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Physical, Health and Safety, and Job Design Conditions as Determinants of Employee Productivity of Polytechnics in Imo and Anambra States, Nigeria

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ABSTRACT: This study examined the effect of work conditions on employee productivity of polytechnics in Imo and Anambra States, Nigeria. The specific objectives were to assess the effect of physical work condition on knowledge transfer, to examine the effect of health and safety condition on teaching effectiveness, and to evaluate the effect of job design condition on intrinsic motivation of staff of polytechnics in Imo and Anambra States. The study was anchored on Herzberg's Two-Factor Theory and the Job Demands-Resources model; adopted a descriptive survey design. The population comprised 2,992 academic staff of four polytechnics, namely; Federal Polytechnic Nekede, Federal Polytechnic Oko, Anambra State Polytechnic, Mgbakwu, and Imo State Polytechnic, Omuma, from which a sample size of 341 was determined using the Krejcie and Morgan (1970) formula and allocated proportionately using Bowley's (1926) formula. The instrument was subjected to face, content and construct validity by experts, and reliability was established using Cronbach's alpha, with coefficients ranging from 0.868 to 0.885. Out of the 341 copies of the questionnaire distributed, 321 copies (94.1%) were correctly completed and used for analysis. The three hypotheses were tested using simple linear regression analysis with the aid of SPSS Version 23 at the 0.05 level of significance. Findings revealed that physical work condition has a positive significant effect on knowledge transfer, health and safety condition has a positive significant effect on teaching effectiveness, and job design condition has a positive significant effect on intrinsic motivation of polytechnics in Imo and Anambra States, with health and safety condition being the strongest predictor ($R^2 = 0.324$). The study concluded that favourable work conditions are not incidental to, but constitute a genuine determinant of, employee productivity in Nigerian polytechnics. It was recommended, among others, that polytechnic management should prioritize the provision and regular maintenance of functional classrooms, teaching equipment and office facilities, strengthen health safety and regular performance feedback.

Keywords: Physical work condition, Health and safety condition, Job design condition, Knowledge transfer, Teaching effectiveness, Intrinsic motivation, Polytechnics

INTRODUCTION

The relationship between work conditions and employee productivity has evolved into one of the most significant areas of inquiry in organizational behaviour and human resource management because employees constitute the most valuable resource available to every organization. Contemporary management philosophy recognises that the environment within which employees perform their duties

substantially determines their capacity to achieve organizational objectives. Work conditions encompass the physical, psychological, health and safety, and structural characteristics of the workplace that influence employees' motivation, satisfaction, commitment, efficiency and overall performance, and in educational institutions, where the quality of service depends largely on intellectual engagement, effective teaching, research and knowledge dissemination, the provision of conducive work conditions has become indispensable for achieving institutional excellence (Armstrong, 2020; Robbins & Judge, 2019).

In Nigeria, the quality of work conditions within tertiary institutions remains a major concern due to persistent infrastructural deficiencies, inadequate government funding, poor maintenance culture, weak occupational safety practices and increasing work demands placed on academic staff. Many institutions continue to experience shortages of modern teaching equipment, overcrowded offices and classrooms, inadequate information technology facilities and insufficient employee welfare programmes (Onyechere, 2021; Dike, 2022). Okeke, Akpamgbo, Dike and Williams (2025), examining workplace management and organizational productivity among aluminum manufacturing firms in Anambra State, established that the manner in which the workplace is managed significantly shapes organizational productivity, underscoring the reality that the work environment which management provides for its employees has measurable productivity consequences, whether in manufacturing firms or in tertiary institutions within the same region.

Federal Polytechnic Nekede, Federal Polytechnic Oko, Anambra State Polytechnic, Mgbakwu, and Imo State Polytechnic, Omuma, play a central role in producing middle-level technical manpower for the South-East geopolitical zone and the country at large. Despite their remarkable growth, academic staff of these institutions have raised concerns over inadequate office space and teaching equipment, poor lighting and ventilation in classrooms and offices, insufficient health and safety provisions, and poorly designed job roles that create ambiguity and role conflict. These conditions have reportedly led to declining motivation, reduced commitment to teaching and an overall decrease in the quality of knowledge transfer to students. Most existing studies on work conditions in Nigerian tertiary institutions have focused on universities, with polytechnics receiving comparatively little scholarly attention. This study, therefore, sought to investigate the effect of physical work condition, health and safety condition and job design condition on the productivity of academic staff of polytechnics in Imo and Anambra States, Nigeria.

