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Towards a Prospective Communication Model for University-Industry Collaborations in Uganda

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Abstract

University-industry collaborations (UICs), which are frequently aided by the government, are thought to be essential to enhancing local and national innovation systems. Previous studies have identified barriers to UICs, but there is a dearth of empirical knowledge about the types of UICs and their challenges in the context of developing prospective models to enhance UICs, thereby restricting our ability to execute UICs. This study seeks to determine a prospective communication model for UICs by examining the various forms of UICs and the communication models used by universities and industries for collaboration. The study also establishes the challenges in UICs and measures to address them. The study adopted a qualitative research approach focusing on the service industry with three (03) service firms that have collaborated with the University of Kisubi, and one academic institution which is the University of Kisubi. The study findings reveal that the various forms of UIC in Uganda include student projects in the form of internships, research projects, and funding of research projects. The study findings also reveal that the barriers to UICs which include lack of trust, fear of knowledge link, and incompatibility occur at different stages. The study concludes that a communication model for UIC is pertinent to solving the barriers to UICs and enables the execution of UICs. The current study also provides a guiding framework for both university and industry practitioners by developing a consolidated communication model for UICs. Theoretically, by integrating the Theory of Communicative Action into UICs, our study provides a robust theoretical foundation for understanding the dynamics of communication in these partnerships and proposes models to enhance collaborations. Universities and industries ought to generate relevant collaboration partners and establish personal links using the communication model.

Keywords: University-industry Collaboration, communication model, collaboration barriers

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Introduction

In the current result-oriented era, universities have undergone a transformative shift globally, with an increasing emphasis on fostering symbiotic relationships between universities and industries. The convergence of academic knowledge and industrial expertise has proven to be a catalyst for innovation, economic development, and societal progress (Tseng et al., 2020).

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University-industry collaborations represent a strategic alignment between academic institutions and various sectors of industry, to mutually benefit from each other's strengths (Mgonja, 2017; O'Dwyer et al., 2023). University-industry collaboration focuses on interactions between professionals from industry and universities who are attempting to commercialize academic research for use in markets (Oliver et al., 2019). Networks are one way that businesses can effectively and efficiently share knowledge and produce breakthroughs (Oliver et al., 2019).

Even though university-industry collaboration plays a significant role in boosting economic development, there is no guarantee of success, and many UICs encounter conflicts that make collaboration difficult (O'Dwyer et al., 2023). Different research methods are also a result of cultural differences between industry and academics (Malik, 2013). While industry typically needs more targeted research that aims to use knowledge as rapidly as possible, universities have an interest in research that generates and disseminates new information and may require longer development. Overcoming these and other obstacles is crucial because industry and university researchers frequently disagree over research topics, timing, and result disclosure due to their divergent perspectives as well as the level of knowledge dispersion created by collaborations (De Wit-de Vries et al., 2019).

Although prior studies have established the challenges of UICs and the various forms of UICs (O'Dwyer et al., 2023; Fernandes et al., 2022; Nsanzumuhire & Groot, 2020; Tseng et al., 2020) little is still known from emerging economies given the cultural differences. This study seeks to contribute to the academic knowledge body by investigating the diverse types of university-industry collaborations prevalent in Uganda. The current study further targets to empirically establish the collaborations between academic institutions and the service industry. The study further establishes the challenges encountered within these collaborative frameworks, as identifying and understanding these challenges is vital for developing informed policies, refining existing communication channels, and establishing effective communication channels that facilitate unified collaboration between universities and industries. The findings of the study provide valuable insights into the current state of university-industry collaborations in Uganda and provide a foundation for developing a prospective communication model that can enhance UICs. The current study contributes to the scholarly understanding of university-industry collaborations in Uganda, with a particular focus on identifying collaboration types and challenges in the UICs. The study provides grounds to inform strategic interventions, policies, and communication frameworks that will foster a more symbiotic and impactful relationship between universities and industries in Uganda.

The paper is structured in three sections. Section One presents the literature and theoretical underpinnings of the study. Section Two entails research methodology. Section Three entails the analytical results and Section Four entails the discussion, conclusions, implications and limitations, and areas for further research.

Literature and theoretical underpinnings

Theoretical underpinnings of the study

The study was anchored on Jürgen Habermas' (1985) Theory of Communicative Action (TCA). The TCA postulates that communicative rationality is central to the development and maintenance of social systems. The TCA states that interactions, institutional structures, and rationalized action lead to collaborations. The idea of communicative rationality—a type of rationality arising from free and open discourse—lays the foundation for communicative

action (Smit, 2019; Fultner, 2014). This logic provides a theoretical foundation for comprehending how stakeholders in university-industry partnerships can align their goals and actions through discourse, and it also underpins successful communication and consensus-building.

