lincoln, Yvonna, 1994). According to Jonker and Pennink (2009), a research paradigm consists of fundamental assumptions and beliefs generally accepted by the scientific community. These paradigms significantly influence how researchers approach social phenomena, framing their understanding and determining whether their goal is to test or generate theory (Creswell & Miller, 2000). For instance, in BL research, the chosen paradigm dictates how researchers perceive and analyze the hybrid nature of traditional and digital learning environments. Among the possible paradigms applicable in research include positivism, interpretivism, critical and pragmatism (Khatri, 2020). In view of the topic under study in this research and the nature of data use (abductive reasoning), this study applied the interpretivism paradigm. Although it presents challenges in generalizing results, this paradigm was chosen and applied in the study because it aligns more closely with the complex and socially constructed nature of blended learning (BL) environments (Khatri, 2020; Bernard et al., 2014; Tracy 2012).

2.5 Combining Abductive Reasoning with Grounded Theory in Blended Learning (BL) Research

Given that many processes in BL research are not significantly different from general educational research processes (Bresnen & Marshall, 2001), but often use more specific terminology, the methodological deviations from classic GT in BL research mirror those seen in organizational and management research. Both fields share a shift in epistemological stance from positivism to interpretivism or pragmatist epistemology. While positivists paradigm maintain that there is only one best method to understand reality, the interpretivists argue that reality is dynamic, shaped by interactions between individuals, and cannot be tested with absolute certainty (Umeokafor & Windapo, 2018) and pragmatist paradigm believe that there is one way approach to establishing the reality and hence combines both positivist and interpretivist approach.

(Järvensivu and Törnroos, 2010) note that positivists typically use deductive research methods, deriving hypotheses from existing theories to be tested or validated against empirical data. In BL research, many studies (Zhang *et al.*, 2010; Blicek *et al.*, 2020; Han & Ellis, 2020) have traditionally been conducted deductively, focusing on testing predefined hypotheses or theories about how technology influences student engagement and learning outcomes. However, the deductive approach has faced criticism for creating disconnect between researchers and their subjects (Green et al. 2009). This separation can limit theory's ability to reflect the actual social reality within BL environments, which are often more complex and multifaceted than a purely deductive approach can capture (Bell & Bryman, 2007) and hence why this study is proposed the different approach, AGT.

In contrast positivism, inductive approaches in BL research move from collecting empirical data to developing theories that explain those observations (Antwi-Boampong, 2022). This interaction between the researcher and participants is an integral part of the inductive approach, as the researcher is embedded within the learning environment. However, inductive methods in isolation may struggle to build strong theories without acknowledging the existing body of knowledge (Korr *et al.*, 2012) and also in instances where sufficient data exist to build theory, then it justifies theory development from the data as such. The variation of GT proposed in this study involves transforming the Corbin and Strauss (2014) model into a abductive approach that is well-suited to BL research. Thus, incorporating abduction into GT modifies the conventional Straussian analytical process as an additional step(s) for iterative theory refinement is/are, based on the amount and quality of data collected and emerging categories, as demonstrated in Figure 1.



(Adapted from Rahmani & Leifels, 2018)

Figure 1: The Research Methodology Framework

The proposed AGT approach in BL research can be visualized as follows:

The proposed AGT approach provides a structured yet flexible framework for investigating the complex dynamics of BL adoption, particularly in educational settings. This methodology combines iterative data collection and analysis, theory building, and abduction to generate context-specific insights. The AGT process in BL research can be visualized through several key stages.

Firstly it derived its initial observations, which then served as a basis for connecting with other experiences and observations to develop hypotheses (Richardson & Kramer, 2006). Sensitizing concepts were used in the initial investigation of the research question, beginning with a review of the existing literature on BL. This included studies on instructional strategies, student engagement, and performance in BL environments. The purpose of the review was to identify key themes that guide the formulation of research questions and help shape the areas of focus for data collection. Although this step was influenced by existing theories, it remains flexible and hence allows new themes to emerge from the data in the process.

Data collection and analysis followed next as in the iterative process. Data was gathered from various sources, including student interviews, classroom observations, and digital analytics from learning platforms. The analysis followed the GT procedures of open coding, where raw data was broken down into categories and selective coding, which focused on refining and integrating the categories.

Memoing played a crucial role in AGT as it served as a continuous process of documenting insights and refining theoretical concepts throughout the research. As new data was analyzed, memos were written to link emerging categories with theoretical constructs from the literature, ensuring that the researchers remained engaged with both the data and the broader theoretical context.

