



ASSESSING THE CREATIVITY OF KAZAKHSTAN BUSINESS STUDENTS

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Abstract. Creativity is vital in business and even to prospective entrepreneurs because it facilitates innovative problem-solving and supports business people in finding distinctive solutions to challenges by offering a competitive edge and boosting productivity. However, the development of creativity among students with the support of formal education still needs more attention and is an under-researched topic in this part of the world. The researchers identified a median level of creative dexterities among Kazakhstan business students with their authentic assessment criterion, which ignited the authors' curiosity in initiating the current research. The core purpose of the study is to assess the creativity tendencies of Kazakhstan's business students from both undergraduate and graduate disciplines and to offer a pragmatic indication of how demographic variables (gender, age, and education) influence creativity tendencies. The researchers administered the Kaufman domains of creativity scale to measure the creative levels of Kazakhstan students by taking a sample of 300 and expanding a stratified and random sampling method after checking the reliability and validity using McDonald's omega and Bartlett's tests. The data gleaned from the subjects was reviewed and coded using *RStudio* and *Microsoft Excel*. Then, the factor extraction method and the dimensionality reduction technique of principal component analysis were used to analyze the data. The selected hypotheses were tested using Cochran's Q test to validate the five hypotheses. The crucial findings are that creativity tendencies are more significant and influenced based on the age and category of the respondents. There is no substantial influence on acquiring creativity because of gender. An impressive 88 percent of Kazakhstan business students accepted that higher education institutions' pedagogical business course curricula improve creativity, innovation, and research skills. The significant limitation of the study is that the research covered only higher education students of business discipline who were studying only in the city of Almaty, Kazakhstan.

Keywords: business students, Cochran's Q test, creativity, Kazakhstan, McDonald's omega and Bartlett's tests, measurement, principal component analysis.

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1. Introduction

Creativity engages and frees the mind, which empowers an individual to absorb knowledge with great ease and confidence and makes the knowledge-earning process more effective and efficient. Creativity offers alternative ways of thinking, which clears traditional thinking patterns by facilitating empathy. Creativity is the most vital skill in all aspects of human life, essential to success as a student and a prospective entrepreneur. In the present day's highly competitive business world, creativity allows businesses to face diverse problems and challenges with innovative solutions confidently, and it helps business people think outside the box, communicate better with all stakeholders of the business, stand out, and adapt to change, and to build long-lasting relationships. Creativity is an essential element imperative to entrepreneurial activity undertaken by anyone to do any business, irrespective of the type and magnitude of business. Creativity and innovation are the most significant

across all industries and companies because of their challenges, and they expect creative resolutions. Creativity serves multiple benefits, from combating stagnation and facilitating growth and innovation by encouraging innovation, boosting productivity, allowing for adaptability, and fostering growth (Boyles, 2022). The Organization for Economic Co-Operation and Development Programme for International Student Assessment assessed the skills and knowledge of around 510 000 students from all 34 member countries and 31 partner countries and economies. It said that the best educationalists have forever intended to encourage the skills needed to perform non-routine tasks to teach for life, not for school (OECD, 2014). The significance of creativity is highlighted in our lives along with specific fields like medical research, business, science, and arts, and emphasizes the pivotal role of creativity in education (Forster, 2014–2015). The same author stated that the island of the classroom must be a microcosm to equip students beyond the curriculum to enhance their creativity, which is constantly changing society. The same research also acknowledged that the faculty should encourage millennials and Generation Z to be inventive, advanced, creative, and compliant, with the rationale, conviction, and dexterities to employ analytical and creative thinking tenaciously and quickly act in response to the confronts and complexities of the new millennium.

