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The Editor in Chief would like to invite submissions for the **Volume XVI, Issue 1(19), Summer 2025** of the **Journal of Research in Educational Sciences** (JRES).

The primary aim of the Journal has been and remains the provision of a forum for the dissemination of a variety of international issues, empirical research and other matters of interest to researchers and practitioners in a diversity of subject areas linked to the broad theme of educational sciences.

The aims and scope of the Journal includes, but is not limited to; the following major topics as they relate to the Educational Sciences:

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- The Role of Education in The Globalization World;
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All papers will first be considered by the Editors for general relevance, originality and significance. If accepted for review, papers will then be subject to double blind peer review.

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Transforming Universities for 21st Century Africa: A Case Study of Sierra Leone

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Abstract: This study aims to examine the critical transformation necessary for universities in Sierra Leone to remain relevant in the 21st century. It focuses on aligning academic programs with the demands of the market, integrating digital tools, and fostering industry-academia collaborations.

The research employs a theoretical and narrative methodology. A theoretical approach is adopted to examine academic frameworks related to curriculum reform, digital integration, and industry partnerships. A narrative methodology is used to explore practical case studies and experiences within Sierra Leone's higher education landscape. The study relies on a combination of secondary sources, including contemporary literature and policy documents, to draw relevant insights into educational transformation in Africa.

The study reveals significant barriers to transformation, such as inadequate funding, misaligned curricula, and insufficient technological infrastructure. However, it also highlights key opportunities for growth, including the adoption of innovative digital tools and the reform of curricula to meet market demands.

This paper provides a comprehensive analysis of Sierra Leone's higher education system, contributing to the broader discourse on university transformation in Africa. It offers actionable recommendations for policymakers and educational leaders to implement strategic reforms that align with sustainable development goals..

Keywords: higher education; digital integration; curriculum reform; Sierra Leone.

JEL Classification: I23; O33; L52; R11.

Introduction

The 21st century presents a complex landscape for higher education institutions (HEIs) worldwide, and particularly for those in developing nations like Sierra Leone. The drive for knowledge-based economies, technological advancement, and global competitiveness necessitates universities to rethink their approach to education (Jackson, 2023). As Sierra Leone continues to navigate the socio-economic challenges it faces, its universities must evolve to not only support the nation's development but also to contribute to the broader African and global knowledge economies.

Sierra Leone's universities must confront historical legacies that have left them underfunded, technologically behind, and limited in their capacity to deliver quality education across the country (Jackson, 2016a). The challenges facing higher education in Sierra Leone, such as inadequate facilities, outdated pedagogies, and misaligned curricula, continue to impact the quality of education. The Fourth Industrial Revolution (4IR), which emphasizes digital technologies, provides an opportunity for HEIs to transform by integrating innovative educational models (Jackson, 2016b).

The call for transformation is not just about education; it is tied to the broader development agenda, including the achievement of the Sustainable Development Goals (SDGs). Universities have the potential to drive economic growth, build human capital, and provide opportunities for social mobility. In this regard, Jackson (2015) emphasizes the need for competitiveness in higher education practices to ensure sustainable growth in Sierra Leone. Universities must prioritize academic programs that are responsive to the needs of the labour market while also addressing national and regional challenges.

This paper aims to analyse the critical transformations needed in Sierra Leone's higher education system to position it as a key player in the development of a knowledge-driven economy. By drawing on recent literature,

such as Jackson (2022), this study provides a framework for how Sierra Leonean universities can enhance their role in the socio-economic development of the nation and Africa at large.

In the 21st century, African universities face a transformative imperative driven by technological advancements, globalisation, and socio-economic shifts. As Sierra Leone seeks to position itself within the knowledge economy, its universities are at the forefront of this transformation. Higher education must evolve to meet the needs of modern society, moving beyond traditional pedagogies to embrace innovative approaches that prepare students for the challenges of an interconnected world (Tamrat, 2023). This paper seeks to analyse how universities in Sierra Leone can undergo the necessary transformations to remain relevant in the context of a rapidly changing Africa.

The transformation of universities in Sierra Leone involves addressing several systemic challenges that have long plagued the country's education system. Issues such as limited access to higher education, outdated curricula, and inadequate funding continue to hamper progress (Duramany-Lakkoh, 2015). Moreover, as Africa embraces the Fourth Industrial Revolution, Sierra Leone's universities must position themselves to capitalise on the potential offered by digital technologies to enhance learning and research capabilities. Through the examination of these key factors, this paper provides a framework for the transformation of Sierra Leone's universities into hubs of innovation and socio-economic development.

1. Literature Review

The transformation of higher education in Sierra Leone reflects broader trends across Africa, where universities are reimagining their role in knowledge economies driven by globalization, technological advancement, and shifting labour market demands. Agbaje (2023) points out that many African institutions, including those in Sierra Leone, are challenged by curricula that fail to align with market needs. This critique echoes findings by Duramany-Lakkoh (2015), who highlighted systemic issues such as outdated pedagogical frameworks and inadequate funding as persistent obstacles. As a result, curriculum reform has emerged as a critical focus for addressing the skills gap and fostering economic development. By aligning academic programs with the needs of key sectors such as agriculture, technology, and health sciences, universities in Sierra Leone can play a pivotal role in addressing both local and global challenges.

Curriculum reform is essential not only for the relevance of university education but also for the global competitiveness of graduates. As emphasized by the African Union (2017) in the Continental Education Strategy for Africa (CESA 16-25), harmonizing educational standards across the continent can enhance the employability of African graduates in both regional and international markets. Jackson (2016a & 2016c) argues that practical skills development and market-responsive academic programs must be central to any curriculum reform effort. In this context, the integration of Information and Communication Technology (ICT) tools into curricula is essential for preparing students to thrive in a digital economy. Sierra Leonean universities, therefore, need to adopt forward-thinking models that emphasize both local and global demands in education.

The adoption of digital tools represents a significant opportunity for higher education reform, particularly in the context of Sierra Leone's limited technological infrastructure. Jackson (2022) highlights how the COVID-19 pandemic exposed the digital divide in Sierra Leonean universities, underscoring the need for robust ICT infrastructure to support online and blended learning models. Asongu and Nwachukwu (2018) further note that digital integration facilitates enhanced research collaboration and innovation, which are crucial for driving socio-economic development in underdeveloped regions. By embracing digital technologies such as artificial intelligence (AI) and data analytics, Sierra Leonean universities can transform their pedagogical approaches and foster environments that encourage critical thinking, collaboration, and creativity.

In summary, the reform of Sierra Leone's higher education system is integral to the country's development agenda, particularly in aligning academic programs with market needs and embracing digital transformation. As Tamrat (2023) notes, universities in Africa must evolve rapidly to meet the demands of modern knowledge economies. The integration of practical skills development, coupled with digital tools and technologies, positions universities not only as educational institutions but also as engines of innovation and socio-economic progress. This literature review supports the assertion that higher education reform in Sierra Leone, with a focus on curriculum relevance and digital integration, is vital to fostering human capital and driving national development, aligning with broader African and global educational trends.

2. Methodology

This study utilises a combination of theoretical and narrative methodologies to investigate the necessary transformation of higher education institutions (HEIs) in Sierra Leone. The **theoretical methodology** involves a

detailed review of existing academic literature and policy frameworks (Jackson, 2018). Key sources include Jackson (2022), which examines the relationship between education and economic growth, and the African Union's Continental Education Strategy for Africa (CESA 16-25) (African Union, 2017). These frameworks provide a foundation for understanding how curriculum reforms and digital integration can drive institutional transformation.

The **narrative methodology** allows the research to capture practical insights by examining specific case studies within Sierra Leone's higher education landscape. Narrative accounts from Jackson (2016a) and Duramany-Lakkoh (2015) are employed to highlight the challenges faced by universities, including limited access to technology and outdated governance structures. The narrative approach offers a deeper understanding of the lived experiences of stakeholders within the system, shedding light on the socio-economic realities that shape the educational context.

Both methodologies are supported by a comprehensive review of secondary data, including policy documents, scholarly articles, and reports. The integration of theoretical and narrative methodologies enables a holistic analysis of Sierra Leone's HEIs, addressing both structural challenges and opportunities for innovation.

3. Analysis

3.1 Curriculum Reform and Relevance

One of the core challenges facing Sierra Leone's universities is the relevance of their curricula. The mismatch between academic programs and market needs is a growing concern, as many graduates struggle to find employment in their fields of study. According to Jackson (2016a), the reform of university curricula must prioritize practical skills development and ensure that graduates are prepared for the demands of the labour market.

Agriculture, technology, and health sciences are key sectors that need to be emphasized in the revised curricula, as these fields are crucial to Sierra Leone's national development. Jackson (2016b) argues that integrating digital tools such as ICTs into the curricula is vital for preparing students to work in modern environments. Furthermore, aligning curricula with regional and international standards will enhance the global competitiveness of Sierra Leonean graduates.

The African Union's Continental Education Strategy for Africa (CESA 16-25) provides a model for harmonizing educational standards across the continent, which Sierra Leone can draw from (African Union, 2017). By adopting a forward-thinking approach to curriculum development, universities can foster a generation of problem solvers and innovators who can tackle the complex challenges facing the country.

Overall, curriculum reform in Sierra Leone must be holistic, considering both the needs of the local economy and the broader global trends in education and employment. Universities must be responsive to change and must continually assess their programs to ensure their relevance in the face of a rapidly evolving labour market (Jackson, 2023).

The relevance of university curricula in Sierra Leone has come under scrutiny as the country seeks to align its higher education system with the needs of a 21st-century economy. According to Agbaje (2023), many African universities, including those in Sierra Leone, continue to deliver curricula that are disconnected from the realities of the labour market. To transform, universities must overhaul their academic programmes to integrate practical skills that foster entrepreneurship, critical thinking, and problem-solving. In the context of Sierra Leone, this involves revising curricula to focus on sectors crucial to national development, such as agriculture, technology, and health sciences.

A successful curriculum reform must be aligned with international standards while considering local needs. Universities in Sierra Leone can draw inspiration from models such as the African Union's Continental Education Strategy for Africa (CESA 16-25), which prioritises the harmonisation of educational standards across the continent (African Union, 2017). By aligning with such frameworks, Sierra Leonean universities can ensure that their graduates are competitive both regionally and globally, while still contributing to the local economy.

3.2 Digital Integration and Technological Advancement

The COVID-19 pandemic highlighted the critical role of technology in education, as many institutions were forced to shift to online platforms to continue teaching. In Sierra Leone, however, this transition was hampered by a lack of ICT infrastructure and digital skills among educators (Jackson, 2016). The integration of digital technologies is not just a temporary measure but a long-term solution for enhancing educational access and quality, particularly in remote areas where physical infrastructure is lacking.

Digital tools such as artificial intelligence (AI), data analytics, and online learning platforms can revolutionize how education is delivered in Sierra Leone (Jackson & Jackson, 2024) By investing in these

technologies, universities can create more dynamic, interactive learning environments that encourage collaboration and critical thinking. Jackson (2017) emphasizes the importance of mobile learning (M-learning) devices in reaching students who may not have access to traditional classroom settings.

Moreover, digital integration allows for greater research collaboration, both locally and internationally. Sierra Leonean universities can enhance their research output by partnering with institutions that have advanced technological capabilities. This can also improve the quality and scope of research, particularly in fields such as health and environmental sciences, which are critical for the country's sustainable development (Asongu & Nwachukwu, 2018).

To achieve meaningful digital integration, however, Sierra Leone must address the barriers to technological adoption. These include inadequate funding for ICT infrastructure, lack of training for educators, and the digital divide that limits access to technology for students from disadvantaged backgrounds (Jackson, 2022). Addressing these challenges is essential for transforming Sierra Leone's universities into modern institutions that can compete globally.

The integration of digital technologies in education is no longer optional but necessary for the future of universities in Sierra Leone. The COVID-19 pandemic underscored the importance of technology in ensuring continuity in education, yet many institutions in Sierra Leone lag in adopting these tools (Jackson, 2016b; Duramany-Lakkoh, 2015). Digitalisation of education offers significant opportunities for expanding access to higher education, particularly in rural areas where physical infrastructure is limited. This transformation requires investment in ICT infrastructure, as well as training for educators to effectively integrate technology into their teaching.

Moreover, the use of digital tools can enhance research output by facilitating collaboration between universities and international partners. Universities in Sierra Leone must harness technologies such as artificial intelligence, data analytics, and online platforms to create a more dynamic and inclusive learning environment. According to Asongu and Nwachukwu (2018), digitalisation can also promote innovative research, particularly in fields such as health and environmental sciences, which are critical for sustainable development in Sierra Leone.

3.3 Industry-Academia Collaboration

In a rapidly changing global economy, industry-academia collaboration is crucial for universities to remain relevant. By working closely with industries, universities can ensure that their academic programs are aligned with the needs of the job market. This collaboration can also enhance research and innovation, as universities partner with industries to address real-world challenges (Jackson, 2015).

Industry stakeholders should be actively involved in the curriculum development process, providing input on the skills and knowledge that graduates need to succeed in the workforce. Internships and work placements should also be an integral part of university programs, giving students the practical experience they need to be competitive in the job market (Jackson, 2017).

Moreover, collaboration between universities and industries can drive innovation, particularly in key sectors such as agriculture and renewable energy, which are critical to Sierra Leone's economic transformation. As noted by the United Nations Economic Commission for Africa (Arogundade, Ngarachu & Bandele, 2024), such partnerships can foster innovation that addresses local challenges while contributing to global knowledge.

