JOURNAL OF SCIENCE TECHNOLOGY AND EDUCATION 13(4), DECEMBER, 2025
E-ISSN: 3093-0898, PRINT ISSN: 2277-0011; Journal homepage: www.atbufstejoste.com

Gap Analysis and Demographic Variations in Awareness of Technology-Based Instructional Resources among Business Educators

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ABSTRACT

The study focused on analyzing the awareness gap and demographic differences regarding technology-based instructional resources (TBIR) among business educators in colleges of education in Edo and Delta States of Nigeria. To guide the research, two questions were formulated and two hypotheses were formulated, which were tested at a significance level of 0.05. A descriptive survey research design was employed. The study's population consisted of 108 business educators across these colleges. A census was conducted in five purposefully selected colleges that offered a Business Education programme, as the number of Business educators was manageable, and the population constituted the sample size. Data was collected using a validated questionnaire titled "Gap Analysis and Demographic Differentiation of Awareness of Technology-Based Instructional Resources" (GDATBIR). The reliability coefficient of the questionnaire was measured at 0.84. The analysis revealed that there is a significant awareness gap among business educators regarding various TBIR for teaching. Additionally, it showed demographic differences in awareness between male and female business educators concerning TBIR used for teaching business subjects. The study recommends that the authorities of colleges of education should create awareness among business educators to encourage the adoption of TBIR for instructional delivery through seminars, workshops, and conferences. Furthermore, both male and female business educators should receive equal sensitization regarding the use of TBIR for effective instructional delivery.

ARTICLE INFO
Article History
Received: August, 2025
Received in revised form: September, 2025
Accepted: November, 2025
Published online: December, 2025

KEYWORDS
Technology-Based Instructional Resources (TBIR), Business Educators, Teaching

INTRODUCTION

In the 21st century, education systems worldwide are undergoing rapid transformation driven by advances in technology. The integration of Technology-Based Instructional Resources (TBIR) such as interactive software, digital libraries, e-learning platforms, projectors, and computer-assisted instructional tools has redefined teaching and learning processes. These resources enhance content delivery, promote learner engagement, and foster skill acquisition, particularly in disciplines such as Business Education, where the application of technological innovations is vital for preparing students for the modern workplace.

In Nigeria, Colleges of Education play a critical role in training future teachers, including business educators who are expected to demonstrate competence not only in subject matter but also in the effective use of technology to deliver instruction. However, despite government policies and institutional investments in ICT, the actual utilization of TBIR by educators remains inconsistent. Research suggests that gaps exist between availability, awareness, and effective usage of these resources, which may

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undermine the quality of instructional delivery and learning outcomes.

Meanwhile, Technology has become an integral part of human endeavors in today's society, and there is increasing pressure on the educational system to effectively implement these new technologies. A teacher's ability to adapt to changes and innovations is a key factor for instructional success. For effective learning to occur in the Nigerian education sector, teachers' skills must be supported by ICT applications. Awareness of Technology-Enhanced Learning (TEL) by teachers is crucial before they can effectively utilize these tools. Awareness involves knowledge or perception of such technologies and their potential applications. According to Oni and Ahiauzu (2016), 'awareness' refers to knowledge about something that exists or to an understanding of a situation or subject based on information or experience. It can also be defined as a recognition, realization, or acknowledgment of a particular situation or development.

Awareness messages can provide general background information about an issue and reinforce the importance of informed action and behavioral change. Rogers (1983, 1995) outlined three types of knowledge: awareness-knowledge, which involves understanding that an innovation exists; how-to knowledge, which pertains to the information necessary to use the innovation; and principles-knowledge, which covers information about how an innovation works. Among these, Rogers emphasized the need for awareness-knowledge, which is essential during the persuasion and decision-making stages. This type of knowledge can easily be disseminated through mass media. The primary aim of teaching is to impart knowledge, information, values, and skills to students. Being aware of TEL can promote the sharing of ideas, thoughts, feelings, and knowledge. The significance of TEL in the teaching-learning process is substantial. Therefore, teachers' awareness of these benefits can motivate them to appreciate, adopt, and utilize technology in their teaching practices, fostering a positive attitude toward instructional technologies.