Collaboration is a process that incorporates inclusive, honest communication that promotes understanding of expectations, goals, and values on both sides (Mattessich & Monsey, 1992). Collaboration establishes the framework for cooperative projects based on common standards. The current study argues that developing a communication model fosters consensus amongst partners, which in turn creates foundations for UICs (Chin, 2012). Herbama's theory emphasises the significance of a communication process in which individuals engage in logical arguments to reach decisions collectively through the application of the communication model. The theory placed additional emphasis on thoughtful cooperation amongst the parties involved. Within the framework of this study, it may be argued that reflexivity promotes adaptive methods in university-industry collaboration, enabling the partnership to change in response to new problems and situations.

Literature review

Existing forms of University-Industry Collaborations

University-industry collaboration (UIC) in academic research and industrial application plays a pivotal role in driving innovation, fostering knowledge exchange, and addressing real-world challenges. Scholars have explored and classified various forms of UIC, shedding light on the diverse ways in which academia and industry collaborate for mutual benefit (Kamal et al., 2023). According to scholars such as (Haller, 2020) and Zhuang and Jiang (2023), University-industry collaboration involves students' project work, often manifested in the form of internships. University-industry collaboration in the form of internships provides students with real-world exposure, allowing them to apply theoretical knowledge in practical settings (Otache, 2022; Zhuoli, 2023). Internships serve as a bridge between academia and industry, fostering experiential learning and enhancing the employability of students (Haller, 2020). The symbiotic relationship benefits both parties, with the industry gaining fresh perspectives and potential future talent, while students acquire valuable industry experience. Research projects represent an advanced level of collaboration between universities and industries (Lee, 1996; Morandi, 2013; Schofield, 2013). These collaborations involve doctoral researchers working closely with industry partners to address specific research questions or challenges. The collaborations through research projects contribute to the generation of practical solutions for industry. The integration of academic rigor with industrial relevance enhances the impact of research outcomes (Morrison & Lowther, 2010).

Researchers have also established that joint research projects that receive external funding are among the forms of university-industry collaboration (Rantala et al., 2021; Schiller & Brimble, 2009). Joint research projects bring together researchers from academia and industry to collectively address complex problems or explore innovative ideas (Bozeman et al., 2013; Klein, 2001). External funding sources, such as government agencies or private organisations, often catalyse these partnerships. The infusion of external resources not only supports the research endeavour but also fosters a shared commitment to achieving tangible outcomes (Mensah, nd).

In addition to externally funded projects, organisations may internally finance joint research initiatives (Perkmann & Walsh, 2007). The externally funded research projects collaborative model allows industry partners to actively engage in the research process, contributing resources and expertise (Barnes et al., 2002; Bozeman et al., 2013). Shared

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financial investment reinforces the commitment of both academia and industry to the success of the collaborative project, fostering a sense of ownership and shared responsibility. Another form of university-industry collaboration involves the direct engagement of universities by industry for research services (Nsanzumuhire & Groot, 2020). Direct engagement is where companies leverage the specialized knowledge and facilities of academic institutions to conduct research tailored to their specific needs. The purchase of research services offers a flexible and efficient way for industry partners to access innovative expertise without necessarily engaging in a long-term collaborative project.

Communication Methods Used in University-Industry Collaborations

Effective communication is fundamental to the success of university-industry collaborations, acting as the requirement for knowledge exchange, innovation, and the translation of research into practical applications (Lakpetch & Lorsuwannarat, 2012). In successful university-industry collaborations, a combination of communication channels is often employed to ensure a comprehensive and effective exchange of information and ideas (O'Dwyer et al., 2023). One of the enabling factors of successful university-industry collaboration is effective communication (Panarina, 2015; Rybnicek and Königsgruber, 2019). Communication between universities and industry is an important process that involves transmitting information, ideas, and feelings between the two parties. For communication to be effective, appropriate channels of communication must be used (Sanina, *et al.*, 2017; Westmyer, *et al.*, 1998). Literature shows that universities and industries use the same channels for communicating (Iordache-Pla Tis and Josan, 2009). Several researchers (Clauss and Kesting, 2017; Dindire, *et al.*, 2011; Hong, *et al.*, 2010) reported that universities and industries communicate through a variety of channels which include the following:

Meetings and workshops: Structured meetings, workshops, and conferences provide a formal platform for stakeholders from academia and industry to come together (Adams et al., 2020; (Karadimitriou & Mironowicz, 2012). These events facilitate in-depth discussions, presentations of research findings, and the establishment of collaborative goals.