However, fostering these collaborations requires universities to adopt a more proactive approach in engaging with industry stakeholders. They must build strong relationships with the private sector, government agencies, and international organizations to create a robust ecosystem that supports research and innovation (Jackson & Jackson, 2024).

For universities to be transformative, they must foster stronger linkages with industries and communities. The disconnect between academia and the labour market has been a longstanding issue in Sierra Leone, where many graduates face difficulties finding employment due to mismatches between their skills and market demands (El-Barrie & Kadry, 2022). Industry-academia partnerships are essential in bridging this gap. By involving industry stakeholders in curriculum development and offering internships, Sierra Leonean universities can produce graduates who are more aligned with the needs of the economy.

This collaboration can also extend to research and innovation, where universities work closely with industries to address local challenges. According to a report by the United Nations Economic Commission for Africa (Arogundade, Ngarachu & Bandele, 2024), stronger partnerships between universities and the private sector can drive innovation, particularly in fields such as renewable energy and agriculture, which are critical for Sierra Leone's economic transformation. By creating a symbiotic relationship between academia and industry, universities can play a pivotal role in advancing the country's development agenda.

3.4 Barriers to Transformation

Despite the need for transformation, universities in Sierra Leone face significant barriers that hinder their progress. One of the main challenges is the chronic underfunding of higher education institutions, which limits their ability to invest in infrastructure, staff development, and research (Jackson, 2015). Furthermore, many universities continue to operate under outdated governance structures that stifle innovation and responsiveness to the rapidly changing educational landscape. Addressing these structural challenges is crucial if Sierra Leonean universities are to successfully transform for the 21st century.

In addition, issues of equitable access remain a major concern. Gender disparities, socio-economic inequalities, and geographical barriers continue to limit access to higher education for many in Sierra Leone (Duramany-Lakkoh, 2015). For universities to truly transform, they must ensure that their reforms are inclusive, providing opportunities for all segments of society to benefit from higher education.

Conclusions and Further Research

Transforming universities for the 21st century is not just a necessity but an urgent priority for Sierra Leone if it is to meet the demands of a globalized economy. By reforming curricula, integrating digital technologies, and fostering industry-academia collaborations, universities in Sierra Leone can become engines of socio-economic development. However, overcoming the barriers of underfunding, outdated governance, and unequal access will require concerted efforts from government, university leadership, and the private sector. This paper has provided a framework for the transformation of Sierra Leone's universities, offering insights that can guide policymakers and educational leaders towards creating a more responsive and dynamic higher education system.

Credit Authorship Contribution Statement

Emerson Abraham Jackson: Wrote all aspects of the paper's contents.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The author declares that he have not used generative AI and AI-assisted technologies during the preparation of this work.

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The Syndrome of Academic Burnout Experienced by Graduate Psychology Students. The Stress Factor

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Abstract: The aim of the study was to investigate the burnout syndrome experienced by postgraduate psychology students and the role of stress. 101 graduate level psychology students participated in the study. This was a sample survey using a self-report questionnaire. Regarding the level of burn out experienced by graduate psychology students, the results of the survey indicate that the students experience low levels of academic burn out. Regarding the level of stress experienced by psychology graduate students, the results show that participants experience moderate levels of idiosyncratic stress and moderate to high levels of situational stress. The analysis showed that there was no statistically significant difference in the means between males and females. Regarding the relationship between academic burnout and anxiety, Pearson r analysis showed that there is no correlation between the two concepts.

Introduction

In today's educational landscape, students face many obstacles, including the demands of academic obligations as well as the expectations of society at large. Among these challenges are academic burnout and stress. Academic burnout is a state of emotional, physical, and mental exhaustion resulting from prolonged and excessive stress. This condition can have a negative impact on a student's overall health and academic performance. As highlighted in a study conducted by Dyrbye *et al.* (2010), academic burnout is a widespread problem among students, with a significant portion of the student population reporting high levels of stress and burnout. The pressure to excel academically, balance a social life and plan for the future can become unbearable for students, leading to feelings of burnout.

One of the main reasons for academic burnout is the high expectations students have of themselves and society. The constant pressure to excel in all areas of life, to participate in social activities can lead to an endless cycle of stress and burnout (Rudman & Gustavsson, 2012). Consequently, these high expectations can lead to feelings of anxiety, depression, and lack of motivation to continue with academic pursuits. Furthermore, another factor contributing to academic burnout is the absence of effective coping mechanisms among students (Fares *et*

al. 2016). Many college students often feel overwhelmed by the demands of college life and struggle to find healthy ways to manage their stress levels. As a result, they may resort to negative behaviors such as procrastination, substance abuse, and social isolation, which only further exacerbate their burnout (Gadzella & Baloglu, 2001).

Academic burnout is a critical issue that needs to be explored for several reasons. First, it can provide information about various student behaviors. Second, it can affect students' involvement and participation in academic activities at the university. Finally, academic burnout can affect students' motivation to continue their education (Moneta, 2011). In recent decades, psychologists and educators have examined the impact of academic burnout on the educational and academic environment. Academic burnout is characterized by feelings of inadequacy and mental fatigue, often stemming from chronic stress and a lack of resources to effectively complete tasks. Studies have shown that college students are prone to academic burnout. Research shows an increasing prevalence of academic burnout among students in recent years, underscoring its importance as a research topic in higher education (Neumann *et al.* 1990).

The issue of academic burnout and stress among students is a pressing issue that must be addressed by universities and educational policy makers. To mitigate this problem, universities should offer various resources and support systems to their students. This may involve providing access to counseling services, organizing stress management workshops, and creating academic support programs. These initiatives can greatly assist students in managing the intense pressures of university life (Reddy *et al.* 2018). In addition, it is important for students to learn effective coping strategies, such as proper time management, practicing mindfulness, and engaging in self-care activities. These techniques can serve as preventive measures against burnout and help students cope effectively with stress (Green *et al.* 2022).

In conclusion, academic burnout and stress are significant challenges for the student population today. By knowing the signs of burnout and taking proactive steps to deal with stressors, students can improve their mental well-being and boost their academic achievement. It is imperative for universities to prioritize the well-being of their students and provide them with the necessary support and resources to thrive in their academic endeavours.

Given the alarming increase in this phenomenon, it is important not to depend solely on the education system to adequately equip students for their academic pursuits. Instead, it is imperative to adopt a comprehensive approach that includes psychological assistance in order to safeguard the holistic well-being of students. This responsibility must be shared by both government bodies and university institutions, as students represent the future potential of a nation (Efthimiou *et al.* 2007). By integrating psychological support services, it becomes possible to identify and address student stressors at an early stage, thus facilitating rapid and appropriate interventions (Visnjic *et al.* 2009).

A survey conducted in China by Yuanyuan *et al.* (2020), highlighted the psychological problems that concerned the student population at that time. The study was carried out in two phases during the pandemic. Transient stress, depression and anxiety, were what disturbed them mentally and connected as a consequence of the coronavirus. The indicators of anxiety symptoms increased in the second cycle of the survey, i.e. the value of 11.4% which was initially, was slowly calculated to 14.7%. Seniors and undergraduates developed quite high rates of psychological difficulties. Despite the above data, it is noted that there were many students who were not affected by the outbreak of the epidemic, they appeared not to manifest symptoms of psychological disturbances and to maintain high levels of resilience. Another study was carried out in 2020 by Wenning and colleagues (2020), which addressed a wide range of adults, specifically 89,588 people in China, including 36,865 students. More specifically, female students aged 26-30 were found to be more vulnerable to anxiety. The same is true for sophomores, seniors, and graduate students, while undergraduates are not at much risk.

Students show various reactions to stress, which can be divided into emotional, cognitive, behavioral and physiological reactions. These responses include feelings of fear, anxiety, worry, guilt, sadness, or depression (emotional), appraisal of stressful situations and coping strategies (cognitive), engaging in behaviors such as crying, self-injury, smoking, and irritability (Misra *et al.* 2000).

There is debate among researchers regarding the relationship between stress and self-esteem, with some arguing that low self-esteem may be a consequence of prolonged or repeated exposure to stress (Schafer, 1996). Additionally, negative outcomes associated with stress include increased alcohol consumption (Morgan, 1997), smoking (Naquin & Gilbert, 1996), and increased suicidal ideation (Hirsch & Ellis, 1996). Research has shown that individuals who experience high levels of stress are more likely to engage in unhealthy behaviors (Hudd *et al.* 2000) and are less satisfied with their overall health, including weight and fitness levels (Hudd *et al.* 2000). This dissatisfaction with aspects of health may contribute to lower self-esteem among college students experiencing high levels of stress. It remains uncertain whether stress directly affects an individual's self-esteem, as some

studies suggest a negative correlation between self-esteem and life stress and academic stress (Abouserie, 1994).

Students are a group that are often exposed to quite stressful factors, which affect both their psychosocial and academic status. And while it seems that the syndrome of academic burnout among students has been studied enough, there are no studies investigating the phenomenon in graduate psychology students.

The purpose of the proposed study was to investigate the syndrome of academic exhaustion (burn out) experienced by postgraduate psychology students during periods of increased academic obligations and the role of stress.

The research questions of the study are:

1. What is the level of academic burnout experienced by psychology graduate students?

2. What is the level of stress experienced by psychology graduate students?

3. Are there differences in the levels of academic burnout experienced by graduate psychology students depending on their gender, year of study and family status?

4. Does age affect the levels of academic burnout experienced by graduate psychology students?

5. What is the relationship between academic burnout experienced by graduate psychology students and the stress factor?

2. Method

Research Design

This work is a cross-sectional study. The research followed quantitative methodology, which is a research approach that aims to uncover empirical generalizations and test theoretical hypotheses (Kyriazi, 2000). To achieve this, a sample study was conducted using a questionnaire as the main tool. This method offers the advantage of quantifying opinions and attitudes, as well as providing insight into the feelings of the population being surveyed about a particular topic (Sukamolson, 2007; Creswell, 2016). As dependent variable we defined academic burnout and independent variables were gender, age, year of study and marital status.

Participants and Sample

The researcher used convenience sampling, which involves inviting people who meet the necessary conditions and criteria for research participation and are in their immediate and extended environment to take part in the study (Creswell, 2016). Participants in the research were 101 postgraduate psychology students, who are over 18 years old and speak the Greek language. Participant characteristics are described in Table 1.

Table 1. Demographic characteristics

	N(101)	%
Gender		
Male	36	36%
Female	64	64%
Year of Study		
1o	48	48%
2o	50	50%
3o	2	2%
Marital status		
Single	55	55%
Married	33	34%
Widowed	3	3%
Divorced	8	8%
	M	SD
Age	31,47	6,533

Materials and Tools

For the collection of the research data, a three-part questionnaire was administered which will be accompanied by an information letter to the prospective participants. The first part of the questionnaire contained questions of a demographic nature in order to describe the research sample but also to make the appropriate correlations for the investigation of the research hypotheses. The second part of the questionnaire was the Maslach Burnout Inventory – Student Survey. The MBI, which was developed by Cristina Maslach and Susan Jackson (1982), was derived from qualitative research and includes three dimensions of burnout. The student version of the MBI

serves as a reliable tool for assessing burnout among college students. It consists of three scales: exhaustion, cynicism and professional efficacy. To take the test, participants are presented with 15 statements related to their feelings about the university and then asked to indicate how often they experience these feelings. Cronbach's alpha internal consistency reliability was found to be satisfactory for the factors of the MBI questionnaire, with α = 0.90. The third part of the questionnaire was the State–Trait Anxiety Inventory (STAI-40) developed by C.D. Spielberger *et al.* (1964). The [STAI-40] is a questionnaire that individuals complete to provide self-reports of their anxiety levels. It consists of a total of 40 items. Respondents rate each item on a Likert scale ranging from 1 to 4. The reliability of the questionnaire is judged to be satisfactory, as shown by its high internal consistency and reliability of repeated measurements. Specifically, the state anxiety subscale exhibits a Cronbach's alpha coefficient of 0.93, while the trait anxiety subscale exhibits a coefficient of 0.92. In addition, the [STAI-40] has been adapted and standardized for use in the Greek population by Liakos and Giannitsi in 1984.

Research Process

After defining the purpose and research questions of the proposed research, the research instrument was constructed in MS Forms and contained the cover letter and questionnaire questions. The questionnaire was distributed electronically to students of the psychology department of the Scientific College of Greece, in online forums where these students participate, with the request that they complete the questionnaire and also send it to other postgraduate psychology students they know. Once the appropriate number of questionnaires was completed, the data was analyzed in order to draw conclusions.

Methodological framework of data analysis

For the analysis of the research data of the present research, it was done through the statistical software SPSS v.27. First, the psychometric properties of the questionnaire were checked. The internal consistency of the tool was checked through the Cronbach α coefficient. α in the present research is equal to .862, a value that shows a high degree of reliability. Descriptive statistics were then performed in order to investigate the levels of academic burnout and stress experienced by the students who participated in the survey. To test the hypotheses and the association of academic burnout, the normality of the population distribution was first checked through the Kolmogorov-Smirnov test. The test showed that $p>.050$, which means that the distribution is normal and thus independent samples t-test and pearson r were used.

