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Article

Towards Designing a Knowledge Sharing System for Higher Learning Institutions in the UAE Based on the Social Feature Framework

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Abstract: Numerous ICT instruments, such as communication tools, social media platforms, and collaborative software, bolster and facilitate knowledge sharing activities. Determining the vital success factors for knowledge sharing within its unique context is argued to be essential before implementing it. Therefore, it is imperative to define domain-specific critical success factors when envisioning the design of a knowledge sharing system. This research paper introduces the blueprint for an Academic Knowledge Sharing System (AKSS), rooted in an essential success framework tailored to knowledge sharing to deploy within an academic institution. In this regard, an extensive exploration of the relevant literature led to the formulation of the research hypothesis that guided the construction of a questionnaire targeting university students through the online platform Pollfish, utilizing a quantitative approach to investigate, while the data collected was analyzed using SPSS version 22. The study unveils critical factors, including encouragement, acknowledgment, a reward system, fostering a knowledge sharing culture, and leading by example, contributing to developing the knowledge sharing framework. Furthermore, the study illustrates how this framework seamlessly integrated into the design, implementation, and execution of the Academic Knowledge Sharing System (AKSS).

Keywords: knowledge sharing system; knowledge management; knowledge sharing; academic knowledge sharing system; knowledge sharing tool; higher education institution



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1. Introduction

Knowledge sharing is a pivotal characteristic of human interaction. It has played a fundamental role in the development and advancement of societies throughout history. From the oral tradition of communication to the modern digital age, knowledge sharing has been critical for accumulating collective wisdom, spreading ideas, and fostering innovation. The knowledge sharing mechanism emerges from exploring motivation, cultural dynamics, the profound impact of learning, collaboration, and the shaping of human civilization. James Gleick, in his book titled *The Information, A History, a Theory, a Flood* (2011), sums up the process of the transition of knowledge sharing from colonial European explorers to the development of Wikipedia. Understanding knowledge is intertwined with human cognition's social nature and emphasizes collective wisdom's importance [1].

Peter F. Drucker foresaw that knowledge sharing would become essential in the emerging economy, holding knowledge as a costly and central resource. Furthermore, knowledge is crucial to foster organizational learning and for the development of learning organizations [2], especially in a fast-changing environment such as the pandemic of COVID-19 [3], where it aids in implementing adaptive strategies. Alongside teaching and learning, knowledge creation is vital for research universities. Knowledge creation processes are managed by establishing research institutes and centers within the university domain [4]. As per [5], knowledge sharing transforms individual knowledge into collective

corporate knowledge by enriching an organization's intellectual capital. A study by [6] revealed that knowledge sharing in the supply chain contributes to organizational success, adds to an organization's competitive advantage, fosters innovation, enhances employee performance, and strengthens the supplier–consumer relationship. High turnover in the oil and gas industries and a lack of knowledge sharing practices have become the reason for enormous knowledge loss [5]. Knowledge sharing has gained extensive research attention, mainly driven by the emergence of the knowledge economy, as it positively influences organizational factors, including job satisfaction, innovation, and competitive advantage [7].

With the advent of technology-based mass media, knowledge sharing further expanded as these mediums allowed widespread dissemination of information to large audiences. The internet took the practice of knowledge sharing to another level, enabling instant and global access to vast amounts of data. The availability of online platforms, for instance, search engines, social media, and numerous collaborative platforms, has transformed how knowledge is shared. These platforms not only democratized access but fostered interactive engagement.

1.1. Effects and Challenges of Knowledge Sharing

Knowledge sharing activities create multidimensional effects on organizations as well as on individuals. Ref. [5] said practices of knowledge sharing encourage the exchange of ideas, develop expertise, add to experiences, and increase innovation within an organization. They improve decision-making by assisting individuals and teams to make informed decisions [2]. For instance, an employee with access to relevant information and expertise from others can evaluate different perspectives and consider a broader range of options before making decisions. Knowledge sharing practices accelerate the learning process as openly shared knowledge adds to the expertise and experiences of peers by enabling them to acquire new skills [8]. Hence, an environment of continuous learning develops.

Moreover, knowledge sharing practices foster collaboration among individuals and across departments, lowering barriers and silos [9]. On the other hand, ref. [10] believe that mutually exchanged knowledge leads to developing “new knowledge”. The concept of knowledge sharing originated because shared knowledge can guarantee success. Knowledge sharing aims to spread knowledge among peers, employees, and society to benefit others [11].

Nevertheless, several reasons restrict the knowledge sharer from participating voluntarily, such as a lack of confidence [12], language barriers [13], the absence of moral support, and the absence of an encouraging environment [14]. In the corporate world, as per [15], one big reason for not sharing tacit knowledge is insecurity among peers and a lack of competency. Knowledge sharing platforms can do wonders by lowering these barriers. Unfortunately, in present times, these platforms are not explicitly designed, keeping in mind the unique requirements of diverse institutes.

1.2. Knowledge Sharing System (KSS) Design

Ref. [16] discussed the process of knowledge distribution and knowledge sharing as fundamental to fostering creativity and innovation. It requires an appropriate system development method to develop a knowledge sharing platform. The latest technology applications in system development ensure that knowledge sharing platforms can be improved through user interaction, engagement, and participation. The success of knowledge sharing systems in enhancing efficiency and effectiveness within an organization depends on numerous factors involved in the development process. These factors can be categorized as individual, group, and organizational.

Though available social media platforms proliferated knowledge sharing practices and developed an urge among individuals to know more, these platforms lack dimension, creating challenges [17]. For instance, knowledge sharing on social media platforms lacks a sharing dynamic and willingness to share tacit knowledge. A perceived lack of personal

benefits to sharing knowledge on such platforms is another challenge empowered by the fear of losing knowledge power. People also fear cross-boundary knowledge sharing as it creates further complications. Organizational culture and the nature of knowledge are other impediments, including the unavailability of managerial or leadership direction, lack of trust, and absence of a reward system adding to the issue.

KS design standards can improve knowledge sharing practices. Primarily defined standards can serve as valuable resources in arranging to outline the design of each component along with the overall product to deliver knowledge precisely when required. Design guides generate the best outcome, along with design reviews and mentoring. Design standards are making KSSs easier and more visible to use. Design standards comprising modularity, platforms, and standard components enable one to focus energy and effort on designing part of the product that adds new value to the system. Because almost 80% of a KSS's design is reused, energy must be focused on the remaining 20% to bring something better and differentiated [18].

According to [16], knowledge sharing system design comprises five phases: generating problem awareness, driving suggestions, a development phase, evaluation, and conclusion. The research process starts with problem awareness, from adequately analyzing the relevant industry and studying the literature in specific disciplines. In this stage, the proposal of the system is developed. The suggestions phase is used to prepare a tentative design which can be used to complete the proposal. The development phase is used to collect relevant artifacts from analysis and design, and a prototype is implemented. The evaluation phase is used to assess the developed prototype and ensure that stakeholders accept it. In the last stage, the evaluation results are implemented to solve the problem identified in the first step.

Ref. [19] mention the requirements as the identification of objectives and needs, deploying a user-centric approach to understand the preferences of potential users, and guideline development for creating, reviewing, and organizing the content. It is also required to incorporate filters, tags, search engines, and collaboration features such as commenting, rating, and sharing. KSS design must ensure accessibility on a variety of platforms. It must have high security and privacy features, incorporating analytics, feedback systems, and continuous improvement. The following section sheds light on currently available but popular KS technologies being used for knowledge sharing in the corporate world.