Joint research projects: Collaborative research initiatives involve joint projects between academic institutions and industry partners (Memon & Meyer, 2017). Regular meetings, progress reports, and project updates serve as communication channels throughout the research process.

Online portals and platforms: Web-based platforms, portals, and intranets create digital spaces for sharing information, research updates, and collaborative resources (Memon & Meyer, 2017). These platforms may include project management tools, document repositories, and discussion forums. Online portals and platforms facilitate real-time communication, document sharing, and serve as a centralised hub for collaborative efforts.

Industry-academia conferences: Conferences that specifically bring together academics and industry professionals to discuss advancements, challenges, and opportunities. These conferences serve as forums for networking and establishing potential collaborations (Chen, 2021).

Internship placements: Exchange programmes, internships, and industry placements provide opportunities for students and researchers to work directly with industry partners

(Busuttil, 2022). Regular feedback sessions and progress reports are integral communication channels in these programmes.

University-Industry Collaboration Challenges

The scholarly literature addressing university-industry collaborations highlights various obstacles or difficulties associated with such partnerships. Challenges of university industry collaboration challenges often stem from differences in incentives among collaborating partners, variations in their openness orientation, and potential conflicts related to intellectual property (Siegel et al., 2003).

Scholars such as Laursen et al (2011) and Al-Tabbaa and Ankrah (2019) highlight that one of the primary challenges in university industry collaboration is the establishment of initial contact and the development of a shared vision between academic institutions and industrial partners. Differing organisational cultures, expectations, and priorities can impede the formation of collaborative ventures (Kelly et al., 2002). Existing literature suggests that overcoming these challenges requires transparent communication, the development of mutual trust, and the cultivation of a shared understanding of goals and expectations.

The collaborative process itself introduces a set of challenges that can affect the efficiency and effectiveness of university-industry partnerships. Laursen et al (2011) posit that difficulties in coordinating activities, aligning research objectives, and managing divergent timelines are common obstacles. Additionally, disparities in research methodologies, publication norms, and the pace of decision-making can create friction between academic and industrial collaborators. Upon successful collaboration and the generation of outputs, new challenges arise in the utilisation of research outcomes. Laursen et al (2011) emphasise issues such as technology transfer, commercialization, and the integration of research findings into practical applications.

Measures to Solve University-Industry Collaboration Challenges

Transparent Communication: Overcoming organisational culture differences requires open and transparent communication (O'Dwyer et al., 2023). Transparent communication involves open and honest dialogue between collaborating partners, emphasising clarity, honesty, and mutual understanding (Sanina et al., 2017; Westmyer et al., 1998). In the context of UIC, transparent communication is crucial for navigating complexities, building trust, and aligning goals and expectations (Al-Tabbaa & Ankrah, 2019). Clear and honest communication fosters an environment where potential conflicts are addressed proactively, preventing misunderstandings that may hinder the collaboration process.

Building Mutual Trust: Establishing trust is crucial, necessitating efforts to understand and respect each partner's priorities (Brinkerhoff, 2002). The successful collaboration between universities and industries hinges on the establishment of mutual trust (Kruss, 2006). Trust is a dynamic element that requires deliberate efforts to cultivate, especially considering the diverse priorities of academic institutions and industrial partners.

Clarifying goals and expectations: Cultivating a shared understanding of goals and expectations helps to align academic and industrial priorities (De Wit-de Vries et al., 2019). Achieving success in such collaborations necessitates a shared understanding of goals and expectations, as this forms the foundation for aligning the distinct priorities of academic and industrial entities.

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Clear communication channels: Maintaining open lines of communication helps coordinate activities and align research objectives (De Wit-de Vries et al., 2019). Clear communication is the lifeblood of successful collaboration. Clear communication channels serve as the backbone of collaborative endeavours between academic institutions and industrial partners. In UICs which have complexities, establishing these channels is instrumental in navigating negotiations (Laursen et al., 2011; Sanina et al., 2017).