Ensuring and Adhering to the Code of Ethics and Conduct

Ethical considerations play a critical role in any research as they provide a set of protocols that must be followed. These protocols include several fundamental principles, including the importance of treating participants beneficially, respecting them, and ensuring their voluntary participation. A key aspect that should be observed is the guarantee of confidentiality, as it is necessary to maintain the trust and privacy of the participants (Creswell, 2016). In this research, together with the questionnaire, there was a cover letter that informed the prospective participant about the purpose of the research, the organization implementing it, the contact details of the researcher as well as details regarding the observance of confidentiality, anonymity and the possibility to withdraw at any time desired from the process. In addition, the researcher informed the participants that they have the possibility to be informed about the results of the research after the end of it, if they wish. Following this ensured that the research was conducted in a responsible and respectful manner.

3. Results

Academic burnout

As shown in table 2, research participants experience low levels of academic burnout. Specifically, in personal achievement the students have M=24.61 (SD=9.277), in depersonalization they have M=5.75 (SD=4.743) and in emotional exhaustion they have M=8.74 (SD=6.348). According to the manufacturers' instructions, low levels of depersonalization and emotional exhaustion with high levels of personal achievement indicate low levels of academic burnout.

Table 2. Academic Burnout

	ACHIEVEMENT	DEPERSONALIZATION	EMOTIONAL EXHAUSTION
Mean	24,61	5,75	8,74
S.D.	9,277	4,743	6,348
Range	36	24	30

Student anxiety

The students who participated in the research experience moderate levels of temperamental anxiety with M=42.2 (SD=8.411) and moderate to high levels of situational anxiety with M= 53.9 (SD= 8,413). The results are shown in table 3.

Table 3. Student anxiety

	TRAIT ANXIETY	STATE ANXIETY
Mean	49,2800	53,9200
Std. Deviation	8,41199	8,41389
Range	60,00	60,00

Differentiation of academic burnout averages based on gender, year of study and marital status

In order to test any difference in the average levels of academic burnout based on the gender of the participants, an independent samples t-test was performed. The analysis showed (see table 4) that there is no statistically significant difference in the averages between men and women as p>.050. Specifically, t=.434, df=98, p=.665, Cohen's d=12.668 with M men= 39.83 (SD=14.320) and M women= 38.69 (SD=1.529).

Table 4. Differentiate academic burnout by gender

	t	df	Sig.	Cohen's d
Academic Burnout	,434	98	,665	12,668

In order to test for any difference in the average levels of academic burnout based on the year of study and the marital status of the participants, a ONE-WAY ANOVA analysis of variance was performed. The results of the analysis showed that there are no statistically significant differences in the levels of academic burnout of the participants based on their year of study (p=.115). On the other hand, it seems that there are statistically significant differences in the levels of academic burnout of the participants based on their family status (F(3,96)=6.753, p<.001). Specifically, post hoc with the Bonferroni correction showed a difference in the levels of academic burnout between students who are single (M.O.=39.75, T.A.=9.313) and those who are divorced (M.O.= 26.63, T.A.=17.517, p=.002), of students who are married/in a partnership (M.O.=40.30, T.A.=11.884) with those who are divorced (M .O.= 26.63, T.A.=17.517, p=.003) and those who are widowed (M.O.=55, T.A.=28.054) with those who are divorced (M.O. .= 26.63, T.A.=17.517, p<.001). The results are shown in table 5.

Table 5. Analysis of variance, academic burnout-marital status

		Sum of Squares	df	Mean Square	F	Sig.	η^2
Academic Burnout * What is your marital status?	Between Groups	2745,655	3	915,218	6,753	,000	,174
	Within Groups	13011,345	96	135,535			
	Total	15757,000	99				

Effect of age on levels of academic burnout

To investigate the effect of the age of the research participants, a correlation test with Pearson r was performed (see Table 6.). The analysis showed that there is a negative correlation between age and academic burnout. Specifically r=-.208, p=.038.

Table 6. Academic Burnout and Age

		Academic Burnout
What is your age?	Pearson r	-,208
	Sig.	,038

Correlation of academic burnout-stress in college students

Regarding the relationship between academic burnout and anxiety, the Pearson r analysis showed that there is no correlation between the two concepts. Specifically, regarding temperamental anxiety and academic burnout p=.168, r=-.138 and regarding situational anxiety and academic burnout p=.271, r=-.211. The results are shown in table 7.

Table 7. Academic burnout-stress relationship

		BURNOUT
TRAIT ANXIETY	Pearson r	-,138
	Sig.	,168
STATE ANXIETY	Pearson r	,111

4. Discussion

The aim of the proposed study was to investigate the syndrome of academic exhaustion (burn out) experienced by postgraduate psychology students during periods of increased academic obligations and the role of stress. 101 graduate level psychology students participated in the survey.

Regarding the level of academic burnout experienced by graduate psychology students, the results of the research show that students experience low levels of academic burnout. Specifically, students experience low levels of depersonalization and emotional exhaustion with high levels of personal achievement, which indicates low levels of academic burnout. Accordingly, Jenaabadi *et al.* (2017) and Sharififard *et al.* (2014) research on nursing students showed that students experience moderate levels of academic burnout.

Regarding the level of stress experienced by graduate psychology students, the results show that participants experience moderate levels of temperamental stress and moderate to high levels of situational stress. Similar findings are shown by the research of Yuanyuan and her colleagues (2020) and Jenaabadi and colleagues (2017) where the levels of anxiety experienced by the participating students were low. In order to test any difference in the average levels of academic burnout based on the gender of the participants, an independent samples t-test was performed. The analysis showed that there is no statistically significant difference in the averages between men and women. The research by Onuoha and Akintola (2016) as well as Ogbueghu *et al.* (2019) and Okeke *et al.* (2020) where the levels of academic burnout of students do not seem to differ based on their gender. There is no significant difference depending on the year of study either, a finding that agrees with those of the study by Aguayo *et al.* (2019). The findings of the present study show that there are differences in the levels of academic burnout of students depending on their family situation. Rahmatpour *et al.* (2019) research that investigated the levels of academic burnout of 303 medical school students in Iran in relation to their marital status leads to similar findings. We find similar results in the research of Mahmoudi and colleagues (2019).

Age seems to be another factor that affects the academic burnout of students. This finding is confirmed by other research studies. Younger students, often fresh out of high school, may face a significant transition in terms of the academic and social demands of college life. Increased workload, pressure for excellence and newfound independence can be overwhelming, leading to feelings of emotional and physical exhaustion (Dyrbye *et al.* 2010). In addition, younger students may have less developed coping mechanisms and self-regulation skills, making them more vulnerable to the negative effects of academic burnout. Conversely, older students, who may have more life experience and a better understanding of their own needs and limitations, may be better equipped to manage the demands of higher education. These students may have developed more effective coping strategies, such as time management skills, stress reduction techniques, and a stronger sense of self-efficacy (Galbraith & Merrill, 2015).

Regarding the relationship between academic burnout and anxiety, the Pearson r analysis showed that there is no correlation between the two concepts. The findings of the present research do not seem to agree with those of the research by Gomez *et al.* (2022) but also by Xu *et al.* (2022) where there seems to be a correlation between academic burnout and the stress experienced by students. The results of this research are considered acceptable and reliable as they were found to be consistent with findings from other studies. However, the sampling method used in this research limited the extent to which the participants were representative of the overall population.

To clarify, the participants selected for this study were limited in number, came from specific geographic areas, and were selected based on personal contacts and convenience of the researcher. It would have been

more inclusive and informative to include a larger and more diverse sample of participants, representing different socio-economic backgrounds and different regions of Greece, including both public universities and private schools. Such a sample would have yielded more specialized and differentiated results. This suggests that future research on this topic could be conducted with a different population, such as college students, during a different time period. Although the results would not be identical, incorporating additional elements and conducting open-ended interviews would undoubtedly enrich the study.

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Industrial Disputes Management and Academic Staff Welfare Improvement in Nigerian Universities

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Abstract: There is a growing need to address the unique challenges of academic staff in universities such as unsatisfactory welfare and incessant disputes. In this regard, industrial dispute management was looked into as a tool to improve the welfare of academic staff in Nigeria. The study adopted the quantitative research approach and descriptive research design. The population of the study was academic staff from six federal universities in Southwest, Nigeria. A sample size of 377 was determined using the Taro Yamane sample size determination and was distributed to the selected Universities based on their respective population. The study sourced for primary data through which a structured questionnaire that was administered online to academic staff. Data collected were analysed with inferential statistical techniques such as correlation and regression analysis. The study found that collective bargaining has significant negative impact on the welfare of academic staff in the universities investigated ($\beta=-0.494$, *p<005*). Similarly, industrial communication had a negative significant impact on the welfare of academic staff in the universities investigated ($\beta=-0.438$, *p<005*). Furthermore, joint consultation had a negative significant impact on the welfare of academic staff in the universities investigated ($\beta=-0.462$, *p<005*). It was also revealed that industrial democracy had a negative significant impact on the welfare of academic staff in the universities investigated ($\beta=-0.319$, *p<005*). It was concluded that the existing industrial disputes management tools are not helping out in improving academic staff welfare in the universities. The study recommends a new approach to improving academic welfare without disputes.

Keywords: collective bargaining; industrial communication; industrial dispute; staff welfare.

JEL Classification: I21; D83.

Introduction

University education remains cardinal to breakthroughs in research, science, technological and innovation (Kruss *et al.* 2015). The accomplishment of the university's goal and vision depends on its academic staff members even though other stakeholders such as government, private individuals, non-academic staff, students and the immediate community among others play their respective roles. Therefore, academic staff size, commitment, mode of operations and calibre are important factors in university education (Abebe & Assemie, 2023). Consequently, their welfare is vital to the survival and functioning of the Nigerian University system. Although monetary compensation is crucial, comprehensive welfare packages for academic staff are more crucial (Wokoma, 2023). According to Akinbode (2019), employee welfare refers to the provision of diverse services, resources and amenities for employees' benefits and improving their quality of life. It is argued that employees who receive adequate welfare will likely feel a sense of belonging to such organisations which could impact their capacity to contribute to the organisation's growth and development (Udewo, *et al.* 2023).

The welfare package comprised a good salary package, better working conditions, good relationships between employees and management, job recognition, training, research opportunities, retirement plans, healthcare plans and promotion which seem to be crucial for improving the quality of services provided by academic staff in Nigerian institutions. However, denial of this welfare has been a source of worry for academic staff and their union. Staff unions and associations exist to give employees a voice and to seek better working conditions. Conversely, employees join these unions and associations to, among other objectives, realise their goals of an accomplished welfare package (Academic Professionals of California, 2022).

In Nigeria, academic staff welfare has been controversial over the years resulting into incessant disputes between government and Academic Staff Union of Universities (Sabo *et al.* 2019). Industrial disputes are defined as conflicts or disagreements between employers and employees over issues related to work conditions, wages, benefits, rights, obligations, or interests (Anggraini & Hoesin, 2023; Akinbode, 2019). The process by which parties involved in conflicts or disagreements come together to find a lasting solution to issues relating to various aspects of work is known as industrial dispute management where tools such as collective bargaining, industrial communication, joint consultation and industrial democracy are used (Asaju, 2023).

Collective bargaining is the process of negotiating many parts of employment contracts, including salaries, overtime pay, bonuses, working hours, and workplace health and safety regulations, between employers and workers' representatives, who are typically grouped into trade unions (Thommen, 2022). Communication is an industrial dispute management strategy that refers to a situation when disagreeing parties ultimately overcome the habit or inertia of conflict avoidance, they begin to honestly communicate information, hear other viewpoints, and improve mutual understanding (Chin & Rowley, 2018). Joint consultation, which is often handled by a joint consultative committee, is a formal mechanism of communication between an organization's management and the representatives of its employees that is used before making decisions that have an impact on the workforce (Mark, 2022). Industrial democracy refers to a workplace democracy in which management and workers jointly decide on all organisational, labour, and management relations problems (Adesubomi Abolade, 2015).

1. Literature Review

1.1 Collective Bargaining and Academic Staff Welfare

In a comprehensive exploration of disputes within organizational settings, various researchers have delved into the dynamics of dispute management. Owoseni (2014) focused on the role of dialogue in mitigating disputes in organizations, emphasizing its potential to simplify and economize dispute resolution processes. Similarly, Ibietan (2013) examined the utility of dialogue systems in the public sector, stressing their significance in addressing disputes arising from employment relationships.

Drawing parallels to these organizational dispute studies, several empirical investigations shed light on specific disputes within the Nigerian educational landscape. Odiagbe's (2012) research on the ASUU-Federal Government dispute highlighted the historical, dynamic, and outcome-oriented aspects of the struggle, proposing measures to address underlying issues. Moyin (2015) analyzed ASUU's role in dispute management, emphasizing the importance of continued dialogue and collective bargaining. Majowa (2015) suggested the use of collaboration, dialogue, and avoidance in managing structural conflicts within manufacturing corporations. Alfagira (2017) explored factors influencing academic staff performance, proposing a framework centred on academic competence and sustained motivation. Stankovska *et al.* (2017) investigated the relationship between job motivation and satisfaction among academic staff in Macedonia, recommending strategies to enhance job

satisfaction. Adewuyi (2020) examined industrial unrest in Nigerian public universities, focusing on the role of ASUU and proposing strategies for resolution.