Objectives of the Study

The broad objective of this study is to examine the effect of work conditions on employee productivity of polytechnics in Imo and Anambra States, Nigeria. The specific objectives are to:

1. assess the effect of physical work condition on knowledge transfer of polytechnics in Imo and Anambra States, Nigeria.
2. examine the effect of health and safety condition on teaching effectiveness of polytechnics in Imo and Anambra States, Nigeria.
3. evaluate the effect of job design condition on intrinsic motivation of polytechnics in Imo and Anambra States, Nigeria.

Hypotheses

The following null hypotheses guided the study:

H01: Physical work condition has no positive significant effect on knowledge transfer of polytechnics in Imo and Anambra States, Nigeria.

H02: Health and safety condition has no positive significant effect on teaching

effectiveness of polytechnics in Imo and Anambra States, Nigeria.

H03: Job design condition has no positive significant effect on intrinsic motivation of polytechnics in Imo and Anambra States, Nigeria.

LITERATURE REVIEW

Work Conditions

According to Armstrong (2020), work conditions refer to the sum total of the circumstances under which employees perform their jobs, encompassing physical facilities, health and safety provisions, organizational culture and the structure of roles and responsibilities. Robbins and Judge (2019) describe work conditions as the environmental and structural factors that either facilitate or hinder employees from achieving high performance standards, while the International Labour Organization (ILO, 2018) defines work conditions as the physical, social and psychological parameters of employment that affect worker welfare, safety and productivity. Dike (2022) argues that work conditions in tertiary institutions are not merely environmental but are embedded within broader institutional structures, including policy frameworks, resource allocation decisions and leadership styles, a perspective particularly relevant to Nigerian polytechnics where systemic underfunding and governance challenges create complex work environments.

Employee Productivity

Employee productivity is broadly defined as the measure of the efficiency and effectiveness with which an employee accomplishes assigned tasks and achieves organizational objectives. In academic institutions, productivity goes beyond quantitative output to encompass the depth of knowledge imparted, the quality of instruction delivered and the extent of professional growth exhibited by staff (Adeyemi & Obi, 2022). Productivity is viewed as a function of the interaction between individual capabilities, motivational states and environmental conditions, such that when employees possess the requisite skills, are motivated and operate in conducive work environments, their productivity is maximised (Robbins & Judge, 2019). Williams and Okeke (2025), in their study of economic factors of corporate sustainability and performance of foam manufacturing firms, found that internal economic and organisational factors significantly shape firm performance, reinforcing the view that output is driven not only by external conditions but also by how internal resources are managed. In this study, employee productivity was measured through knowledge transfer, teaching effectiveness and intrinsic motivation.

Physical Work Condition and Knowledge Transfer

Physical work condition refers to the tangible and observable aspects of the work environment that affect how employees carry out their tasks, including the quality of office space, classroom facilities, laboratory equipment, lighting, temperature, noise levels, ventilation and access to ergonomic furniture and tools (Eze & Nwosu, 2021).

Knowledge transfer, on the other hand, refers to the deliberate and systematic process through which knowledge, skills, expertise and competencies are communicated and acquired; in polytechnics, it is the effective communication and application of technical and professional knowledge that enables students to develop competencies relevant to their field of study (Aluko & Ibrahim, 2023). The availability of functional classrooms, well-equipped laboratories, library resources and communication technologies directly determines the capacity of academic staff to organise, present and facilitate the acquisition of knowledge by students; when physical conditions are inadequate, the knowledge

transfer process is severely compromised (Aluko & Ibrahim, 2023).

Herzberg's Two-Factor Theory identifies physical working conditions as hygiene factors which, when inadequate, generate dissatisfaction and reduce productivity, and when adequate, remove barriers to performance. Okeke, Akpamgbo, Dike and Williams (2025) similarly showed that the way the workplace is managed significantly influences organizational productivity among aluminum manufacturing firms in Anambra State, lending support to the proposition that the provision and maintenance of physical facilities is a managerial responsibility with direct productivity outcomes.