Industry-academia conferences: Industry-academia conferences help to solve the problem of utilization of research outcomes. Conferences that bring together academia and industry can aid in commercialisation efforts (Bruneel et al., 2010). One of the critical challenges in UICs lies in the effective utilisation of research outcomes. Industry-academia conferences emerge as a proactive measure to address this challenge, providing a platform where academia and industry professionals come together to discuss advancements, challenges, and opportunities. Conferences offer invaluable networking opportunities, fostering relationships between researchers and industry professionals. These connections are essential for understanding the specific needs of industries, aligning research objectives with practical applications, and establishing collaborative ventures (Dindire et al., 2011). The personal interactions facilitated by conferences contribute to a richer understanding of how research outcomes can be effectively utilized in real-world contexts.

3.0 Methodology

Philosophical paradigm: The study adopted an interpretivism philosophical paradigm along with a qualitative research design (Fetters, Curry and Creswell, 2013). The qualitative approach was preferred in exploring a prospective communication model for UICs because it offers opportunities to study contextual determinants such as; challenges in UICs, different types of UICs to generate meaningful conclusions (Guetterman and Fetters, 2018).

Study population and sampling: The study targeted 03 firms which are players from the service industry in Uganda that have engaged in some form of collaboration with the University of Kisubi. The interviewees included officials from the Public Relations Officers (PROs) from the respective service firms and PROs in the University of Kisubi who facilitate and promote industrial collaborations by communicating strengths, building trust, managing conflicts, and enhancing the institution's reputation and partnerships. Before data collection, the authors sought permission from the firms where data was to be collected. requested the organisations where data was to be collected seeking permission to collect data from the key informants. The researcher sought the respondents' consent before data collection upon confirmation that the data would be treated confidentially. Codes were used to identify the reviewers and did not include the interviewees' details on the data collected.

Instrument development: We administered 12 interview guides by selecting two informants (managers) in each of the three manufacturing companies, and we reached a point of saturation at the tenth (n=10) informant. The ten informants were sufficient to infer the study findings according to Guest, Bunce, and Johnson (2006), who recommend that administering interview guides to a minimum number of six to twelve (6-12) informants is adequate to infer the findings to the entire population. The interview guide was appropriate because it allowed the researcher to collect detailed information from the target population by administering face-

to-face interviews in a bid to probe the informants to give their opinions, perceptions, views, and explanations on the subject matter (Sekaran and Bougie, 2009).

Data analysis and presentation: We collected qualitative (QUAL) data which were entered into NVIVO software, coded, categorised and analysed for content analysis to identify the themes that emerged from the content analysed as recommended by Schreier *et al.* (2019). Data was presented using themes and sub-themes. According to Tabachnich and Fidell (2010), themes and subthemes present the main and similar responses from respondents which are coined together when presenting the study findings.

Results

The current study sought to establish a prospective communication model for UIC. Specifically, the study sought to establish the different types of UIC, and the challenges faced in UIC and propose a communication model to enhance UIC using a sample from manufacturing firms and Universities in Uganda. The preliminary inquiry as to whether the respective manufacturing firms had collaborated with universities or not revealed that the respondents were aware of the collaboration and affirmed that the firms had some forms of UIC. This implies that the empirical evidence was derived from firms practising UIC. This means that the information used in this study was valid since it was obtained from the right informants who had adequate knowledge about IUC. The thematic findings from the content analysis revealed that the key informants had heard about UIC. The results of the question stated "Do you know about UIC*?* If yes, how did you know about it"? "The findings indicated that most informants were aware of UIC, and the informants affirmed that there were various executions the organisations had conducted to connect with Universities which included admitting students for apprenticeships in the form of internships as well as collaborating with universities to conduct research in the form of "call for grants". This means that the informants have vast knowledge about the collaborations that the organisation has with universities.

Regarding the most fundamental question which sought to explore the different types of IUC, the findings from content analysis revealed that the key forms of UIC were students' project work which was in the form of internships. Joint research projects which were funded externally, government-funded joint research projects, and purchase of research services. For instance, the respondents indicated that they received students who worked as student assistants in various departments which were in coordination with the students' line of specialisation. For example, one key informant was quoted saying *"We periodically admit internship students to come and practice what they theoretically learn from class. The field supervisor keenly supervises the students".* In another interview, another key informant remarked. *"When we receive internship students, university supervisors for the students on internship periodically visit our organisation to interact with the students and the field supervisors to establish the extent to which the student can implement what was learned in class.''* The informant added, *"The university supervisor through interaction with the field supervisor can establish the areas of weakness which the university must improve and vice versa. For example, we advise universities to get an IFMIS for accounting students so that they can learn an integrated accounting system as this was one of the weaknesses detected by Accounting interns''.* The respondents from the key informants show that student-project work in terms of internship is one of the types of UICs. Key informant 1 further augmented that *'We regard the involvement of internship students in our activities as a part of the social responsibility of the organisation. Involvement in these activities is founded in the*

