

LEVERAGING CHICKEN GROWTH SIMULATION PROGRAM (CGS) TO ENHANCE POULTRY PRODUCTION IN ANAMBRA STATE

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Abstract

The present study aims to investigate the effectiveness of a Chicken Growth Simulation Program as an educational tool in the field of poultry production. The research was conducted at a poultry farm in Umunze Community, Anambra State, with students enrolled in the Federal College of Education Technical, Umunze as primary participants. The study adopted a pre- and post-test approach. The study integrated the simulation program into the curriculum and measured its impact on students' interest in poultry production. The t-test analysis performed on the data indicates that the treatment group showed a significant improvement in interest in poultry production compared to the control group ($p < 0.05$). Students exposed to contemporary technology demonstrated a deeper understanding and engagement with poultry management. The results of this study could have significant implications for both education and poultry production, potentially leading to curriculum development changes, enhanced learning experiences, and growth in the poultry industry.

Keywords: chicken, simulation, poultry production, students

Introduction

The agriculture sector has undergone significant transformations over the past few centuries. The advent of industrialization and intensification has revolutionized farming practices, leading to increased production to meet the rising demand for both quantity and quality of food. The industrialization and intensification of agriculture have profoundly impacted the quantity and quality of food produced. On one hand, these practices have led to a significant increase in food production, ensuring that the growing global population can be fed. On the other hand, they have also been allowed to produce a wider variety of crops, improving the quality and diversity of food available. Livestock farming is one of the essential aspects in the agricultural sector that has witnessed significant growth in recent times. Livestock farming, an integral part of the agricultural sector, has recently grown substantially. Farming involves rearing animals for food, fiber, medicinal plants, and other products to sustain and enhance human life. Livestock farming plays a crucial role in the economy of many countries. It provides essential food products such as meat, milk, and eggs, contributes to livelihoods, and alleviates poverty (Shehu et al., 2011). Accordingly, Compassion in World Farming (2011) reports that over 50 billion chickens are raised annually as a food source for their meat and eggs. Livestock represents an essential source of high-quality animal protein, providing about 36.5 percent of the total protein intake of Nigerians. Nigeria, a country rich in agricultural potential, has witnessed a significant surge in poultry production in recent years (Jatau et al., 2016). This growth is a testament to the country's efforts to boost its agricultural sector and achieve food security. The poultry industry is a significant component of

Nigeria's agricultural sector, providing employment opportunities and contributing significantly to the country's Gross Domestic Product (GDP) (Amos, 2006; Bamiro et al., 2012; Ekunwe et al., 2010; Enhanced Reader, n.d.; Hassan et al., 2016; Ibikunle et al., 2020; Joshua Olorunwa, 2018; Kperegbeji et al., 2009; Maikasawa & Jabo, 2011; Onuk et al., 2017; Sanni et al., 2021), and a booming sector in Africa (Kiba et al., 2020). It comprises various segments, including broiler meat production, egg production, and the rearing of other poultry species. The demand for eggs and poultry meat has significantly increased in Africa due to the population rise (Heise et al., 2015). Several factors have contributed to the massive growth in Nigeria's poultry production. The increasing population and rising consumer demand for poultry products have been key drivers. Government policies promoting local production over imports and investments in poultry farming technology and infrastructure have also played a significant role.

The growth in poultry production has profoundly impacted Nigeria's economy and its people. It has created jobs, stimulated economic activity in related industries such as feed production and poultry processing, and increased the availability of affordable protein sources for the Nigerian population. The future of poultry production in Nigeria appears promising. With continued government support, technological advancements, and the implementation of sustainable farming practices, the industry is well-positioned to continue its growth trajectory. Despite the impressive growth, the poultry industry in Nigeria faces challenges, including disease outbreaks, high production costs, and inadequate access to quality feeds. Addressing these challenges is crucial for the industry's sustainable growth.

Poultry production is a complex process that involves several stages before the final products reach consumers. It is a multi-stage process that requires careful management at each step. From breeding to hatchery to farming and processing, each stage plays a crucial role in ensuring the quality and safety of the final poultry products that reach consumers. As the demand for poultry products continues to rise, so does the importance of understanding and improving these production stages. Production management must be tailored to the education system to ensure that it continues to make positive and sustainable contributions to a stable human society. Smallholder poultry production is vital in feeding the world and maximizing the benefits; it should be accompanied by technological tools and simulation programs highlighting the relevant phases in poultry production.

Technology integration in poultry production is revolutionizing the industry, enhancing productivity, improving animal welfare, and ensuring food safety. Automated systems are increasingly being used in poultry production. These include automated feeding and watering, egg collection, and climate control systems. These technologies reduce labor costs and ensure a consistent and optimal environment for the birds. Technology also plays a crucial role in disease detection and prevention. For instance, machine learning algorithms can analyze sensor data to detect early signs of disease, allowing for timely intervention. Vaccination robots are also being developed to ensure efficient and stress-free vaccination of birds. Precision farming involves using technology to monitor and manage poultry production at an individual animal level. This includes using sensors to monitor temperature, humidity, and light levels in poultry houses and RFID tags to track individual birds' health and productivity. This data-driven approach allows farmers to make informed decisions, improving efficiency and animal welfare (Monteiro et al., 2021). The smart poultry hub's chicken growth simulator is designed for younger students and demonstrates the growth curve of broilers when temperature, lighting, and crude protein are considered. The smart simulator exercise equips the learner with farming skills to set the optimum conditions to get the healthiest and most efficient chicken. Chickens need the right amount of light and protein at an optimum temperature.