The new millennium is frequently called the “age of a creative society” (Kacerauskas, 2017; Reimeris, 2016). Creativity has traditionally been associated with artistry, entrepreneurship, information technology, innovations, culture, fashion, fine arts, and civil engineering and has gradually become important in texts describing politics, education, and science (Seder-evičiūtė-Pačiauskienė et al., 2018). In the present-day digital era, the application of creativity boundaries has been expanded significantly in almost all businesses, leadership, information technology, education, management, human resource management, marketing, public relations, project management, etc. In the current highly competitive business world, creativity is essential for survival irrespective of the type, magnitude of business, and geographical location they are operating. Creativity is an indication of innovation, which is imperative for the evolution of human society and its economic, social, and cultural significance, and is an engine of economic and technical development (Sawyer & Henriksen, 2024; Smith-Bingham, 2006; Sternberg & Lubart, 1999). The significance of creative thinking is extensively intensified and made prominent by rapid globalization, increasing competition, technological enhancements (Soriano de Alencar et al., 2017), and uncertainties and complexities imposed by global phenomena such as the COVID-19 pandemic. Creative thinking assists professionals in succeeding in complex problem-solving and decision-making processes and adapting successfully to the demands of daily life (AACSB International, 2010; Verzat et al., 2017; Morris & König, 2020). Creativity is paramount for the business sector; it promotes innovation, boosts productivity, helps flexibility and adaptability, and fosters growth. Hence, business and economics professionals must be equipped with creative thinking skills, among other skills and competencies (Karunarathne & Calma, 2024). Creativity confidently changes the lifestyles of the public, introduces societal progress with inventions and discoveries, and helps societies progress by changing how people relate to the world and making them more flexible and open to changes (Glaveanu et al., 2020). Creativity is linked with other cognitive activities, such as leadership, critical thinking, decision-making, metacognition, and motivational and

behavioral factors (Zacher & Johnson, 2015; Zhang et al., 2018). It can be progressed over time by augmenting domain-specific skills and knowledge and a stimulating environment for individuals' cognitive processes and personality factors, including motivations (Karpova et al., 2011). Thus, higher education institutions need to actively facilitate a supportive environment, resources, and opportunities that enhance creativity so that it becomes an explicit part of student's higher education experience (Hannon et al., 2004; Ungaretti et al., 2009; Vincent-Lancrin et al., 2019; Whiting, 2020).

Creativity is not the right of any individual, which means developing original value-based ideas, executing them, and convincing others of their worth, which indicates successful change or innovation. Pink (2013) stressed the urgency and need to motivate the young generation to "sell" them the challenge of conveying their ideas and persuading others to design and develop creativity. Fostering creativity in the workplace needs to be introduced and greatly supported by higher education institutions, which teach the culture of creativity and can help businesses develop unique and innovative solutions, products, and services. The outcome of higher education institutions is that students can only start their professional careers with proper creative and innovative capabilities, which are learned and improved from their disciplines after completing their undergraduate and graduate courses. The outcome of higher education institutions should enter into the corporate world with competent conceptual and technical dexterities with highly creative and innovative approaches. Only then will there be a possibility of understanding and challenging the highly competitive business world by introducing creative thought processes. Creativity is the most vital feature for an individual, which every company and occupation essentially demands, and organizations are vigorously looking for innovative human resources who can efficiently communicate their thoughts to endorse superior throughput and further the business. Based on the demands from the corporate sector for creative and innovative mindsets, the primary onus is on the shoulders of the family. The principal responsibility lies with educational institutions, particularly at the young age of an individual. Here, the scholars came into the scene with a research objective to comprehensively measure whether university business students of Kazakhstan are acquiring the expected degree of creative skills during their coursework.

2. Literature review and theoretical framework

With an enhancing trend of global competition and a turbulent milieu, creativity is a *sine qua non* for any company's survival. The fusion of creativity and strategic thinking is no longer a novel business concept but a necessity because of the increasing trend of market expectations with total customer satisfaction. Whereas conventional business skills are vital for maintaining operations and managing resources, including creative skills in the business mindset can be the strategic pitch to unlocking innovation, fostering adaptability, and driving overall success. According to the Deloitte Insights report, companies' think tanks always consider creativity a force for growth, which becomes more complex due to rapid societal, technological, and economic changes (Singer & McCallum, 2023). Collis (2024), professor of practice at Thunderbird School of Global Management, United States, and programme director of the Sidney Poitier New American Film School at Arizona State University, United

States, stated that creativity and innovation are essential in business and emphasized that business is a place

“where you can take your wildest ideas and put business structures around them. Creativity will help bring it into reality in a way that delivers value for customers and sustains that business”.

