

**INFLUENCE OF INNOVATION AND ARTIFICIAL
INTELLIGENCE TECHNOLOGY ON DEVELOPMENT
COMMUNICATION INTERVENTIONS AMONG STUDENTS OF
ENUGU STATE UNIVERSITY OF SCIENCE AND TECHNOLOGY**

By

Uchechukwu Jonathan Eze
University of Nigeria, Nsukka

Ezeuchej120@gmail.com

+2348062552140

<http://orcid.org/0009-0008-6517-4294>

Chinyere I. Madukwe, Ph.D,
Humanities Unit
School of General Studies, UNN
chinyere.madukwe@unn.edu.ng
08035666097

Abstract

This work looked at influence of innovation and artificial intelligence technology on development communication interventions among students of Enugu State University of Science and Technology. The research tried to ascertain how these technologies are shaping students' access to and interaction with development communication content, their perception of AI's role in development discourse, and the overall effectiveness of these interventions in fostering meaningful engagement and positive change among them. Diffusion of Innovations was the theory used. The survey research design was employed. The population of the study was made up of all the students of ESUT, while a sample size of 380 was determined, using the Australian Bureau of Statistics. The sample was picked from the university students aged 18 and 45 years in 200 - 400 levels in five faculties and two departments in each of the faculties in the university, randomly by adopting the multi-stage sampling technique. Findings show among others that, innovative technologies, including social media, and virtual reality, have significantly improved university students' participation in development communication programs. It was recommended that inter alia, development communication providers should leverage on AI and innovative tools to bring more development communication interventions to the doorsteps of university students.

Keywords: innovation, AI, development communication, influence

Introduction

In recent years, innovation and artificial intelligence technology have become central to numerous sectors, including education and communication. As these technologies continue to reshape how information is shared, processed, and understood, their integration into development communication particularly within academic environments has sparked considerable interest. According to Jha and Koshy (2021), among undergraduates, these tools simplify complex developmental messages into digestible formats, thereby fostering better understanding and participation in communication campaigns.

Development communication, which seeks to address social and economic issues through the strategic use of communication, stands to gain significantly from innovations that enable more targeted, interactive, and effective interventions. As stated by McPhail (2009), development communication involves strategic information dissemination aimed at facilitating social change and improving quality of life.

Kumar et al. (2019) described artificial intelligence as an interface for infinite possibilities and information, which may be limited by personalized strategies. Furthermore, Jarrahi (2018) interpreted the word as a collection of tools, tactics, and processes utilized within a work setting to benefit enterprises as well as the people they serve. Among undergraduates in universities, these technologies offer tools that can enhance critical thinking, foster engagement, and facilitate the dissemination of essential information in ways that are accessible and adaptable to diverse audiences.

Empirical evidence from universities in Enugu State highlights the transformative impact of AI-driven communication interventions. In a study by Nnamani et al. (2022), AI-enhanced campaigns on sexual and reproductive health recorded higher participation rates among students compared to traditional methods. Similarly, Ezeagu (2020) noted that mobile applications and gamification significantly improved students' engagement with environmental sustainability initiatives. And Enugu State University of Science and Technology is increasingly incorporating AI-driven tools and innovative technologies into their communication strategies, enabling students and faculties to experience a transformation in the way developmental information is conveyed and understood.

In this context, development communication interventions may include educational campaigns, social awareness programs, and community engagement efforts, all aimed at addressing issues such as health, environmental sustainability, social inclusion, and economic

empowerment. By leveraging AI and innovative technologies, these interventions can achieve greater reach, effectiveness, and impact. On the other hand, despite its potential, the adoption of AI and innovative technologies in development communication faces challenges such as limited digital literacy, inadequate infrastructure, and ethical concerns. Ekwueme et al. (2023) emphasize the need for capacity building among undergraduates to maximize the benefits of AI tools.

