



## Innovative Research Skills of Business Educators for Commercializing Research in Tertiary Institutions in Rivers State, Nigeria

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### Abstract

Research output commercialization is gaining popularity in all academic fields as a way to better demonstrate higher institutions' external impacts. Thus, this study investigates the extent to which Business Educators' in tertiary institutions in Rivers State possessed innovative research skills for research outputs commercialization. A survey design was employed for the study. Three specific objectives, three research questions and three hypotheses were used in the study. All 73 Business Educators' in the six tertiary institutions in Rivers State made up the population of the study, and because of its manageable size, the entire population was used for the study. Data was gathered using a self-structured instrument titled: "Innovative Research Skills for Research Outputs Commercialization" questionnaire, which was validated by experts. The Cronbach Alpha reliability test was used to pretest the instrument, and the results showed an index of 0.86 which denote that the instrument was reliable. Out of 73 questionnaires that were given to the respondents, 71 were reclaimed and utilized for the study. The obtained data was analyzed using mean and standard deviation, and hypotheses formulated for the study were tested using Analysis of Variance at 0.05 level of significance. The findings of the study revealed that the extent of innovative research skills possessed by Business Educators for research outputs commercialization is generally low. Therefore, it recommends amongst others that, Higher Education Institutions management should organize workshops, seminars and mentorship programmes related to research commercialization and innovative research skills in collaborations with industry partners, local and international researchers for academic researchers.

**Keywords:** Innovative Research Skills, Research Outputs, Commercialization, Business Educators

### Introduction

Higher Education Institutions serves as a catalyst for creativity by fostering an atmosphere of intellectual freedom and accelerating the collaboration of researchers, businesses and government in an entrepreneurial ecosystem to proffer solutions to societal problems. One practical process through which the academia accomplishes this socio-economic impact is research, which in most cases contain findings and recommendations that has potential commercial values. The findings and products produce from research activities are known as research outputs, which could be in the form of invention or non-invention. Whereas the invention form is a technological solution that are of product or processes, the non-invention form includes publications (such as: books, training materials, articles, etc.), research cooperation, consulting and training. Thus, research outputs include new knowledge, publications, materials, technologies, knowhow, innovation, skills, training and other creations, including those covered by the intellectual property regime's protections and those that are not protected (Xuyen et al., 2020). It's interesting to highlight, that these intellectual creations do not have to remain in academic libraries as theses and journal articles; instead, they might be used to create marketable goods and services by applying business mechanism like commercialization.

Commercialization is the process of introducing new goods or services to the market via commercial channels in order to create value. This business mechanism is essential for transforming inventions and ideas into viable businesses, thereby fostering economic growth. Thus, research output commercialization is the process of turning research findings into economically viable products, services, technology or enterprises for societal benefit. In the opinion of Ghebreorgis and Mehreteab (2018), research output commercialization is the process of translating research results into products and services that can be offered to market in order to generate revenue for economic benefit. It basically involves using academic knowledge to create tangible or intangible assets that will benefit the economy and society. According to Jagusiak-Kocik and Janasik (2023), research output might be either directly or indirectly commercialized. The process of directly licensing research outputs to an entity for use

is direct commercialization. Conversely, indirect commercialization of research output refers to the process in which the author or inventor (either alone or in collaboration with a partner) implements the research output through a start-up entity. However, the process of commercializing research output may involve identifying and leveraging the market potential of the research output, securing intellectual property rights, obtaining funding and investment, managing regulatory requirements and establishing partnerships with industry and/or entrepreneurs to bring the output to market. Therefore, compared to a typical product, commercializing research output may be a complex and daunting process (Razwinani et al., 2024), however, its economic advantages cannot be overstated.

Research outputs commercialization can strengthen a country's economy and increase its competitiveness in the global economy (Goh et al., 2016; Dynaty & Ncanywa, 2022). Accordingly, Dehghani (2015) emphasized that the commercialization research output is fundamental to rapid development and advancement of technology in developed nations. Thus, commercializing research output can accelerate the conversion of research findings into industrial processes and products for national development. Again, commercializing research outputs is essential to bridging the link between academia and industry in order to influence civilization and spur economic growth. This suggests that commercializing research outputs can improve academia, industry and government collaboration for a nation's innovation system and development. Thus, Benibo and Bupo (2024) asserted that most governments around the world have established institutions and mechanisms to promote the commercialization of research output. Also, commercializing research outputs provides a means of recovering research investment expenses and protecting the intellectual property associated with the research outputs. To academia, commercializing research outputs is a potential source of revenue (Kalomo & Chama-Chiliba, 2022). Thus, commercialization of academic research output has become a common discourse at higher education institutions globally (Magdalena et al. 2020). However, Minh and Van (2022) noted that there is low commercialization of research output at higher education institutions in developing nations.