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organisational philosophy of wanting to be a part of educating young people''. Importantly, Informant 5 stated that *'student projects can provide value for both parties. The students learn by practising, and the organisation benefits by having these students contribute to the organisation by rendering their services.''*
Furthermore, several people believe that student projects or hiring student assistants are the best ways to start a hiring process because they give the companies a glimpse into the professional and social competencies of the applicants (Key Informant 7). It is noted that this entrance point is a useful way to learn about the priorities of the students and provide the business with a head start on the hiring process. Hence, the thematic analysis results reveal that the firms studied in the manufacturing industry regard student-projects as one of the forms they collaborate with universities. The results further revealed that research projects which include masters funded projects are another form of university-industry collaboration. For instance, Informant 2 remarked that *'Student projects are often involved in exploring or solving practical challenges in the organisations''.*

The study also investigated the communication channels used by universities and industry players in collaboration. The study findings from the informants revealed that among the key communication channels used in University-industry collaboration are meetings, joint research workshops, online portal platforms, and conferences. For instance, one of the key informants said: *'We periodically advertise calls for conference papers where we invite academicians to write papers on various themes that help solve overarching problems in the organisations'.* This implies that the organisations used online platforms to communicate with universities. Another key informant from the university also remarked that the university advertises its projects on the various university platforms that are used by the industry players. The findings also revealed that internship placements act as a key channel for university-industry collaborations which provide opportunities for students and researchers to work directly with industry partners. Informant 4 revealed that *'Regular feedback sessions and progress reports are integral communication channels that we use to communicate to universities as the organization through the field supervisor writes feedback to the university regarding the internship activities and performance.'* Results also show that collaborative research initiatives like joint projects between institutions and universities are an important channel for university-industry collaboration.

As regards the key question of the challenges faced in UIC, the respondents were first asked whether they faced some challenges while in the collaboration. The informants revealed that there were quite a few challenges that they experienced at UIC. The results of the thematic analysis revealed that the challenges were categorised into: challenges associated with initiating the collaboration, challenges associated with the collaboration process, and challenges in utilizing the output. For instance, Informant 10 revealed:

''The process of initiating a collaboration is dynamic and can be affected by internal and external relations of the company and the primary content of collaboration and the required competences''. The response of Informant 07 rhymes with the response from Informant 09 who describes that *''Particularly for a company lacking prior involvement in university-industry collaborations, initiating contact with a university signifies surpassing a significant threshold. Formulating precise inquiries and tailoring the project details for discussion within a university context can pose challenges in such situations''.*

Another informant (Informant 10) disclosed that certain challenges are associated with discrepancies among collaborating partners in incentives, variations in their approach to openness, and potential conflicts related to intellectual property. A majority of the informants highlighted that a significant challenge in initiating the collaboration process is the search for a relevant partner. According to the interview findings, both universities and companies actively seek partners, and the informants recognize that network relations play a role in this search process. As emphasized in the interviews, both companies and universities engage in active partner searches. The key informants emphasized that network connections are crucial in the search for collaboration, and the social dimension is vital, fostering connections based on mutual knowledge exchange and ideas.

The thematic analysis results further indicate that challenges in UIC are inherent in the collaboration process, revolving around disparities in time perspectives and the necessity for documentation before applying or exploiting results.

Additionally, distinctions in emphasis between product and process, as well as heightened controlling demands in externally funded projects, contribute to these difficulties. For instance, Informant 04 remarked that *"Universities are more interested in the process than in the product/outcome of the collaboration".*
The respondents also revealed that the challenge that concerns utilizing the output is that the end result is only a report which is a document without an implementation plan. For instance, Informant 8 revealed that *"Turning the output of a university collaboration project into practice has also on occasions been a challenge."*