Health and Safety Condition and Teaching Effectiveness

Health and safety conditions refer to the organizational provisions designed to protect employees from physical harm, occupational illnesses and psychological distress arising from the work environment, encompassing safety policies, protective equipment, risk assessments and emergency response procedures (ILO, 2018). Teaching effectiveness refers to the ability of academic staff to deliver instructional content in a manner that promotes student learning, engagement and the achievement of educational objectives, encompassing clarity of communication, appropriate pedagogical strategies, timely feedback and the ability to adapt instruction to diverse learning needs (Kwon & Lee, 2021). When staff feel safe, healthy and protected from occupational hazards, their cognitive resources are freed for lesson preparation, innovative pedagogy and responsive interaction with students; conversely, when health and safety provisions are inadequate, staff energy is diverted to managing stress and coping with health challenges, all of which reduce teaching effectiveness (Garcia & Martinez, 2022).

Fernandez and Lopez (2023) emphasize that health and safety investment is not merely a legal compliance issue but a strategic organizational decision that directly translates to improved employee productivity and professional commitment. Within the Job Demands-Resources model, health and safety provisions function as job resources that protect employees against the health impairment process through which excessive demands consume energy and lower performance (Bakker & Demerouti, 2007). Nwokedi, Osaheghe, Okereke and Gbenga (2022), examining conflict management and organizational performance in breweries of South East States of Nigeria, found that the way management handles workplace tensions significantly influences organizational performance, which reinforces the view that reducing sources of workplace strain, whether interpersonal or occupational, frees employees to concentrate on their core duties.

Job Design Condition and Intrinsic Motivation

Job design condition refers to the structural and organizational arrangements that define the tasks, responsibilities, autonomy, feedback mechanisms and role clarity of employees within an organization. According to Hackman and Oldham (1976), well-designed jobs that incorporate skill variety, task identity, task significance, autonomy and feedback create psychological states of experienced meaningfulness, experienced responsibility and knowledge of results, which are the direct antecedents of intrinsic motivation. Intrinsic motivation refers to the internal drive that propels an individual to engage in an activity for its own inherent satisfaction rather than for some separable external reward (Deci & Ryan, 1985); in academic settings, it manifests as a lecturer's genuine interest in teaching, research and mentorship and the willingness to go beyond minimum job requirements (Adeyemi & Obi, 2022).

Conversely, poorly designed jobs characterised by role ambiguity, excessive

workload and limited autonomy diminish academic staff's sense of ownership over their work, weakening their intrinsic drive to perform and innovate (Ogunbiyi & Fadare, 2022). Morgeson and Humphrey (2006) extend the job design literature by noting that collaboration opportunities, interdependence and social support are integral components of job design that shape employee engagement. In this regard, Nwokedi, Osaheghe, Okereke and Gbenga (2022) found that effective management of workplace relations significantly enhances organizational performance in breweries of South East Nigeria, an outcome consistent with the view that clearly structured roles, which reduce ambiguity and role conflict, sustain the internal commitment of employees.

Empirical Review

Physical Work Condition and Knowledge Transfer

Aluko and Ibrahim (2023) examined the effect of physical work conditions on knowledge transfer in polytechnics in Nigeria. The population comprised academic staff from five federal polytechnics, from which a sample of 240 respondents was selected using stratified random sampling, and data were analysed using multiple regression. The findings revealed that physical work conditions have a strong positive effect on knowledge transfer and that adequate equipment facilitates effective instructional delivery.

Ezeani and Nnadi (2023) investigated the influence of workplace physical conditions on knowledge transfer among lecturers in public polytechnics in Southeast Nigeria, using 170 respondents selected by simple random sampling, and found through regression analysis that availability of modern teaching facilities enhances knowledge dissemination. Similarly, Nwachukwu and Eze (2022), using a cross-sectional survey of 160 respondents in Nigerian polytechnics, found that physical conditions significantly facilitate knowledge transfer while poor facilities reduce instructional effectiveness.