As the data collection and analysis process progressed, categories become saturated, and the relationships between them were clarified. Theoretical grounding occurs when the emergent theory became robust enough to explain the phenomena under study, thus faculty and student experiences with BL in this case. Once the categories became saturated and solidified, the theory was refined and contextualized within the specific BL setting that was being studied, offering valuable insights into the adoption process in context.

3. Methodology

3.1 Case Study as a Worked Example

The study was conducted at a mid-sized university Ghana Communication Technology (GCTU), where BL had been introduced as part of an institutional strategy to enhance teaching and learning. Faculty members from various departments were selected to participate based on their involvement with BL initiatives. The focus of the case study was to understand how and why faculty members adopt or resist BL. The Ghana Communication Technology University had recently adopted a strategic plan emphasizing digital transformation, which included a strong push towards BL. This initiative was supported by institutional investments in technology infrastructure and professional development programs. However, despite these

efforts, adoption rates among faculty varied, prompting the need for a deeper exploration of the factors influencing this variability. Understanding the factors that drive, or hinder faculty adoption of BL was thus critical for the successful BL implementation in the GCTU.

3.2 Research Method and Design

The study adopted qualitative research design, guided by the principles of AGT. Semi-structured interviews were the primary data collection method, supplemented by observations and document analysis. This design allowed for the flexible exploration of faculty members' experiences with BL. Participants were selected using theoretical sampling, ensuring that those involved had varied experiences with BL. The research questions were developed iteratively, starting with broad questions about faculty experiences with BL and refining them as data collection and analysis progressed. The final research question that emerged from the process reads as: "how Abductive Grounded Theory should be used to generate context-specific and theory-driven insights into the factors influencing faculty adoption of blended learning in developing countries? A preliminary literature review was conducted to identify existing theories and models related to technology adoption in education.

3.3 Data Collection

Interviews were conducted with twenty-two (22) faculty members across different departments, focusing on their experiences with BL. The interviews were semi-structured, allowing participants to discuss their views freely while ensuring that key topics were covered. Interviews were recorded and transcribed for analysis. The interview protocol was designed based on the initial research questions and informed by the preliminary literature review. As shown in Table 1, the protocol included open-ended questions about faculty members' experiences with BL, the challenges they faced, and the support they received from the institution. Interviews were administered in a flexible manner, allowing participants to guide the conversation based on their experiences. Follow-up questions were used to probe deeper into specific issues as they emerged. In addition to interviews, observations of BL workshops and faculty meetings were conducted to gain a deeper understanding of the institutional context. Relevant documents, such as the university's strategic plan and BL guidelines, were also analyzed.

Table 1: Example of the Analytic Process of Open Coding in Blended Learning (BL) Research

Interview Notes	Open Codes	Memos
Question: What are the main challenges in adopting Blended Learning (BL) at your institution? Answer: One of the biggest challenges is the lack of understanding about the scope of BL. Faculty often struggles with how to integrate digital tools into their existing teaching frameworks. There's a lot of uncertainty about what is expected and how to make the transition.	Awareness of scope, Uncertainty	Memo1: Faculty need to have a clear understanding of the BL framework and objectives to successfully adopt it. Uncertainty should stem from the complexities of BL, not from a lack of knowledge. Memo2: BL requires more clarity on how to integrate traditional and digital teaching methods.
Question: How do you decide whether to implement Blended Learning in your course? Answer: We look at various factors, including the type of course, the needs of students, the availability of digital tools, and how comfortable the faculty are with using technology. It's a balancing act of considering all these factors, but ultimately, it's about whether BL enhances the learning experience.	Multi-criteria assessment, Faculty comfort, Student needs	Memo3: The decision to adopt BL depends on multiple factors like course type, student needs, and faculty's comfort with technology. It's important to weigh these factors carefully. Memo4: Experience with technology adoption plays a significant role in whether faculty decide to integrate BL into their courses.

Source: Field Data

3.4 Data Analysis

Data analysis began immediately after the first interview and continued concurrently with data collection. This approach enabled the researcher to iteratively refine interview questions and delve deeper into emerging themes as the study evolved. NVivo software was used to assist with data organization and coding. The software facilitated the systematic analysis of large volumes of qualitative data, enabling the researcher to identify patterns and relationships more effectively.