Possible ICT intervention for mitigating communication challenges in university-industry collaboration
Most respondents noted that it is high time the university management started using the new communication channels in the form of a centralised communication portal where industry, universities, and even job seekers can access all the relevant information. It is believed that information technology has the power to enhance communication between universities and industries. However, it was noted that the limiting factor in embracing information technology is financial constraints. Many respondents noted that universities should prioritize budgeting for communication to improve the way they collaborate with industry. This was backed by the information that the National Council for Higher Education (NCHE) communication to upcountry institutions is normally not real-time because it is delayed and expensive for end-users in this category. The NCHE usually requests the universities to send representatives to pick up the information from NCHE offices. The institutions also have to wait until someone is travelling to pick up the information from the NCHE. All the respondents believed that Information Communication Technology if well utilized can hasten effective communication.
Possible ICT intervention for mitigating communication challenges in university-industry collaboration
The university-industry collaborations exist but the strengths of their collaborations vary. In the Second Level Collaboration Model (Figure 1) proposed by Fateh et al., (2015), there is direct communication between Industry and University. This poses a risk of having many communications that may be unsystematic with mis-alignment in industry needs and university solutions.

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Figure 1: Second Level UIC (Source: Fateh et al., (2015))

This model needs to be improved with the inclusion of an effective communication portal that will work as a data repository for industry needs and solutions proposed by universities. This will minimise direct communication while providing a pool of data from which universities and industry can derive their businesses.

Proposed University-Industry Communication Model

In the proposed model (Figure 2), a communication portal comprises two main sections of industry needs and university solutions stands in between the two entities.

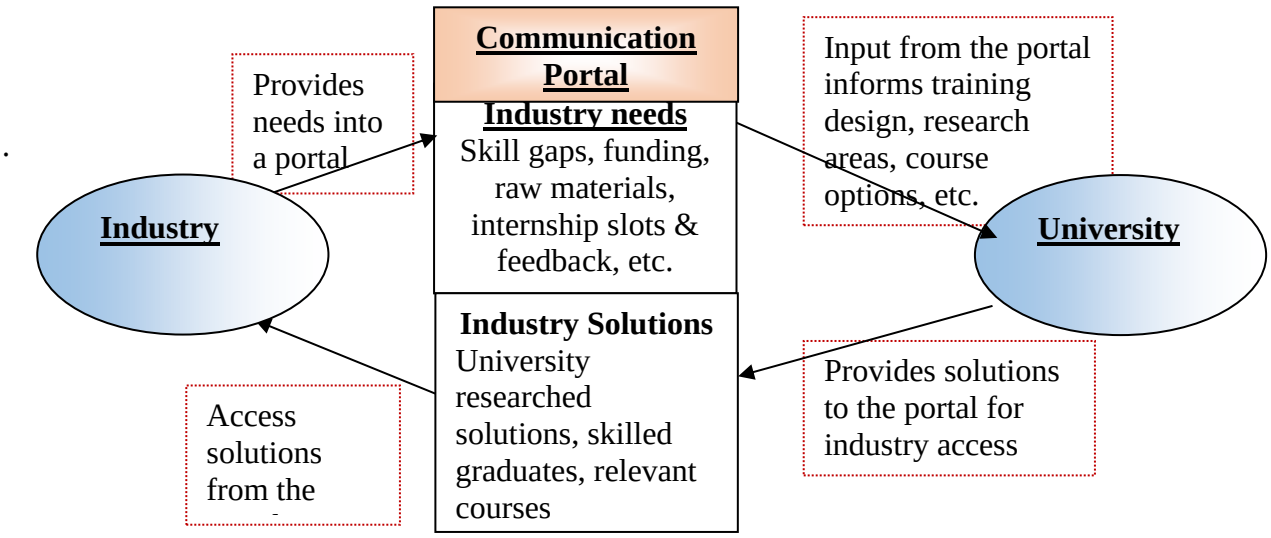

Figure 2: Proposed UIC Communication Model (Adapted from Fateh et al., 2015))

On the one hand, the industry provides all its needs into the communicational portal. These needs may include but are not limited to skills gaps in their employees and interns, areas of research the industry can support available funding, and raw materials they require. On the other hand, universities access industry data from the portal, analyse it, and produce optimal solutions for the industry such as relevant training courses and project proposals. These solutions shall be accessed by the industry through the portal. This kind of interaction will improve efficiency in communication and ensure that university solutions are aligned with industry needs.

Discussion and Interpretation of Findings

The increasing emphasis on universities to monetize academic knowledge, in addition to their traditional core missions of research and teaching, has elevated the importance of

collaboration between industry and academia. A burgeoning body of knowledge on UICs explains the success factors of IUCs. However empirical evidence on the different types of UIC and developing a prospective communication model is wanting. The current study sought to establish the different types of UICs, the communication channels used in the UIC, the challenges in the UIC, and the measures to solve the communication challenges using empirical evidence from the service industry in Uganda. The study findings reveal that universities and industries collaborate in several ways, among which are placement of students for industrial training and internships through which students get to improve their social and technical skills. This argument was consistent with literature findings (Anderson and Sanga, 2019; Lee, 2000). Furthermore, some universities collaborate with industry in different ways such as by writing research project proposals focusing on solving industry problems.