Collis (2024) highlighted the benefits of creativity to any business as a tool for innovation and problem-solving, adaptability in a rapidly changing environment, effective communication and storytelling, employee engagement and collaboration, customer-centric approach, risk management, and decision-making. Creativity and innovation are widely recognized as core capabilities in dynamic, technology-driven environments, with creativity serving as a key antecedent to innovation and competitive advantage. Recent research highlights that extra-role creativity significantly enhances innovation outcomes, reinforcing its role in sustained organizational performance (Kottwitz et al., 2024). Moreover, creativity is increasingly viewed as a multidimensional competence encompassing cognitive, social, and technological dimensions, essential for problem-solving and adapting to rapid market and technological changes (Mirzaei et al., 2025; Amoozegar et al., 2025). In higher education, this has prompted a stronger emphasis on embedding creativity within pedagogical design to develop students' innovative and adaptive capabilities (Muñoz-Salinas et al., 2025). Accordingly, higher education institutions should systematically integrate the development of creativity across curricular and co-curricular frameworks to prepare graduates for complex and competitive global environments.

Against the above backdrop and the significance of creativity and innovation, the higher education system in every country has to review its existing curriculum (Kenesovna Jumasseitova et al., 2024) and determine whether it teaches the culture of creativity and innovation at an expected level of the corporate sector. The candid review of the kind confidently proffers comprehensive information on the current situation of the actions and activities of the higher education system in developing creative and innovative thinking among the students. For this reason, higher education institutions must assess or evaluate students' current knowledge-earning process in developing a creative approach. The investigators have initiated the current study to measure the Kazakhstan business students in the first phase based on the prominence and urgent need for creativity to start their profession or become an entrepreneur with a core intent to enhance business students' capability to agree with constant contests they look at the work atmosphere.

With a similar objective, many academics conducted studies and published their research in globally reputed and indexed journals. Chen Tsai and Cox (2012) conducted a creativity survey in the United States to examine business students' perceptions of creativity in general, creativity in schools, and the manifestation of creativity in their working environments. The survey results emphasized that most students believed in the need for creativity in the work environment, and many stated helplessness to stimulate creativity in their existing occupation positions. The learners also expressed some dissonance between their quantitative and qualitative responses concerning their ability to use their creativity in the work environment. Assessment has been a perplexing dilemma for creativity researchers over the years because

creativity research seeks to monitor and appraise uncommonly novel, innovative, and unusual things, be they products, ideas, or people (Silvia et al., 2012). Creativity assessment broadly sorts into a few categories of measurements: creative products, creative cognition, creative traits, and creative behaviour, and accomplishments (Kaufman et al., 2008). Most of the creativity assessment studies concentrated only on undergraduate students. Some authors (Snyder et al., 2019) comprehensively reviewed creativity measurement in undergraduate students from 1984 to 2013, which concluded with suggestions for forthcoming creativity research based on the outcomes. Another book chapter emphasized critical aspects related to the evaluation of creativity. Also, it defined technical matters to be well-thought-out by those concerned with making better use of the existing valuation apparatuses of creativity, gesturing their boundaries, potentials, and the protections that should be taken in both the application and explanation of their results (Soriano de Alencar et al., 2021). Some researchers extensively studied creativity measures using four dimensions – 1) person; 2) process; 3) product; 4) press – and direct or indirect student learning assessments. Conventionally, there is a severe consensus that institutions prove their academic excellence by highlighting their students' success, for which it is a must to document their students' learning. The higher education sector is alienated between those who back up traditional measurement tests to compare institutions' academic performance and those who believe that valid measurement of students' achievements is based on assessing the performance of students along and at the end of their academic tenure in the university.

Maki (2004) believed that evaluation must be humanized as it conflicts with standardized assessment, considering the demographics of institutes, as students do not all start at the same place in their learning and also need the tools to assess their progress. She stressed the significance of institutional evaluation within the perspective of a combined review of student learning with the support of faculty, staff, administrators, and campus leaders to identify and document the students' performance. Higher education institutions should introduce more than one measure of the variable(s) to be assessed because multiple measures enhance the ability to grab expected results. Researchers like Cropley (2000) and Zeng et al. (2011) posited and documented their research with differences in the sensitivity of measures for the same variable. Particularly, Cropley (2000) stressed that creativity tests should measure cognitive variables such as thinking differently, developing networking, creating and blending wide-ranging groups, or working on diverse ideas at a time along with noncognitive facets of creativity such as motivation (*e.g.*, instinct expression, desire for newness, risk-taking), and facilitatory personal possessions like tractability, open-mindedness for individualism, or progressive thoughts to differentness. One more exhilarating research highlighted that the development of creativity concerning economics, business administration, and management can be encouraged in diverse backgrounds, and involvements can differ, making it a flawless field for creating and innovating (Velez et al., 2024). The research study from Indonesia proposes to develop an entrepreneurial model to justify the formation of entrepreneurial behaviour, focusing on students' roles of creativity, passion, alertness, and entrepreneurial intention and proving that creativity plays a dominant role along with the remaining factors (Oktavio et al., 2023).