1.3. Current KS Technologies

Numerous studies have evaluated how sharing knowledge through individual digital technologies can impact job performance [2,8,20,21]. Technology-based knowledge sharing systems possess unique features and capabilities for generating, disseminating, and exchanging knowledge [8,13,22]. Consequently, organizations are increasingly combining various digital technologies to enhance knowledge sharing to improve communication and decision-making [20]. The following are some of the popular KS technologies and their features:

- SharePoint: is an effective platform for team collaboration and managing documents [23] but does not promote sharing tacit experiences [24] or involve any elements to urge knowledge sharing practices.
- Slack: another excellent platform to enhance real-time communication between team members. It may facilitate team members' sharing of common knowledge [25] on projects or topics of concern, but it lacks an encouragement and acknowledgment element.
- Yammer: a social networking platform that allows organizational employees to connect, collaborate, and share information [26,27] without motivational features, formal acknowledgment, or a reward system. Yammer enhances communication within an organization by improving transparency. It can recognize the moods of organizational employees [28].
- HubSpot: this platform provides a community forum to share knowledge of marketing, sales, and customer services [29].

- LinkedIn: it can be called a professional social networking platform [30] but is not organization-specific; therefore, many of its strengths turn into weaknesses, such as privacy, trust, and encouragement. According to [31], LinkedIn has a 93.3% adoption rate among big businesses.

The list above is not exhaustive in the presence of numerous KS platforms. These can be categorized based on their specialties: for instance, LinkedIn can be a professional networking platform [30,31]. Sharepoint, Monday.com, Space, Wrike, and Onboard are specialized in collaboration facilities among team members. Slack, Microsoft Teams, Zoom, and Google Meets are more appropriate for communication development [25]. GitHub, Hubspot, Quora, Stack Overflow, and vBulletin are popular community forums, while Yammer, Facebook, and Twitter are for social networking [27,31]. YouTube, Flickr, and Instagram are folksonomy related [30].

On the other hand, learning management systems (LMS) such as Blackboard, Brightspace, Canvas, and Moodle are effective in improving the teaching experience with the availability of a variety of tools, including screen magnification, screen readers, audio descriptions, speech recognition, and braille displays. These platforms also exhibit limitations in fostering knowledge sharing practices, not limited to a lack of familiarity among teachers and students. Additionally, these LMS platforms do not offer specific features designed to promote and encourage user knowledge sharing [32]. Similarly, ref. [33] stated that Blackboard and Brightspace are often seen as comprehensive virtual learning environments, but they fall short when promoting online teaching beyond typical paradigms. Arguably, relying on these platforms for knowledge sharing practices can be less efficient in facilitating the learner journey in fostering effective knowledge sharing. Ref. [34] stated that currently available online learning platforms, including Blackboard, Brightspace, Microsoft Teams, and Google Classroom, have limitations in promoting active knowledge sharing among students, which should be a central goal for higher education institutes.

Despite the availability of numerous knowledge management systems to be used in educational institutes, no proper study has been made to design a knowledge sharing system for the use of teachers, learners, academicians, and students, even in the presence of diverse studies focusing on the social features required to embed in knowledge sharing systems to accelerate knowledge sharing practices. A study conducted by [35] offers a design for collaboration and knowledge sharing tools focusing on educational institutes—however, their design centers on embedding collaboration tools, authoring, and assessing. Therefore, we propose the Academic Knowledge Sharing System (AKSS) framework, which includes social features essential to building an effective knowledge sharing system/platform.

1.4. Problem Statement

Higher education institutions (HEIs) face challenges and gaps that hamper effective knowledge exchange and collaboration. For example, there is a lack of industry-specific KS platforms, barriers within the realm of knowledge sharing, limited support from hierarchical structures, complexity of jobs, ambiguous working relationships, and cognitive dimensions. Despite the obstacles, knowledge sharing remains critical for enhancing organizational productivity, innovation, sustainability, and overall competencies. Interestingly, most existing studies in this domain predominantly revolve around similar constructs, including engagement, social ties, language, and trust [8,14,20]. Surprisingly, a notable research gap exists in exploring knowledge-sharing behavior within HEIs involving faculty and students. The gap is evident in the works of [4,14,33]. Some prominent problems in this regard are mentioned below:

1. Lack of an industry-specific KSS: Although several KS platforms exist, there is a lack of a specific KSS that focuses on social features to promote knowledge-sharing behavior among HEIs.
 - Barriers to existing KS: There are various barriers to existing KS, including a lack of support from hierarchical structures, a lack of encouragement from leadership, the nature of knowledge, vague working relationships, unsystem-

- atic confidence, contextual differences, and cognitive dimensions [8]. Low self-confidence and limited time are other deterrents [36].
- Essentialness of KS: KS is essential for increasing organizational productivity, sustainability, and survival-promoting innovation, and to improving organizational competencies [21,36].
2. Absence of KS for academics: On the other hand, HEIs have a knowledge-centric environment that promotes academic eagerness to share knowledge [37]. Despite the importance of KS, there is minimal research on knowledge-sharing behaviors among faculty members and students, according to several researchers [10,14,38–41].

1.5. Objectives of the Study

Universities are knowledge repositories responsible for creating and disseminating knowledge; however, noticeable restrictive behavior among students and scholars suggests the need for primary research to investigate the influencing social features helpful in designing an effective Academic Knowledge Sharing System (AKSS) promoting knowledge sharing practices among tertiary education students. The study objectives are:

- To assess the influence of encouragement, acknowledgment, and rewards on knowledge-sharing behavior among tertiary education students.
- To explore the role of a knowledge sharing culture and leading by example in shaping a university-wide knowledge sharing environment.
- To develop a comprehensive framework for evaluating the impact of the mentioned social features on student knowledge-sharing behavior and to assess the effectiveness of the proposed Academic Knowledge Sharing System (AKSS) in fostering knowledge-sharing behavior among students and faculty.
- To investigate whether integrating these factors within the AKSS can enhance knowledge sharing practices in the academic setting.

The research follows a quantitative approach, utilizing the online Pollfish platform to gather data through a targeted close-ended questionnaire aimed at university students from the United Arab Emirates, both at graduate and postgraduate levels. The factors examined in the Academic Knowledge Sharing System (AKSS) include encouragement, acknowledgment, reward systems, knowledge sharing culture, and leading by example, informed by findings from the literature review.

This paper's structure encompasses sections on AKSS design, an extensive literature review highlighting the importance of social features and knowledge sharing and articulating research gaps, the research framework, and hypotheses development. The Section 4 outlines data collection, analysis, and discussion tools and techniques. Subsequent sections cover data analysis, including participant demographics, hypothesis testing and evaluation, and comprehensive discussions based on the research outcomes. The paper concludes with a proposal for a new system rooted in research insights, followed by a concise summary and insights into future research implications.