Okafor *et al.* (2023) investigated the relationship between employee relations and academic staff performance in Enugu State University of Science and Technology. The study investigated the correlation between employee relations and academic staff performance at Enugu State University of Science and Technology (ESUT). It aimed to determine the impact of regular salary payments on staff attendance and the relationship between research grants and academic staff research output. Using a descriptive survey design, the study surveyed 1,530 academic staff members at ESUT, with a sample size of 317 determined using the Taro Yamane Formula. A validated questionnaire was employed, and reliability was assessed using Cronbach's alpha. Convenience sampling was utilized for participant selection. Results indicated a significant positive correlation between regular salary payments and academic staff attendance, as well as between research grants and academic staff research output at ESUT. The study concluded that effective employee relations positively influenced academic staff performance through consistent salary payments and the provision of research grants. Based on these findings, the study recommended that university management prioritize regular salary payments and research grant disbursement to enhance staff performance. Additionally, it suggested encouraging employees to maintain good attendance and increase research publication output. Based on above views, the study hypothesizes that:

Ho1: Collective bargaining does not have a significant impact on the academic staff welfare enhancement in federal universities in South West, Nigeria.

1.2 Industrial Communication and Academic Staff Welfare

Yusuf-Habeeb and Kazeem (2017) conducted a study on dispute management as a tool for achieving industrial harmony, recommending improved communication between management and employees as a preventive measure. Nwakoby *et al.* (2020) examined Trade Union Hallucination, Periscoping ASUU and Educational Development of Public Universities in Nigeria: A Rethink. The study delved into the phenomenon of trade union influence, particularly focusing on the actions of ASUU (Academic Staff Union of Universities) and its impact on the educational development of public universities in Nigeria. The motivation behind the research stemmed from the recurrent ASUU strikes in Nigeria, which have disrupted academic calendars, hindered the continuity of academic activities, and impeded the normal learning process. Furthermore, despite these challenges, public universities in Nigeria continue to struggle with inadequate infrastructure and facilities essential for effective teaching and learning. The findings of the study revealed that the actions of ASUU have not significantly contributed to the implementation of curricula or improved infrastructural facilities in public universities in Nigeria due to a communication breakdown. As a result, the researcher proposed recommendations to address these issues. To enhance the implementation of curricula, the researcher suggested that both the government and university administrations should ensure strict adherence to the guidelines provided by the University Commission for each discipline or department. Additionally, the researcher emphasized the importance of monitoring infrastructural developments in public universities to ensure the effective implementation of educational initiatives.

Osakede *et al.* (2018) studied conflict management in tertiary institutions: A study of selected universities in south-western Nigeria. This study investigates conflict management practices in Nigerian tertiary institutions, focusing on Lagos State University (LASU) and Adekunle Ajasin University Akungba-Akoko (AAUA). The objectives are to assess the extent to which conflict management has facilitated stakeholder participation since the inception of these institutions and to determine whether the performance of conflict management boards has improved over time. Data were collected from primary and secondary sources, including structured questionnaires, interviews, and various publications. The sample size comprised 500 respondents, with 280 from LASU and 220 from AAUA. Analysis was conducted using the percentage method and Chi-square non-parametric technique. Results indicate that conflict management has promoted stakeholder involvement in decision-making and conflict resolution within the selected universities. Furthermore, the performance of conflict management boards at LASU and AAUA has shown significant progress in managing crises and fostering peace.

Eze and Chukwuemeka (2022) examined labour conflict an Albatross to the Performance of Ebonyi State University; a Proglegomena. The study serves as an introduction to labour conflicts' impact on the performance of Ebonyi State University in Abakaliki. Over time, Nigerian universities, including Ebonyi State University, have experienced a decline in performance, often attributed to frequent conflicts between the Academic Staff Union of Universities (ASUU) and the government. Employing sample survey research methodology, which is effective in characterizing large populations, the study utilized tables, mean values, and regression analysis to present the data. The findings of the study revealed that upward revisions of wages and salaries significantly influence the

quality of teaching at Ebonyi State University. Furthermore, collective bargaining significantly affects the stability of academic activities at the university. Consequently, the study concludes that collective bargaining promotes industrial harmony by ensuring a stable academic calendar, enhancing staff productivity and effective communication in university education programs. Additionally, it contributes to the quality of teaching, students' academic performance, and the overall stability of academic activities at Ebonyi State University. It was against these views that the came up with the second hypothesis that:

Ho2: Industrial communication has no significant influence on the academic staff welfare improvement in federal universities in South West, Nigeria.

2. Joint Consultation and Academic Staff Welfare

Salau *et al.* (2020) investigated the impact of workplace environments on retention outcomes of public universities in Southern Nigeria. The study investigates the influence of workplace environments on the retention of academic staff in public universities in Southern Nigeria. Employing a cross-sectional and descriptive approach, data were collected from 384 academic staff selected through random and purposive sampling. A modified questionnaire was used for quantitative data collection, and Structural Equation Modeling (SEM_PLS) was employed for analysis. The findings revealed concerns regarding inadequate and deteriorating infrastructural facilities in the sampled universities. Many lecturers, including professors, occupy offices that are dilapidated, poorly ventilated, and poorly furnished. The results also highlighted challenges such as increasing impoverishment, inconsistent promotion criteria, unreliable power supply, overcrowded classrooms, and an imbalance in the ratio of teaching staff to students. To address these issues, the study proposes strategies for mitigating challenges in state universities, including creating conducive environments, adequately funding tertiary education, ensuring effective administration, and motivating staff in the sampled institutions, among other recommendations.

Oleribe *et al.* (2018) studied healthcare workers' industrial action in Nigeria: A cross-sectional survey of Nigerian physicians. A cross-sectional, descriptive study was conducted between April and June 2017, focusing on participants mainly from the recently concluded West African College of Physicians (WACP)/Royal College of Physicians (RCP) Millennium Development Goal 6 Partnership for African Clinical Training (M-PACT) course, representing Nigeria's six geopolitical zones. A self-administered pre-tested structured questionnaire with open-ended questions was used to allow participants to express their views comprehensively. Poor staff welfare was identified by 16.7% as the most common cause of strikes in the healthcare system which is a result of a communication breakdown. Other cited causes included salary issues (13.9%), leadership and management (13.9%), poor hospital infrastructure (11.1%), inadequate guidelines and services (11.1% each), and inter-professional disputes (5.6%). The study also outlined the negative consequences of strikes, identified the groups benefiting from them, and proposed solutions, with 98.2% of respondents advocating for training physicians in leadership skills. The study highlighted poor staff welfare, salary disputes, leadership/management issues, and governmental failure to implement agreements as the primary causes of healthcare worker strikes. These strikes resulted in disruptions to service delivery and training programs, increased morbidity and mortality rates among patients, and a loss of confidence in hospitals and healthcare professions.

Abada *et al.* (2023) studied Federal Government-ASUU dispute over university autonomy and industrial disharmony in federal universities in Nigeria, 2009-2023. The university is envisioned as a bastion of academic excellence, a hub of knowledge creation and dissemination aimed at fostering societal development across various domains. Ideally, it should operate in an environment of peace and order, devoid of tension or discord, to effectively pursue its objectives. However, federal universities in Nigeria have been plagued by persistent industrial disputes, which literature attributes to poor leadership, power struggles within unions, and conflicts between the Federal Government of Nigeria and the Academic Staff Union of Universities (ASUU) regarding the implementation of agreements. Despite this understanding, limited research has explored the impact of the FGN-ASUU dispute on university autonomy, which is a critical aspect of the ongoing industrial disharmony. Therefore, this study aimed to investigate the relationship between the FGN-ASUU dispute over university autonomy and industrial disputes in federal universities in Nigeria, framed within the Marxian conflict theory. Adopting a time series design, the study employed quantitative data collection methods. The findings revealed that the FGN-ASUU dispute over academic, administrative, and financial autonomy has led to frequent strikes, dialogues, negotiations, protests, and confrontations in federal universities in Nigeria between 2009 and 2023.

Aduma and Njoku (2022) studied assessment of effect of ASUU strike on performance of universities in South Eastern States of Nigeria. This study investigated the impact of Academic Staff Union of Universities (ASUU) strikes on the performance of universities in the South Eastern States of Nigeria. Specifically, the objectives were to assess the effects of ASUU strikes on graduate employability and university global visibility in

the region. Using a survey design, the study targeted a population of 86,580 staff and graduates, with a sample size of 398 academic staff and graduates from the universities. Data were collected from both primary and secondary sources, utilizing a five-point Likert scale for scaling responses. Mean score analysis was employed for data analysis. The findings indicated that ASUU strikes had resulted in low graduate employability and poor university global visibility in the South East of Nigeria. Consequently, the study concluded that ASUU strikes had significantly hampered the performance of universities in the region. Premised on these extant studies, the third hypothesis for this study was proposed that:

Ho3: Joint consultation has no significant impact on academic staff welfare in federal universities in South West, Nigeria.

2.1 Industrial Democracy and Academic Staff Welfare

Studies like Zakari's (2018) investigation into industrial disputes at the Federal College of Education in Zaria and Kelechi et al (2016) research on the administration of pay at Dangote Nigeria Headquarters contribute valuable insights into dispute causes, effects, and resolution strategies which include the use of joint consultation and democratic conflict resolution. Igbinoba *et al.* (2023) examined Bolstering conflict management strategies and sustainable commitment of academic staff in selected public universities. Strikes have become a recurring aspect in the history of higher education in Nigeria, reflecting the strained relationship between the government and academia. This study was prompted by the lack of acknowledgement and reluctance to address interpersonal conflicts within universities. It aimed to investigate how conflict management strategies—specifically avoidance, dominating, compromise, obliging, and integrating—affect faculty commitment in selected public universities in Southwest Nigeria. Utilizing Smart PLS 3.0, the study analyzed 416 completed questionnaires, representing an 83% response rate. The results indicate that conflict management approaches significantly impact the affective, normative, and continuance commitment of academic faculty. Encouraging compromise, integration, and obliging conflict management tactics was suggested to enhance faculty involvement in conflict resolution. Based on these findings, the study recommends that open-mindedness and willingness to listen to opposing views were highlighted as essential for reaching sensible resolutions.

Mgbatogu *et al.* (2023) studied labour-management relations and industrial conflict in Calabar and Port-Harcourt Sea Ports: A Theoretical Exposition. The study assesses the impact of the interplay between labour-management relations and industrial conflicts at the Nigeria Port Authority in Calabar and Port Harcourt on a broad scale. To investigate this interrelationship, four null hypotheses were formulated, focusing on leadership behaviour, communication behaviour, collective bargaining, and the implementation of employee-management agreements. A total of 300 randomly selected employees (both male and female) from the two ports participated in the study, with 63% from Port Harcourt and 37% from Calabar Port. The research utilized a multi-stage sampling technique, including stratified, cluster, proportional, and simple random sampling methods. Data collection involved the researcher and two trained research assistants, who administered a 30-item questionnaire. The collected data underwent editing, scoring, and analysis, employing descriptive statistics such as mean, percentage, and frequency. The Pearson Product Moment Correlation (PPMC) test was utilized for hypothesis testing. The study findings revealed that three null hypotheses—concerning leadership behaviour, collective bargaining, and the implementation of labour-management agreements—were rejected, while one hypothesis related to communication behaviour was accepted. Consequently, the research recommends the importance of fostering mutual relationships to cultivate cordiality, and trust-building, and promote industrial harmony and peaceful coexistence within an organization. It contributes to existing knowledge by highlighting that authoritative leadership tends to breed conflicts, whereas democratic leadership fosters industrial harmony. Hakim's (2020) study at PT Jakarta Tourisindo in Indonesia examined the impact of factors such as remuneration and work environment on job satisfaction and organizational commitment. These empirical studies collectively highlight the intricate dynamics of disputes within organizational and educational contexts, emphasizing the importance of addressing root causes, implementing effective dispute management strategies, and enhancing factors like motivation and financial rewards to foster a harmonious environment.

Sule and Akhigbe (2018) examined academic staff performance of public higher institutions in Nigeria. The study examined the correlation between union commitment and academic staff performance in Nigerian universities, employing a survey design. The population comprised 1,306 academic staff members of public higher institutions in Rivers State, Nigeria, with a determined sample size of 297 due to the unavailability of a comprehensive academic staff list. Cluster sampling was utilized for participant selection. Statistical tools such as Pearson Product Moment Correlation and Partial Correlation were employed to test nine hypotheses. The findings indicated a significant relationship between union commitment and academic staff performance, suggesting that a

favourable industrial relations climate positively influences academic staff performance in Nigerian public higher institutions. Based on the findings, the study recommended that management take proactive steps to foster a cordial and conducive industrial relations climate. This could be achieved through routine meetings or discussion forums between the trade union and management, ultimately enhancing the performance of academic staff in higher learning institutions. Based on above views, the fourth hypothesis evolved that:

H_{o4}: There is no significant relationship between industrial democracy and academic staff welfare improvement in federal universities in South West, Nigeria.

3. Methods

The study was conducted in federal universities operating in Nigeria among which are University of Ibadan, University of Lagos, Obafemi Awolowo University, Federal University of Technology, Akure (FUTA), Federal University of Agriculture, Abeokuta (FUNAAB) and Federal University Oye Ekiti (FUOYE). The study adopted the quantitative research approach and survey research design through which management of industrial disputes and the welfare of academic staff was investigated

The population of the study was made up of academic staff of the institutions. The details is provided in Table 1.