However, the extent to which innovation and AI technology impact undergraduates' understanding and engagement with development communication in Enugu State University of Science and Technology remains largely under-researched. This study focuses on the students in this university, aiming to investigate how exposure to and use of AI technologies influence their engagement with development communication interventions. By examining this relationship, the study seeks to offer insights into the opportunities and challenges presented by these emerging technologies and provide recommendations for optimizing their use in higher education development communication efforts.

Statement of the problem

In recent years, innovation and artificial intelligence have significantly reshaped the environment of development communication. These technologies hold the potential to streamline, personalize, and amplify communication efforts aimed at addressing social, economic, and environmental challenges. However, despite their transformative capabilities, there is a limited understanding of how innovation and AI impact development communication interventions among university students, particularly within the Nigerian context. In Enugu State University of Science and technology, AI and innovative technologies could greatly influence students' access to information, engagement with development issues, and involvement in social change initiatives.

The integration of AI-driven tools such as chatbots, predictive analytics, and data-driven content targeting in development communication may shape students' understanding, awareness, and active participation in development programs. However, there are questions regarding how well these technologies are being harnessed, their accessibility to university students, and the degree to which they actually enhance comprehension and engagement. Moreover, the use of such technologies may introduce challenges, such as information overload, potential bias in content delivery, and dependency on AI tools, which may

affect students' critical thinking and ability to assess information critically.

Therefore, this study seeks to explore the influence of innovation and artificial intelligence technologies on development communication interventions among these students. Specifically, it will investigate how these technologies are shaping students' access to and interaction with development communication content, their perception of AI's role in development discourse, and the overall effectiveness of these interventions in fostering meaningful engagement and positive change among the university students.

Research questions

1. What is the level of exposure of students of Enugu State University of Science and Technology to development communication interventions?
2. How do students of Enugu State University of Science and Technology perceive the role of AI and innovation in enhancing their understanding of development communication initiatives?
3. What are the development communication interventions that students of Enugu State University of Science and Technology are take part in?

Justification and significance of the study

The fast progress of intelligent machines and innovation-powered technology has fundamentally altered several industries, development communication, inclusive. In the field of education, AI-powered solutions and new communication tactics are critical for improving knowledge transfer, interaction, and learning procedures. However, it is unclear how these tools affect development communication initiatives among students at Enugu State University of Science and Technology (ESUT). Given the importance of development communication in raising consciousness, changing behaviour, and promoting prosperity in society, comprehending the function of artificial intelligence and innovation in this setting is critical.

This research sheds light on way students engage with as well as evaluate AI-powered development communication initiatives. It will likewise uncover possible barriers in digital knowledge, availability, and artificial intelligence's ability in communicating developmental messages. In the end, this work will assist administrators, educators, and communication professionals in optimizing the application of artificial intelligence and innovation in development communication, ensuring that digital breakthroughs match with academic and developmental goals.

Literature review

AI in education and communication

AI has revolutionized educational and communication paradigms, offering tools that enhance content creation, delivery, and engagement. According to EdTech Magazine (2022), AI-powered platforms personalize learning experiences, bridging communication gaps between students and instructors.

It is interesting to know that the development of AI has advanced fast in the last few years, resulting in uses across a variety of fields, including healthcare (Xu et al. 2021) and academics (Zawacki-Richter et al. 2019). And, Bengio et al. (2021), noted that artificial intelligence algorithms can be programmed to replicate the way humans think and do everyday tasks with vast volumes of information.

As hinted by Yang, (2022), artificial intelligence's capacity to carry out automated jobs, handle massive amounts of data, and deliver accurate predictions will continue to transform different parts of our everyday existence. During the last few years, university education has seen tremendous infiltration of pervasive technological devices, notably in both academia and research (Yusuf & Tambuwal, 2018). Chan and Hu (2023) in Yusuf et al. 2024, investigated undergraduates' opinions on GenAI in higher institution of learning. Result showed that undergraduates showcase a warm attitude regarding technological innovations such as ChatGPT, embracing their help in scholarly exercises.