In Nigeria, Fosci et al. (2019) contended that despite Nigeria's high production of academic research outputs, a large portion of them are of low quality for commercialization. As a result, Echono (2022) claimed that Nigeria industries source research outputs outside the country for development. Corroborating this view, Okagbue et al. (2024) stated that Nigerian academic research output has not had a significant impact on technological advancement. Thus, in the global economic community, Nigeria's economy can be viewed essentially as one that adopts innovation rather than producing them. The implication is that there could be a valley of death between academic research and economic development in Nigeria, as the majority of the research outputs were not commercialized to provide economic value. While there could be other reasons for the low quality of commercialization in developing countries, particularly in Nigeria, scholars pointed out that academic researchers lack commercialization experience and innovative research skills (Abereijo & Obisanya, 2019; Bolo, 2020; Wenham et al., 2021; Janasik et al., 2023). This implies that in today's knowledge economy, innovative research skills are significantly indispensable to developing effective strategies to identify market gaps and research prospects for valuable commercial returns.

Innovative research skill refers to the ability to apply new perspectives to address research questions to proffer solutions to societal problems. According to Adom (2023), innovative research is a cross-disciplinary science that focuses the creation of new things, where the new could be products, services, processes or a combination of all. Furthermore, he enumerated that innovative research improves the quality and effectiveness of products/services, meets customer needs and expectations and boosts profit margins. Thus, innovative research skills could be significant in the process of undertaking research adventure and commercializing its outputs. Emphasizing the relationship between innovative research skills and research output commercialization, the National Office for Technology Acquisition and Promotion (2024) stated that a marketable research output should be structured with a variety of innovative research skills. Typical of these skills are industry-collaborative skill, market research skill, risk management skill, entrepreneurial skill and data analysis skill (Leloux et al., 2016; Hamburg et al., 2019; Bhagavathy et al., 2021; Dynaty & Ncanywa, 2022). However, this study shall focus on industry-collaborative skills, market research skills and risk management skills. Industry-collaborative skills enhance faculty access to ideas, information and capabilities well beyond what they could develop internally to commercialize research outputs. This is increasingly important in today's competitive environment where survival and growth depend on the speed with which one can acquire new skills and knowledge and apply them to satisfy customer needs. Thus, Ismail and Mohamed (2016) averred that cooperation between academia and industry is critical for the effective commercialization of innovative research outputs. In the opinion of Nyemba et al. (2021), academic collaboration with industry could competitively boost a nation's economic growth. However, Echono (2022) stated that Nigerian academia and industry do not effectively collaborate to foster economic and social development. The reason, according to Cobblah et al. (2022), academic research outputs in Africa do not satisfy industry development needs. Recognizing this fact, Hayes (2016) noted that, only highly skilful researchers are typically chosen and partnered with by industry partners. This could mean, there is a disconnection between

academia and industry for innovative ecosystems in Africa, especially in Nigeria. Thus, researchers are urged to work with industry institutes in order to determine the commercial worth of research results and market applications (Razwinani et al., 2024). A lack of industry-collaborative skills may hinder academic researchers' ability to establish partnerships, effectively communicate research output to industry stakeholders and secure funding among others. Another essential innovative research skill that enhances research outputs commercialization is market research skill.

Market research skill is the ability to gather and analyze data related to potential customer's preferences and needs for products or services. According to Ikpesu (2020), market research skills can enhance academic researchers to better understand market needs, trends and dynamics in order to fill the identified gap with research output for competitive advantage. Zhuravlov (2021) averred that organizations are shifting focus towards consumer-centered experiences in the marketplace. Accordingly, Magdalena et al.(2020) suggested that academic researchers should assess customer's needs before developing a research proposal. Ismail et al. (2021) corroborated this view by stating that the market approach is vital for academic researchers in determining commercialization activities. Therefore, a viable research output process should comply with the requirements and preferences of a customer needs. This indicates that market research skills boost academic researchers to be acquainted with consumer preferences and market trends to offer better solutions-driven research output with commercial value. A lack of market research skills may lead to a misalignment between research outputs and market demands, resulting in low interest or failure of the products/services. The ability to manage risk is another essential skill for research output commercialization.