2. Academic Knowledge Sharing System (AKSS) Design

Peter F. Drucker wrote in his book *Post Capitalist Society*, published in 1993, that knowledge is an essential resource of the economy. His statement coincides with the birth of formal knowledge management systems (KMS). The success of knowledge management systems developed the quest for more knowledge. Consequently, knowledge sharing systems (KSS) were developed to collect knowledge and share tacit experiences to fill that appetite. Unfortunately, no knowledge sharing system exists emphasizing knowledge repositories (universities), but developing such a system can lead to new avenues of exploration. According to [42], a conceptually clear system design must incorporate five design principles: (1) personalization, (2) design ecosystem, (3) intergenerational tasks, (4) goal reflection, and (5) productive system design. Ref. [19] said that the system design of KSS comprises client/server architecture, a cloud server, a scripting language, a database, and unique language programs where collaborative filtering algorithms are

used for recommendations so that knowledge can be retrieved or shared anytime and anywhere. KSS designs hold main conceptual functions. Therefore, use cases must be developed for preliminary design, proposal development of the overall architecture, and data models [43]. Ref. [16] showed that JAD (joint application development) could help to get requirements according to user expectations. Ref. [44] mentioned that rapid application development (RAD) could be used with unified modeling language (UML) to enhance the effectiveness of the developed system. Ref. [45] emphasized the use of creativity support tools (CSTs) in human–computer interaction (HCI) to promote usability satisfaction scores. Ref. [46] made a similar point in his book *Design at Work* that difficulty is not associated with the development of computer applications but primarily with involving, embedding, and evoking social interaction. To overcome these barriers, application developers and technicians require end-user cooperation to enhance functionality, mainly during the early phases of the design process.

However, the present study researches certain social factors that must be embedded in a proposed AKSS to urge knowledge sharing practices.

3. Literature Review

The following section sheds light on social features vital to accelerate knowledge-sharing behavior in an AKSS to develop hypotheses followed by a study design to collect primary data.

3.1. Social Features and Knowledge Sharing

Collaboration has become a compulsion for businesses, individuals, societies, and nations to succeed in the knowledge-based era. Organizations are developing policies to expedite knowledge sharing among peers to store, disseminate, and utilize it [12] when required. Anand et al. [36] explain that organizations are developing effective knowledge management systems (KMS) with continuous improvement to extract as much knowledge as possible, leveraging KMS demand worldwide. Edwards [47] finds creating an ability challenging, but it varies from organization to organization. Aurora et al. [25] argue that senior management could be essential in developing a culture of increased collaboration with maximum knowledge sharing activities.

Al Kurdi [39] emphasize that faculty members' researching, teaching, and sharing roles in higher education institutes should not be undermined by the production, reuse, and turning of tacit knowledge into an institute's intellectual property.

Furthermore, Koranteng and Wiafe [14] stress that sharing knowledge among professors and scholars is considered inevitable for the success of universities. Though modern institutions invest hugely in developing knowledge sharing platforms to urge students and faculty to share knowledge [39], sharing knowledge is still challenging. Hence, researchers are motivated to study and identify socio-cognitive factors to leverage the process of knowledge sharing. Edwards [47] argues that the social factors promoting this behavior are social identification, increased interaction, enhanced communication, and acknowledgment.

The next section of this paper discusses the social features of encouragement, acknowledgment, reward systems, fostering a culture of knowledge sharing, and leading by example in relation to knowledge-sharing behavior among institutes of higher education.

3.2. Encouragement

The more the technological era becomes complex, the more people want to hide their job secrets to avail themselves of a competitive edge against their peers [36]. In this situation, sharing knowledge is critical because encouragement is reinforced by providing confidence and the hope to continue something [48]. Through an evidence-based study, Kremer et al. [49] prove that management support is critical to promote knowledge sharing activities. However, leaders usually do not encourage their employees [36,41,48]. Research by Gagné et al. [41] on the behavior of employees in hiding their knowledge shows that encouragement from management has a strong positive relationship with knowledge

sharing practices. Their study used self-determination theory (SDT) to explain the effect of management's encouragement toward employees through intrinsic and extrinsic motivation concepts.

Ryan and Deci [50] explained that highly autonomous motivation generates better results than less autonomous motivation, while Pereira and Mohiya [9] interpret intrinsic motivation as the highest form of autonomous motivation. According to Aydi et al. [48], encouraging motivation can enhance intrinsic motivation. Gagné et al. [41] argue that intrinsically motivated people are so passionate that they spontaneously share their knowledge. Ryan and Deci [50] debated whether intrinsic motivation enhances the willingness of a person to share their knowledge. Then, whether or not it is in a higher education institute (HEI) or not, management support influences the level of willingness, including the quality of shared knowledge [14].

Encouragement is directly associated with confidence [48]. Individuals must be confident about their knowledge [21]. Hence, knowledge ownership is an essential knowledge sharing prerequisite, ref. [22] determined. This argument received support from [51] study that shows higher authorities can assure individuals about their ownership of knowledge they have gained by providing the confidence to share their tacit knowledge. Consequently, sharing self-owned knowledge increases employees' internal satisfaction and their motivation [41] to perform certain practices in the future. Thus, management must work to improve employee ownership beliefs [13]. In an academic environment, knowledge ownership among students comes from developing presentations, preparing background notes, and other activities.

Fullwood and Rowley [38] claim that the creation and dissemination of knowledge is the primary duty of HEIs. On the contrary, Al Kurdi [39] believe that knowledge hoarding has become a common practice among academics instead of knowledge sharing. He further emphasizes that knowledge sharing practices are voluntary activities, thus suggesting that HEI management must encourage and motivate such behavior among faculty and students.

3.3. Acknowledgment

Logically, decisions related to knowledge sharing activities are highly associated with behavioral issues [39]. In this regard, Koranteng and Wiafe [14] emphasize that acknowledgment is a significant factor in knowledge-sharing behaviors. Philip Morris International defines acknowledgment as recognizing the quality or importance of someone's efforts. The definition in [52] states that acknowledgment is a form of recognition to perform a specific action.

To elaborate on knowledge sharing and learning practices among students in Malaysian HEIs, ref. [3] demonstrated through their research that a person finds himself content and motivated when he realizes his efforts received recognition. As per [5], acknowledgment from team members having diversified expertise increases participation in knowledge sharing. Kremer et al. [49] highlighted that acknowledgment and recognition from colleagues accelerate knowledge sharing, but the impact of acknowledgment from managers and leaders is significant.

Ref. [37] said acknowledgment can be monetary, such as awards and bonuses, or non-monetary, like thanking letters and appraising words. Ref. [5] further explain that extrinsic rewards mean salary appraisal and bonuses, while intrinsic rewards include acknowledgment and recognition of knowledge sharing activities. Similarly, ref. [49] mentioned that acknowledgment could be monetary, such as rewards, promotions, and grants, but can also be non-monetary, like appreciation, image enhancement, and praise.

In addition, ref. [9] mentioned disagreement among a unique genre of social outcasts who prefer to contribute to knowledge sharing within a heterogeneous environment. Conversely, ref. [39] described that hard-earned knowledge is always shared with an expectation of personal gain. Ref. [3] define acknowledgment as a widely accredited personal gain in reciprocation of knowledge sharing efforts. Ref. [37] study at Bowen University in Nigeria authenticates this concept because the study proves that acknowledgment works as

a motivation among academicians to leverage knowledge sharing practices. Subsequently, ref. [5] hypothesized that an increase in acknowledgment practices by an organization of the knowledge sharing efforts of employees can enforce knowledge-sharing behavior. Ref. [49] asserted that asking for employee recommendations and new ideas encourages knowledge sharing practices. However, it is crucial to acknowledge participants' efforts and implement the best recommendations to encourage them to partake further.