Numerous TEL resources and software applications have great potential in education. Teachers are expected to use the tools and resources provided by educational institutions. However, if business educators are not aware of the various TEL options available or how to effectively use them, they will not be able to utilize them optimally in teaching their students. The government's initiative for ICT integration in Nigerian educational practices aims to empower and enhance the competence of the education sector to meet its responsibilities. This effort is particularly focused on producing ICT-literate citizens who can thrive in an information age where technology plays a crucial role in society. In line with this initiative, the Federal Republic of Nigeria (2013) mandates that academic staff in all higher education institutions integrate ICT into their pedagogical practices. There is a particular emphasis on the integration of ICT in teacher education programs, ensuring that pre-service teachers trained in Nigerian universities and colleges acquire the relevant skills and competencies needed to teach effectively with technology in this information age.

In essence, awareness can often be cultivated through education, training, or life experiences, with the goal of enhancing cultural sensitivity to specific topics or issues. Awareness represents knowledge about particular information that can be expressed through specific behaviors (Akpojotor, 2016). Thus, the awareness of technology-based instructional resources (TBIR) among business educators aims to foster a change in teaching practices. When teachers recognize the benefits of TBIR, they are more likely to appreciate, adopt, and effectively integrate these technologies into their teaching. This shift in awareness can contribute to the development of positive attitudes among teachers concerning the use of instructional technologies. Consequently, the level of awareness of TBIR among business education teachers may significantly influence their willingness to adopt these technologies appropriately.

Technology-based instructional resources are modern tools used to convey knowledge from teachers to students, both inside

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and outside the classroom. The use of TBIR in teaching business education courses is expected to provide educators with various ways to access knowledge and enhance effective teaching. Business education teachers are encouraged to utilize and guide students in using these resources safely, wisely, and productively. Demographic factors, such as age, gender, teaching experience, and academic qualifications, may significantly influence how educators incorporate TBIR into their instructional practices. For example, younger instructors may demonstrate greater adaptability to technology, while more experienced educators might rely more on traditional teaching methods.

Additionally, variability may arise from institutional support, training opportunities, or personal attitudes toward technology. These differences raise important questions about equity, efficiency, and the overall impact of TBIR on the quality of education. This study assumes that the awareness of TBIR among business education teachers may vary based on their demographic characteristics, including gender, academic qualification, and work experience. Gender refers to the sex of the teacher, whether male or female. Literature indicates a moderating effect of gender on the intention to use information technology (Magsamen-Conrad, Upadhyaya, Joa, & Dowd, 2015; Maldonado, Khan, Moon, & Rho, 2011; Wang & Shih, 2009). For instance, Wang and Shih (2009) found that gender significantly influenced the impact of performance expectancy on the intention to use an information kiosk, with men showing a stronger perception of its usefulness, thus affecting their willingness to use it. Therefore, this study will explore demographic characteristics such as age, gender, educational qualification, and teaching experience. In this context, the terms business education teacher, business educator, and teacher are used interchangeably.

To determine whether differences exist in business educators' awareness of TBIR in their pedagogical practice, a gap analysis may be employed. A gap analysis can also be viewed as a need analysis; it identifies the space between the current state of awareness that business educators possess and the targeted or expected state. This method assesses the difference between the actual awareness of TBIR among business educators and the expected level of this awareness. Conducting a gap analysis will play a crucial role in understanding where business educators currently stand in terms of their awareness of TBIR and what areas need improvement. The results of this study are expected to be beneficial to the stakeholder namely: colleges of education authorities, National Commission for Colleges of Education (NCCE), Business education lecturers and students in Colleges of education, and Researchers when published in reputable journals and presented in conferences.

STATEMENT OF THE PROBLEM

The integration of technology into education highlights the importance of Technology-Based Instructional Resources (TBIR) in enhancing teaching and learning, especially in business education, where practical skills are essential. However, researchers observed that many educators in Nigerian tertiary institutions, including Colleges of Education, lack awareness of available instructional technologies, leading to underutilization and reduced effectiveness.