Research output commercialization requires investment of time, energy, money and other resources under uncertainty. Therefore, academic researchers need to strategically assess, prioritize and respond to any unfortunate event in commercializing research output. However, scholars have reported that academic research output commercialization is an extremely risky venture (Hayes, 2016; Razak & Murray, 2017; Ismail and Sidek, 2019). Relatedly, Oehmen et al. (2014) averred that developing risk management skills is the most effective and efficient risk management practice. Thus, it academic researchers must utilise management skills to assess possible risks and opportunities that may arise in commercializing research output. Failure to mitigate risk in commercializing research output can lead to financial, reputational, legal and regulatory consequences among others (United Kingdom Government, 2023). However, Janasik et al. (2023) observed that academics lack the enthusiasm to undertake the risk related to commercializing research outputs. The implication is that, without proper risk management skills, academic researcher may pursue unviable commercialization paths, leading to heightened chances of project failure and wasted resources. In essence, academic researchers are expected to be skilful both in the conduct of research and the commercialization of its outputs in today's knowledge economy. The lack of innovative research skills in today's knowledge economy where innovation and creativity has become a pivotal force for economic and social relevance can hinder any academic researcher, particularly, Business Educator that plays significant role in national development (Benibo & Bupo, 2024), to survive in the innovation marketplace. The range of quality research Business Educators carry out ought to be commercialised for economic and other benefits. Thus, it is imperative to have an insight into the extent to which Business Educators possess innovative research skills in academic research production for competitive commercial value.

### Statement of the Problem

Academics generate a lot of intellectual properties in the course of their teaching, research and community development services that has economic value. One property of such intellectual properties is research output which makes a valuable contribution to the body of knowledge relating to a wide range of disciplines. Furthermore, certain research outputs generated by academics have the potential for commercial exploitation and the creation of products and/or services for the public good. The commercialization of these research outputs could provide new revenue generation, job creation, innovation dissemination and foster economic development in any nation. Thus, the commercial exploitation of academics' research output can have a positive impact on the national and international economy and may result in financial and other benefits to the institution and the academic concerned.

Despite these viable economic potentials of commercializing research output, many academics seem not to have the essential potential to incubate value-driven research to meet market needs. Echono (2022) asserted that academics in Nigeria's higher education institutions lack the innovative skills required to conduct meaningful and viable solution-driven research for commercialization. This anomaly indicates that innovative research skills play a crucial role in matching academic research output with market needs and trends in today's competitive and knowledge-driven economy. The lack of innovative research skills in today's knowledge economy would make academics only undertake conventional research for the purposes of career progression. However, leveraging innovative research skills can enhance academics' explore unconventional research and create competitive value

for both themselves and society. Thus, this study tends to empirically determine the extent Business Educators in tertiary institutions in Rivers State possess these viable skills to commercialize research output for economic value.

### Purpose of the Study

The main purpose of the study is to investigate the extent to which Business Educators in tertiary institutions in Rivers State possess innovative research skills for research outputs commercialization. The study intends to specifically:

1. Determine the extent to which Business educators possess the industry-collaborative skills for research outputs commercialization in tertiary institutions in Rivers State.
2. Ascertain the extent to which Business Educator’s possess market research skill for research outputs commercialization in tertiary institutions in Rivers State.
3. Find out the extent to which Business Educator’s possess risk management skill for research outputs commercialization in tertiary institutions in Rivers State.

### Research Questions

The following research questions guided the study.

1. To what extent do Business Educators possess industry-collaborative skills for research output commercialization in tertiary institutions in Rivers State?
2. To what extent do Business Educators possess market research skills for research outputs commercialization in tertiary institutions in Rivers State?
3. To what extent do Business Educators possess risk management skills for research output commercialization in tertiary institutions in Rivers State?

### Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

1. There is no significant difference in the mean response of Business Educators in tertiary institutions in Rivers State on the extent to which they possess industry-collaborative skills for research outputs commercialization.
2. There is no significant difference in the mean response of Business Educators in tertiary institutions in Rivers State on the extent to which they possess market research skills for research outputs commercialization.
3. There is no significant difference in the mean response of Business Educators in tertiary institutions in Rivers State on the extent to which they possess risk management skills for research outputs commercialization.

### Methodology

A survey design was used for this study. The survey included all 73 Business Educators from six public tertiary institutions. Details of the population are shown in table 1 below. Because of the population's manageable size, all 73 Business Educators were used, with no sampling technique applied. Data was collected using a self-structured instrument titled: "Innovative Research Skills for Research Outputs Commercialization" questionnaire rated on a four-point scale with weigh response options of High Extent (4), Moderate Extent (3), Low Extent (2) and Very Low Extent (1) which was validated by experts. The reliability of the instruments was assessed using Cronbach Alpha reliability test, which provided an index of 0.86 indicating the instrument was reliable. Out of 73 questionnaires administered to the respondents, 71 were retrieved and used for the study. Mean and standard deviation were used to analyze the data obtained; a mean score of 2.50 stood as the benchmark for acceptance, while Analysis of Variance (ANOVA) was employed to analyze the study's hypotheses at a 0.05 level of significance.

**Table 1: Population Distribution.**

S/N	Institution	Number of Business Educators
1.	RSU	30
2.	IAUE	17
3.	UNIPORT	6
4.	FCE/T, OMUKU	12
5.	CAPT. ELECHI AMADI POLY	5
6.	KENPOLY	3
	TOTAL	73

Source: Business Education/OMT Department (RSU, IAUE, UNIPORT, FCE/T, Omuku, Capt. Elechi Amadi Poly and Kenploy).

## Results

**Research Question 1:** To what extent do Business Educators possess industry-collaborative skills for research outputs commercialization in tertiary institutions in Rivers State?

**Table 2: Mean response on the extent Business Educators in tertiary institutions in Rivers State possess industry-collaborative skills for research outputs commercialization**

S/N	Items	Mean	SD	Remarks
1.	I collaborate with industry to gain market insight to carry out innovative research for commercialization.	2.13	1.11	LE
2.	I synergize with the industry to increase the visibility of research outputs to reach potential market targets.	2.06	1.26	LE
3.	I transfer research findings to industry to develop tangible outcomes for commercialization.	1.92	.92	LE
4.	I assign research findings to the industry to secure financial and other incentives for my investment and efforts.	2.03	1.03	LE
5.	I network with industry partners to foster joint venture to accelerate my academic entrepreneurship.	2.08	1.14	LE
6.	I partner with industry to significantly improve my future research outcomes and development pursuit.	2.08	1.08	LE
	Grand Mean	2.05		LE

Source: Field survey, 2024

Table 2 shows the mean response of Business Educators in tertiary institutions in Rivers State on the extent to which they possess the industry-collaborative skills for research outputs commercialization. The table indicated a low extent for all the items with a grand mean score of 2.05. Thus, the extent to which Business Educators' in tertiary institutions in Rivers State possess industry-collaborative skill for research output commercialization is low extent.

**Research Question 2:** To what extent do Business Educators possess market research skill for research outputs commercialization in tertiary institutions in Rivers State?

**Table 3: Mean response on the extent Business Educators in tertiary institutions in Rivers State possess market research skill for research outputs commercialization**

S/N	Items	Mean	SD	Remarks
7.	I assess consumer value to commercialize research output.	2.04	1.13	LE
8.	I assess consumer needs to commercialize research output.	1.99	1.14	LE
9.	I assess market trend to conduct research for commercialization.	2.27	1.30	LE
10.	I observe consumer behaviour in a market environment to conduct research for commercialization.	2.27	1.22	LE
11.	I conduct field survey for research processes to ascertain market advantage.	2.19	1.25	LE
12.	I evaluate the competitive analysis of consumer preference to translate research output into product.	2.07	1.11	LE
	Grand Mean	2.14		LE

Source: Field survey, 2024

Table 3 shows the mean response of Business Educators in tertiary institutions in Rivers State on the extent to which they possess market research skills for research outputs commercialization. The table indicated a low extent for all the items with a grand mean score of 2.14. Thus, the extent to which Business Educators in tertiary institutions in Rivers State possess market research skill for research outputs commercialization is low extent.