Therefore, the acknowledgement system model (ASM) for HEIs to stimulate knowledge-sharing behaviors developed by [40] at the Malaysian Public University is worth mentioning. As rewarding behaviors helps to achieve goals [41], acknowledgment-based ASM can play an essential role, primarily if rewards are associated with the number of acknowledgments issued. According to the ASM designed by [40] a university's management should provide monetary and non-monetary acknowledgments and endorse non-monetary acknowledgments from system users. For example, monetary benefits must be calculated and evaluated with due consideration to acknowledgments from fellow academicians, staff, and students. Management should also send a letter of recognition or praise to the one who carried out an activity. Figure 1 depicts an ASM which is inspired originally by [40], where the institution sends thanks or appreciation messages to the one who shared knowledge, and users send non-monetary acknowledgments to the sharer.

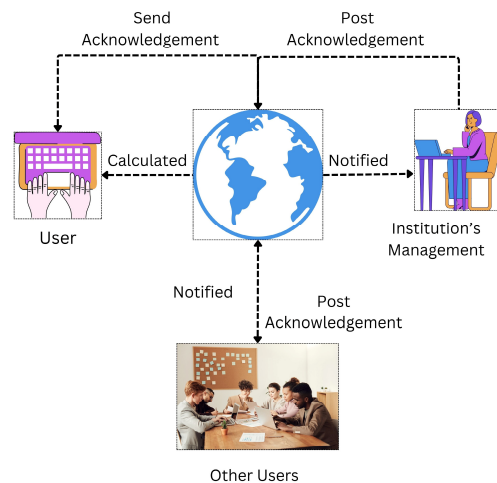


Figure 1. Illustration of an acknowledgement system Method in KS inspired by [40].

3.4. Reward System

While researching factors influencing knowledge-sharing behavior, ref. [5] concluded that rewarding organizational systems could encourage individuals to participate in knowledge sharing activities. A study by [9] shows a positive link between a reward system and knowledge sharing. Ref. [15] argued that the intensity of this relationship could vary from organization to organization. Ref. [39] identified knowledge as an employee's strength, so it is highly improbable that hard-earned knowledge, mainly tacit experience, would be shared without any reason. Consequently, cloaking behavior becomes frequent among academics because they believe their knowledge is power and sharing may hamper their promotional opportunities [22]. This argument increases the importance of fostering a reward system to stimulate knowledge sharing initiatives.

Nevertheless, various scholars agree that proper reward systems and schemes of distributing incentives based on knowledge sharing performance improve knowledge-sharing behavior and practices among HEIs [5,9,22,39]. The study by [5] showed a strong positive relationship between knowledge sharing practice and a reward system with a Cronbach's alpha of 0.881. In addition, theories of social capital and social exchange complement the concept of a reward system [13,14,38,39]. Similarly, ref. [15] suggested that an organization must embrace fairness and justice in distributing and allocating rewards, and employees must get equal opportunities. Hence, it is claimed that the reward system

ultimately contributes to developing an effective knowledge management system (KMS) to leverage knowledge sharing practices among academics and students of tertiary education.

Conversely, some researchers failed to establish any strong relationship between a reward system and knowledge sharing [9,36,38]. Ref. [21] moderated the argument by stating that anticipated rewards may negatively impact knowledge sharing. In addition, ref. [41] argue that rewards can motivate employees to share explicit knowledge but may not help in sharing tacit knowledge. However, researchers have examined different types of rewards, finding that they impact differently on the behavior of individuals [36,41,49]. Thus, it becomes essential to research the most influential types of rewards rather than discuss their absence or presence.

3.5. Knowledge Sharing Culture

Pawel Lewicki's theory of 1985 confirms that conditioning is highly associated with positive behavior. Griffith in 1970 showed that the educational outcomes of students in a pleasant environment is enhanced compared to an unpleasant environment. Ref. [38] stressed that in HEIs, the role of academics and faculty members is inevitably vital in disseminating knowledge. Academic staff and faculty foster the culture of an institute of higher education [39]. Therefore, management at HEIs must support knowledge sharing activities while leadership and faculty must promote it by leading by example [37]. In addition, refs. [38,39] admitted that two different types of leadership exist in universities: managerial and academic. Further, these researchers agree that academics require support from managerial leadership in accelerating their knowledge sharing activities.

Refs. [15,39] emphasized that organizational justice is a significant factor of organizational culture where an organization assesses employees against their performance. Ref. [13] stated that in HEIs, an employee's performance is determined by his/her education because it works as an input and generates output in the form of a salary. Ref. [39] extended this by arguing that employees compare their outputs (salaries) against inputs (education and efforts) with co-workers but are discouraged upon encountering injustice.

Trust is another dominant feature in developing an organization-wide knowledge sharing culture [37]. Much discussion has taken place on the role of trust in fostering knowledge-sharing behavior [5,36,39,49]. As per [5], an increased level of trust alleviates the negative element of sharing tacit knowledge that is a high perceived cost relative to any gain. Ref. [21] mentioned that cognitive-based trust positively impacts knowledge sharing at individual and team levels. [36] used social exchange theory to explain the influence of trust and justice within an organizational environment to promote knowledge-sharing behavior. [41] seconded [36] by stating that people examine the level of trust and justice as they provide knowledge and expect reciprocity.

On the other hand, [41] also argued that a fostered knowledge sharing culture may not necessarily provoke academics to share tacit knowledge. Additionally, it requires reasonable external control [15]. In a competitive environment, practices of knowledge sharing cannot prosper in the quest to stay ahead of peers [39]. Conversely, a cooperative environment builds trust among employees [5,39,41,49] and it is also a prerequisite for sharing knowledge [36]. A study by [49] established the theory that when new ideas are appreciated within an organization and failures are not punished but counted as a way to learn, effective knowledge sharing can come into practice.

3.6. Leading by Example

A study by Helen Fisher at Yale University described the importance of stimuli created by attraction. The reward theory of attraction demonstrates that people are attracted to or influenced by those who have rewarding attitudes. The likeness, affection, or influence of successful people is an excellent example to understand this phenomenon. Additionally, the process of practical knowledge sharing is comprises self-determination theory [39,41], social identity theory [3,13,36], and social influence theory [3,9,38]. Most importantly, the behaviors of managers and leaders, their actions, and attitudes in this regard cannot

undermine knowledge sharing [3]. One point of view is that managers serve as role models in knowledge sharing practices [21]. However, ref. [2] defined a role model as someone reflecting the set of expected behavior associated with the position he/she holds within a social context. He emphasized that people have discrete expectations from particular roles.

The success of knowledge management within an organization hugely depends on top management [36–38]. The knowledge value of top management influences employees to develop knowledge manipulation skills [5]. In addition, [53] emphasized that leaders influence knowledge management practices by swaying subordinates. Some other researchers [5,36,39,41] notably have concluded that the behavior of management in valuing knowledge can serve as an inspiration for employees, urging them to participate in knowledge exchange.