Health and Safety Condition and Teaching Effectiveness

Garcia and Martinez (2022) evaluated the effect of workplace safety conditions on academic staff productivity in Spanish higher education institutions. The population comprised 190 academic staff from twelve institutions, and Structural Equation Modelling revealed that health and safety provisions significantly enhance teaching effectiveness and reduce absenteeism. Okoro and Edeh (2022) examined the influence of occupational health and safety conditions on academic staff productivity in public polytechnics in Southeast Nigeria, with a sample of 170 respondents selected through stratified random sampling, and found through multiple regression that health and safety conditions significantly improve teaching effectiveness and that safe working environments reduce job-related stress. Eze and Nwosu (2021), using a sample of 145 staff from federal institutions in Southeast Nigeria, found that health and safety conditions positively predict teaching effectiveness and reduce health-related absenteeism. Likewise, Fernandez and Lopez (2023), using PLS-SEM on 165 academic staff across three European Union countries, showed that staff with secure working environments demonstrate higher teaching quality.

Job Design Condition and Intrinsic Motivation

Kwon and Lee (2021) examined the effect of job design on teaching effectiveness and staff engagement in Asian universities. The population comprised 165 academic staff from universities in South Korea and Japan, and Structural Equation Modelling revealed that job design significantly influences intrinsic motivation and that role clarity enhances the sense of ownership over instructional duties. Adewuyi and Oke (2023) examined the effect of job design on

employee productivity and motivation in higher institutions in Nigeria, using a sample of 210 respondents from selected federal universities, and found that job design significantly improves intrinsic motivation and that workload management supports self-driven commitment. Johnson and Smith (2021), studying 175 academic staff from ten universities in the USA, found that job design significantly influences intrinsic motivation and that task significance improves professional commitment. In the South-East context, Okafor and Chukwu (2023) confirmed that job design conditions in Southeast Nigerian polytechnics significantly predict staff intrinsic motivation, with autonomy and feedback identified as the most critical job design elements.

METHODOLOGY

The study adopted a descriptive survey research design, which enabled the researcher to systematically describe and examine the effect of work conditions on employee productivity without manipulating any of the variables. The study was conducted across four polytechnics in Imo and Anambra States, namely Federal Polytechnic Nekede, Owerri; Federal Polytechnic Oko, Orumba North; Anambra State Polytechnic, Mgbakwu; and Imo State Polytechnic, Omuma. The population of the study comprised 2,992 academic staff of the four institutions (1,230, 930, 421 and 411 respectively) as derived from the school personnel records for the 2025/2026 academic session. Using the Krejcie and Morgan (1970) formula, a sample size of 341 was determined and allocated proportionately to the institutions using Bowley's (1926) formula (140, 106, 48 and 47 respectively), after which a stratified random sampling technique was employed, with simple random sampling used to select respondents within each institution.

Primary data were collected using a structured questionnaire, while secondary data were obtained from textbooks, peer-reviewed journals, National Board for Technical Education (NBTE) publications and the institutions' annual reports. The instrument was subjected to face, content and construct validity by experts in Business Administration, Human Resource Management and Educational Administration, whose corrections were incorporated before final administration. Reliability was established through a pilot study of 30 respondents from a comparable institution outside the study area, and Cronbach's alpha coefficients ranged from 0.868 to 0.885 across the constructs, indicating that the instrument was reliable. Out of the 341 copies of the questionnaire distributed, 321 copies (94.1%) were correctly completed and used for analysis. Data were analysed using frequencies, percentages, means and standard deviations, while the three hypotheses were tested using simple linear regression analysis with the aid of SPSS Version 23 at the 5% level of significance, based on the models $KTR = \beta0 + \beta1PWC + e$, $TEF = \beta0 + \beta1HSC + e$ and $INM = \beta0 + \beta1JDC + e$, where KTR is knowledge transfer, TEF is teaching effectiveness, INM is intrinsic motivation, PWC is physical work condition, HSC is health and safety condition and JDC is job design condition. The decision rule was to reject the null hypothesis where the p-value was less than 0.05.

RESULTS AND DISCUSSION

Hypothesis One: Physical Work Condition and Knowledge Transfer

H01: Physical work condition has no positive significant effect on knowledge transfer of polytechnics in Imo and Anambra States, Nigeria.