**Research Question 3:** To what extent do Business Educators possess risk management skill for research outputs commercialization in tertiary institutions in Rivers State?

**Table 4: Mean response on the extent Business Educators in tertiary institutions in Rivers State possess risk management skill for research outputs commercialization**

S/N	Items	Mean	SD	Remarks
13.	I have developed written contingency plan to mitigate potential legal uncertainties in commercializing research output.	1.86	.96	LE
14.	I effectively manage interest rate risk for investment to commercialize research output.	1.86	.91	LE
15.	I maintain relationship risk with venture partners in commercializing of research output.	1.86	1.03	LE
16.	I conduct field tests to assess the viability of product model of research output for mass production.	1.85	1.01	LE
17.	I have predefined risk strategy on market trend to mitigate competition in commercializing research output.	1.80	.97	LE
18.	I develop measures to gain public perception of research output innovation sustainability.	2.14	1.16	LE
	Grand Mean	1.89		LE

Source: Field survey, 2024

Table 4 shows the mean response of Business Educators in tertiary institutions in Rivers State on extent to which they possess risk management skills for research outputs commercialization. The table showed low extent for all the items with grand mean score of 1.89. Thus, the extent to which Business Educators' in tertiary institutions in Rivers State possesses risk management skill for research outputs commercialization is low extent.

**H0<sub>1</sub>:** There is no significant difference in the mean response of Business Educators in tertiary institutions in Rivers State on extent to which they possess collaborative industry skills for research outputs commercialization.

**Table 5: ANOVA showing difference in the mean response of Business Educators in tertiary institutions in Rivers State on extent to which they possess industry-collaborative skills for research outputs commercialization**

Group	Sum of Squares	Df	Mean Square	F-cal.	Sig.	F-crit	Decision
Between Groups	26.29	5	5.26	9.63	.00	2.36	Reject H0 <sub>1</sub>
Within Groups	35.51	65	.55				
Total	61.80						

Source: Field survey, 2024

Table 5 displayed the summary of ANOVA results for hypothesis 1 tested at 0.05 level of significance. The information in the table indicates that N = 71, dfb = 5, dfw = 65, F-cal. is 9.63, and F-crit. is 2.36. Because the F-calculated value of 9.63 is higher than the F-critical value of 2.36 at 0.05 level of significance and degrees of freedom 5 and 65 between groups and within groups respectively, the hypothesis was rejected. This indicates that there is a significant difference in the mean response of Business Educators in tertiary institutions in Rivers State regarding the extent to which they possess industry-collaborative skill for research outputs commercialization.

**H0<sub>2</sub>:** There is no significant difference in the mean response of Business Educators in tertiary institutions in Rivers State on the extent to which they possess market research skills for research outputs commercialization.

**Table 6: ANOVA showing difference in the mean response of Business Educators in tertiary institutions in Rivers State on extent to which they possess market research skill for research outputs commercialization.**

Group	Sum of Squares	Df	Mean Square	F-cal.	Sig.	F-crit	Decision
Between Groups	32.09	5	6.42	9.01	.00	2.36	Reject H0 <sub>2</sub>
Within Groups	46.31	65	.71				
Total	78.40						

Source: Field survey, 2024

The ANOVA results for hypothesis 2 tested at 0.05 level of significance are summarized in Table 6 above. N = 71, dfb = 5, dfw = 65, F-cal. is 9.01, and F-crit. is 2.36, according to the table. Since the F-calculated value of 9.01 is higher than the F-critical value of 2.36 at 0.05 level of significance and degrees of freedom 5 and 65 between groups and within groups respectively, the hypothesis was rejected. This reveals that there is a significant

difference in the mean response of Business Educators in tertiary institutions in Rivers State regarding the extent to which they possess market research skill for research outputs commercialization.

**H0<sub>3</sub>:** There is no significant difference in the mean response of Business Educators in tertiary institutions in Rivers State on extent to which they possess risk management skill for research outputs commercialization.