Barbot (2019) stated that creativity is not a static entity that progresses as people mature and can be trained and nurtured. Some academicians initiated creativity assessments based on divergent thinking, salient task attributes, and promoting new millennium education. The study was conducted with the support of computerized creativity assessment with a figure test (computerized creativity assessment with figure test) based on divergent thinking, which was fortified with an automated scoring system and built around a deep-learning-based semantic space model called *word2vec* (Sung et al., 2024). Weiss et al. (2024) discussed many creativity measurement taxonomies and identified a significant number of shortcomings, as well as 228 creativity measures that have appeared in the literature since 1900. They classified each measure according to their task attributes by two independent ratters. Another extensive research from Europe emphasized the didactic trials posed by the future of work, examining the new millennium skills, their conception, assessment, and valorization, which focused on crucial soft skill capabilities acknowledged as the 4Cs: creativity, critical thinking, collaboration, and communication (Thornhill-Miller et al., 2023). In its closing remarks, the same research highlighted massive opportunities for future research and new technologies such as artificial intelligence and virtual reality. Another comprehensive research from China highlighted that artificial intelligence implementation in higher education institutes significantly affects students' learning performance and creativity (Wang et al., 2023). A research study from Taiwan shows that creativity, innovation, entrepreneurship (CIE) education includes the ability to create and innovate in the curriculum planning goals. The CIE education spotlights the introduction of creative education courses, innovative themes, and entrepreneurial business models exclusively to enhance students' creativity, teamwork competence, creative intellectuality, and entrepreneurial spirit (Chou et al., 2023).

Every business student must realize the imperative situation of the emergence of creativity and innovation skills requirement, which are essential to continue their professional career or entrepreneurial intention. To grasp the essentiality of these two skills, the business students' community has to initiate efforts to acquire them by tapping curricula, co-curricular extra-curricula-based activities, and actions with a future orientation. Extensive research was conducted in the Eastern European country Poland to empirically verify the influence of creativity on students' entrepreneurial intentions, proving that creativity strengthens their entrepreneurial intentions to start their businesses (Wach & Bilan, 2023). A similar kind of research from Malaysia to study the operational connection between creativity-relevant processes, domain-relevant skills, innate task motivation, creativity, and the facilitating effect of social milieu (Emami et al., 2023) proved that the said factors above, except social environment significantly influence the university students' creativity. Many academicians have the chance to take up research related to educational stimuli of risk-taking and creativity to foster innovation. Their research can contribute to overcoming the challenges organizations face in the marketplace. The literature review-based article findings highlighted three focal groups of theoretical invention: 1) tools and techniques to increase creativity; 2) educational interventions towards innovativeness, and 3) antecedents of entrepreneurial activity (Graciano et al., 2023). Geer Hammershøj (2014), in his research article, highlighted social analytical theory in which creativity is the interplay of the sensuous forces

of imagination, transcendence, and judgment, which are essential to fostering creativity among students. Extensive research from Mexico to verify the implied impacts of creativity, the direct effect of the family business, and teacher creativity proved that the family business environment has a positive and teacher creativity has a negative and insignificant impact on raising entrepreneurial intentions of university business students (Valdez-Juárez & García Pérez-de-Lema, 2023). Another research exploring the role of entrepreneurial education, technology, and teachers' creativity in excelling in sustainable business competencies confirmed a significant association between these factors and entrepreneurial competencies (Tu & Akhter, 2023). Karunaratne and Calma (2024) presented the deficits and improvements essential for first-year business and economics students to improve their creative thinking skills. They assessed the respondents' creativity under three broad categories: 1) creative expression; 2) knowledge creation; and 3) creative problem-solving, and identified severe deficits in enhancing creative thinking skills.