Table 1: ANOVA and Regression Coefficient for Physical Work Condition and Knowledge Transfer

Model	F	Beta	t	Sig. (p-value)	Decision
Physical Work Condition (PWC) → KTR	110.339	0.507	10.504	0.000	Reject H0

Source: Field Survey, SPSS Version 23 Output (2026)

Table 1 shows that physical work condition has a positive effect on knowledge transfer which is statistically significant at the 5% level of significance, since the p-value (0.000) is less than the alpha value (0.05). The R Square value of 0.257 shows that physical work condition accounts for 25.7% of the variance observed in knowledge transfer among the polytechnic academic staff sampled, while the F-statistic of 110.339 indicates that the regression model significantly predicts knowledge transfer. The unstandardised coefficient (B = 0.529) indicates that a one-unit increase in physical work condition is associated with a 0.529-unit increase in knowledge transfer, and the standardised Beta coefficient (β = 0.507) confirms a positive and moderate effect. Since the p-value of the test statistic is less than the level of significance, the null hypothesis is rejected, and the alternative hypothesis, that physical work condition has a positive significant effect on knowledge transfer of polytechnics in Imo and Anambra States, Nigeria, is accepted.

Hypothesis Two: Health and Safety Condition and Teaching Effectiveness

H02: Health and safety condition has no positive significant effect on teaching effectiveness of polytechnics in Imo and Anambra States, Nigeria.

Table 2: ANOVA and Regression Coefficient for Health and Safety Condition and Teaching Effectiveness

Model	F	Beta	t	Sig. (p-value)	Decision
Health and Safety Condition (HSC) → TEF	152.958	0.569	12.368	0.000	Reject H0

Source: Field Survey, SPSS Version 23 Output (2026)

Table 2 shows that health and safety condition has a positive effect on teaching effectiveness which is statistically significant at the 5% level of significance, since the p-value (0.000) is less than the alpha value (0.05). The R Square value of 0.324 shows that health and safety condition accounts for 32.4% of the variance observed in teaching effectiveness, the highest explanatory power among the relationships tested, while the F-statistic of 152.958 indicates that the regression model significantly predicts teaching effectiveness. The unstandardised coefficient (B = 0.581) indicates that a one-unit increase in health and safety condition is associated with a 0.581-unit increase in teaching effectiveness, and the standardised Beta coefficient (β = 0.569) confirms a positive and moderately strong effect. Since the calculated p-value is less than the alpha value, the null hypothesis is rejected, and the alternative hypothesis, that health and safety condition has a positive significant effect on teaching effectiveness of polytechnics in Imo and Anambra States, Nigeria, is accepted.

Hypothesis Three: Job Design Condition and Intrinsic Motivation

H03: Job design condition has no positive significant effect on intrinsic motivation of polytechnics in Imo and Anambra States, Nigeria.

Table 3: ANOVA and Regression Coefficient for Job Design Condition and Intrinsic Motivation

Model	F	Beta	t	Sig. (p-value)	Decision
Job Design Condition (JDC) → INM	139.899	0.552	11.828	0.000	Reject H0

Source: Field Survey, SPSS Version 23 Output (2026)

Table 3 shows that job design condition has a positive effect on intrinsic motivation which is statistically significant at the 5% level of significance, since the p-value (0.000) is less than the alpha value (0.05). The R Square value of 0.305 shows that job design condition accounts for 30.5% of the variance observed in intrinsic motivation, while the F-statistic of 139.899 indicates that the regression model significantly predicts intrinsic motivation. The unstandardised coefficient (B = 0.596) indicates that a one-unit increase in job design condition is associated with a 0.596-unit increase in intrinsic motivation, and the standardised Beta coefficient (β = 0.552) confirms a positive and moderately strong effect. Since the p-value of the test statistic is less than the level of significance, the null hypothesis is rejected, and the alternative hypothesis, that job design condition has a positive significant effect on intrinsic motivation of polytechnics in Imo and Anambra States, Nigeria, is upheld.

Discussion of Findings

The test of hypothesis one revealed that physical work condition has a positive significant effect on knowledge transfer of polytechnics in Imo and Anambra States (β = 0.507, t = 10.504, p = .000), explaining 25.7% of the variation in knowledge transfer. This finding agrees with Aluko and Ibrahim (2023), who studied 240 academic staff drawn from five federal polytechnics in Nigeria and reported that physical work conditions strongly enhance knowledge transfer, and with Ezeani and Nnadi (2023), who found among 170 lecturers in Southeast public polytechnics that modern teaching facilities enhance knowledge dissemination. It also resonates with Okeke, Akpamgbo, Dike and Williams (2025), who found that workplace management significantly enhances organizational productivity among aluminum manufacturing firms in Anambra State. Since physical work condition accounts for roughly a quarter of the variation in knowledge transfer, the finding suggests that facilities are an important but not the only driver, and other factors, such as staff attitude and institutional support, also shape how knowledge is transferred.