The study's findings illuminate the multifaceted nature of University-Industry Collaboration (UIC), highlighting various forms through which academia and industry converge for mutual benefit. The study underscores the role of UIC in enhancing students' social and technical skills through placements and internships, a finding consistent with the literature (Anderson and Sanga, 2019; Lee, 2000). This form of collaboration serves as a bridge between academia and industry, providing students with real-world exposure and practical experience. The symbiotic relationship benefits both parties, with the industry gaining fresh perspectives and potential talent, while students acquire valuable industry experience (Haller, 2020; Taylor et al., 2005). The research findings imply that internally financed joint research initiatives represent a collaborative model where organizations actively engage in the research process, contributing resources and expertise. Joint research projects receiving external funding stand out as a significant facet of UICs. These collaborations bring together researchers from academia and industry to collectively address complex problems or explore innovative ideas. The infusion of external resources not only supports the research endeavour but also fosters a shared commitment to achieving tangible outcomes. External funding sources catalyse partnerships, emphasising a collaborative approach to solving challenges and advancing knowledge.

The study findings also revealed that the communication channels used in the UIC included internship placements, workshops, conferences, online platforms, and joint research workshops. The study’s identification of various communication channels within University-Industry Collaboration aligns with the recognised significance of effective communication as a fundamental requirement for successful partnerships (Panarina, 2015; Rybnicek and Königsgruber, 2019). The diversity of communication channels employed in the study reflects the multifaceted nature of UIC, where different modes of communication are leveraged to facilitate knowledge exchange, innovation, and the practical application of research outcomes. The study reiterates that one of the enabling factors of successful UIC is effective communication, supported by previous research (Panarina, 2015; Rybnicek and Königsgruber, 2019). Effective communication, as highlighted by Sanina et al. (2017) and Westmyer et al. (1998), involves the use of appropriate channels to transmit information, ideas, and feelings between universities and industry partners. The current study enriches the existing body of knowledge by recognising the diversity of communication channels emphasizing the need for a comprehensive approach, where stakeholders leverage a combination of methods to ensure comprehensive and effective exchange of information.

The study findings revealed that one of the key challenges in the UICs is the challenges associated with initiating the collaboration which is affected by the dynamism resulting from external and internal factors of the company and expertise. The study findings concur with the assertions of Fitjar and Gjelsvik (2018) who posit that due to the resource-intensive nature

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of search processes, organizations might restrict their exploration to a narrower scope when seeking suitable collaborative partners from universities. This limited scope could involve focusing on institutions already familiar to the company, ones it deems reliable and trustworthy. The study findings further resonate with the works of Bruneel et al. (2010) who revealed that obstacles related to university-industry collaborations stem from differences in incentives among collaborating partners, variations in their openness orientation, and potential conflicts related to intellectual property.

The study results further revealed that the UICs' challenges can be solved by establishing transparent communication, building mutual trust, and establishing clear communication channels. The study findings echo the findings of (Yee et al., 2015) who revealed that transparent communication is key in overcoming hurdles throughout the collaboration process which serves as the foundation for understanding diverse perspectives, aligning goals, and mitigating potential conflicts. Further still, the findings align with existing literature (Fernandes, Domingues, et al., 2022), emphasizing the pivotal role of communication in navigating differences in organizational cultures, expectations, and priorities. The current study enriches the available body of literature by establishing measures to overcome the challenges of UICs using a unified communication model that supports collaborating parties in the collaboration process.

Conclusion and Recommendations

The necessity for universities to enhance the commercialization of academic knowledge, beyond their two longstanding core missions of research and teaching, has heightened the pertinence of industry-university collaboration. The current study sought to develop a prospective communication model for enhancing UIC collaboration. Specifically, the study established the different forms of UICs, the communication channels used in UICs, the challenges faced in the UICs, and the measures used to solve the challenges of UICs. The study findings revealed that universities and industries collaborate using student internships, master's research projects, and funding research projects. The challenges of UICs include initiating the collaboration and using the results of the collaboration. Based on the study findings, the study concludes that UICs are executed by involving university students in the industry, by assigning them work projects in the form of internships, joint research projects in the organisation, master's research projects where master's candidates manage their research projects, which projects are connected to other projects in the organization, and funding of university research projects, for instance in the form of "Call for proposals". The study also concludes that the various channels used by universities and industry players in the UIC are meetings and workshops, joint research projects, online portals, conference proceedings, and internship placements. The study further concludes that the challenges of UIC in Uganda include the initiation of the collaboration and implementation of the collaboration initiatives. The study further concludes that the interventions to solve the challenges facing UICs entail establishing a transparent communication platform such as a unified communication model that is used to facilitate effective communication between the collaborating parties, building mutual trust, and establishing clear communication channels.