Table 1. Population of the Study

Selected Universities	Academic Staff Strength
University of Ibadan	1524
University of Lagos	1627
Obafemi Awolowo University	1,493
Federal University of Technology, Akure	933
Federal University, Oye-Ekiti	454
Federal University of Agriculture, Abeokuta	658
Total	6,689

However, a sample size was determined from the population with Yamane's formula.
Yamane's formula is expressed as:

$$n = \frac{N}{1 + Ne^2}$$

Where:
n is the sample size.
N is the population size.
e is the margin of error
For this study, the total population (N) is determined to be 6689
A margin of error (*e*) of 5%, representing 0.05 in the formula.
Using the formula, the calculated sample size (*n*) is as follows:

$$\frac{6689}{1 + 6689 \, x \, 0.0025}$$

n=377

Therefore, the sample size used for this study is 377. To ensure adequate representation of the sample size in the population. Three sampling techniques were adopted for the study. This is refered to as the multi-stage: purposive, stratified and simple random sampling techniques. The first stage involves academic staff that are members of union (ASUU). They were purposively selected due to the content of the study. Second stage was to classify the academic staff by their colleges and faculties. This is stratified sampling techniques while the third stage gave every of the academic staff that are union members in each of the colleges and faculties equal chances of participation in the study. This is simple randon sampling technique.

The source of data for this study was primary data. Primary data are data that are collected directly from the respondents for the study for the first time for data analysis (Bhardwaj, 2019). The primary data for this study was obtained through a self-administered online questionnaire. The research instrument contained structured items aimed at obtaining demographic information, participants' experiences with industrial disputes, and their perspectives on academic staff welfare. Additionally, open-ended questions are included to allow participants to

provide detailed insights and opinions on the identified issues. The structured questions employed Likert scales, multiple-choice options, and dichotomous responses to ensure a comprehensive and varied dataset.

The data collection process involved the dissemination of the online questionnaire to academic staff members within the selected universities in Southwest Nigeria. The Google Form link was distributed through various online platforms, accompanied by a clear and concise overview of the research objectives, emphasizing the importance of academic staff participation. Participants were assured of the confidentiality of their responses and the significance of their input in enhancing the understanding of industrial dispute management and academic staff welfare. To minimize the risk of non-academic individuals participating in the survey, a screening question was strategically incorporated into the questionnaire. This question specifically inquires about the participant's current affiliation with the academic institution, ensuring that only academic staff members are eligible to proceed with the survey. Participants were requested to provide relevant details, such as their department or faculty, to further verify their academic status. Furthermore, a follow-up reminder was sent during the data collection period to encourage and maximize participation.

The validity of the research instrument was carried out to ensure the questionnaire measures what it is expected to measure through the constructs adopted for the study. The validity process involved experts, supervisors and Union leaders in Federal Universities to satisfy the face and content validity. Other validity tests were carried out using statistical techniques to ensure the data fit the various inferential statistical techniques adopted for the study. The reliability of the study was carried out using a pilot test where a few copies of the questionnaire were administered to academic staff in a selected state University in Ibadan (Technical University, Ibadan, Oyo state). Thereafter, the data was analysed and the Cronbach Alpha test of reliability was used to investigate the reliability of the study constructs. In addition, the Cronbach Alpha test of reliability was also used for the main data that was used to gathered later in the study. Lastly, a few diagnostic tests were also carried out, particularly the principal component factor analysis and collinearity tests.

4. Experiments

The data were subjected to diagnostic tests, including reliability, collinearity, and factor analysis. The results are presented in the following tables.

The reliability test was carried out using the Cronbach Alpha test of reliability. Nine constructs were tested for reliability and the results are presented in Table 2

Table 2. Reliability Test

Constructs	Alpha Value	Number of Items	Decision
Collective Bargaining	0.841	5	Reliable
Industrial Communication	0.860	5	Reliable
Joint Consultation	0.897	5	Reliable
Industrial Democracy	0.898	5	Reliable
Salary	0.899	3	Reliable
Working Condition	0.957	3	Reliable
Career Development	0.953	3	Reliable
Health Benefits	0.935	3	Reliable
Retirement Benefits	0.953	3	Reliable

Source: Field Survey, (2024)

The reliability test results are shown in Table 2 where nine constructs were tested for reliability. The Cronbach's Alpha test requires that each construct must have an alpha value greater than or equal to 0.7. The result shown above revealed that this condition is satisfied for all the constructs. Therefore, the study concludes that the reliability test is satisfactory and could be used for further inferential statistical tests.

Table 3. Factor Analysis Result

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.910
Bartlett's Test of Sphericity	Approx. Chi-Square	13745.908
	Df	630
	Sig.	.000

The KMO shows the adequacy of the sampling and the benchmark requires the value to be between 0.8 and 1. The result in Table 3 showed that the sampling is adequate as the KMO is above 0.8 and below 1.

Table 4. Collinearity Statistics

Variables	Tolerance	VIF
CB	.437	2.286
IC	.312	3.209
JC	.332	3.008
ID	.540	1.850

The collinearity of the data set was tested using the variance inflation factor. The test required that the VIF values must be below 10. The results showed that all variables have VIF less than 10 which satisfied the collinearity condition. This showed that there is no multi-collinearity with the data set.

This study employed a systematic and rigorous approach to derive meaningful insights from the collected data. Analysing quantitative data from the online questionnaire requires adequate statistical tools. Frequencies, percentages, and averages were used to describe participants' demographics and structured question replies. Inferential statistical approaches like correlation and regression analysis were used to examine variable associations, including industrial dispute causes and academic staff well-being. This analytical method seeks data patterns, trends, and significant relationships. The data analysis methods for this study are appropriate because they match the research objectives and questions. The online questionnaire generated quantitative data, which required different analytical techniques. The quantitative data was analysed using descriptive and inferential statistics to summarise and test the hypotheses.

5. Results

Ho$_1$: Collective bargaining does not have a significant impact on the academic staff welfare enhancement in federal universities in South West, Nigeria.

Table 5. Regression Result of Ho$_1$

Variables	Beta coefficient	t	Sig.
Constant	3.440	11.675	.000
Collective bargaining	-.494	-6.542	.000
R=0.32, R-squared=0.10, F=42.799, p<0.05			

The regression results in Table 5 showed the impact of collective bargaining on academic staff welfare in the universities investigated. The results showed that there is a significant positive relationship between collective bargaining and academic staff welfare (*r=32%*). This revealed that collective bargaining has a low positive relationship with academic staff welfare. The result showed that collective bargaining explains 10% variation in the welfare of academic staff. This revealed that other factors are responsible for explaining the welfare of academic staff in the Universities investigated. A statistically significant model was achieved for academic staff welfare. The beta coefficient revealed that collective bargaining had a negative significant impact on the welfare of academic staff in the Universities investigated (β=-0.494, *p<005*). This implies that for every increase in collective bargaining, there will be a 4.94% decrease in academic staff welfare in the Universities. With this result, the null hypothesis is rejected and the study concludes that collective bargaining has significant negative impact on academic staff welfare.

Ho$_2$: Industrial communication has no significant influence on the academic staff welfare improvement in federal universities in South West, Nigeria.

Table 6. Regression Result of Ho$_2$

Variables	Beta coefficient	T	Sig.
Constant	3.247	10.450	.000
Industrial Communication	-.438	-5.572	.000
R=0.277, R-squared=0.74, F=31.043, p<0.05			

The regression results in Table 6 showed the impact of industrial communication on academic staff welfare in the Universities investigated. The results showed that there is a significant positive relationship between industrial communication and academic staff welfare (*r=27.7%*). This revealed that industrial communication has a low positive relationship with academic staff welfare. The result showed that industrial communication explains 7.4% variation in the welfare of academic staff. This also revealed that other factors are responsible for explaining the welfare of academic staff in the Universities investigated. A statistically significant model was achieved for academic staff welfare (*F=31.043, p<0.05*). The beta coefficient revealed that industrial communication had a negative significant impact on the welfare of academic staff in the Universities investigated (β=-0.438, *p<005*). This implies that for every increase in industrial communication, there will be a 43.8% decrease in academic staff welfare in the Universities. With this result, the null hypothesis is rejected and the study concludes that industrial communication has significant negative impact on academic staff welfare.

H_{o3}: Joint consultation has no significant impact on academic staff welfare in federal universities in South West, Nigeria.

Table 7. Regression Result of H_{o3}

Variables	Beta coefficient	T	Sig.
Constant	3.353	10.214	.000
Joint consultation	-.462	-5.594	.000
R=0.278, R-squared=0.75, F=31.298, p<0.05			

The regression results in Table 7 showed the impact of joint consultation on academic staff welfare in the Universities investigated. The results showed that there is a significant positive relationship between joint consultation and academic staff welfare (*r=27.8%)*. This revealed that joint consultation has a low positive relationship with academic staff welfare. The result showed that joint consultation explains 7.5% variation in the welfare of academic staff. This also revealed that other factors are responsible for explaining the welfare of academic staff in the Universities investigated. A statistically significant model was achieved for academic staff welfare (*F=31.043, p<0.05)*. The beta coefficient revealed that joint consultation had a negative significant impact on the welfare of academic staff in the Universities investigated (β=-0.462, *p<005*). This implies that for every increase in joint consultation, there will be a 46.2% decrease in academic staff welfare in the Universities. With this result, the null hypothesis is rejected and the study concludes that joint consultation has significant negative impact on academic staff welfare.

H_{o4}: There is no significant relationship between industrial democracy and academic staff welfare improvement in federal universities in South West, Nigeria.

Table 8. Regression Result H_{o4}

Variables	Beta coefficient	T	Sig.
Constant	2.803	7.538	.000
Industrial democracy	-.319	-3.439	.001
R=0.175, R-squared=0.028, F=11.828, p<0.05			

The regression results in Table 8 showed the impact of industrial democracy on academic staff welfare in the Universities investigated. The results showed that there is a significant positive relationship between industrial democracy and academic staff welfare (*r=17.5%)*. This revealed that industrial democracy has a low positive relationship with academic staff welfare. The result showed that industrial democracy explains 2.8% variation in the welfare of academic staff. This also revealed that other factors are responsible for explaining the welfare of academic staff in the Universities investigated. A statistically significant model was achieved for academic staff welfare (*F=11.828, p<0.05)*. The beta coefficient revealed that industrial democracy had a negative significant impact on the welfare of academic staff in the Universities investigated (β=-0.319, *p<005*). This implies that for every increase in joint consultation, there will be a 31.9% decrease in academic staff welfare in the Universities. With this result, the null hypothesis is rejected, and the study concludes that industrial democracy has significant negative impact on academic staff welfare.

Table 9. Summary of Results

Variables	Beta coefficient	t	Sig.
Constant	3.588	9.373	.000
Collective bargaining	-.362	-3.174	.002
Industrial communication	-.087	-.630	.529
Joint consultation	-.188	-1.333	.183
Industrial democracy	.107	.879	.380
R=0.334, R-squared=0.102, F=11.664, p<0.05			

The regression results in Table 9 showed the impact of industrial dispute management methods on academic staff welfare in the Universities investigated. The results showed that there is a significant positive relationship between industrial dispute management methods and academic staff welfare (*r=33.4%)*. This revealed that industrial dispute management has a low positive relationship with academic staff welfare. The coefficient of determination shown through the r-square revealed that industrial dispute management explains 10.2% variation in the welfare of academic staff. This revealed that other factors are responsible for explaining the welfare of academic staff in the Universities investigated but were not captured in the study. A statistically significant model was achieved for academic staff welfare (*F=11.664, p<0.05*). The beta coefficient revealed that collective bargaining had a negative significant impact on the welfare of academic staff in the Universities investigated (β=-0.494, *p<005*). In addition, other variables; industrial communication (β=-0.087, *p>005*) and joint consultation (β=-0.188, *p<005*) have negative but insignificant impacts on academic staff welfare while industrial democracy (β=0.107, *p>005*) have positive but insignificant impact on academic staff welfare.

6. Discussion

The study found that academic staff are not satisfied with the current welfare provisions. This supports Oleribe *et al.* (2018) who highlighted poor staff welfare, salary disputes, leadership/management issues, and governmental failure to implement agreements as the primary causes of strikes. This conforms with the prevailing economic conditions in the country where the prices of goods and services have skyrocketed in the past year due to factors such as fuel subsidy removal leading to a hike in the cost of living across the country. This could also be due to poor funding of public Universities in Nigeria. The findings of Ogbomah & Moses (2024) were also supported as the results underscored poor funding of public Universities and the imposition of IPPIS as the main triggers for ASUU strikes. The government should allocate a special annual grant to public universities to address funding challenges. The study found that welfare provisions could be improved through adequacy of health benefits, retirement benefits, professional development opportunities, housing assistance, work-life balance programs, childcare facilities, employee assistance programs, access to recreational facilities and support for mental health.

Collective bargaining had a negative significant impact on the welfare of academic staff in the Universities investigated. This opposed Owoseni (2014) who emphasised the potential of collective bargaining to simplify and economize dispute resolution processes. The findings of Ibietan (2013) which stressed the significance of collective bargaining in addressing disputes arising from employment relationships were not supported by the findings from the current study. Based on the current study, issues of collective bargaining have always been prolonged unnecessarily in public Universities in Nigeria which could explain the negative impact it has on the welfare of academic staff in these Universities. Owing to the historical, dynamic, and outcome-oriented aspects of the struggle between the academic staff labour union and the Federal Government, Odiagbe's (2012) proposed measures to address underlying issues. This was also emphasized by Moyin (2015) as to the use of continued dialogue and collective bargaining. The continued adoption of dialogue and collective bargaining could result in a positive influence on the welfare of academic staff.