Despite government advocacy for ICT in education and investments in technology, there remains a disconnect between available TBIR and educators' understanding of their benefits. This gap threatens the quality of business education graduates, who need to be tech-savvy for the workplace. Awareness of TBIR varies among educators, influenced by factors like age, gender, teaching experience, and academic qualifications. Younger educators may be more familiar with digital tools, while older ones might struggle due to limited exposure. This study aims to analyze the awareness of TBIR among business educators and the impact of demographic variations, highlighting the need for a better understanding to facilitate effective integration and innovation in education.

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Purpose of the Study

The main purpose of this study was to determine gap analysis and assess the demographic difference in the awareness of technology-based instructional resources among Business Educators in colleges of education in Edo and Delta State. Specifically, the study investigated:

1. The awareness needs of business educators regarding TBIR for teaching business education courses
2. The differences in the level of awareness of TBIR between male and female Business Educators for teaching business education courses.

Research Questions

The following research questions guided the study:

1. What are the awareness needs of business educators in the colleges of education in Edo and Delta States concerning TBIR for teaching?
2. What differences exist between male and female Business educators regarding their awareness of TBIR for teaching in the Colleges of Education in Edo and Delta States?

Hypotheses

The following null hypotheses were formulated for the study and tested at the 0.05 level of significance

1. There is no significant difference in the mean responses of business educators regarding their Possessed and Expected levels of awareness of TBIR for teaching.
2. There is no significant difference in the mean responses between male and female business educators concerning their levels of awareness of TBIR for teaching.

METHODOLOGY

This study investigates the gap analysis and demographic variations in awareness of technology-based instructional resources among business educators. To guide the study, two research questions were formulated and answered, and two hypotheses were developed and tested at a significance level of 0.05. The research employed a descriptive survey design. The study population comprised 108 business educators from colleges of education in Edo and Delta States. A census was conducted of business educators in five purposively selected colleges where the business education programme was available, as the number of business educators was manageable.

Data collection utilized a questionnaire titled "Gap Analysis and Demographic Differentiation of Awareness of Technology-Based Instructional Resources" (GDATBIR), which experts validated. The questionnaire consisted of 15 items related to the research questions. It included two types of response scales: the "possessed" scale and the "expected" scale. The possessed scale used a 5-point Likert scale with the following nominal values: VHA (Very Highly Aware), HA (Highly Aware), AA (Averagely Aware), SA (Slightly Aware), and NA (Not Aware). The expected scale also employed a 5-point Likert scale. The reliability coefficient of the questionnaire was 0.84.

The data collected were analyzed using the mean and standard deviation. The statistical tools employed for data analysis included mean (X) and standard deviation (SD) to address the research questions, while the t-test statistic was utilized to test the hypotheses. For research question 1, the Mean and Difference in Awareness Index (DAI) was calculated as follows: (a) The mean (Xp) of the possessed category was determined for each item. (b) The mean (Xe) of the expected category was determined for each item. (c) The awareness gap (AG) was calculated by finding the difference between the two means for awareness, using the formula: (Xe - Xp) = AG. If AG was negative (-) or equal to zero, it indicated that awareness was not needed. If AG was positive (+), it signified that awareness was needed for that item.

The remarks for the research questions were based on a weighted aggregate of 3.00, and the t-test was used to test the null hypotheses at a

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0.05 significance level. A p-value less than the alpha level of 0.05 resulted in the rejection of the hypothesis, whereas a p-value greater than or equal to the alpha level led to the acceptance of the hypothesis.

Research Question 1:
What are the awareness needs of business educators in the colleges of education in Edo and Delta States on Technology-Based Instructional Resources (TBIR) for teaching?