The study draws important recommendations for managers in industry organizations and university settings. The study recommends managers develop an integrated communication model that enhances the linkage between industry players and universities to share updated information about industry trends to align university activities with the current industry demands. Management of industry firms and universities ought to establish implementation strategies to ensure that organizational employees utilize the communication

model to share information with the management to increase communication networks to achieve UICs. This will enable the collaborating parties to get relevant information about collaboration so that the challenge of initiating collaboration is solved since the communication model is a system that circulates information to the concerned stakeholders.

Implications of the Study

Implications for practice

The current research has insightful implications for policy and practice. The study findings inform industry players with the requisite benchmark to make corporate social responsibility decisions to universities like funding research projects by establishing universities that robustly collaborate with the industry to add value by periodically assessing the value of the collaborations generated by the respective universities. The current study also provides a guiding framework for both university and industry practitioners by developing a consolidated communication model for university-industry collaboration. Specifically, the prospective communication model provides grounds for promoting university and company awareness in the students' community and deeper insights into the society with which the company works. The study further provides a synchronized system of communication that provides a platform for the integration of university-industry activities. Hence, universities can design their programs while doing benchmarks with the industrial labour demands which in turn enables industry players to source relevant labour resources. The study further enables universities and industries to generate relevant collaboration partners and establish personal links using the communication model. The emphasis on transparent communication suggests the need for training programs and resources that enhance communication skills among collaborators. Building mutual trust requires intentional efforts in relationship-building activities and workshops. Establishing clear communication channels calls for the development of structured frameworks and technology platforms to facilitate seamless information exchange.

Implications to policy

The study findings further shape the trajectory of policy regulatory bodies such as the government and NCHE to establish the standards to approve university programmes by first establishing the relevance of the programmes to the industry by using the communication models to track the relevance of the programmes in the industry using information from the communication model. The study findings further provide important insights to decision makers like the government to apportion government funds to public universities by first assessing the collaborations that the university is having with the industry since the industry contributes to the economy. For instance, the government can do this by periodically assessing and quantifying the collaborations the universities have with the industry using data from the communication model to determine the research projects and other university activities that must be funded by the government.

Implications to theory

The current study also provides important insights to researchers by empirically establishing the different forms of UICs. The research study extends the applicability of the theory of Communicative Action by affirming that communication is based on mutual understanding through collaborations like the UIC which further translates to mutual benefit and dialogue. The study further contributes to research and theory by categorizing the different forms of UICs and establishing the challenges of UICs using empirical evidence from Uganda. The study affirms Habermas' Theory of Communicative Action by establishing a robust

foundation for understanding and analysing the intricate dynamics of university-industry collaboration using a communication model which provides for open communication, consensus building, deliberative decision-making, and reflexive communication, that in turn offers a lens through which researchers and practitioners can navigate the complexities of collaborative endeavours between academia and industry.

Limitations and areas for further research

This study is not without its limitations which form the basis for recommendations for further research. First, the current study collected data at one point in time using interviews which may not portray the changes in the collaborations over time due to the nature of the changing environment in industries. Further scholars ought to replicate the study findings using a longitudinal research approach by collecting data at different time intervals to establish the nature of the university-industry collaborations over time at different time intervals. The study was limited to establishing a prospective communication model by establishing the different forms of UICs and the challenges faced in the UICs. Future studies should enhance the knowledge of UICs by establishing how each of the forms of UICs such as student internships, master's research projects, and funding projects enhance communication between universities and industry. Third, the current study applied a qualitative methodology which is robust in exploring the research question. Further studies should replicate the study by using a mixed method approach and quantitative analytical techniques like structural equation modelling, and hierarchical regression among others to enrich the study findings. It is also worth noting that the current study established UICs taking the University of Kisubi as the university in context and the general usability of the results may be limited to industry collaboration with the University of Kisubi. Future scholars should conduct studies on UIC between industry and other universities.

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