Based on the extensive discussion above on the meaning and significance of creativity and its assessment among business students of higher education institutions in general and Kazakhstan, in particular, to continue their profession and entrepreneurial intent, the investigators selected only the following hypotheses.

2.1. Hypotheses selected

■ Hypothesis 1:

H1. The age of the Kazakhstan business students is the most influential factor in developing creativity;

H0. The age of the Kazakhstan business students is not the most influential factor in developing creativity.

■ Hypothesis 2:

H1. The gender of the Kazakhstan business students is the most prominent factor in acquiring creativity;

H0. The gender of the Kazakhstan business students is not the most prominent factor in acquiring creativity.

■ Hypothesis 3:

H1. Working students have more competent creativity skills than regular students;

H0. Regular students have more competent creativity skills than regular students.

■ Hypothesis 4:

H1. Studying Kazakhstan's higher education institutions' pedagogical business courses curriculum substantially improves creative research skills;

H0: Studying Kazakhstan's higher education institutions' pedagogical business courses curriculum does not substantially improve creative research skills.

■ Hypothesis 5:

H1. Kazakhstan higher education institutions' business curriculum confidently improves their students' creativity and innovation skills;

H0. Kazakhstan higher education institutions' business curriculum does not confidently improve their students' creativity and innovation skills.

3. Methodology

The present research is a descriptive study and gleaned data with a three-part self-administered and well-structured comprehensive questionnaire from 300 business students studying undergraduate and graduate courses from different higher education institutions in the city of Almaty. The all-inclusive three-part questionnaire consists of information about the demographic features of respondents as part one; the second part of the questionnaire, the investigators used the Kaufman domains of creativity scale; in the final part of the instrument consists of a closed-end question *are you satisfied with the curricular, co-curricular, and extra-curricular activities and actions introduced by your higher education institution to develop creativity skills?*. The well-thought-out questionnaire was then translated into local vernacular languages of Russian and Kazakh to provide crystal-clear clarity on every question in the instrument. The three forms of a well-organized questionnaire were uploaded to *Google Forms* to prepare a link, which was sent to local university business students by availing all sorts of communication methods, specifically social media. With the help of the first 20% of responses, the researchers employed McDonald's omega and Bartlett's tests to check the internal consistency and validity of the total 54 variables instrument. The researchers estimated the total population of around 3000 business students from the targeted city of Almaty and planned to study with a sample of 10%. Even though the investigators targeted more than 300, they received only 288 responses with complete answers. Only with the collected 288 responses did the scholars initiate the data-cleaning process before carrying the data into the statistical computing tool, *R* (programming language) in *RStudio*, after managing the vast data with *Microsoft Excel*.

For the comprehensive three-part questionnaire, the respondents replied to select one option with numbers in the given multiple options, like 1 = much less creative, 2 = less creative, 3 = neither more or less creative, 4 = more creative, and 5 = much more creative. After transforming the categorical data within each question, the dimensionality reduction technique, principal component analysis (PCA), was executed and engaged in linear dependence. The first principal component (PC1) explains the most variance spread in the data. In contrast, the principal component (PC10) expounds the most negligible variance created by the numerous categorical choices selected by the respondents. Hence, each selected PC1 for each of the six questions was further analyzed to prove or disprove the created hypothesis in this research (Zheng & Casari, 2018). Then, the selected five hypotheses were tested by executing Cochran's Q test.

4. Results and discussion

The results and discussion part of the article emphasized the subjects' demographic profile, the instrument's reliability and validity, the testing of the selected five hypotheses, and a thorough discussion on the creativity levels of the Kazakhstan business students.

4.1. Demographic profile of the respondents

Table 1 posited the demographic features of the respondents like the age, gender, and category of students (only-student, students with employment).