3.4.1 Coding procedure in blended learning (BL) research

With the transcripts organized in NVIVO folders, the next stage involved coding the individual transcripts. Two primary approaches to coding are highlighted in the literature: key point coding and micro-analysis coding (Georgieva & Allan, 2008). Key point coding involves reading the text and assigning codes to the main meanings derived from it, while micro-analysis coding is a more labor-intensive process that involves analyzing individual words, phrases, or clauses, and assigning codes to the generated meanings. In this study, the key point coding approach was employed. Initially, there was uncertainty regarding what and how to code, but following (Glaser, 1965), the process was approached with an open mind. The transcripts were analyzed, and concepts that emerged from the respondents' descriptions of their experiences with BL were coded without imposing preconceived assumptions (Glaser, 2002). As the researchers read through the transcripts, key sentiments related to participants' lived experiences with BL were identified, and meanings were abstracted from chunks of text. These abstract meanings were assigned words or phrases and renamed as codes. All the transcripts were subjected to this coding process, resulting in numerous codes reflecting different meanings and understandings. Through constant comparison (Glaser, 1965; Corbin & Strauss, 1990), the codes from different transcripts were compared for similarities and differences. Similar codes were assigned to the same label, while codes representing different ideas were assigned to new labels. Over time, related codes were grouped into concepts, which represented sets of codes with shared attributes, properties, and meanings.

3.4.2 Open coding

The first stage of coding, open coding, involved breaking down the transcripts into distinct parts and assigning labels to emerging concepts. For example, discussions about faculty struggles in incorporating technology into their teaching were coded as "Technology Integration Challenges."

3.4.3 Axial coding

After identifying the initial concepts, axial coding was applied to examine the relationships between those concepts. For instance, the concept of "Technology Integration Challenges" was connected to "Institutional Support" and "Pedagogical Shifts," revealing how these factors interacted to influence faculty adoption of BL. Table 2 demonstrated the analytical process of the axial coding.

Table 2: Analytic Process of Axial Coding for the Category of 'Selection criteria' in Blended Learning (BL) Adoption

Sub-category	Codes	Definition
Institutional Characteristics	• Technological Infrastructure • Administrative Support • Faculty Training • Budgetary Constraints	Certain characteristics of an institution, such as the quality of its technological infrastructure and the availability of administrative support, affect BL adoption. These factors represent the institution's capacity to integrate blended learning effectively.
Faculty Objectives	• Pedagogical Flexibility • Professional Development • Engagement with Technology • Research Integration	Faculty objectives, including their desire for flexibility in teaching methods, opportunities for professional development, and engagement with technology, influence their willingness to adopt BL.
External Factors	• National Educational Policies • Technology Trends • Student Expectations • Competitive Pressures	External factors such as government policies, emerging technology trends, student preferences, and competition among institutions play a critical role in shaping BL adoption decisions.
Internal Constraints	• Institutional Culture • Resource Availability • Leadership Support • Faculty Workload	Internal constraints within the institution, including its culture, available resources, leadership, and faculty workload, can either hinder or facilitate the adoption of BL.