The test of hypothesis two showed that health and safety condition has a positive significant effect on teaching effectiveness of polytechnics in Imo and Anambra States (β = 0.569, t = 12.368, p = .000), explaining 32.4% of the variation in teaching effectiveness. This is consistent with Garcia and Martinez (2022), who found that health and safety provisions significantly enhance teaching effectiveness and reduce absenteeism in Spanish higher education institutions, and with Okoro and Edeh (2022), who reported from 170 lecturers in Southeast public polytechnics that health and safety conditions significantly improve teaching effectiveness and lower job-related stress. The finding further aligns with Williams and Okeke (2025), whose study of foam manufacturing firms showed that deliberate internal investment in organisational factors significantly improves performance. The comparatively large coefficient recorded suggests that assurance of personal safety and access to

occupational health support is particularly valued by academic staff in the sampled polytechnics.

Finally, the test of hypothesis three showed that job design condition has a positive significant effect on intrinsic motivation of polytechnics in Imo and Anambra States (β = 0.552, t = 11.828, p = .000), explaining 30.5% of the variation in intrinsic motivation. This finding is consistent with Kwon and Lee (2021), who found that job design significantly influences intrinsic motivation, with role clarity enhancing the sense of ownership over instructional duties, and with Adewuyi and Oke (2023), who reported that job design significantly improves intrinsic motivation in Nigerian federal universities. It also aligns with Nwokedi, Osaheghe, Okereke and Gbenga (2022), whose study of breweries in South East Nigeria found that effective management of workplace relations significantly enhances organizational performance. The finding suggests that polytechnic lecturers who have clear roles, manageable workloads, autonomy and regular feedback are more likely to perform their duties diligently without close supervision or external reward.

Summary of Findings

i. Physical work condition has a positive significant effect on knowledge transfer of polytechnics in Imo and Anambra States, Nigeria, with a Beta of 0.507, a t-value of 10.504 and a p-value of 0.000, statistically significant at 5% level of significance.
ii. Health and safety condition has a positive significant effect on teaching effectiveness of polytechnics in Imo and Anambra States, Nigeria, with a Beta of 0.569, a t-value of 12.368 and a p-value of 0.000, statistically significant at 5% level of significance.
iii. Job design condition has a positive significant effect on intrinsic motivation of polytechnics in Imo and Anambra States, Nigeria, with a Beta of 0.552, a t-value of 11.828 and a p-value of 0.000, statistically significant at 5% level of significance.

CONCLUSION

The study concludes that work conditions, specifically physical work condition, health and safety condition and job design condition, have a positive significant effect on employee productivity of polytechnics in Imo and Anambra States, Nigeria. Physical work condition supports knowledge transfer by providing the functional classrooms, equipment and office facilities that make effective instructional delivery and collegial knowledge sharing possible; health and safety condition supports teaching effectiveness by assuring staff of a secure and hazard-free environment in which to prepare and deliver instruction; and job design condition, through role clarity, manageable workload, autonomy and performance feedback, supports intrinsic motivation by giving staff a sense of ownership over their professional outcomes. This underscores the reality that favourable work conditions are not incidental to, but constitute a genuine determinant of, employee productivity in Nigerian polytechnics.

Recommendations

Based on the findings, the following recommendations are made:

i. Management of polytechnics in Imo and Anambra States should prioritise the provision and regular maintenance of functional classrooms, lecture halls, teaching equipment and office facilities, given the significant positive effect of physical work condition on knowledge transfer.
ii. Polytechnic authorities should strengthen health and safety policies, provide functional safety and emergency response equipment, and institute occupational health support programmes for academic staff, in order to further enhance teaching effectiveness.

iii. Polytechnic authorities should design academic job roles with clearly defined responsibilities, reasonable and manageable workloads, adequate autonomy and regular constructive performance feedback, in order to sustain and strengthen the intrinsic motivation of academic staff.

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