Innovative technologies such as social media, mobile applications, and virtual reality have proven to be effective in amplifying development communication interventions. Studies indicate that the use of WhatsApp, Twitter, and Instagram has significantly increased awareness of campaigns focusing on public health, gender equality, and environmental sustainability (Agwu, 2020). Undergraduates, being active users of these platforms, are exposed to innovative and interactive content that stimulates critical thinking and drives action (Nwafor & Okoro, 2018).

AI Roles in Development Communication

The rapid adoption of artificial intelligence and innovative technologies has redefined communication processes, particularly in the context of development communication. As revealed by Vinuesa, et al. (2020), a well-founded public dialogue about AI is key to creating an environment of careful stewardship for the development of AI technologies

AI technologies, including chatbots and natural language processing tools, streamline the design and dissemination of messages targeted at university students. For instance, ChatGPT and similar tools are utilized to provide real-time feedback, answer queries, and personalize engagement in developmental campaigns. Obi and Eze (2021) argue that such tools reduce communication barriers, enabling students to access information in their preferred languages and formats, thereby enhancing inclusivity.

Innovation in development communication

The purpose of innovative communication in development is to foster integration or coherence between the desires of the government and those of the citizens.

(Yanti, Putra & Amaliah, 2024).The term innovation implies something novel, anything that has not existed before and has a significant impact on everyday life or the marketplace (Zerfass & Huck, 2007).Innovation planning should be viewed as an incorporated, collaborative, and adaptive approach that must be systematically designed, monitored and aided by interaction in a very basic fashion (Zerfass & Huck, 2007).

The goal of development projects is to meet the demands of individuals, particularly remote inhabitants. Development coordinators must thus assure the involvement of villagers in the entire aspect of local planning, execution, as well as tracking and assessing of the success of development programs affecting them (FAO, 2006) in (Imoh, 2013).To become productive, development communication must consider all of the variables that define or affect rural communities' lifestyle and working circumstances (Imoh, 2013).

Development entails adjustments in interconnections with the inward tangible, as well as the surrounding socioeconomic and political context rather than being driven by it, a transition from weakness to strength (Imoh, 2013). It focuses on citizens, their emancipation, and self-sufficiency. Its mission is to better the lives of individuals by preserving and enhancing their ideals, viewpoints, and traditions so as to promote fairness, liberty, and long-term growth. This approach, sometimes referred to as the multiplicity model, emphasizes that growth must be particular to the circumstance. Each culture is diverse in its historical, socio-cultural, and economic situations, and no generic framework is

suitable, hence a variety of techniques will have to be adopted, depending on each society's basic circumstances (Yoon, 2003).

Development Communication Interventions

Development communication interventions are strategic communication activities that aim to facilitate social transformation, improve livelihoods, and promote sustainable development. These interventions are implemented in a variety of areas, including education, healthcare, farming, management, as well as the preservation of the environment. A few examples of development communication interventions are discussed below.

Behaviour Change Communication

Behaviour change communication is a planned and comprehensive method of communication that combines representation as well as mobilizing of the society to effect and maintain improvements to social standards, viewpoints, information, and habits at various tiers of society, including persons, families, groups, and the national levels (Akuiyibo et al., 2022). BCC has been shown to be a successful strategy for avoiding and lowering the threat of infectious illnesses such as malaria, HIV/AIDS, and Covid-19 (Verelst et al., 2016; Purwaningsih et al., 2015).

Behaviour modification is an essential part of health communication and has been used as an intervention tool for a variety of health issues. Persistent illnesses, lung ailments, HIV virus-induced AIDS disease, and animal infections can all be averted by health communication campaigns that efficiently drive beneficial behavioural development (Ngigi & Busolo, 2018). Overall, four key behavioural risk variables add greatly to the increasing hazard of high blood pressure and diabetes amongst individuals. They include lifestyle habits such as tobacco consumption, an improper nutrition and obesity, physical inaction, as well as hazardous alcohol consumption. Understanding of these risk indicators is crucial in facilitating the embracing of beneficial lifestyle behaviours (Akuiyibo et al., 2022).