Industrial communication had a negative significant impact on the welfare of academic staff in the Universities investigated. This is evident in the level of welfare packages offered to academic staff in Nigerian public Universities. The findings also suggest industrial disharmony which is a result of a breakdown in industrial communication between parties in conflict. This also supports Salau *et al.* (2020) who revealed concerns regarding inadequate and deteriorating infrastructural facilities in the sampled universities. Matters of welfare are better resolved when industrial communication is effective and is evident from the findings that the level of industrial communication has not had a significant positive impact on the welfare of academic staff in Nigerian public Universities. This also supports Abada *et al.* (2023) who revealed that the FGN-ASUU dispute over

academic, administrative, and financial autonomy has led to frequent strikes, dialogues, negotiations, protests, and confrontations in federal universities in Nigeria between 2009 and 2023.

Joint consultation had a negative significant impact on the welfare of academic staff in the Universities investigated. This showed that joint consultations have not been yielding positive results for conflicts in public Universities in Nigeria. Chibugo & Emeka (2020) emphasized fruitful negotiations between parties in conflict to increase the likelihood of reaching a compromise, thereby facilitating a speedy resolution of conflicts. As earlier stated, industrial communication negatively impacts academic staff welfare in the Universities investigated which explains the reason for the negative impact of joint consultation on staff welfare. This supports Nwakoby *et al.* (2020) who affirmed that public universities in Nigeria continue to struggle with inadequate infrastructure and facilities essential for effective teaching and learning. Furthermore, ASUU has not significantly contributed to the implementation of curricula or improved infrastructural facilities in public universities in Nigeria due to a communication breakdown. Joint consultation is connected with industrial communication and a breakdown in the communication between the parties involved in conflict could impede the effectiveness of joint consultation.

The study revealed that industrial democracy had a negative significant impact on the welfare of academic staff in the Universities investigated. Igbinoba *et al.* (2023) affirms that conflict management approaches significantly impact academic faculty's affective, normative, and continuance commitment. The current study revealed that industrial democracy negatively impacts the welfare of academic staff. The overall model revealed that industrial dispute management explains 10.2% variation in the welfare of academic staff. The study did not investigate other factors responsible for explaining the welfare of academic staff in the Universities. Industrial communication and joint consultation have negative but insignificant impacts on academic staff welfare while industrial democracy has a positive but insignificant impact on academic staff welfare. Nevertheless, collective bargaining was found to have a statistically significant impact on academic staff welfare in public Universities. Hakim's (2020) emphasises the importance of addressing root causes, implementing effective dispute management strategies, and enhancing factors like motivation and financial rewards to foster a harmonious environment. These findings suggest that these industrial dispute management methods have not addressed the root causes of the problems with academic staff welfare in public Universities in Nigeria.

Theoretical contribution

This study strengthened theoretical perspectives related to the study. For instance, systems theory, conflict theory, and stakeholder theory are all strengthened. At the instance of Systems Theory's historical roots, overarching propositions, and application strengths help explain and resolve university industrial disputes. Despite criticism, its practical applications and integration with dispute-resolution mechanisms show its relevance in organisational studies. Also, Conflict theory explains industrial disputes in universities by considering them as manifestations of structural inequalities and power imbalances between academic staff unions and university management boards or government agencies while Stakeholder theory advocates for improving the quality of stakeholder engagement and communication in dispute resolution processes and outcomes, such as the level of participation, representation, inclusion, transparency, accountability, and trust among the stakeholders.

Practical contribution

This research contributes to the existing body of knowledge with evidence of support that can aid industrial dispute management options on academic staff welfare. The study found that these industrial dispute management options only explain 10.2% variation in academic staff welfare. Therefore, the findings of this study contribute to the effectiveness of specific industrial dispute management options on academic staff welfare. Furthermore, it raises concern about the intricacies of academic staff welfare in the Nigerian public Universities and suggests that there are more factors that explains these variations. These factors should be given adequate consideration by policy makers to effectively improve academic staff welfare in these Universities. These findings offer insights and recommendations for policymakers, university administrators, academic staff unions, and other stakeholders on how to improve the industrial relations climate and enhance the welfare of academic staff in Nigerian universities.

Conclusion and Further Research

The study concludes that academic staff in Federal Universities in Southwest, Nigeria are not satisfied with the current welfare provisions. The study also concludes that all welfare packages provided in the form of salaries, working conditions, career development, health benefits and retirement benefits. The study also concludes that collective bargaining, industrial communication, joint consultation and industrial democracy have negative impact on the welfare of academic staff. The respondents suggested that their respective institutions could improve their welfare provisions through adequacy of health benefits, retirement benefits, professional development

opportunities, housing assistance, work-life balance programs, childcare facilities, employee assistance programs, access to recreational facilities and support for mental health. The study concludes that major themes for the new industrial dispute management option proposed by the study include adequate and fair welfare packages using global standard, funding and grants for research, grievance redress mechanisms, inclusive dialogue and periodic round table discussions for good decision output, mental support initiatives, negotiation, tenure-track positions and long-term contracts to provide job security, flexible working schedule to reduce workload, healthy work-life balance and leave policies, wellness and mental health support programs, and third-party mediators and arbitrators for dispute resolution.

This study was geographically confined to Southwest Nigeria, limiting the generalizability of the findings to other regions or countries. Also, the study relied heavily on self-reported data from copies of questionnaire, which may be subject to biases such as social desirability or recall bias, potentially affecting the accuracy of the results. Furthermore, the sensitive nature of industrial disputes and staff welfare issues might have led to underreporting or reluctance to share candid responses.

Future studies can be carried out along: longitudinal studies could provide insights into the long-term effects of industrial dispute resolutions on academic staff welfare and overall institutional performance. Investigating the role of technology and digital platforms in facilitating effective dispute resolution and enhancing staff welfare could also offer innovative solutions in the contemporary academic environment. Furthermore, examining the impact of external factors such as government policies, economic conditions, and international educational standards on industrial disputes and staff welfare would provide a holistic understanding of the challenges faced by universities. Lastly, qualitative research involving in-depth interviews with key stakeholders, including university administrators, union leaders, and academic staff, could uncover nuanced perspectives and practical recommendations for improving dispute management and welfare initiatives. By pursuing these research directions, scholars can contribute to the development of robust frameworks and strategies for fostering a harmonious and productive academic environment in Nigerian universities.

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Credit Authorship Contribution Statement

Ezekiel Taiwo: Was involved in theortical reviwed, conceptualization.
James Akinbode: Contributed to the writin gof the literature review.
Morohunmubo Olayinka Akinrinlola: Was involued with the data collection and analysis.
Itunu Olu-Ogunleye: Did the discussion of findings, revived and editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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The Cases of Criminality and Law Violations among Young People and Minors

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Abstract: The chosen scientific article mainly scrutinizes the cases of criminality and law violations among young people as well as minors, which were characterized as crucial social problems.
The study identified the main purpose of the spread of criminal cases among young people and the trend of their growth, as well as factors that actively influence this process.
The criminality and delinquency among young people and minors are treated as a cybernetic system, which is justified from the point of view of the systematic approach envisaging a socio-economic system with special complexity, dynamism, emergence, and stochasticity in the paper.
Global experience with juvenile offenders sheds light on the complex and varied needs of children in conflict with the law. Much of the growing literature on deviant behavior in juvenile offenders shows significant overlap between criminological, social, and medical research. Based on the econometric approach, multi-regression models of the dependence of criminality among young people on the influencing regressors of the environment were built, their qualitative characteristics were tested and mathematically justified that they are a suitable mechanism for optimal management and forecasting in the paper.

Keywords: youth and minors; crime and offences; criminality and delinquency; cybernetic system; econometric modeling; multi-regression model.

JEL Classification: E71; F61; H 41; K42; I12.

Introduction

One of the main obstacles that disrupt the formation of the young generation as decent citizens are criminality and delinquency among the youth and minors, which are considered social problems within society.

Consequently, the cases of young people's criminality have an increasing trend depicting the prognostic characteristic of criminality in the country.

Youth and juvenile delinquency should be identified as a complex, dynamic and probabilistic economic-cybernetic system open to environmental influences. Referring to this, it will be possible to quantitatively evaluate the dependencies between youth criminality and the factors affecting it with the help of relationship equations and to build optimal management strategies.

Delinquency and criminality among young people as a social problem. Azerbaijan is a part of the global world, in this respect, it is not isolated from many of the processes of the world. Unfortunately, some negative processes are also found in these worldly processes.

1. Literature Review

Juvenile and youth delinquency and delinquency issues are a constant concern throughout the civilized world (Rodríguez-Díaz et al. 2010). The main reason is that the young generation is the natural reserve power of the country's social development. On the other hand, the crimes committed by young people and the large scale of these crimes act as prognostic characteristics of criminality in society (Carney, M. & Buttell, F. 2003).

In the studies of V.A. Serebryakov, A.S. Shlyapochnikov, V.K. Zvirulya, M.M. Babaev, A.B. Sakharov, A.I. Dolgova, O.M. Minkovsky, A.A. Gabiani, R.G. Gachechiladze, A.V. Zavarzin, G.I. Zabryansky, S.P. Luknitsky, A. Leps, E.M. Mazin, E.E. Raski, E.N. Dzenis, G.G. Minberg, A.Z. Januaskas, Ya.I. Gilinsky, V. Fox, E. Shur and other criminologists, theoretical and methodological issues of the influence of individual social factors on crime were considered; the existence of certain correlation dependencies between the processes of urbanization and migration, age-sex and socio-professional composition of the population, types of settlements, the degree of their population, the existing social environment and other factors, on the one hand, and crime, on the other hand, was established.

Various aspects of juvenile delinquency are widely studied in both foreign and domestic sociology and criminology. Significant contributions to the development of this issue were made by foreign sociologists E. Durkheim, R. Merton, G. Becker, E. Giddens, A. Cohen, E. Sutherland, T. Sellin, N. Smelser, G. Schneider, E. Schur and others.

In scientific works on criminal law by Vietnamese authors and editors, the issue of criminal liability of minors under 18 years of age is analyzed in accordance with the General Provisions of the Criminal Code. These are such Vietnamese authors, editors as: Nguyen Ngoc Kien, Nguyen Ngoc Hoa, Pham Van Beo, Tran Thi Quang Vinh, Cao Thi Oanh, as well as the works of such Russian scientists as F.R. Sundurov, I.A. Tarkhanov, V.V. Veklenko, I.Ya. Kozachenko, G.P. Novoselov, A.I. Bastrykin. At the same time, the diversity of scientific trends and schools has significantly complicated the structure of modern foreign sociology of crime.

Research shows that juvenile delinquency and delinquency have common roots, or rather, these acts follow patterns that can be considered common (Ellis, R. 2000, 329.). It is not surprising that the opportunities of older people in society are not the same, and there are sharp socio-economic differences in these opportunities. These differences affect children and young people in a unique way. The elderly and the young differ not only in terms of age but also in terms of different statuses. If the elderly citizen has a valuable social status, the condition of the minors is more in line with the dependent (Harder, J., 2005, 248). Age differences among society members ultimately lead to social differences and inequalities. As in most countries of the world, the young generation in Azerbaijan is dissatisfied not only with the false "incomprehension, being ignored," not meeting the "behavior and presence standards" of the elderly but also with the inequality of opportunities compared to the elderly. These inequalities manifest themselves most in providing housing, finding a job, and having opportunities to protect one's interests. As a result, young people are more likely to break social norms and become victims of crime (Levin, A. & Mills, L., 2003, 467).

In all societies, there is a contradiction between the ever-increasing demands of people and the possibilities of meeting these demands. This contradiction is more acute for minors and young people (Roberts, A. & Springer, D., 2007, 172.), who are considered to be the most delicate and sensitive section of the population to the effects of the environment (Patterson, G., 2004, 275). With the rapid development of the physical, mental, and emotional capabilities of youth (Madden, R. & Wayne, R., 2003, 341.), the strengthening of their self-awareness and self-affirmation cannot find an environment for self-realization. So, in real life, they face low social perfection, little life experience, and little or not any professionalism, which leads to the formation of the status of incompleteness in a definite part of the young generation (Roberts, A., 2004, 45) in a complex manner.

2. Method also called Materials and Methods or Experimental Methods

An econometric study of factors affecting juvenile and youth delinquency. Thus, youth have a demand for public recognition and social self-affirmation. Failure to satisfy this demand gives rise to the "Herostratus complex" of activity in youth, that is, they resort to negative forms of social activity - violence, crime, and, in extreme cases, alcoholism and drug addiction. The Decree "On State Youth Policy", signed in 1999, defined the main strategic goals of state bodies for the implementation of youth policy in the Republic of Azerbaijan. On January 26, 2015, the "Strategy for the Development of Youth in Azerbaijan for 2015-2025" was approved. In this development strategy, which is considered a strategic roadmap for the formation of the youth of our country as worthy citizens with national and world values, youth development is considered as one of the essential components of the state social policy. The development strategy states that youth, who make up the majority of the population, are the main innovative potential and labor resource of the country. Therefore, one of the main directions of the state's youth policy is achieving success in the economic sphere.