Table 1. Demographic profile of the respondents (N (number) = 288) (source: created by authors)

| No. | Demographic feature | | Students (in figures) | Students (in percentage) |
|-----|---------------------|--------------------------|--------------------------|-----------------------------|
| 1 | Age | 17–20 | 182 | 63.19 |
| | | 21–25 | 92 | 31.95 |
| | | 26–30 | 07 | 02.43 |
| | | 31–45 | 07 | 02.43 |
| | | Total | 288 | 100.00% |
| 2 | Gender | Male | 87 | 30.21 |
| | | Female | 201 | 69.79 |
| | | Total | 288 | 100.00% |
| 3 | Student category | Regular students | 209 | 72.57 |
| | | Students with employment | 79 | 27.43 |
| | | Total | 288 | 100.00% |

4.2. Reliability and validity of the questionnaire

The investigators initiated the reliability and validity of the questionnaire after collecting the first 20% sample. They proved that the questionnaire was reliable, had poised internal consistency, and planned to select the best tests before collecting the data from the chosen sample. The scholars checked the questionnaire's validity and reliability by administering the McDonald omega and Bartlett's tests of sphericity. The scholars assessed the reliability and validity of the questionnaire exclusively designed to know the opinions of Kazakhstan business students studying in higher educational institutions in the city of Almaty. McDonald's omega test was created using a factor analytic approach primarily grounded in the correlation between the questions. Omega has been demonstrated to be more vital than alpha against variations from the prospects stated for the study. It will thus predominantly be a more appropriate measure of internal consistency (Stensen & Lydersen, 2022). The variance between alpha and omega will be sensible, though it can also be significant and provisional based on the size of the variances from the hypotheses (Yang & Green, 2011). Related to alpha, McDonald's omega test has a value between 0 and 1, and the internal consistency of the questionnaire is commonly believed appropriate if the evaluation is 0.70 or higher (McNeish, 2018). Revelle and Zinbarg (2009) persuaded and verified that omega performs a more accurate calculation of a scale's reliability and that omega is relatively higher. As mentioned in Table 2, the McDonald's omega test value is 0.693 for the chosen questionnaire, which has 50 variables, and Bartlett's test of sphericity's differential value is 126.

Table 2. Reliability and validity of the questionnaire (source: created by authors)

| Dataset variables | McDonald's omega test | Bartlett's test | |
|-------------------|-----------------------|------------------|-----|
| 50 | 0.693 | Difference value | 126 |

4.3. Dimensionality reduction method: principal component analysis

Table 3 highlights a sample of 10 records of a total of 288 data records and vertical columns reduced from 50 to 10 by executing the dimensionality reduction technique. PCA was executed to evaluate the 50 factors together. The analyzed resulting factors from the PCA reduced the dimensions from 50 Likert scale variables to only 10. Out of the attained 50 dimensions from PCA, 10 together cover more than 90% of the total variance. In the vertical columns, which were reduced to 10, the PC1 contributed significantly to the variance (70%) observed with the PC1 in the initial 50 variables, gleaned with the questionnaire’s support. However, 10 principal components (PC1 to PC10) were considered for analysis to increase the accuracy and meaningfulness of the hypotheses testing. These 10 principal components cover more than 90% of the variance observed from the analysis of the initial 50 variables.

Table 3. Principal component analysis (PCA): results from the PCA statistical analysis (source: created by authors)