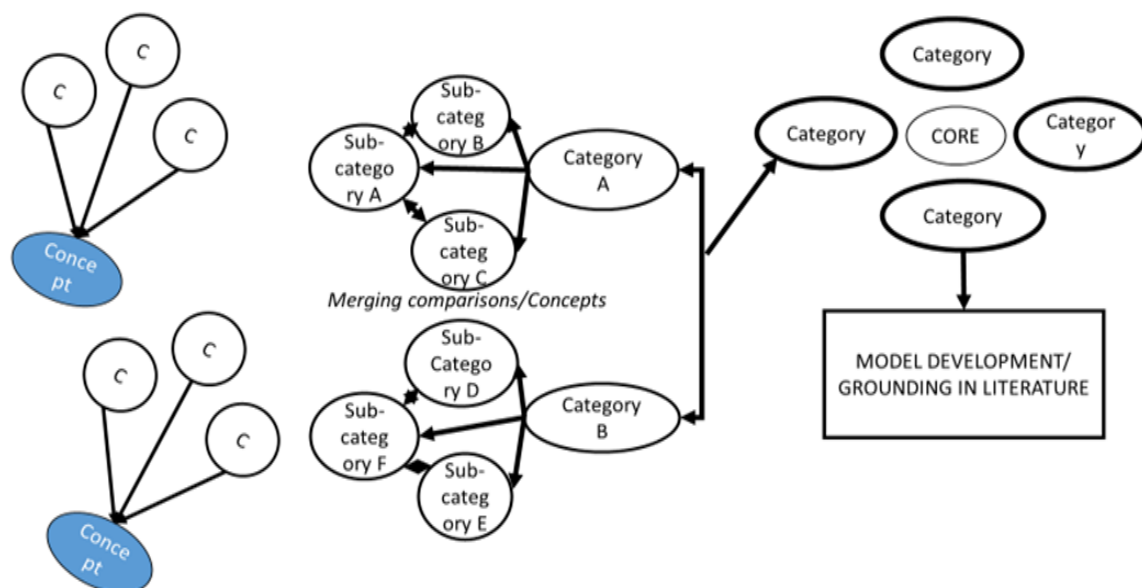
Source: Field Data

3.4.4 Selective coding and theory matching

In the selective coding phase, core categories were integrated into a comprehensive theoretical framework. At this point, the Motivation-Hygiene Theory was used abductively to explain emerging patterns in the data concerning faculty identity and institutional culture. According to the theory, there are intrinsic (motivators) and extrinsic (hygiene factors) elements that impact job satisfaction and motivation. For instance, intrinsic factors such as recognition, achievement, and professional growth directly influence faculty identity. Faculty members who perceive that adopting BL will enhance their professional development or align with their teaching philosophy are more likely to embrace the technology. The extrinsic factors or hygiene elements, such as institutional policies, administrative support, and access to technology, relate to the institutional culture. If these external conditions are not favorable, even motivated faculty may resist BL adoption.

3.4.5 Theoretical sampling

Theoretical sampling was employed as a systematic, inductive method to guide data collection and coding as the research progressed. In theoretical sampling, data is collected and analyzed to inform further data collection (Glaser, 2002). This iterative process helped refine theoretical formulations and further explore faculty members' experiences with BL. Data collection and analysis proceeded simultaneously through constant comparison of codes and concepts until no new insights emerged. Once the relationships between concepts were established, codes with similar meanings were grouped into higher-order concepts. These concepts were critically examined for unique meanings and subsequently grouped into sub-categories through axial coding as shown on Figure 2. Through axial coding, sub-categories with shared properties were abstracted and grouped into categories, which were tested against the data (Strauss & Corbin, 1990). The core category began to emerge during this process, guiding the researcher toward the central theory.



GT Process to Model Faculty Adoption Experiences (Adapted from (Daengbuppha, Hemmington & Wilkes, 2006)

Figure 2: Interview transcripts (B) Regrouping concepts (C) Identifying the core category

3.4.6 Theory development

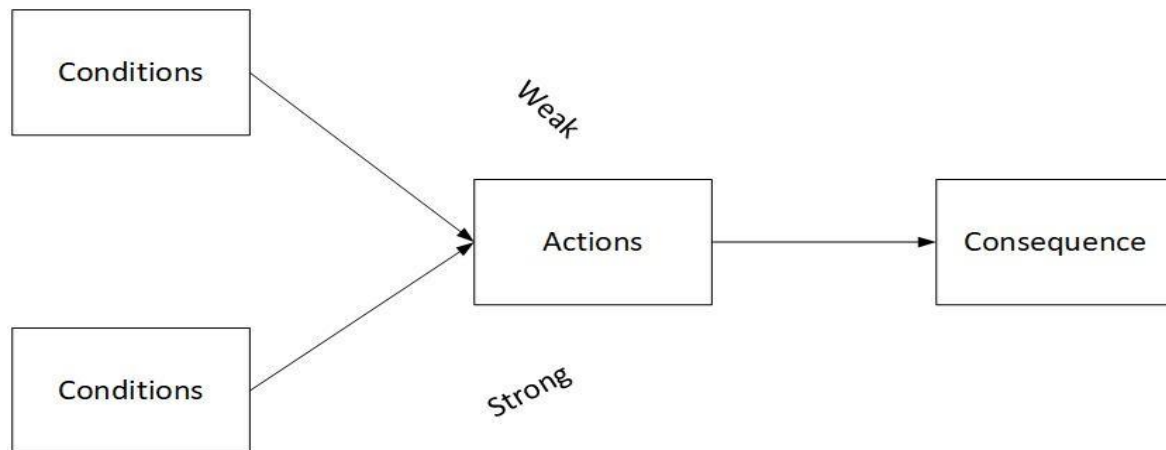
Theory matching continued throughout the theoretical sampling and selective coding stages, with the goal of achieving representativeness and consistency until theoretical saturation was reached (Strauss & Corbin, 1990). This stage, termed "Theoretical Grounding" (Bruscaglioni, 2016) established connections between categories based on abducted theory. During this phase, selective coding aimed to find a theory that best explained the interdependencies between the emerging categories.

In this study, after a thorough review of existing theories, the concept of motivation emerged as a key driver of faculty adoption decisions in BL. Theory of Motivation (Herzberg, Mausner & Snyderman, 1959) was used to

explain why faculty members chose to adopt or reject BL. Though originally focused on employee motivation, the theory was adapted to explain faculty motivations in the context of BL adoption, including factors such as technology readiness, institutional support, and student disposition towards BL (Antwi-Boampong, 2020).