Leaders can provide opportunities to gain knowledge through learning and experience [9,21] and then influence others toward sharing or transferring knowledge [37]. Management-led knowledge sharing environments develop employee trust [3,21,37,38] about the prevalence of knowledge sharing attitudes. Researchers also agree that examples set by management in this regard are highly influential. In universities, however, leaders have different roles than in other organizations [38]. As mentioned, managerial leadership within HEIs has more power than faculty and academics, and their corporate style cannot judge academics, resulting in tensions [38,39]. Hence, management must develop a knowledge sharing culture and encourage academics to demonstrate leading-by-example behavior to foster knowledge sharing practices.

3.7. Research Gap

The literature review to evaluate the essential social factors within an Academic Knowledge Sharing System (AKSS) to nurture knowledge sharing practices among tertiary education students underlines a notable gap in the existing research landscape. Within the existing body of literature, most attention is given to examining the factors influencing knowledge-sharing behavior among corporate employees [2,5,9,12,21,36,41,49,51,53] leaving a significant research gap in understanding similar issues within higher education institutes (HEIs) and among academic professionals. Besides, close scanning reveals a tendency to investigate the effectiveness of certain factors. For instance, [39] emphasized the significance of technology, trust, rewards, and motivation. [40] delved into different dimensions of motivation, i.e., appreciation, praise, image enhancement, grants, and monetary and non-monetary rewards. [14] researched three dimensions of knowledge sharing: social interactions, engagement factors, and cognitive aspects. On the other hand, [13] investigated the relationship between shared language, shared vision, social interaction and identification, and perceived social support. The study of [37] reinforced a momentous dearth of relationships between faculty and academics in promoting knowledge sharing practices.

Therefore, it is critical to acknowledge the scarcity of research investigating knowledge-sharing behavior among tertiary education students, with the exceptions of [3,13,14] addressing this gap, especially when [8,16] have suggested having discipline-specific knowledge sharing platforms. Moreover, existing studies focus on Western HEIs, completely ignoring the cultural and social nuances of the Middle Eastern region, highlighting the pressing need to conduct primary research within UAE HEIs addressing the crucial aspects of acknowledgment, reward systems (intrinsic and extrinsic), knowledge sharing culture, and the role of leading by example to give the topic a new dimension.

3.8. Research Framework

Figure 2 depicts the framework for the primary research that aims to investigate whether the factors of acknowledgment, reward systems, knowledge sharing culture, and leading by example influence knowledge-sharing behavior among students and whether embedding of these factors in AKSS can further leverage knowledge sharing practices by increasing its effectiveness toward the creation and dissemination of tacit and explicit knowledge.

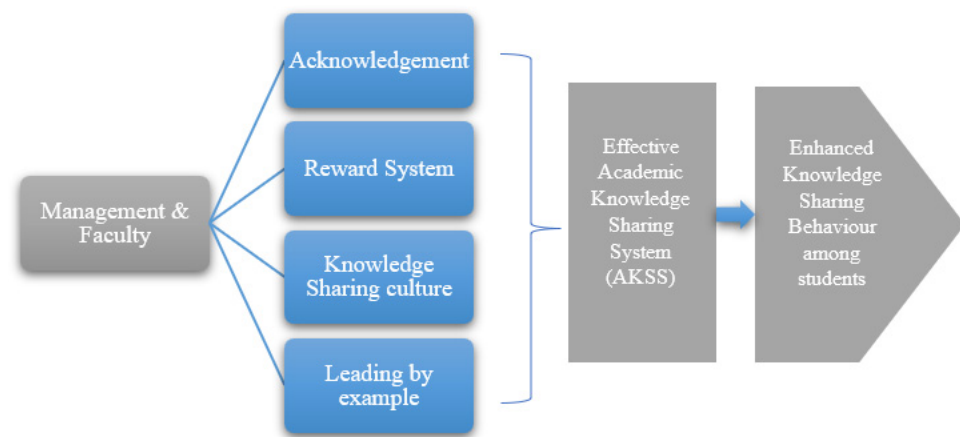


Figure 2. Research framework.

The behavior of management and faculty is independent, while acknowledgment, the reward system, the knowledge sharing culture, and leading by example are considered as mediating variable to improve knowledge sharing practices by improving the effectiveness of the proposed Academic Knowledge Sharing System (AKSS), which will result in enhanced knowledge-sharing behavior among students.

An evolving conceptual framework is used to assess a complex phenomenon in a specific higher education institute over a defined timeframe, informed by the perspective of students from undergraduate to postgraduate levels across multiple universities in the United Arab Emirates.

3.9. Hypothesis Development

The hypotheses that were tested by analyzing the data of the primary research are presented below (Table 1).

Table 1. Hypothesis development.

No.	Hypothesis
H1	Acknowledgment from management and faculty does not positively impact knowledge-sharing behavior among tertiary education students.
H2	Intrinsic and extrinsic reward systems do not encourage knowledge sharing practices among tertiary education students.
H3	A knowledge sharing culture is not crucial to developing a university-wide knowledge sharing environment.
H4	A leading by example attitude from faculty members, academics, and management does not influence tertiary education students' approach toward knowledge sharing practices.

4. Methodology

After reviewing the literature, the primary research was designed to analyze the hypotheses to determine the relationship between the research variables and assess their contribution to increasing the effectiveness of the Academic Knowledge Sharing System (AKSS). The observed variables were acknowledgment, a reward system, a knowledge sharing culture, and leading by example. The research was designed following the steps of [54] research onion and the philosophy of positivism of [55]. A deductive research approach was deployed in the next step, considering how the study moved from general information to specific [54]. A quantitative research methodology was selected in combination with a survey questionnaire to collect cross-sectional data.

The questionnaire survey (refer to Appendix A) was designed using the online platform Pollfish because it is an acclaimed and widely accepted tool for collecting data

targeting various audiences [56]. Online platforms add to the research data's efficiency, reliability, and validity as it is easy to track manipulation [57]. The questionnaire was designed following the standard of a five-point Likert scale where "Strongly Agree" was coded as (1) and "Strongly Disagree" as (5). The survey presented the hypotheses mentioned in Section 3.9 to participants for enhanced understanding. A few preliminary questions were asked to recruit the participants. For instance, whether they were currently studying in a UAE university. Based on a 95% confidence level, a 5% error margin, and assuming a 50% population proportion, the research sample size of 400 is adequate for generalizing findings, considering the estimated total student population in UAE higher education is around 295,626 [58]. Furthermore, the research design focused on the categories of participants based on their eligibility to be enrolled in higher education institutes within the UAE, aiming to investigate a comprehensive view of the higher education student population in the region, keeping in mind that focusing exclusively on students from a specific institution would have hampered a broader approach and discouraged diverse perspectives. The statistical test of ANOVA was performed on data using the SPSS platform due to its accuracy in analyzing quantitative data and determining relationships among variables.

5. Data Analysis

In the research framework, the behavior of management and faculty in the university was an independent variable. The primary research was conducted to evaluate its four aspects: acknowledgment, the reward system, the KS culture, and leading by example to assess whether these behaviors can impact the dependent variable of "Knowledge-sharing practices among students" and whether deploying these characteristics in AKSS led to an improvement in knowledge-sharing behavior among students. The hypotheses reflected in the questionnaire and sub-variables were used to collect data. The statistical method of ANOVA was used to test the hypothesis with a significance of 0.05 level. A Cronbach's alpha test was performed to determine the collected data's internal consistency and reliability, resulting in a 0.758 measure. This value suggested a moderate internal consistency and reliability level for the measured items (Table 2).