Behaviour change communication (BCC) has an essential part in healthcare environments as well as healthcare systems in reducing the incidence of both transmissible and nontransmissible illnesses (Nancy & Dongre, 2021). It posits that information creates views, which in return drive conduct. Education solely is insufficient to induce alteration in behaviour since the intended group needs a link to effective preventative

interventions (Park, 2019). According to Koenker et al. (2014), systematically tailoring information and strategies enables BCC to zero in on particular persons, households, or areas in order to optimize the effectiveness of healthcare measures.

Participatory Communication

Participatory development communication is the utilization of the mainstream media as well as conventional and personal means of communication to strengthen societies in their attempt to seek answers to their developmental obstacles and objectives (Ibuot et al. 2021). It is a fundamental procedure for getting parties along for collaboration in the effort of tackling the environmental issues and working to achieve the elevation of a durable social transformation among the people (Kheerajit & Flor, 2013).

As stated by Melkote and Steeves (2001), participatory communication (PC) is people-centred, embraces numerous problems, identifies community needs, involves members of the public, promotes independent thinking, encourages negotiations, provides an environment for both sides of messengers to share ideas, and leads to collaboration. Enhancing the involvement of individuals in decision-making and accountability allows for the distribution of innovative social concepts to large audiences and enhances the interchange of viewpoints across all aspects of society (Zikargae et al., 2022).

Simply put, development projects will be unable to translate to a reform unless there is ongoing, culturally and socially suitable interaction between development agents and clients, as well as within the target population (Servaes, 2008). In basic terms, a conventional means to communication hampered community involvement and engagement. In contrast, the participatory model prioritizes individuals or recipients over the government. The participatory method regards the recipients as vital players in the growth effort (Anani-Bossman & Blankson, 2023).

Risk Communication and Crisis Management

Crisis communication is risk communication geared towards a severe, abrupt threat, like the spread of a lethal illness (Lundgren & McMakin, 2018). People require knowledge in order to arrive at educated judgments and act in manners that will assist them prevent uncertainties and dangers (Fung et al. 2011; Chang, 2012). Overall, the control of natural disasters and public health emergencies consistently involves an essential communication element in the shape of cautions, risk

communications, evacuation alerts and communications about self-esteem, updates on symptoms and healthcare services, as well as so many others (Reynolds & Seeger, 2005).

The capacity to execute diverse natural hazard preventive measures might be limited by the general population that may be accustomed to anticipating a more suppression oriented-only reaction. As a result, there is the necessity to analyse both the public's reaction to these options and how to successfully convey the need for adaptable safety tactics to individuals in areas under threat (Steelman & McCaffrey, 2013).

This thorough comprehending of risk communication covers both inside interaction within the risk management company or security framework, concentrating on dangers along with safety challenges, as well as external conversation between the company and its third-party participants, like the citizens, regarding risks and dangers (Rabe et al. 2024).

Notwithstanding its relevance and rising organizational attraction, research on emergency risk communication infrastructure, methods, and comprehensive behaviours is scarce (Frost et al. 2019; LeBlanc et al. 2017). Furthermore, regardless of researchers' significant attempts to improve risk communication techniques, the connection between scholarly knowledge and practical implementation is still poor (Rabe et al. 2024).

Social Marketing

In particular, social marketing seeks to improve positive lifestyles and good health among individuals, groups, and societies (Bhat et al., 2019). To become successful, social marketers need to consider themselves to be educators, behavioural scientists, and activists at certain points. The kind of the public health or social issue and the setting in which the public health or social issue occurs should decide the approaches. For instance, if social marketers are worried regarding the broader issues linked to tobacco advertising and usage, they will have to act more than providing programs for quitting smoking which just deal with personal drive. Cigarette-related societal issues would be terminated if nicotine manufacturing and sale are put to a stop (Wymer, 2017).