3.4.7 Emergence of core category and model development

The core category that emerged from the data was "motivation," representing the underlying element that connected all other categories and explained most of the variation in faculty adoption decisions. Using a paradigm model (Daengbuppha et al., 2006) and as demonstrated in Figure 3, relationships between categories were mapped, showing how causal conditions (e.g., faculty support structures) influenced the central phenomenon (BL adoption), shaped by context (e.g., institutional culture), intervening conditions (e.g., technology infrastructure), action strategies (e.g., faculty training), and consequences (adoption or rejection of BL).



Source: Adapted from (Daengbuppha, Hemmington & Wilkes, 2006)

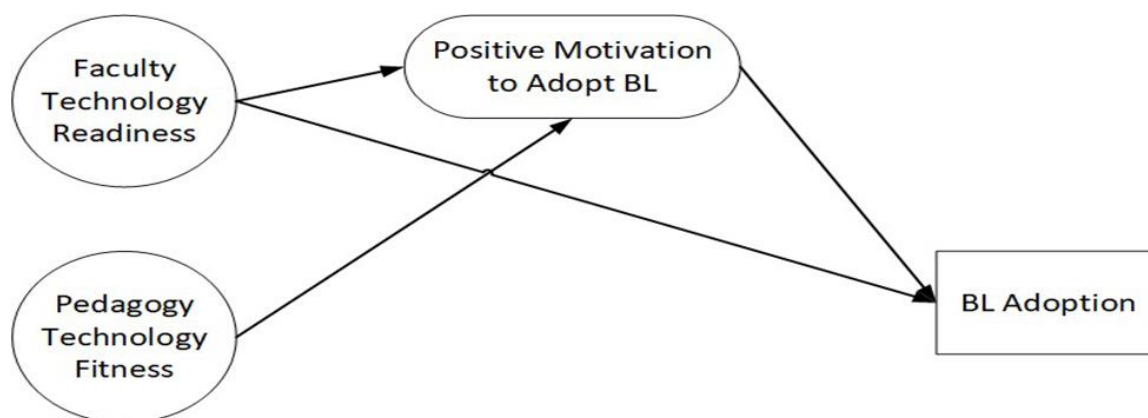
Figure 3: Paradigm Model

Through this process, motivation emerged as the central theme around which other constructs revolved, determining faculty adoption decisions. Strong or weak conditions related to motivation, such as institutional readiness and technology alignment, influenced the likelihood of BL adoption. Ultimately, the integration of theory and sufficiently available data helped build a comprehensive model explaining how faculty members constructed their BL experiences and the factors that motivated them to adopt or resist the approach.

3.4.8 Emergence of theory

The integration of empirical data with existing theories led to the development of a theory explaining faculty adoption of BL as a dynamic interplay of individual, institutional, and contextual factors. This theory expanded traditional models of technology adoption by incorporating "Pedagogical Identity" as a key factor influencing faculty decisions to adopt BL. Pedagogical Identity (PI) refers to how faculty members' self-perception as educators shapes their engagement with BL technologies.

This emerging theory was refined through additional data collection and analysis, ensuring that it remained robust and reflective of the experiences captured in the study. Validation was achieved through further member checking, where participants reviewed and confirmed the findings, ensuring alignment with their lived experiences. The emerging theory is shown in Figure 4.



Source: Field Data

Figure 4: Faculty Blended Learning Adoption Model

3.4.9 Motivation as the core concern in faculty blended learning adoption (FBLAM)

In the context of the FBLAM as shown in Figure 4.0, motivation emerged as the pivotal factor driving faculty adoption of Blended Learning (BL). Drawing from Herzberg's Motivation-Hygiene Theory, the core concern identified throughout the analysis process of FBLAM is that both intrinsic and extrinsic factors play a key role in shaping faculty motivation to adopt or resist BL. Motivation is the central category that integrates other constructs such as Faculty Technology Readiness, Pedagogy-Technology Fit, and Institutional Hygiene Readiness, acting as a mediator in the adoption process.

As shown in Figure 4, the FBLAM postulates that faculty adoption of BL is contingent upon certain external and internal factors that stimulate motivation. The emergent core category of 'motivation' was identified during the theoretical sampling process, where data was analyzed through coding stages, from open to selective coding. At each stage, motivation surfaced as the key influencer for faculty decisions to engage with or reject BL.