RESULTS AND DISCUSSION

Table 1: Mean, Standard Deviation, and Mean Difference on the Level of Awareness of TBIR for Teaching

		Possessed		Expected		Gap	
S/N	**Item Statement**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**Remarks**
1	Fully aware of the pedagogy to be adopted on the internet in teaching business subjects	1.52	.572	4.58	.549	3.06	AN
2	Fully aware of the TBIR within the school and external environment that can be used in teaching business subjects	1.54	.571	4.47	.618	2.93	AN
3	Knowledge of an appropriate internet-enabled electronic device, such as hardware and software for teaching of business subjects	1.67	.611	4.44	.568	2.77	AN
4	Knowing how to surf the internet is a worthwhile skill for teaching business subjects	1.58	.598	4.37	.635	2.79	AN
5	Knowing educational podcasting, such as IPod/MP3 to upload a complete lecture into a subject website as quickly as possible after the lectures	1.53	.603	4.36	.648	2.83	AN
6	Awareness about digital cameras to take important photographs and store them as a digital file and make use of them during instructional delivery	2.49	.704	4.36	.618	1.87	AN
7	Knowledge of the email service to collaborate with students on a given project	1.64	.587	4.39	.653	2.75	AN
8	Knowing how to give academic support to students on assignments and other related information through email	2.57	.739	4.39	.681	1.82	AN
9	Knowledge of e-mail service to aid teaching and encourage learners to learn at their own pace and convenience	1.51	.538	4.51	.634	3.00	AN
10	Knowledge of cloud computing applications available on the net	1.68	.667	4.52	.555	2.84	AN

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S/N	Item Statement	Possessed Mean	Possessed SD	Expected Mean	Expected SD	Gap Mean	Remarks
	that support the use of PowerPoint slides (PPT) for teaching activities						
11	Awareness about the application of cloud computing to augment the teaching of business subjects	1.65	.660	4.47	.603	2.82	AN
12	Knowing to generate updated eBooks and more information from web tools via cloud computing	2.63	.705	4.53	.571	1.90	AN
13	Having knowledge to create social network group page to schedule events that relate to lesson for students	1.62	.666	4.51	.648	2.89	AN
14	Having knowledge to engage students in discussion forum on particular business subject through social network technologies	2.49	.690	4.48	.676	1.99	AN
15	Broad knowledge of social network group page to schedule events that relate to lesson for students.	2.44	.585	4.58	.643	2.14	AN
	Aggregate	**1.90**	**.213**	**4.46**	**.378**	**2.56**	**AN**

Note. SD = standard deviation AN = Awareness Needed

Table 1 reveals the mean, standard deviation, and the mean difference (gap) between the means of possessed and expected levels of awareness of TBIR for teaching. The mean responses of possessed level of awareness ranged from 1.51 to 2.49, while the mean responses on the expected level of awareness ranged from 4.36 to 4.58. The table also shows that the gap analysis (mean difference) ranged from 1.87 to 3.06, which indicates positive mean differences above zero. The aggregated mean responses for possessed (M = 1.90) and expected (M = 4.46) levels of awareness, with positive gap analysis (M = 2.56), indicate the need for an increase in the level of awareness of TBIR for teaching among business educators in colleges of education in Edo and Delta States. It can, however, be deduced that the extent to which awareness is needed reduces as the values of the TBIR awareness gap analysis also decrease.

Hypothesis 1:

There is no significant difference in the mean responses of business educators between possessed and expected levels of awareness of TBIR for teaching.

Table 2: Paired t-test on the Difference between Possessed and Expected Levels of Awareness of TBIR for Teaching

Awareness	Mean	N	SD	df	t	p	Decision
Possessed Level of Awareness	1.904	108	.213	107	-60.651	.000	Significant
Expected Level of Awareness	4.464	108	.378				

Note. SD = standard deviation.

Data presented in Table 2 show the aggregate mean responses of business educators on the possessed (M = 1.904) and expected (M = 4.464) levels of awareness of TBIR for teaching. The table shows significant difference (t = 60.651,

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df = 107, $p < .005$) between the possessed and expected levels of awareness of TBIR for teaching among business educators since the p-value is less than the alpha value of 0.05. The null hypothesis is therefore rejected. Hence, there is a significant difference in the mean responses of business educators between possessed and expected levels of awareness of TBIR for teaching.