As mentioned above, several factors influence crime among socially disadvantaged youth. If we approach crime among youth as an outcome factor then the number of 14 to 29-year-olds studying in higher education institutions, and the number of youths employed and unemployed between the ages of 15 to 27, as influential regressors, it can be explicitly observed that it directly affects this outcome indicator and cause its increase or decrease, the nominal average monthly wage in particular, the economic growth of GDP can be taken.

3. Case Studies

In connection with the increase in the number of works devoted to various manifestations of crime, and the continuing involvement of new branches of science in the research, the subject of the sociology of crime continues to expand and change, which complicates the development of an integrated paradigm. In general, the analysis of the development of foreign and domestic sociological thought on the problems of crime and deviant (including delinquent) behavior shows that in recent decades no new fundamental theories have appeared in this area. Apparently, this means that researchers have reached a certain threshold (level) of understanding crime. And, probably, the existing knowledge is insufficient to overcome it and move to a new level of understanding this phenomenon. That is why many researchers are turning to the problems of constructing social mechanisms, to the search for economical and effective measures to prevent crime, suggesting their optimal combination within the framework of resources available to society.

4. Research Results

The following table shows the statistical data reflecting the change in the number of criminals among the youth in the country and the influential indicators we took as regressors affecting this outcome indicator during the years 2005-2021 (Table 1).

As can be seen from Table 1, the authors did not include 2020 and 2021 statistics for the indicators of the number of young people between the ages of 15-29 who got a job and were given the status of unemployed, as the pandemic caused certain problems in the collection of these indicators.

Table 1. Statistics of the quantitative change of criminality among young people and the factors affecting

Year	Young people aged 14-29 who have committed a crime (persons)	Young people aged 14-29 studying in higher education institutions (persons)	Number of employed youths between the ages of 15-29 (persons)	The number of young people between the ages of 15-29 who were given the status of unemployed (persons)	Nominal average monthly salary (manats)	Economic growth of GDP by years (%)
2005	6208	129586	15201	26883	117.9	28
2006	6839	128680	15737	27126	119.8	34.5
2007	6508	129365	17442	25923	142.0	25
2008	6710	135232	13469	20560	268.0	10.8
2009	7223	138119	11642	19665	298.0	9.3
2010	7076	139151	12443	18874	325.0	5
2011	7351	141751	11947	18800	356.6	0.1
2012	6981	144296	11671	17916	396.0	2.2
2013	6301	150424	11703	17655	420.5	5.8

Year	Young people aged 14-29 who have committed a crime (persons)	Young people aged 14-29 studying in higher education institutions (persons)	Number of employed youths between the ages of 15-29 (persons)	The number of young people between the ages of 15-29 who were given the status of unemployed (persons)	Nominal average monthly salary (manats)	Economic growth of GDP by years (%)
2014	6441	157400	11670	14082	444.3	2.8
2015	6403	160392	11604	13891	464.4	1.1
2016	6444	162801	20542	15029	498.6	-3.1
2017	6249	166298	15934	15850	528.2	0.2
2018	5864	175138	14700	8790	544.1	1.5
2019	6044	185752	24033	23445	635.1	2.5
2020	5749	196170			707.7	-4.3
2021	6305	188944			732.1	5.6

Source: compiled by the authors based on Azerbaijan (2022).

A timeline representation of the change in youth crime from 2005 to 2021 is as follows (Figure 1).

Figure 1. Graph of the order of the dynamics of crime among young people
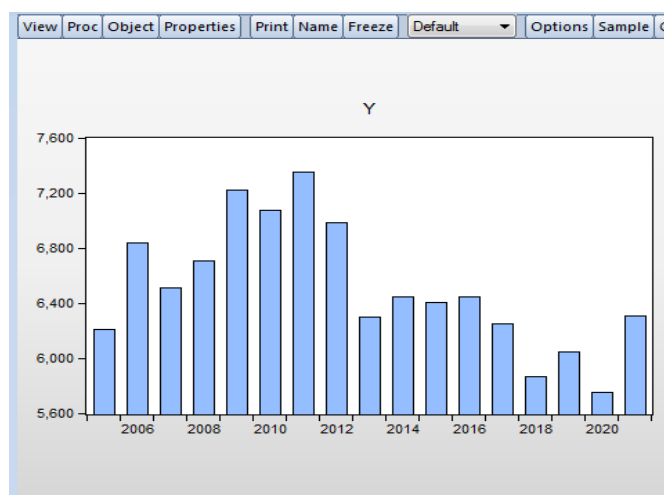
Source: compiled by the authors.

The graph illustrated in Figure 1 shows that in the period up to 2013, there was an increasing trend in criminality among youths, and in the following period, a decreasing trend was observed.

Thus, delinquency and criminality among young people, which is a serious social problem for society, can be studied as an economic-cybernetic system of complex, dynamic, and stochastic nature, which has complex direct, and opposite relations with many other characteristics of the environment. In this case, the subject of the research will be to carry out econometric modeling (Hacızalov Y., 2013) of the impact of the factors affecting criminality among young people on this complex system and to determine the quantitative characteristics of those effects based on these mathematical instruments (Dougherty, C., 2011). In our research, we will use the correlation-regression analysis method of econometric modeling (Stock, J., 2010), s it will build a linear multiple regression model (Harrington, E., 1965, p. 494-498) f the dependence of criminality among youth on the regressors that affect it in the form of - ($Y=b\_0+b\_1 \ x\_1+b\_2 \ x\_2+ \ …+b\_n \ x\_n+e$), - parameterization and verification of that model will be carried out.

As mentioned above, many factors have an impact on the level of crime among young people to one degree or another. It is practically impossible to undertake all influencing factors in the econometric study of this social problem. Therefore, in our research, we will use the socioeconomic factors reflected in table 1 as regressors affecting the level of criminality among young people. Note that our study has a more social nature.

One of the basic principles of econometric modeling (Studenmund, A., 2010.) is that the indicators involved in the study of the problem should be identified as endogenous (explanatory) and exogenous (explanatory) parameters (Gujarati, D. & Porter, D., 2009). In the research process, the indicators reflected in Table 1 were identified in the form of endogenous (Y) and exogenous (x_i) parameters as follows:

➢ Endogenous parameters:
  • the number of persons who have committed a crime among 14-29-year-old youth in the country (Y);
➢ Exogenous parameters:
  • the number of 19-29-year-olds studying in higher education institutions (x_1);
  • number of employed youths between the ages of 15-29 (x_2);
  • the number of young people between the ages of 15-29 who were given the status of unemployed (x_3);
  • nominal average monthly salary by country (x_4)
  • Economic growth of GDP in % by years (x_5).

Thus, the purpose of the econometric research we will conduct is to determine the dependence of the number of youth offenders in the country on the influential regressors we classified above.

$$Y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + e \qquad (1)$$

It will be to quantitatively evaluate the linear multiple regression model and based on this econometric model to quantitatively evaluate the effect of explanatory regressors xi on the dependent variable Y. The authenticity of the results obtained from the econometric analysis is directly related to the stationarity of the time series of the factors involved in the research process. Thus, the results obtained on the basis of non-stationary time series are not adequate enough for real conditions. Therefore, in this study, the stationarity of the time series reflected in table 1 was tested by the correlogram method (taking into account the small number of observations) and all the time series are stationary according to the 1st differences. It has been determined that they are appropriate for conducting econometric studies.

The table below shows the statistics of parameterization of the dependence of the number of youth offenders on influential regressors (1) to the linear multiple regression model (Sevüktekin, M., 2014.) with the help of the EViews software package (Table 2).

Table 2. Linear multivariate regression model parameterization statistics

Variable	Coefficient	Standard error	t-statistic	p-value
C	11858.68	3713.383	3.193496	0.0109
x_1	-0.045058	0.038280	-1.177069	0.2694
x_2	-0.005932	0.042336	-0.140106	0.8917
x_3	0.030599	0.038413	0.796595	0.4462
x_4	3.069828	5.310047	0.578117	0.5774
x_5	-20.67576	33.38156	-0.619377	0.5510
	Value			
R-squared	0.731878			
Adjusted R-squared	0.582922			
S.E. of regression	283.5361			
Sum squared residual	723534.6			
Log likelihood	-102.1630			
F-statistic	4.913372			
Prob (F-statistic)	0.019118			
Mean dependent var	6576.133			
S.D. dependent var	439.0356			
Akaike info criterion	14.42173			
Schwarz criterion	14.70495			
Hannan-Quinn criterion	14.41871			
Durbin-Watson stat	2.305159			

Source: compiled by the authors.

Then the linear multivariate regression model of the dependence of the number of criminals among youth in the country on the selected influential regressors will be as follows:

$$Y = 11858.68 - 0.05 x_1 - 0.01 x_2 + 0.03 x_3 + 3.07 x_4 - 20.68 x_5 \qquad (2)$$

Without touching on the quality of this multivariate regression model let us give a preliminary economic interpretation. Based on this model, the number of students studying in higher education institutions in the country, the number of employed youths, and the economic growth of GDP over the years have an effect on the incidence of crime among young people in the direction of decrease, while other explanatory variables have an effect in the direction of increase. The second one is (2) verification of the multivariate regression model and its

evaluation in the chosen study. As is known, the most common indicator of the regression model is the determination coefficient R^2. According to the above statistics, the value of the determination coefficient is equal to $R^2=0.73$. Therefore, 73% of the variation of the dependent variable Y is explained by the regression we studied. On the other hand, $F\_fakt=4.91 > F\_crit=3.48$ was obtained, which means that the actual value of the Fisher criterion is greater than its theoretical value. Hence, the multiple regression model (2) is significant. (2) since $|t\_fakt| < t\_crit$ for the values of the coefficients of the multiple regression model, these coefficients are also insignificant. Therefore, model (2) is not adequate to real conditions and certain changes should be made on it.

Furhtermore, the stepwise elimination of variables algorithm to obtain a regression model in which all coefficients are significant. Here, the variables x_2 and x_4 from the model are removed and the regression equation again for the remaining variables are built.

$$Y = 10396.76 - 0.03x_1 + 0.03x_3 - 39.18x_5 \tag{3}$$

The quality of the multivariate regression model we built (3) is higher than the quality of the regression model (2), as only the explanatory variable x_3 is insignificant in this model. As it is known, the subject of linear regression analysis is the evaluation of linear dependencies between indicators of economic systems. However, such dependencies do not exist a priori. Therefore, during an econometric study, it is necessary to convert non-linear dependencies between indicators into linear dependencies. Note that this approach is possible in many cases and allows for defining management decisions that are quite adequate to real-life conditions. The simplest example of linearizing a non-linear regression model is logarithmization, or rather, the regression equation baseline model in the form of:

$$Y = b_0 + b_1x_1 + b_2x_2 + \ldots + b_nx_n + e \tag{4}$$

is to bring it to a logarithmic equation in the form:

$$\log(Y) = b_0 + b_1\log(x_1) + b_2\log(x_2) + \ldots + b_n\log(x_n) + e \tag{5}$$

If we conduct research based on this model, the logarithmic regression equation will be obtained as follows. When constructing the model, we do not logarithmize the economic growth indicator of GDP, because this time series is expressed as a percentage.

$$\log(Y) = 15.89 - 0.65\log(x_1) + 0.07\log(x_3) - 0.01x_5 \tag{6}$$

According to statistics (6), the value of the coefficient of determination for the logarithmic multivariate regression model was equal to $R^2=0.73$. More precisely, 73% of the variation of the dependent variable is explained by regression. On the other hand, since $F\_fakt=9.92 > F\_crit=3.59$, regression equation (6) is significant. Of the coefficients of the equation, only x_3 is not significant, because the condition $|t\_fakt| < t\_crit$ is fulfilled for it at the limits of probability $P>0.05$. So, let's continue the process of improvement of (6) regression model.

The econometric studies sometimes use models in which the dependent variable Y depends not only on the current values of the factor variables but also on their previous values. The structure of such a model will be as follows.

$$Y_s = b_0 + b_0x_t + b_1x_{t-1} + \cdots + b_kx_{t-k} + \varepsilon_t \tag{7}$$

Here, the coefficients $b\_1, b\_2, \ldots, b\_к$ reflect the share of the past values of the actual variables in the formation of the current value of the dependent variable. The set of values of the factor variable $x\_(t-k), \ldots, x\_(t-1), x\_t$ forms a dynamic series or a lag whose value is equal to k. Therefore, the econometric model we have described above is called a distributed lag model or simply a lag model.

Let's construct a lag model for the logarithmic multiple regression model. The statistics of the process of transformation of the logarithmic regression model into the lag model are reflected in Table 3.

According to the statistics in the Table 3, we get:

$$\log(Y) = 20.01 - 0.96\log(x_1(-1)) + 0.02\log(x_2) - 0.01\,x_5(-1) \tag{8}$$

$R^2=0.77$ was obtained for the multiple regression model, which means that 77% of the variation of the dependent variable is explained by regression. $F\_fakt=11.05 > F\_crit=3.59$ shows that the logarithmic multiple regression model can be considered as a significant model. Since $|t\_fakt| > t\_crit$, the value of the three coefficients of equation (8) can be considered significant at the $P\leq0.05$ confidence level. Hence, the overall quality of the model has improved significantly. Based on the outcomes of the evaluation of the test regressors, the H_0 hypothesis about the adequacy of the linear specification to real-life conditions is rejected in favor of the alternative hypothesis about the adequacy of the logarithmic specification. The H_0 hypothesis about the adequacy of the logarithmic specification cannot be rejected by the alternative hypothesis. Thus, the logarithmic specification should be considered the superior specification.