| Re-cords | Principal component 1 | Principal component 2 | Principal component 3 | Principal component 4 | Principal component 5 | Principal component 6 | Principal component 7 | Principal component 8 | Principal component 9 | Principal component 10 |
|----------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|
| 1 | -7.56305 4737 | 0.7925 0247 | 0.56488 0191 | -1.79057 0609 | 1.832258 8502 | 0.53377 1925 | 0.4297630140 | -0.98987 6089 | -1.107506 e**+00 | 0.7279 2112 |
| 2 | -3.46534 0558 | -0.2792 7968 | -3.49105 3486 | -0.45675 1298 | -1.164515 8247 | 2.14989 6358 | 2.3643011231 | 0.45473 4970 | -7.775578 e-01 | 0.5653 0600 |
| 3 | 2.90987 0344 | -1.1540 5404 | -0.68505 7336 | 0.39185 8244 | 1.329273 7638 | 0.06174 5300 | 3.1004319499 | -0.34841 8599 | -1.462395 e+00 | 0.2206 8068 |
| 4 | 0.26162 7016 | 1.0282 8603 | 0.28939 3496 | 4.27143 6281 | 0.193395 5952 | -0.50133 1003 | 0.4636506168 | -1.08642 2506 | 1.602068 e+00 | -0.2357 6244 |
| 5 | -1.88900 4802 | -1.1776 2022 | -3.72291 6367 | 3.69610 5447 | 2.047154 2527 | -0.37344 6894 | 2.0871084586 | 0.44941 5460 | -1.736144 e+00 | 1.3579 0698 |
| 6 | 4.29667 0937 | -0.1905 3321 | -0.19561 4250 | 0.48570 9700 | 0.166341 2890 | 2.04282 9541 | 1.7833527877 | -0.27381 6095 | -1.512849 e+00 | -0.8827 9255 |
| 7 | -0.96126 1771 | 0.0461 1743 | -0.57094 9062 | -0.14176 2610 | -0.870274 8007 | -1.07710 1018 | 0.0825680632 | -0.27858 9658 | -4.174239 e-01 | -0.7361 6639 |
| 8 | -1.74550 2650 | 3.8821 1602 | 0.06331 7719 | -0.04030 4123 | 0.500947 5872 | 2.10858 1933 | 1.2256382472 | -0.96625 7279 | 1.635735 e+00 | 0.7348 4557 |
| 9 | 2.34370 6019 | -7.3476 0341 | -0.87881 3477 | -0.63345 8412 | -1.245827 4038 | -1.39429 2368 | 0.6056499048 | -0.96119 3891 | -1.489573 e-01 | -2.6887 6153 |
| 10 | 1.29447 9120 | -1.5025 7966 | 1.47848 6194 | -1.98542 6999 | 1.515808 7216 | -1.07960 3659 | 0.6278176807 | 1.22100 1079 | -1.847875 e-01 | -0.7838 1174 |

Note: *e – exponent.

4.4. Testing of hypotheses with Cochran’s Q test

Cochran’s Q test is a non-parametric way to discover differences in matched sets of three or more frequencies or proportions, which the investigators selected to validate the five chosen hypotheses. It is an addition of the McNemar’s test; the two tests are identical if Cochran’s Q test is calculated for two groups. The null proposition for Cochran’s Q test is that the comparison of “successes” is equal for all groups. The alternate hypothesis is that the proportion

differs for at least one cluster. The null assumption is rejected when the calculated Q critical value exceeds a critical chi-squared value (Statistics How To, 2026). Table 4 shows the five selected hypotheses (alternative and null) with proportionality test results and interpretation concerning their validity or invalidity.

Table 4. Testing of hypotheses (source: created by authors)

| Hypothesis no. (dataset) | Null and alternative hypotheses (H1 and H0) | Proportionality test result | Interpretation |
|--------------------------|---|--|---|
| 1 | H1. The age of the Kazakhstan business students is the most influential factor in developing creativity. H0. The age of the Kazakhstan business students is not the most influential factor in developing creativity. | Cochran's Q test value: 9.5474; q-value (statistics): 0.7213. | Since the q-value is not statistically significant (> 0.05), the null hypothesis (H0) failed to be rejected. Thus, the age of Kazakhstan business students is not the most influential factor in developing creativity. |
| 2 | H1. The gender of the Kazakhstan business students is the most prominent factor in acquiring creativity. H0. The gender of the Kazakhstan business students is not the most prominent factor in acquiring creativity. | Cochran's Q test value: 5.2478; q-value: 0.0487. | Since the q-value is statistically significant (< 0.05), the null hypothesis (H0) is rejected. Therefore, the gender of Kazakhstan business students is the most prominent factor in acquiring creativity. |
| 3 | H1. Working students have more competent creativity skills than regular students. H0. Regular students have more competent creativity skills than regular students. | Cochran's Q test value: 15.6472; q-value: 0.9516. | Since the q-value is not statistically significant (> 0.05), the null hypothesis (H0) failed to be rejected. Thus, regular students have more competent creativity skills than students involved in employment. |
| 4 | H1. Studying Kazakhstan's higher education institutions' pedagogical business courses curriculum substantially improves creative research skills. H0. Studying Kazakhstan's higher education institutions' pedagogical business courses curricula does not substantially improve creative research skills. | Cochran's Q test value: 7.6421; q-value: 0.0486. | Since the q-value is statistically significant (< 0.05), the null hypothesis (H0) is rejected. Accordingly, studying Kazakhstan's higher education institutions' pedagogical business courses curriculum improves creative research skills. |