Drawing upon Herzberg's Two-Factor Theory, motivation is framed as both intrinsic (self-driven factors like personal growth and achievement) and extrinsic (factors outside the individual's control, like institutional support or student disposition towards BL). In the FBLAM, intrinsic motivators include faculty beliefs in the pedagogical value of BL and the personal satisfaction derived from improved student outcomes. Conversely, extrinsic motivators encompass factors such as administrative support, institutional policies, and access to technology that align with and support faculty teaching practices. The theoretical development of FBLAM led to the construction of a middle-range theory where motivation acts as the key mediator. For instance, Faculty Technology Readiness and Pedagogy-Technology Fit directly predict BL adoption when mediated by motivation. The FBLAM suggests that the stronger the alignment between these constructs and motivational drivers, the more likely faculty members are to adopt and sustain BL practices in their teaching.

3.5 Testing the Validity of the Abductive Grounded Theory

The connections established through the process of open coding, concept development, category identification, axial coding, and selective coding, culminating in the integration of categories into a theoretical model, enhanced the internal validity of the data in BL research. This process reached theoretical saturation when no new insights were emerging, and further analysis provided minimal benefit. At this point, the emerged theory is said to be grounded in literature, and this was confirmed by comparing it to existing theories and frameworks, which showed that the findings and positions were within the broader field of BL research, and specific areas where the results could be applied, were identified.

Applying the GT approach in a way removed biases as it inherently addressed preconceptions and researcher biases as it applied data triangulation (involving multiple data sources or methods to validate findings) (Fernández, Lehmann & Underwood, 2001 ; Lysek, 2018), thus ensuring credibility and trustworthiness.

During the data collection phase, the researchers indicated to participants to review their interview transcripts and approve statements attributed to them: thus, ensuring that the participants' views were accurately presented. Also, data related to the drivers of BL adoption were collected from university policy documents and interviews with top management, while data from students and faculty were obtained from primary sources.

To further ensure reliability and minimize bias, the researchers employed external-coding measures. Selected transcripts were sent to subject-area experts for coding. The themes and codes generated by external coders were compared with those of the researchers to ensure consistency. Where discrepancies arose, the researchers and the external coder discussed the differences to reach a common understanding. In most cases, the themes identified by the external coders aligned with those of the researcher. Additionally, the researcher maintained a data management repository to store all collected data, and external auditors not affiliated with the study were engaged to review the research process. These measures ensured the trustworthiness and rigor of the data.

4. Discussion

In the evolving landscape of educational technology, BL has become a crucial area of focus, particularly as institutions seek to balance traditional and digital pedagogical methods. This study aimed to explore how maximum value could be achieved through effective adoption and implementation of BL technologies, particularly by focusing on faculty motivation and institutional support as primary drivers of adoption. While BL itself is not new to education, there remains a significant gap in understanding the mechanisms behind faculty adoption, particularly within higher education institutions (Walker & White, 2021; Jones et al., 2022). To address this, the Faculty FBLAM was developed as a middle-range theory, grounded in the core principles of Grounded Theory (GT) and using an abductive approach to refine emerging themes throughout the research process.

The study found that motivation play a central role for faculty adoption of BL. Much like decision-making processes in complex organizational settings, faculty members assess their willingness to adopt BL technologies based on both internal and external motivators. Drawing parallels to *Prospect Theory*, which suggests that individuals are generally averse to risk and uncertainty, this study found that faculty members adjust their engagement with BL based on perceived benefits, institutional support, and the level of control they have over their teaching outcomes (Berkovich, 2024), like they do in the traditional face to face sessions.

Institutional factors emerged as significant moderators of the uncertainty and perceived risk associated with adopting new technologies. Specifically, faculty members are more likely to adopt BL when they feel supported through comprehensive development programs, technological resources, and strong administrative backing. The findings suggest that faculty members' confidence in BL adoption is directly linked to the quality and availability of these institutional supports systems (Hill, Smith & Smith, 2023). Therefore, a robust institutional infrastructure that offers both technical and pedagogical assistance could alleviate perceived risk of adopting new teaching, such as BL and hence fostering greater faculty engagement with BL (Porter *et al.*, 2016).

The iterative development of the FBLAM model was closely aligned with the systematic processes of GT. This methodology allowed the theory-building process to evolve in tandem with data collection, ensuring that emerging themes and categories were validated through continuous comparison and refinement. Categories such as Faculty Technology Readiness, Institutional Support, and Student Disposition were refined through multiple rounds of analysis, eventually coalescing around motivation as the central category. Importantly, theoretical saturation was achieved through ongoing comparison with existing frameworks, such as *Herzberg's Two-Factor Theory*, which helped to validate the final constructs of the FBLAM model (Ibrahim & Nat, 2019).