Table 2. Cronbach's alpha.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.758	0.758	22

5.1. Demographic Analysis

The research respondents comprised 56% females and 44% males, establishing a good mix of views from both gender groups. Age-wise, 17.75% were between 18 and 24 years, 19.75% were 25 to 34 years, 24.25% fell between 35 and 44, 22.75% were between 45 and 54 years, and 15.5% were older than 54 years, generating points of view of almost all age groups (Table 3).

Table 3. Participant demographics.

	Male	Female			
Gender	44%	56%			
Age-group	18–24 17.75%	25–34 19.75%	35–44 24.25%	45–54 22.75%	>54 15.5%

Research participants were students of undergraduate (42.75%), graduate (28.5%), and postgraduate (28.75%) courses. Regarding native language, 37.25% were English speakers, 34.25% were Arabic speakers, and 28.5% spoke other languages. Almost 39% of respondents were from Dubai, 32.75% were from Abu Dhabi, 15.75% were from Sharjah,

7.25% were from Ajman, 2.75% were residents of Ras Al Khaimah, and 2.5% were from Fujairah. Among the respondents, 53.5% agreed that they knew the knowledge sharing concept. At the same time, almost half of them were unaware, which should concern the university management. Again, 52% agreed that they were sharing knowledge with their friends, but the rest may not have been motivating themselves to do so. Almost half of the respondents agreed that knowledge sharing is a common practice among university students, and the other half disagreed with the statement. In addition, 52.5% believed that knowledge sharing is a behavioral issue, and it can be further developed among students.

5.2. Hypothesis Testing

The following section analyzes the hypotheses of the research.

H1: Acknowledgement

The first hypothesis states that “acknowledgment from management and faculty does not positively impact knowledge-sharing behavior among tertiary education students”. Students were asked if peer acknowledgment, instructor acknowledgment, acknowledgment from the university’s leadership, and all kinds of acknowledgment facilitate knowledge sharing practices among students, or if they believe acknowledgment does not matter.

The one-way ANOVA analysis in Table 4 examined the influence of various acknowledgment forms on knowledge-sharing behavior among tertiary education students. For peer acknowledgment, the F-value is 1.406, with a *p*-value of 0.231, indicating no significant impact. For instructor acknowledgment, the F-value is 4.850 with a *p*-value of 0.001, both showing a significant positive impact. Similarly, leadership acknowledgment has an F-value of 6.744 and a *p*-value of 0.000, reflecting a significant positive impact. On the other hand, the combined impact of all acknowledgment is marginally significant, with an F-value of 2.134 and a *p*-value of 0.076, while the view that acknowledgment is ineffective has an F-value of 0.170 and a *p*-value 0.954. In essence, instructor and leadership acknowledgment positively influence knowledge-sharing behavior, while peer acknowledgment and all acknowledgment in general do not. Therefore, the hypothesis can be partially accepted.

Table 4. Knowledge sharing and acknowledgement.

		ANOVA				
		Sum of Squares	Df	Mean Square	F	Sig.
Peer acknowledgement	Between Groups	10.332	4	2.583	1.406	0.231
	Within Groups	725.546	395	1.837		
	Total	735.878	399			
Instructor acknowledgement	Between Groups	39.355	4	9.839	4.850	0.001
	Within Groups	801.343	395	2.029		
	Total	840.698	399			
Leadership acknowledgement	Between Groups	54.427	4	13.607	6.744	0.000
	Within Groups	796.951	395	2.018		
	Total	851.377	399			
All acknowledgements	Between Groups	16.216	4	4.054	2.136	0.076
	Within Groups	749.534	395	1.898		
	Total	765.750	399			
Acknowledgement ineffective	Between Groups	1.435	4	0.359	0.170	0.954
	Within Groups	835.002	395	2.114		
	Total	836.438	399			

H2: Reward System

The second hypothesis claims that “intrinsic and extrinsic rewarding system do not urge knowledge sharing practices among tertiary education students.” The hypothesis is

further divided into the intrinsic reward system, the extrinsic reward system, both reward systems, and ineffectiveness of the reward system (Table 5).

Table 5. Knowledge sharing and the reward system.

		ANOVA				
		Sum of Squares	Df	Mean Square	F	Sig.
Intrinsic reward system	Between Groups	28.399	4	7.100	3.933	0.004
	Within Groups	713.111	395	1.805		
	Total	741.510	399			
Extrinsic reward system	Between Groups	21.684	4	5.421	2.748	0.028
	Within Groups	779.094	395	1.972		
	Total	800.778	399			
Both reward systems	Between Groups	16.685	4	4.171	2.088	0.082
	Within Groups	789.065	395	1.998		
	Total	805.750	399			
Rewards ineffective	Between Groups	14.418	4	3.604	1.716	0.146
	Within Groups	829.560	395	2.100		
	Total	843.978	399			

The results indicate that intrinsic and extrinsic rewards significantly and positively influence knowledge sharing practices, with F-values of 3.933 and 2.748 and *p*-values of 0.004 and 0.028, respectively. However, when considering both reward systems together, there appears to be a marginal impact, with an F-value of 2.088 and a *p*-value of 0.82, though not as strong as the individual reward systems. Reward ineffectiveness was found to have no significant impact on knowledge sharing practices as the F-value is 1.716 and the *p*-value 0.146. Briefly, the given hypothesis is not supported, and the data suggested that both (intrinsic and extrinsic) reward systems positively influence knowledge sharing practices among tertiary education students.

H3: KS culture

The third hypothesis “A knowledge-sharing culture is not crucial to developing a university-wide knowledge-sharing environment” investigated the impact of various organizational factors on developing a university wide knowledge sharing environment. The assumption is divided into organizational justice, trust, and cooperation, and whether a knowledge sharing culture is ineffective. The results show that organizational justice, with an F-value of 3.607 and a *p*-value of 0.007, organizational trust, with an F-value of 7.442 and a *p*-value of 0.000, and organizational cooperation, with an F-value of 4.543 and a *p*-value of 0.001, all significantly and positively influence the creation of such an environment. Especially, the ineffectiveness of the knowledge sharing culture, with an F-value of 2.013 and a *p*-value of 0.092, does not significantly impact the development of the university-wide knowledge sharing environment. Therefore, the hypothesis can be rejected as the data suggested that factors like organizational justice, trust, and cooperation are pivotal in establishing such an environment (Table 6).

Table 6. Knowledge sharing and KS culture.

		ANOVA				
		Sum of Squares	Df	Mean Square	F	Sig.
Organizational justice	Between Groups	27.575	4	6.894	3.607	0.007
	Within Groups	754.863	395	1.911		
	Total	782.438	399			

Table 6. Cont.