Chicken growth simulation is a technological innovation integrated into poultry production. It provides a unique and interactive tool for understanding the science behind raising healthy broiler chickens. The software exposes the most efficient strategy for growing the best chicken. This simulator is an educational tool, particularly for students, providing hands-on experience in controlling these factors. It allows them to experiment with different combinations of these factors to optimize the growth curve of their virtual broiler chickens. The practical application of this tool extends beyond the classroom. It provides poultry farmers with insights into how changes in the environment can affect the health and efficiency of the chickens. This interactive approach encourages critical thinking and problem-solving, making it a valuable addition to the poultry industry. The chicken growth simulator is a significant technological advancement in poultry production. It enhances understanding of poultry science and contributes to the optimization of poultry farming practices.

Poultry simulation is a technological tool that has sparked students' interest in poultry production. It provides an interactive and engaging platform for students to learn about the complexities of poultry farming. Poultry simulation allows students to manage a poultry farm virtually, making decisions about feeding, housing, health management, etc. This hands-on approach makes learning more engaging and fun, increasing students' interest in poultry production. Through simulation, students can see the real-world implications of their decisions. They can observe how changes in diet, environment, or health management can impact the growth and productivity of the poultry. This practical experience enhances their understanding and appreciation of poultry production. Poultry simulation also encourages problem-solving skills. Students must analyze data, identify problems, and make decisions to maintain the health and productivity of their virtual poultry farm. This active learning approach enhances their interest in poultry production and equips them with valuable skills for their future careers. Providing an interactive and practical learning experience helps students gain a deeper understanding of the industry and inspires them to pursue careers in this field. While students lack interest in poultry production in Nigeria (Anosike et al., 2020), exposing the students to simulation modeling could help spark interest and ensure sustainable growth of this vital sector.

Method

To investigate the potential of a chicken growth simulation program to foster poultry production in Anambra State. A sample of 24 undergraduate students was randomly drawn from the Federal College of Education, Technical, Umuze. The participants were assigned to the treatment group and the control group. Before implementing the intervention, both groups were administered a pretest to establish baseline knowledge of digital technology in education. The treatment group was exposed to chicken growth simulation modeling, while the control group continued with the existing teaching method. The study used a t-test to compare post-test scores between the treatment and control groups at a significant level: $\alpha = 0.05$.

Result

Table 1 shows the t-test

Source of variation	N	Mean	SD	df	t	Sig
Experimental	13	16.19	9.68			
Control	11	14.39	9.38	83	6.113	000

In an era where technology permeates every aspect of our lives, understanding its impact on education is crucial. The present study investigates how contemporary technology influences students' interest in poultry production. The t-test analysis performed on the data indicates that the treatment group showed a significant improvement in interest in poultry production compared to the control group ($p < 0.05$). Students exposed to contemporary technology demonstrated a deeper understanding and engagement with poultry management. No significant gender differences were observed in the impact of poultry simulation modeling on interest in poultry production ($p > 0.05$). Both male and female students benefited equally.

Discussion

The present study examined chicken simulation software as a tool that could influence students' preparedness to engage in poultry production. Twenty-four undergraduates in various fields at the Federal College of Education, Technical, Umunze, participated in the study. The t-test analysis revealed that chicken simulation software statistically significantly predicted engagement in poultry farming among the respondents ($p < 0.05$). Thus, the finding suggests that the students exposed to chicken simulation software are likelier to engage in poultry-related activities than others. A possible explanation for this current outcome might be the software's ease of use. For example, Chickens require the proper amount of light and nutrition at the right temperature. The software reveals the most effective technique for raising the best chicken. The software's architecture allows users to select the age of their chicken, as well as the lighting, temperature, and percentage of crude protein. As a result, they will be able to run a poultry farm properly.

Indeed, the result supports previous findings, which applauded the use of simulation tools in farming (Basche et al., 2021; Fernandes et al., 2022; Hawkins et al., 2019; Woodward et al., 2008). Similarly, research in new educational technologies has suggested more simulation techniques in education due to their learning effectiveness compared to conventional teaching (Boostel et al., 2021; Budi et al., 2021; Egara et al., 2022; Shanbari & Issa, 2019; Suwarni & Budiprayitno, 2019; Talli et al., 2022). The fact that computer simulation offered a virtual interface and feedback on the poultry concept may have contributed to its attractiveness. Users can interact with computer simulations, which minimizes the rigorous examination of the poultry environment. Simulation activates experimental awareness and will enable students to visualize, explore, and formulate explanations in poultry management that were otherwise impossible to understand and comprehend on a physical poultry farm. This implies that computer simulation improves students' willingness more than the traditional method. Similarly, the result indicates that students who experience simulation exercises in relation to poultry management are more suitable to acquire a positive attitude toward poultry production. Thus, the chicken simulation might potentiate curiosity in livestock farming and probably instigate efficiency in poultry management and development in agribusiness.

Conclusion

The study's results on the potential of a Chicken Growth Simulation Program to foster students' interest in poultry production in the Federal College of Education, Technical, Umunze could have several implications for education and poultry production. The results suggest that it could enhance students' learning experience, making the subject matter more engaging and easier to understand. The findings could influence curriculum development, with more emphasis placed on practical, hands-on learning experiences like the simulation program. The increased interest in poultry production could guide students towards careers in this field, helping to address any skills gaps in the industry. An increase in students' interest could lead to more individuals entering the poultry industry, potentially leading to

advancements in the field. With more skilled individuals in the industry, there could be more innovation and growth in poultry production. These implications could have far-reaching effects on the agricultural sector and the economy.

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