The integration of motivation as the central category in FBLAM is consistent with existing technology adoption theories, but the model extends the literature by demonstrating how intrinsic (pedagogical beliefs) and extrinsic (institutional support) factors intersect to influence faculty behaviour. In doing so, the study addresses the need for more nuanced frameworks that can better account for the complexities of faculty decision-making in the context of BL adoption (Han, Wang & Jiang, 2019). Moreover, the abductive approach allowed the research to adapt to the evolving nature of BL, ensuring that the model remains flexible and applicable to diverse educational settings.

This study's findings underscore the importance of motivation as a driving factor in faculty adoption of BL, highlighting the need for institutions to offer comprehensive support systems that address both technical and pedagogical needs. The FBLAM model provides a robust theoretical framework for understanding the adoption process, contributing significantly to the literature on BL adoption in higher education. Further research is encouraged to test the model across diverse institutional settings and expand on its practical implications for educational administrators and policymakers (Ali & Georgiou, 2024).

5. Conclusion

This study set out to answer the question posed in the Introduction: how should AGT be used to generate context-specific and theory-driven insights into the factors influencing faculty adoption of BL in developing countries? Using an abductive grounded theory approach, we collected rich qualitative data (22 in-depth interviews of academics, institutional policies, training records, and LMS logs) to show how Ghanaian faculty construct and navigate BL teaching. Our analysis generated a context-grounded model (FBLAM) in which faculty motivation is central: it is stimulated by both external factors (institutional readiness and support) and internal factors (technology readiness and pedagogical fit). In practice, faculty who perceive strong institutional support and see BL tools as aligning with their teaching philosophy are more motivated to adopt BL. We have shown that BL adoption at GCTU is not driven solely by simplistic “useful vs. difficult” calculations (as TAM/UTAUT might suggest) but emerges from a mix of contextual enablers and personal dispositions.

The use of Abductive Grounded Theory (AGT) was instrumental in shaping these findings. Unlike purely inductive or deductive methods, AGT allowed us to iteratively move between our data and existing theories. Rahmani and Leifels (2018) explain that an AGT analytic strategy enables researchers to “fully explore all of the theoretical underpinnings” through abductively connecting emergent categories to pre-existing ideas (Antwi-Boampong, 2024). In our study, this meant that as we coded faculty responses, we constantly compared and integrated relevant concepts from technology adoption theory. For example, we initially framed faculty comments in terms of TAM’s *perceived usefulness* and *ease of use*, and UTAUT’s *performance expectancy* and *social influence*, then refined these interpretations based on what the data revealed. The abductive phase allowed us to re-contextualize these constructs: for instance, perceived usefulness became blended with expectations that BL improves learning outcomes, and social influence was captured in how peer norms and leadership endorsement affected motivation. In short, AGT’s back-and-forth between data and theory ensured our findings were both deeply grounded in GCTU faculty experiences and firmly linked to the broader literature (Antwi-Boampong, 2024).

The conclusion explicitly reconnects our results to the major frameworks introduced earlier. The Technology Acceptance Model (TAM) posits that perceived usefulness and ease of use predict technology adoption (Zawacki-Richter & Jung, 2023), while the Unified Theory of Acceptance and Use of Technology (UTAUT) identifies performance expectancy, effort expectancy, social influence, and facilitating conditions as key predictors (Zawacki-Richter & Jung, 2023). Our data echo parts of these theories: for example, faculty often mentioned expected benefits of BL (performance expectancy) and noted how user-friendly platforms were easier to integrate. Importantly, however, our findings extend these frameworks by showing that faculty motivation must be the mediating bridge between perceptions and action. In line with motivational research, we found that both extrinsic and intrinsic factors powerfully influenced faculty willingness to adopt BL (Ibrahim and Nat, 2019). Instructors who believed in the efficacy of online learning and saw BL as a way to broaden student access (intrinsic motivators) were far more likely to engage with BL (Antwi-Boampong, 2022). Conversely, without external support (facilitating conditions), even willing instructors could become demotivated: as noted, Ibrahim and Nat (2019) indicate that lack of adequate institutional support can decrease instructors’ motivation to implement BL (Ibrahim & Nat, 2019). This was evident in our data, where concerns about training, time, and resources frequently surfaced. Thus, institutional readiness – the degree to which the university provides a supportive environment – emerged as a critical antecedent: consistent with our earlier definition, it represents the institution’s preparedness to create conditions conducive to BL (Antwi-Boampong, 2022). Faculty described how ongoing professional development and incentives (e.g. workload adjustments, recognition) increased their commitment to BL. Indeed, recent studies argue for multi-level training and reward mechanisms to sustain BL adoption (Li, Han & Cheng, 2023), and our conclusions reinforce that such institutional supports are vital.