		ANOVA				
		Sum of Squares	Df	Mean Square	F	Sig.
Organizational trust	Between Groups	59.516	4	14.879	7.442	0.000
	Within Groups	789.781	395	1.999		
	Total	849.297	399			
Organizational cooperation	Between Groups	33.987	4	8.497	4.543	0.001
	Within Groups	738.690	395	1.870		
	Total	772.678	399			
KS culture ineffective	Between Groups	15.892	4	3.973	2.013	0.092
	Within Groups	779.545	395	1.974		
	Total	795.438	399			

H4: Led by example

The fourth hypothesis investigated that a “leading by example attitude from faculty members, academics, and management does not influence tertiary education students toward knowledge-sharing practices.” The results demonstrate that both instructors as role models and instructors leading by example significantly and positively influenced students in adopting knowledge sharing practices, with F-values of 3.236 and 3.378 and *p*-values of 0.012 and 0.010, respectively. In contrast, leadership as a role model, leadership as an example, and leadership as an ineffective example do not have a significant impact, as their F-values are 1.775, 1.445, and 0.901, with *p*-values of 0.133, 0.218, and 0.463, respectively. Therefore, the relevant hypothesis is partially supported, given that it is supported for instructor related factors but not for leadership-related ones (Table 7).

Table 7. Knowledge sharing and leading by example.

		ANOVA				
		Sum of Squares	Df	Mean Square	F	Sig.
Instructor as role model	Between Groups	24.297	4	6.074	3.236	0.012
	Within Groups	741.481	395	1.877		
	Total	765.778	399			
Instructor leading by example	Between Groups	26.645	4	6.661	3.378	0.010
	Within Groups	778.865	395	1.972		
	Total	805.510	399			
Leadership as role model	Between Groups	14.792	4	3.698	1.775	0.133
	Within Groups	822.968	395	2.083		
	Total	837.760	399			
Leadership leading by example	Between Groups	11.555	4	2.889	1.445	0.218
	Within Groups	789.742	395	1.999		
	Total	801.297	399			
Leading by example ineffective	Between Groups	7.878	4	1.970	0.901	0.463
	Within Groups	863.319	395	2.186		
	Total	871.197	399			

5.3. Hypothesis-Based Framework

Figure 3 suggests that part of hypothesis H1 is supported because leadership and instructor acknowledgment factors are essential (0.001, 0.000) for promoting student knowledge sharing practices. H2 is also partially supported because intrinsic and extrinsic reward systems have been shown to encourage knowledge sharing practices effectively (0.004, 0.0028). Hypothesis H3 is fully supported because all three elements of knowledge sharing culture are critical for encouraging students to share knowledge (0.007, 0.000, 0.001). H4 is

again partially supported given that the instructor as a role model and leading by example from faculty members has a positive influence on knowledge sharing practices (0.0012, 0.010). At the same time, the impact of the university's leadership is ineffective.

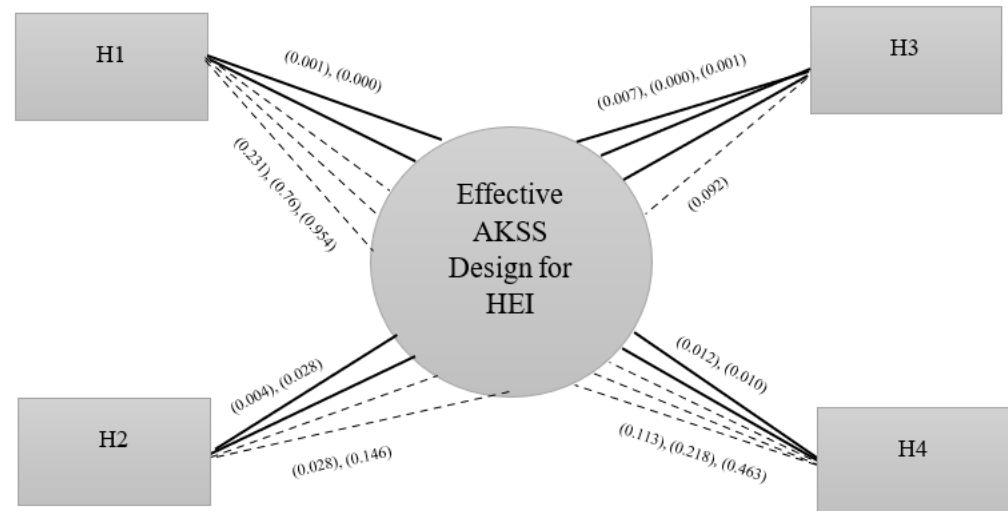


Figure 3. Framework derived from the hypotheses.

5.4. Discussion

The findings of the primary research support the claims of [40] that the acknowledgment system model (ASM) can play an essential role in accelerating knowledge-sharing behavior among students. However, they are counter to the findings of [5,49] that acknowledgment from team members increases participation in knowledge sharing. The findings are in harmony with [15,39] who found that organizational justice is a significant factor in corporate culture. The results also contribute to a consensus that trust is another dominant feature in developing an organization-wide knowledge sharing culture [5,36,37,39,49]. They align with social exchange theory to explain the influence of trust and justice within an organizational environment to promote knowledge-sharing behavior as stated by [36] and that people examine the level of trust and justice as they provide knowledge and expect reciprocity [41]. This research recommends developing a cooperative environment that builds employee trust and organizational justice.

The research findings align with the reward theory of attraction, which demonstrates that people are attracted to or influenced by those having rewarding attitudes. Ref. [21] stated that managers might serve as role models in knowledge sharing practices. The literature review highlights the importance of top management in developing knowledge-sharing behavior among employees. Nevertheless, in the case of students, they are influenced by their instructors and consider them as role models. This research suggests that instructors should lead by example to increase knowledge sharing practices among students. Management must encourage academics to demonstrate leading-by-example behavior to foster knowledge sharing practices.

6. Proposed System

Figure 4 represents a proposed system design of an AKSS to promote knowledge-sharing behavior among students and faculty in a university. For instance, if a student shares a post, the system will check its contents, hidden innovation, authenticity, uniqueness, and other required features. Once the contents are declared legitimate, they should be published/posted on the AKSS and be viewable by all members. Faculty members must acknowledge the post for its quality, advise on how the idea can be improved, or correct the information. The system will evaluate these acknowledgments against numbers, type, level of brainstorming, uniqueness, and other defined criteria. Students are then assessed on their performance annually or semi-annually and rewarded intrinsically or

extrinsically per prescribed rules. Students' rewards must be shown to all members to appreciate those who receive awards and encourage others. The proposed AKSS also believes in the leading-by-example behavior of faculty members. Hence, they must initiate discussion topics or share their knowledge of interest according to time availability or willingness. Faculty participation must undergo some decision criteria and receive intrinsic or extrinsic rewards as per their efforts. Though management/decision-making authority within the university will be responsible for defining the criteria for issuing rewards, these rewards must be calculated by the system automatically to refrain from any bias. The whole system must be administered or supervised by a facilitator (person or committee) to ensure that justice prevails to increase the trust of students and faculty in the system. The committee must enforce cooperation among members.