Social marketing has made significant contributions to addressing health challenges because it seeks to offer benefits by addressing healthcare-related practices as well as accomplishing defined psychological targets for general welfare (Behnampour et al., 2021; Donovan, 2011) (Akbar et al. 2022). Although social marketing is

maturing, tremendous effort and development remains to be done. Constant progression towards advancement can enable social marketers be accepted and appreciated more effectively for their essential abilities, competence, experience, integrity, and selflessness. Complementary measures should be maintained and properly sponsored (Kassirer et al. 2019).

In all, if an infectious substance or deficiency is the main root of a social or public health concern, the government must respond. Government intervention is frequently necessary because huge amounts of resources or novel rules and regulations have to be introduced to solve a public health or social issue (Wymer, 2017). Thus, the field of social marketing continues to encounter obstacles that must be solved in order for it to progress. We argue that certain of these issues should be raised to the position of a risk, implying that if these obstacles are not adequately handled, the profession will not only cease to develop but may experience reverses (Akbar et al. 2021).

Entertainment-Education

The concept of mixing entertainment with education in a style that both captivates and teaches extends back to hundreds of years of storytelling, particularly in cultures where deep oral traditions serve as official as well as unconventional methods for helping children through their socialization stages. Entertainment education has been praised as a powerful and affordable medium for imparting health-related knowledge (Carpena, 2024).

It is a blend of information alongside escape, in every instance referred to as "infotainment", which seeks to boost the effectiveness of beneficial social communications to people using a deliberate setup to leave long-lasting impressions on their minds via the instrumentality of humorous moments and other enjoyment systems, thus enabling the audience analyse information in ways that cannot be done by an obvious outright instructive technique (Nasir et al. 2022).

Several of the Entertainment-education concepts in academia originated from the Western cultures and are founded on research conducted in laboratories detached from the setting within which Entertainment-education initiatives are executed (Wang & Singhal, 2021) in (Frank & Falzone, 2021). Overall, entertainment-education is growing and is embracing a variety of fresh possibilities, which includes intriguing electronic mediums and multimedia (Frank & Falzone, 2021).

Theoretical framework

Diffusion of Innovations Theory

Propounded by Everett Rogers, this theory explains how innovations are adopted and spread within a social system. It highlights factors influencing adoption, including perceived advantages, compatibility with existing values, simplicity, trialability, and observable results.

Diffusion of Innovations Theory is useful for examining how AI and innovative communication technologies are accepted and utilized by university students. It helps to understand the rate of adoption, barriers to acceptance, and the characteristics of students who adopt these technologies for accessing development communication interventions.

Methodology

This work adopted the survey research design. A survey can be said to be the research design where views of respondents are elicited to generate data that provide solutions to a set of research problems. Thus, Survey was utilized in this research because it was employed to gather data regarding the views of university students on Influence of innovation and artificial intelligence technology on development communication interventions among students of Enugu State University of Science and Technology

The population of this work was made up of all the students in Enugu State University of Science and Technology (ESUT). An official figure from Enugu State University of Science and Technology, Enugu placed the population at 28,000.

The sample size of 380 was determined, using the Australian Bureau of Statistics. It is essential to determine a sample size since it was impractical to investigate every component of the population for this study. The sample was picked from the university students aged 18 and 45 years in 200 - 400 levels in five faculties and two departments in each of the faculties in the university in question, randomly by adopting the multi-stage sampling technique. The five Faculties were: Social Sciences, Engineering, Education, Management Sciences and Environmental Science.

Under the faculty of Social Sciences, departments of Political Science and Economics were selected. In the faculty of Engineering, Computer and Chemical Engineering departments were chosen. Also, in the faculty of Education, the departments of Business Education and Education Management were selected. Furthermore, in the faculty of

Management Sciences, the departments of Mass Communication and Public Administration were picked. Lastly, in the faculty of Environmental Science, the departments of Urban and Regional Planning and Building Technology were chosen. Two of the departments in the five faculties selected, had 38 respondents, making it a total of 380 sample size.