Another core concept was pedagogical identity, operationalized here as Pedagogy-Technology Fit. In our model, the better the alignment between an instructors’ teaching approach and the BL technology, the stronger their motivation to adopt it. As hypothesized in FBLAM, “the better the pedagogy used for teaching fits with the technology, the more positive the anticipation that faculty would teach in blended mode” (Antwi-Boampong 2022). Our interviews confirmed that: faculty who felt that BL respected their teaching style (for example, interactive workshops or real-world problem-based pedagogy) were enthusiastic about using it, whereas those who saw BL as a mismatch (e.g. rigid LMS that clashed with hands-on teaching) hesitated. In this way, our conclusions integrate TAM/UTAUT (which focus on cognitive perceptions) with sociotechnical factors: they

demonstrate that faculty adoption decisions are filtered through their professional identity, motivation, and the ecosystem of support.

Finally, we emphasize how our Faculty Blended Learning Adoption Model (FBLAM) contributes to theory and practice, and how it coherently ties back to all parts of the paper. FBLAM is a middle-range theory grounded in context-specific data from GCTU. It explicitly incorporates the key constructs identified in our literature review and methodology, showing how they interrelate in this context. This model addresses notable gaps in the BL adoption literature: for instance, Antwi-Boampong (2022) observed that constructs like pedagogy-technology fit and institutional readiness had been under-explored, but our analysis confirms that these are in fact crucial drivers of faculty motivation. By rooting these constructs in actual faculty experiences, FBLAM goes beyond the generic assumptions of TAM/UTAUT to offer a nuanced, empirically supported framework.

5.1 Implications for Practice

The findings of this study, grounded in Abductive Grounded Theory (GT), provide crucial insights for institutions looking to implement blended learning programs. The emphasis on pedagogical identity and cultural factors suggests that institutional BL support initiatives should extend beyond technical training. Faculty decisions to adopt BL are influenced not only by technological readiness but also by how well BL aligns with their pedagogical values and identities (Radovan, 2024). Institutions, therefore, need to design support programs that address these identity-related concerns, ensuring that BL can be adopted without compromising individual teaching philosophies.

By applying an AGT approach, this study demonstrates that institutional support must be both technological and pedagogical. This framework for faculty adoption ensures that BL programs are not only technically sound but also aligned with the pedagogical values of the faculty members adopting them (Martins & Nunes, 2016).

5.2 Contribution to Theory

This study contributes to the broader literature on technology adoption by introducing the concept of PI into the FBLAM. By employing AGT, the research bridges the gap between empirical data and theoretical frameworks, refining existing technology adoption models. The integration of motivation and identity as core elements in the adoption process is particularly relevant in higher education, where faculty roles and identities are deeply intertwined with pedagogical practices (Radovan, 2024).

The iterative nature of AGT allows for the flexible and evolving development of theory, making it an ideal approach for capturing the complexities of BL adoption (Smith & Hill, 2019). Situating faculty motivation and identity at the core of FBLAM, the study enhances our understanding of how pedagogical and institutional factors interact to influence BL adoption.

5.3 Limitations of the Worked Example

Although this study provides valuable insights into the faculty adoption of BL, the findings are contextualized within the specific institutional setting where the research was conducted. The use of AGT, while rich in contextual understanding, may limit the generalizability of the findings to other institutional contexts (Vilhenninger *et al.*, 2024). Additionally, the sample size, though sufficient for qualitative analysis, may not fully capture the diversity of faculty experiences across a wide range of educational settings.

Future research should expand the sample to include participants from various institutions and regions, thus offering more generalized insights. This expansion can help ensure that the findings are applicable across different institutional types and educational systems. Furthermore, future studies should investigate how institutional policies and practices can better align BL initiatives with faculty members' pedagogical values, enhancing motivation and fostering greater adoption of BL technologies (Brenya, 2024).

By continuing to explore these dimensions, future research can contribute to the development of more effective strategies for the implementation of BL, fostering environments where educational technologies are adopted in alignment with both institutional goals and faculty identities (Smith & Hill, 2019).

AI Statement: The author(s) affirm that this work was conducted without the assistance of artificial intelligence (AI) tools, including but not limited to generative AI systems such as ChatGPT, Google Bard, or similar technologies. All aspects of the research design, data analysis, and writing were carried out solely by the author(s) to ensure the integrity, originality, and academic rigor of the work.

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