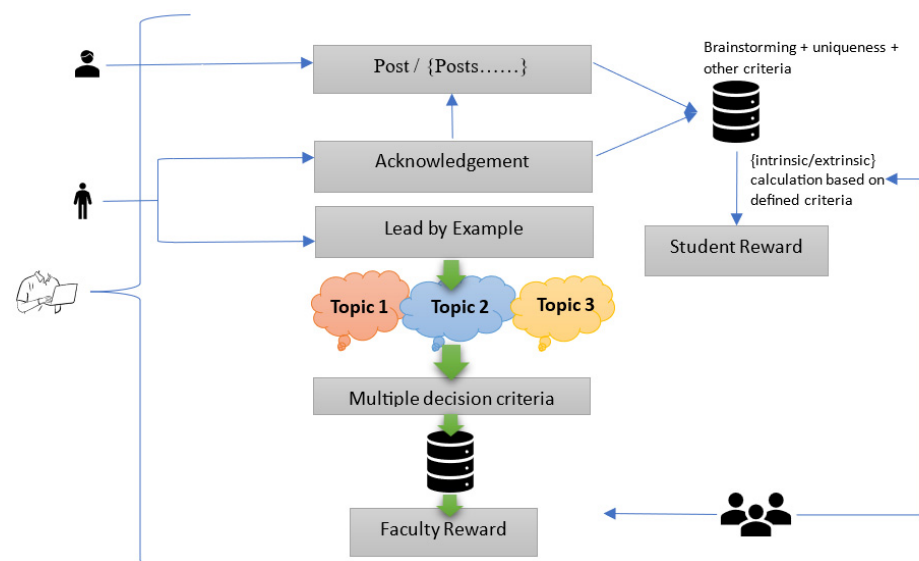


Figure 4. Proposed system design based on social features considered essential as per research findings.

The proposed AKSS will be a continuation of available social networking platforms. It will incorporate available technologies such as communication, folksonomy, collaboration, and community engagement by linking it with popular platforms. For instance, the creator can share a post with thoughtful content on their social media platforms linked with the AKSS, and faculty members can also do so, provided the post is worth sharing. Each share, like, or positive comment will be evaluated and calculated to add points to the student's academic wallet. Nevertheless, faculty members' sharing will serve as a non-monetary reward to students and motivate them to share tacit knowledge.

Additionally, the proposed AKSS will incorporate MS Teams, Google Meets, Zoom, HubSpot, and other online platforms to enhance the experience for students and faculty, to benefit from the functionality of these platforms, and to serve as a "one-stop-shop" for all educational, social networking, communication building, community development, and collaboration activities.

The platform will be accessed through the university's website and will be attached to a central student database. Exceptional achievements of a student can be shared on the AKSS to motivate and influence, such as a student of the year, remarkable research papers, published articles, graduates, and extraordinary performances in all areas.

Students will be eligible to participate in online blogs associated with the AKSS. Those interested can share their blogs, stories, poetry, unique ideas, or experiences, which will be published after approval of the concerned committee.

7. Conclusions

Knowledge sharing is a critical catalyst for the growth, innovation, and development of higher education institutes (HEIs). The present research investigated the intricacies of

knowledge-sharing behavior among tertiary education students by shedding light on key findings that can shape the future of knowledge dissemination in HEIs. The study affirms the importance of acknowledgment from both faculty and management in response to students' contributions, as it positively influences their knowledge-sharing behavior. This emphasizes the significance of fostering an appreciation culture within HEIs to motivate and engage students in sharing their insights. Reward systems (intrinsic and extrinsic) have been identified as compelling motivators for student knowledge sharing as students become more active in knowledge sharing activities as they perceive tangible and intangible rewards for their contributions. Therefore, incorporating reward mechanisms within educational institutes to stimulate collaborative learning is deemed necessary. This research demonstrated that a university-wide knowledge sharing environment is impossible without elements of organizational trust, justice, and cooperation. Hence, universities must prioritize the development of a culture rooted in trustworthiness, fairness, and collaboration to facilitate knowledge sharing effectively. The research findings emphasize the influential role of instructors as knowledge sharing role models who lead by example to demonstrate their active engagement in knowledge and inspire students to follow suit. They stress that faculty members must be responsible for setting positive examples to encourage students to open up their insights. Finally, this research proposes a systematic approach to developing an Academic Knowledge Sharing System (AKSS) to harness these findings. The framework integrates acknowledgment, rewards, knowledge sharing culture, and faculty leadership into the AKSS to serve as a comprehensive platform for promoting knowledge sharing within HEIs. Integrating these social features can become paramount in a constantly evolving educational landscape. Furthermore, implementing the proposed AKSS framework can empower educational institutes to foster a vibrant culture of knowledge sharing. Consequently, HEIs can improve learning outcomes and nurture a generation of well-equipped students to thrive in the knowledge-driven economy of the future.

8. Future Implications

Though the present research has identified several factors that influence knowledge sharing practices among students, there is still much to learn about these factors and how they interact. Future research could delve deeper into the nuances of these factors and examine their interrelationships to gain a more comprehensive understanding of the drivers of knowledge-sharing behaviors among tertiary education students, such as unveiling the differences in knowledge sharing practices among genders to know if knowledge sharing barriers for women are higher in comparison to men. It also suggests exploring cultural differences, essential for a multicultural society like the UAE. There is a need to study the relationship between the knowledge sharing practices of students and academic success to explore the impact of students' knowledge sharing practices on their post-graduation performances and what holds them back from not sharing. Moreover, it is deemed necessary to include professors' perspectives to promote knowledge-sharing behavior among students of tertiary education.

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Appendix A

Survey name: Factors promoting Knowledge sharing among the students.

Q1 Which of the following best describes you? (Single Selection) (Screening question)

1. I am currently a university student.
2. I have completed my university education.
3. I am considering joining a university

Q2 Please select your native language. (Single Selection)

1. English
2. Arabic
3. Other

Q3 Please select your study program. (Single Selection)

1. Undergraduate student
2. Graduate student
3. Postgraduate student

Q4 I am aware of the knowledge-sharing concept. (It is the activity of sharing knowledge with friends, colleagues, and others) (Single Selection)

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

Q5 I am sharing knowledge with my friends and peers at the university (Single Selection)

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

Q6 Knowledge sharing is a common practice among university students. (Single Selection)

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

Q7 Knowledge sharing is a behavioral issue and can be improved among students. (Single Selection)

1. Strongly agree
2. Agree
3. Neither agree nor disagree
4. Disagree
5. Strongly disagree

Q8 H1: Acknowledgement from management and faculty impact positively on knowledge sharing behavior among students of tertiary education. (Matrix Single Selection)

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Acknowledgement encourages students					
Peer acknowledgment is essential					

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Instructor acknowledgment is essential.					
Leadership acknowledgment is essential.					
All mentioned acknowledgments are essential.					
Acknowledgment is ineffective.					

Q9 H2: Intrinsic and extrinsic rewarding system urges knowledge sharing practices among students of tertiary education. Intrinsic = non-monetary benefits: acknowledgment, appreciation, certificate Extrinsic = monetary benefits: fee discount, scholarships, awards (Matrix Single Selection)

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Rewarding system motivates students					
The intrinsic reward system is effective.					
The extrinsic reward system is effective.					
Both reward systems are essential.					
The reward system is ineffective.					

Q10 H3: A knowledge sharing culture is crucial to develop university wide knowledge sharing environment. (Matrix Single Selection)

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
A fostered knowledge sharing culture is essential.					
Organizational justice is an important component in knowledge sharing culture.					
Trust is another crucial component in knowledge sharing culture.					
Cooperation is requisite in knowledge sharing culture.					
A fostered knowledge sharing culture is not essential.					

Q11 H4: Leading by example attitude from faculty members, academics, and management influencing students of tertiary education toward knowledge sharing practices. (Matrix Single Selection)

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagree
Successful people influence students.					
Students consider instructors as a role models.					
Instructors must lead students by example.					
University leadership influences students.					
University leadership must lead students by example.					
Lead by an example scenario is ineffective.					

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