Research Question 2:
What is the difference between the awareness of male and female Business educators' on TBIR for teaching in the Colleges of Education in Edo and Delta States?

Table 3: Mean and Standard Deviation on Level of Awareness of TBIR for Teaching based on Gender

S/N	Item Statements	Sex	N	Mean	SD	Remarks
1	Fully aware of the pedagogy to be adopted on the internet in teaching business subjects	Male	56	1.50	.632	SA
		Female	52	1.54	.503	SA
2	Fully aware of the TBIR within the school and external environment that can be used in teaching business subjects	Male	56	1.55	.502	SA
		Female	52	1.52	.641	SA
3	Knowledge of an appropriate internet-enabled electronic device, such as hardware and software for teaching business subjects	Male	56	1.73	.618	SA
		Female	52	1.60	.603	SA
4	Having knowledge of how to surf the internet is worthwhile skill for teaching business subjects	Male	56	1.63	.558	SA
		Female	52	1.54	.641	SA
5	Knowing educational podcasting, such as iPod/MP3, to upload a complete lecture into a subject website as quickly as possible after the lectures	Male	56	1.48	.539	SA
		Female	52	1.58	.667	SA
6	Awareness about digital camera to take important photographs and stored in as digital file and make use of it during instructional delivery	Male	56	2.41	.757	SA
		Female	52	2.58	.637	SA
7	Knowledge of the email service to collaborate with students on a given project	Male	56	1.50	.539	SA
		Female	52	1.79	.605	SA
8	Knowing how to give academic support to students on assignments and other related information through e-mail	Male	56	2.52	.763	SA
		Female	52	2.63	.715	SA
9	Knowledge of e-mail service to aid teaching and encourage learners to learn at their own pace and convenience	Male	56	1.50	.539	SA
		Female	52	1.52	.542	SA
10	Knowledge of Cloud computing application available on the net that support the use of PowerPoint slides (PPT) for teaching activities	Male	56	1.68	.690	SA
		Female	52	1.67	.648	SA
11	Awareness about application of cloud computing to augment teaching of business subjects	Male	56	1.66	.668	SA
		Female	52	1.63	.658	SA
12	Having knowledge to generate an updated eBooks and more information from web tools via cloud computing	Male	56	2.66	.769	SA
		Female	52	2.60	.634	SA
13	Having knowledge to create Social network group page to schedule events that relate to lesson for students	Male	56	1.55	.601	SA
		Female	52	1.69	.729	SA
14	Having knowledge to engage students in discussion forum on particular business subject through social network technologies	Male	56	2.54	.660	SA
		Female	52	2.44	.725	SA
15	Broad knowledge of Social network group page to schedule events that relate to lesson for students	Male	56	2.45	.570	SA
		Female	52	2.44	.608	SA
	Aggregate	**Male**	**56**	**1.89**	**.207**	**SA**
		Female	**52**	**1.92**	**.220**	**SA**

Note. SD = standard deviation SA = Slightly Aware

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Data presented in Table 3 depict the mean responses of male and female business educators on the level of awareness of TBIR for teaching. The table shows that the mean responses of male business educators ranged from 1.48 to 2.66, while the mean responses of female business educators ranged from 1.52 to 2.60. The aggregate mean responses shows that female business educators had higher mean response (*M* = 1.92) on the level of awareness of TBIR for teaching than the male business educators of (*M* = 1.89) with a mean difference of 0.03.

Since, Table 3 has an aggregate mean of 1.89, and 1.92 for male and female business educators respectively, and standard deviation score are below one (1). It comprehended that each mean score of male and female business educators were not very far from the aggregate mean, and thus proves a slightly differences to the responses on their awareness on TBIR for teaching business subject. Hence, this signifies that female business educators' awareness of TBIR for teaching business subjects is more than that of male business educators in Edo and Delta State Colleges of Education.

Hypothesis 2:
There is no significant difference between male and female business educators in the mean responses on their levels of awareness of TBIR for teaching.