Examination of the correlogram of the residuals of the multivariate regression model shows that there was a significant additive jump in 2013. Therefore, considering this additive jump, let's transform the econometric model (8) into a dummy variable regression model (Table 4).

Table 3. Lag model construction statistics

Variable	Coefficient	Standard error	t-statistic	p-value
C	20.01384	2.084921	9.599329	0.0000
$log(x_1(-1))$	-0.957834	0.179653	-5.331588	0.0003
$log(x_3)$	0.021626	0.015281	1.415228	0.1874
$x_5(-1)$	-0.004969	0.001531	-3.245707	0.0088
	Value			
R-squared	0.768170			
Adjusted R-squared	0.698621			
S.E. of regression	0.036792			
Sum squared residual	0.013536			
Log likelihood	28.72489			
F-statistic	11.04500			
Prob (F-statistic)	0.001628			
Mean dependent var	8.793106			
S.D. dependent var	0.067018			
Akaike info criterion	-3.532127			
Schwarz criterion	-3.349539			
Hannan-Quinn criterion	-3.549028			
Durbin-Watson stat	1.626143			

Source: compiled by the authors.

In order to improve the quality of the research, if we analyze the residuals of model (8), we get the following result (Figure 2).

Figure 2. Statistics of the study of the residuals
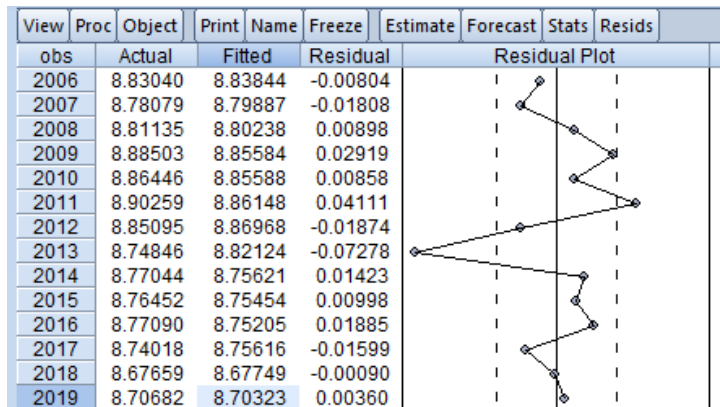
Source: compiled by the authors.

According to the statistics in the table, the new version of the logarithmic multivariable regression model of the dependence of the number of crimes committed by young people in the country on influencing factors is as follows:

$$\log(Y) = 21.60 - 1.09 \log(x_1(-1)) + 0.02 \log(x_2) - 0.01\, x_5(-1) - 0.10\, F2013 \quad (9)$$

For this new version of the regression model, $R^2=0.92$ was obtained, which means that 92% of the variation of the dependent variable Y is explained by regression. The multivariate regression model (9) is a significant model because of the obtained statistics *F_fakt=27,58 >F_krit=4,35*. On the other hand, all the coefficients of the regression equation are also significant because *P≤0,05* for the reliability level *|t_fakt |>t_krit* obtained.

The purpose of econometric modeling is to obtain a regression equation that is adequate for today's conditions and to build an effective management strategy based on this model. Therefore, the model coefficiency should have a precise and logical economic interpretation. Based on the model (9), we can say that the number

of educated people and the level of economic growth of GDP affect the crime rate among young people between the ages of 15-29 with a certain delay. Thus, a 1% increase in the number of students reduces crime by 1.09 people, and a 1% increase in GDP reduces crime by 0.01 people. A 1% increase in the number of unemployed youths between the ages of 15-29 has an impact on crime. As the last model option, we will accept the multiple regression model (9).

Table 4. Dummy variable regression model statistics

Variable	Coefficient	Standard error	t-statistic	p-value
C	21.60055	1.306346	16.53509	0.0000
$log(x_1(-1))$	-1.092366	0.112423	-9.716559	0.0000
$log(x_3)$	0.024884	0.009219	2.699155	0.0244
$x_5(-1)$	-0.006282	0.000969	-6.480452	0.0001
F2013	-0.104701	0.024239	-4.319592	0.0019
	Value			
R-squared	0.924564			
Adjusted R-squared	0.891037			
S.E. of regression	0.022122			
Sum squared residual	0.004405			
Log likelihood	36.58394			
F-statistic	27.57663			
Prob (F-statistic)	0.000046			
Mean dependent var	8.793106			
S.D. dependent var	0.067018			
Akaike info criterion	-4.511991			
Schwarz criterion	-4.283757			
Hannan-Quinn criterion	-4.533119			
Durbin-Watson stat	2.262305			

Source: compiled by the authors.

Now let's check whether the autocorrelation of model (9) is present or not. For this purpose, we will use the Breusch-Godfrey test. The idea behind the Breusch–Godfrey test is that if there is correlation between neighboring observations, then

$$e_t = \rho_1 e_{t-1} + \rho_2 e_{t-2} + \ldots + \rho_k e_{t-k} + v_t, \ (t = \overline{1,n}) \tag{10}$$

the value of the coefficient e_t in the equation will be significantly different from 0. Here, ρ_k are the random deviations of the initial regression model tested for autocorrelation. Then the hypotheses about the existence of autocorrelation are formed as follows:

H0: $\rho\_1= \rho\_2= \llbracket\ldots=\rho\rrbracket\_k=0$ (no autocorrelation);
H1: $\rho\_k\neq0$ (k-order autocorrelation is present).

The application of the Breusch–Godfrey test is practically brought to the estimation of the auxiliary regression we applied above with the help of the method of least squares.

To test the hypothesis, you can use the F statistic, which compares the value of the coefficient of determination of the auxiliary model of the test with the coefficient of determination of the version of that model without lags of random deviations. If the condition of the existence of linear dependence between exogenous variables and random deviations of the ECM is satisfied, then the value of the coefficient of determination of the lag-free model will be quite close to zero.

The following table (9) shows a fragment of the statistics of testing the multivariate regression model for the existence of autocorrelation with the help of the Breusch-Godfrey test (Table 5).

Table 5. Statistics of the Breusch-Godfrey test

Test	Value
F-statistic	0.391020
Obs*R-squared	1.406901
Prob. F (2,7)	0.6903
Prob. Chi-Square (2)	0.4949

Source: compiled by the authors.

According to the statistics of the table above, the value of *Prob(F-statistic) of Fstat* is equal to *0.6903*, and this value is greater than the *α=0.05* confidence level indicator we conducted our research: *Prob(F-statistic)= 0.6903> α=0.05*. Therefore, the *H1* hypothesis about the existence of autocorrelation in model (9) is not accepted (there is no autocorrelation). This result is also in the table *Prob(Obs*R-squared)= 0.4949> α=0.05* is confirmed again.

One of the main assumptions of the ECM is that the variances of the random deviations for any observation should be constant. Otherwise, the properties of the values obtained with the EKCM will change. In the theory of econometric modeling, the fulfillment of this condition is called homoscedasticity, and its violation is called heteroscedasticity.

The following Table (6) shows a fragment of the statistics of testing the multivariate regression model for heteroscedasticity with White's test.

Table 6. White's test of the regression model verification statistics

Test	Value
F-statistic	0.732506
Obs*R-squared	3.438413
Scaled explained SS	0.962472
Prob. F (4,9)	0.5922
Prob. Chi-Square (4)	0.4873
Prob. Chi-Square (4)	0.9154

Source: compiled by the authors.

According to the statistics of the regression shown in the table, the value of *F-statistic Prob(F-statistic)= 0.5922* is greater than the value of *α=0.05*, which we accept as the confidence level. Therefore, the hypothesis of the existence of homokedasticity is accepted. On the other hand, according to the statistics of the White test shown in the table *Prob(Obs*R-squared)= 0.4873>α=0.05* condition is paid. Therefore, the conclusion that the multiple regression model (9) is a homoscedastic model is also confirmed by the *Prob(Obs*R-squared)* characteristic of that statistic.

Thus, the linear multiple regression model (9), which quantifies the dependence of the number of youth crimes in the country on the explanatory regressors affecting this social problem, can be considered a homoscedastic regression model without autocorrelation. The fact that this model has high-quality characteristics and, therefore, is quite adequate to real conditions, allows it to be used as an effective mechanism in optimal management development and forecasting strategies that ensure to reduction of criminality among young people.

5. Discussions

If there is heteroscedasticity in the econometric model, then the estimation of the regression model with ECM can lead to the following undesirable situations:

1. If the values of the parameters are not shifted and remain linear, they will lose their effectiveness. An increase in price dispersion reduces the probability of obtaining maximum accurate prices.

2. The variances of the parameter values will be calculated by sliding. Therefore, all the results obtained based on the relevant t and F statistics, as well as the interval values, will not be valid. As a result, values that are not truly statistically significant may be considered significant. White's test is mainly utilized to detect heteroskedasticity. According to this test, the residuals of the original model are determined and the auxiliary regression model of their squares is evaluated on all its exogenous variables, their squares, and their cross-products. If the number of parameters in the initial model is large enough, then the "no cross" variant of White's test, which does not take into account the cross products, can be used.

Conclusions and Further Research

The current state of criminality and delinquency among young people and minors in the Republic of Azerbaijan, the influence of the factors causing this social problem on the process was analyzed from the point of view of a systematic approach, and econometric modeling of existing quantitative dependencies in this field was carried out in the study. As a result of the conducted econometric analysis, a linear multiple regression model reflecting the dependence of the number of criminal cases among young people, which is taken as an endogenous parameter, on social regressors that actively influence this indicator was evaluated. It was revealed that the quality characteristics of the initial model are not satisfactory. By returning to the specification stage, a lagged logarithmic

relationship equation was established through the help of special tests, and it was determined that the Gauss-Markov conditions are satisfied for this model which can be considered a multicollinearity-free, autocorrelation-free, homoscedastic regression model. The adequacy of this model to real-life situations allows it to be referred to in the development of strategies aimed at reducing the number of criminals among young people.

Credit Authorship Contribution Statement

Leyla Huseynova: Writing – review and editing, Methodology, Supervision, Project administration;
Mehriban Aliyeva: Writing – original draft, Investigation, Visualization;
Elmira Gojaeva: Writing – original draft, Methodology, original draft, Data curation;
Esmira Ahmadova: Writing – review and editing, Formal analysis.
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.
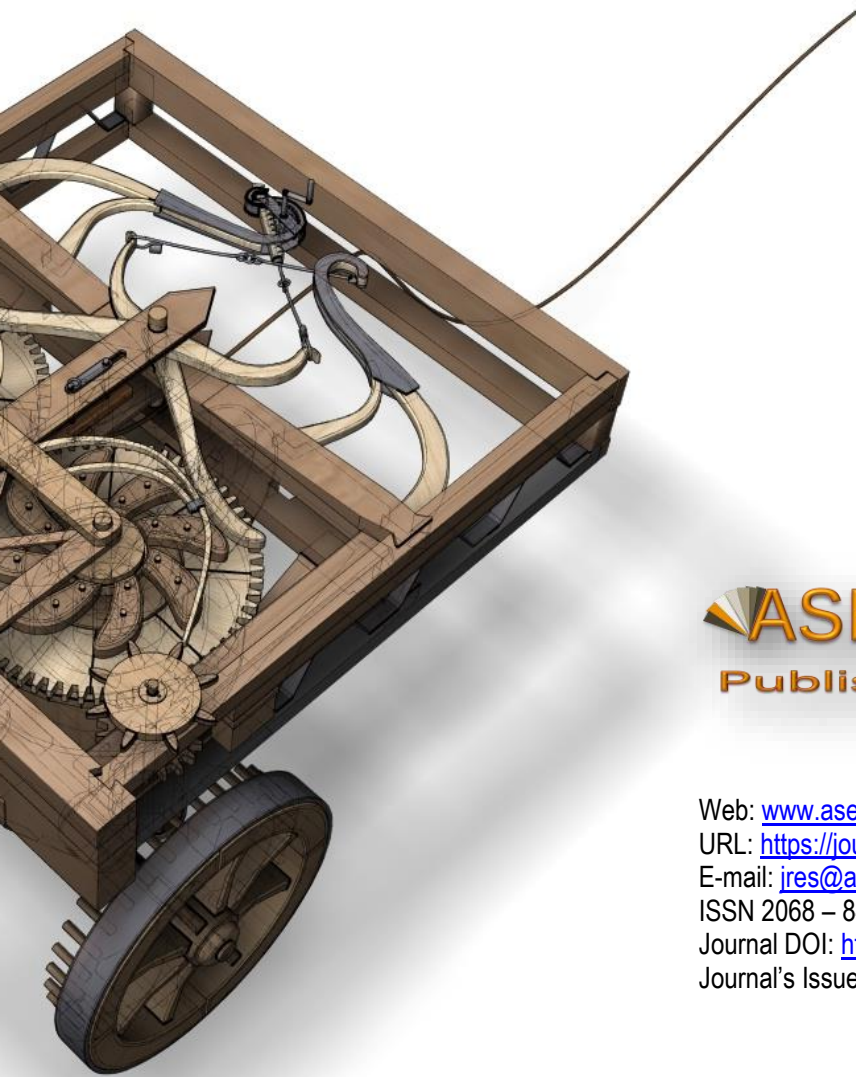
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