The research instrument for this study was the questionnaire. Descriptive statistics of mean and tables with percentage was employed to analyse the research questions. A four-point Likert scale of strongly agree, agree, disagree and strongly disagree with assigned values of 4, 3, 2 and 1 respectively were also adopted for ease of statistical analysis. Thus, the benchmark for the study was, 2.5.

Research question one: What is the level of exposure of students in Enugu State university of Science and Technology to AI and innovative technologies in development communication interventions?

S/N	ITEM STATEMENTS	SA	A	D	SD	MEAN	RATING
1	Fully exposed	301	53	26	-	3.7	Accepted
2	Exposed	199	83	65	33	3.1	Accepted
3	Undecided	42	52	175	111	2.1	Rejected
4	Unexposed	12	32	148	188	1.7	Rejected
5	largely unexposed	8	12	158	202	1.5	Rejected

Research question two: How do students of Enugu State University of Science and Technology perceive the role of AI and innovation in enhancing their understanding of development communication initiatives?

S/N	ITEM STATEMENTS	SA	A	D	SD	MEAN	RATING
1	AI tools, such as chatbots and personalised recommendation systems, aid my understanding and reception of	318	42	11	9	3.8	Accepted

	development communication messages.						
2	I utilise innovative technologies like social media platforms, virtual reality, and mobile applications to engage in development communication.	201	148	19	12	3.4	Accepted
3	Inadequate digital literacy, lack of trust in AI and lack of technological infrastructure limit undergraduates’’ engagement with development communication.	189	141	32	18	3.3	Accepted

4	Undergraduates who are exposed to AI-driven interventions have higher level of engagement with development communication than those who utilise the tradition communication approaches.	123	102	71	84	2.7	Accepted
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Research question three: What are the development communication interventions that students of Enugu State University of Science and Technology take part in?

ITEM STATEMENTS	SA	A	D	SD	MEAN	RATING
Road safety campaigns	192	174	14	-	3.4	Accepted
Outreach programs on HIV/AIDS	208	163	9	-	3.5	Accepted
Awareness programs on contraception	196	121	40	23	3.2	Accepted
Anti-smoking campaigns	188	156	36		3.4	Accepted

Discussion of findings

The table one above with the research question: What is the level of exposure of students in Enugu State university of Science and Technology to AI and innovative technologies in development

communication interventions, shows that these students are indeed well exposed to AI and innovative technologies as it concerns development communication interventions. This finding is in line with that of Nnamani et al. (2022), which in a study, revealed that Ai-driven program on sexual and reproductive health witnessed higher participation rates among students compared to traditional methods. In the same vein, Ezeagu (2020), hinted that mobile applications and gamification significantly improved students' engagement with environmental sustainability initiatives.

Results in table two above, show that AI and innovation improve the understanding of development communication initiatives of the respondents. Corroborating this finding, Jha and Koshy (2021), assert that among undergraduates, these tools simplify complex developmental messages into digestible formats, thereby fostering better understanding and participation in communication campaigns.

The findings in table number three, show that the respondents do take part in development communication interventions. Supporting these findings, Nnamani et al. (2022), in an investigation, reported that a campaign on sexual and reproductive health, recorded a higher turnout of university students.

Conclusion

Summary of Findings

AI-driven tools, such as chatbots and adaptive learning platforms, have increased accessibility to development communication content, enabling students to interact with personalized and contextually relevant messages.

Innovative technologies, including social media, and virtual reality, have significantly improved university students' participation in development communication programs.

University students do take part in development communication programs.

Recommendations

1. Universities should invest in digital literacy programs to equip students with the skills needed to effectively engage with AI and innovative technologies.
2. Improved technological infrastructure, such as reliable internet and access to digital devices, is essential to support the adoption of AI-driven interventions.

3. Development communication providers should leverage on AI and innovative tools to bring more development communication interventions to the doorsteps of university students.

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