Table 4: The t-test on the Levels of Awareness of TBIR for Teaching based on Gender

Variable	Sex	N	Mean	SD	df	t	p	Decision
Possessed Level of	Male	56	1.891	.207	106	-.669	.505	Not Significant
Awareness	Female	52	1.918	.220				

Note. SD = standard deviation.

The results of Table 4 present the aggregate mean responses of male (*M* = 1.891) and female (*M* = 1.918) business educators on the levels of awareness of TBIR for teaching. The table showed no significant difference (*t* = .669, df = 106, *p*> .05) between the male and female business educators on the levels of awareness TBIR for teaching since the p-value is greater than the alpha value of 0.05. The null hypothesis is therefore accepted. Hence, there is no significant difference between male and female business educators in the mean responses on their levels of awareness of TBIR for teaching.

DISCUSSION OF FINDINGS

The result of research question one in Table 1 showed that all fifteen items of TBIR for teaching have the value of awareness gap analysis ranging from 1.87 to 3.06, which indicates positive mean differences and above zero signifies that awareness is very highly needed by the Business educators. Eyeballing the result of the data analysis in Table 1 for research question 1, it further revealed that Business educators needed awareness of various TBIR for teaching, as pinpointed in all 15 items of TBIR for teaching. This finding is in disparity with that of Christiana and Chika (2016) who reported that Business educators in tertiary institutions South East Nigeria were aware of web 2.0 to a high extent, similarly, the finding is in agreement with those of Fakomogbon, Olanrewaju, and Soetan (2015) who reported that the lecturers of State Colleges of education in Southwest of Nigeria had moderate awareness of Instructional Media (IM). However, the result of the corresponding hypothesis statistically revealed that there was a significant difference in the mean responses of business educators between possessed and expected levels of awareness of TBIR for teaching in Edo and Delta States Colleges of Education. This implies that there is an awareness gap (difference) between possessed and expected levels of awareness of TBIR for teaching among business educators.

The result of the data analysis in Table 3 for research question 2 revealed that there

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exists demographic differentiation of awareness between male and female Business educators regarding TBIR for teaching Business subjects. The result showed that business educators are slightly aware of TBIR for teaching activities. All 15 items of the questionnaire used to measure this area showed slight differences between male and female respondents on awareness of TBIR for teaching. The findings of the study are in disparity with those of Ajise and Fagbola (2013) who reported a high level of awareness of Web 2.0 by lecturers in tertiary institutions in Nigeria.

Web 2.0 technologies, which business educators are aware of most, include Facebook, wikis, Twitter, WhatsApp, and online discussion forums. Also, this finding is in disagreement with that of Okiki (2011), which reported that there was mass unawareness of web-based technology in Nigeria. The result of the corresponding hypothesis three statistically showed that there is no significant difference between male and female business educators in the mean responses on their levels of awareness of TBIR for teaching. This shows that there is no demographic differentiation between male and female business educators about the awareness of TBIR for teaching business subjects

CONCLUSION

The study found that Business educators in Colleges of Education in Edo and Delta States have a significant gap in their awareness of Technology-Based Instructional Resources (TBIR) for teaching. The average scores across all fifteen TBIR items indicated a strong need for increased awareness. Statistical analysis confirmed a significant difference between current awareness levels and the expected levels. This suggests that, despite some exposure, Business educators require more training and awareness efforts for effective TBIR integration. Moreover, while there were slight differences in awareness between male and female educators, the statistical evidence revealed no significant demographic differences. These findings highlight the urgent need to bridge the awareness gap regarding TBIR use among Business educators to enhance teaching effectiveness and align with global educational technology standards.

RECOMMENDATIONS

Based on the findings of this study, the following recommendations are deemed necessary:

1. Colleges of education should work to raise awareness among Business Educators about adopting Technology-Based Instructional Resources (TBIR) for effective instructional delivery. This can be achieved through seminars, workshops, and conferences.
2. Both male and female Business Educators should receive equal sensitization regarding the use of TBIR for enhanced instructional practices.
3. College management should enhance awareness among Business Educators from diverse demographics by offering lectures, webinars, seminars, and training sessions via video conferencing.

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