**Table 7: ANOVA showing the difference in the mean response of Business Educators in tertiary institutions in Rivers State on the extent to which they possess risk management skills for research outputs commercialization**

Group	Sum of Squares	Df	Mean Square	F-cal.	Sig.	F-crit	Decision
Between Groups	22.50	5	4.50	9.09	.00	2.36	Reject H0 <sub>3</sub>
Within Groups	32.18	65	.50				
Total	54.68						

Source: Field survey, 2024

The ANOVA results for hypothesis 3 tested are summarized in table 7 above. According to the table, N = 71, dfb = 5, dfw = 65, F-cal. is 9.09, and F-crit. is 2.36. With the F-calculated value of 9.09 being greater than the F-critical value of 2.36 at 0.05 level of significance and degrees of freedom 5 and 65 between groups and within groups respectively, the hypothesis was rejected. Thus, there is a significant difference in the mean response of Business Educators in tertiary institutions in Rivers State regarding the extent to which they possess risk management skill for research outputs commercialization.

### Discussion

The findings of the study reveal that Business Educators in tertiary institutions in Rivers State extent to which they possess industry-collaborative skills for research outputs commercialization was low. This indicate that the respondents may miss industry partnership opportunities. The findings concur with Echono's (2022) claims that Nigeria academics in higher institutions lacked the innovative research skills necessary to conduct significant and feasible solution-driven research for commercialization. The results further support Putit et al. (2014)'s assertion that, in developing nations, there is poor industry-academia linkage, which hinders the commercialization of research outputs because of a lack of skill. The findings is also in support of Fosci et al. (2019) view, that Nigeria's academia-industry collaboration is poor. According to Razaki et al. (2023), academics' skills to collaborate with industry are fundamental for institutions to achieve entrepreneurial mission. Thus, the lack of industry-collaborative industry skill may make it difficult for academic researcher to discover suitable and potential industry partners. This can limit the potential for commercialization of research findings and reduce their impact on business community.

Also, the findings of the study shows that Business Educators' in tertiary institutions in Rivers State extent to which they possess market research skill for research outputs commercialization was low. The finding is agreement with Echono (2022), who asserted that Nigerian academics in higher education institutions lack innovative skills essential to conduct substantial and worthwhile solution-driven research for commercialization. According to Razwinani et al. (2024), this could lead to difficulty in effectively marketing research outputs. Proficiency in market research facilitates the development of persuasive marketing strategies that appeal to potential customers, leading to greater acceptance and sales of research outputs. Thus, Ismail et al. (2021) stated that market tactics are crucial for academic researcher to identify viable commercialization undertakings. Therefore, low market research skill can lead to ineffective targeting market needs and trends, which can result in poor research outputs commercialization and market penetration.

Furthermore, the findings of the study reveal that Business Educators' in tertiary institutions in Rivers State extent to which they possess risk management skill for research outputs commercialization was low. The findings collaborate Echono (2022) view that academics at Nigerian higher education institutions lack innovative skills to conduct meaningful and viable solution-driven research for commercialization. The findings is also in consonant with Janasik et al. (2023) opinion that academics lacks the keenness to take on the risk connected with research outputs commercialization. This may be attributed to their lack of risk management skills. Business Educators equipped with risk management skills can effectively analyze the marketplace to identify both opportunities for innovation and potential threats to the commercialization process, allowing them to navigate challenges proactively. Furthermore, with risk management skills, Business Educators can better allocate resources to the most promising projects, maximizing returns on investments and enhancing overall efficiency. Thus, the lack of risk management skills may result in the inability to recognize and act on lucrative market opportunities, negatively affecting potential revenue generation and innovation impact.

## Conclusion

According to the findings of the study, it is concluded that the extent to which Business Educators in tertiary institutions in Rivers State possess innovative research skills is low. This could pose a significant challenge to them as academic researchers to effectively commercialize research outputs for incentive and national development.

## Recommendations

Based on the results, the following recommendations are made:

1. Business Educators should invest in developing innovative research skills to enhance the relevance and impact of their research, instead of just embarking on research to publish papers for career promotion.
2. Higher Education Institution's management should organize workshops, seminars and mentorship programmes related to research commercialization knowledge and innovative research skills in collaboration with industry partners, local and international researchers for academic research.
3. Intellectual Property and Technology Transfer Offices should create innovation hubs that support the commercialization of research, providing resources, guidance and expertise in navigating the commercialization process for academics.
4. The government should create a viable national system for academics with basic infrastructure and facilities with budgetary allocation to motivate research output commercialization for economic development.

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