End of Table 4

| Hypothesis no. (dataset) | Null and alternative hypotheses (H1 and H0) | Proportionality test result | Interpretation |
|--------------------------|--|---|---|
| 5 | H1. Kazakhstan higher education institutions' business curriculum confidently improves their students' creativity and innovation skills. | Cochran's Q test value: 4.8761; q -value: 0.0287. | Since the p -value is statistically significant (< 0.05), the null hypothesis (H0) is rejected. Hence, Kazakhstan higher education institutions' business curriculum confidently improves their students' creativity and innovation skills. |
| | H0. Kazakhstan higher education institutions' business curriculum does not confidently improve their students' creativity and innovation skills. | | |

Table 4 emphasized that the Kazakhstan higher education institutions' business students' age and regular students do not significantly influence acquiring creativity with the academic programmes they have taken, with q -values of 0.7213 (hypothesis 1) and 0.9516 (hypothesis 3). The age of the business students does not affect their creativity earning activity because most students treat the activity as a unique feature of an individual, which can be enhanced by acquiring conceptual, technical, human, and diagnostic dexterities with the regular curriculum by thinking differently. Concerning hypothesis 3, working students have identified notable limitations in developing creative skills beyond the regular lines because of heavy work stress compared to non-working business students. Kazakhstan business students regularly working odd shifts have identified a persistent failure in balancing their work and student responsibilities. Associated with hypothesis 2 Cochran's Q test value of 5.2478 and q -value of 0.0487, the gender of business students substantially influences the creative skill development process because female students mainly concentrate on the curriculum with great dedication and commitment, which leads to gaining confident knowledge based on which these are developing competent creativity and innovation skills. The researchers obtained this information using two sources. One source, during their regular classes, female students expressed the kind of information, and the second one is while collecting the opinions through questionnaires, we had the opportunity to have an information discussion with some female students who expressed the above views on gaining creativity and innovative skills. Related to hypotheses 4 and 5 with q -values 0.0486 and 0.0287, there would be an outstanding possibility to acquire creative research, creativity, and innovative skills by studying the pedagogical curriculum introduced by Kazakhstan higher education institutions. The undergraduate and graduate business programmes curriculum substantially and comprehensively covers and delivers the required knowledge to enhance business students' managerial and operational functional understanding of business and research and creative and innovative skills by introducing various courses in different programmes. For the closed-end question on the satisfaction levels of a business programme curriculum, co-curricular, and extra-curricular activities of Kazakhstan higher education institutions, 88% of students

expressed their contentment over the programme-specific activities to improve their creativity and innovative skills and expected specific improvements taken into the consideration of uncertainty conditions prevailing in domestic and international markets, and developments taking place in the way of doing business in the current highly volatile macro-environmental influence situations. The remaining 12% of business students who participated in the survey posited their discontented views with their information discussion on swift global orientations in improving the curriculum, uniform, and quality deliverables from all faculty, pragmatic approaches based on domestic and international orientations.

5. Practical implications

The current research outcome proffers invaluable inputs to Kazakhstan higher education institutions to review their current business curriculum to increase competent creativity and innovation skills, which are imperative for students to survive in their professional and entrepreneurial intent. At the same time, the study also offers students to recognize their current level of performance both academically and creatively. The government mechanism has an excellent opportunity to review its plans, policies, programmes, procedures, strategies, and budgets by observing the outcomes of this study to introduce necessary guidance to upgrade their higher education institutions pedagogical structures based on the exact expectations of the Kazakhstan students and their parents to survive in their professions and to satisfy their entrepreneurial intentions. The study is also helpful to business programme faculty, administrators, researchers, and even the corporate sector to know about the current level of gratification of business students in gaining creativity and innovation skills. The article demonstrates that in higher education, creativity is considered an integrative property, the vital features of which are the aptitude to harvest original ideas, outcome orientation, solution of practical problems, uniqueness and pace of discerning, candidness to new experience, and tolerance for uncertainty, which is the one of the core responsibility of higher education institutions in any country. The authors have identified the creativity-enhancing factors, conditions, and levels of the creative development process of Kazakhstan business discipline students. The scholars of the current researchers also identified that the defining contribution to the development of business students' creativity is applying a comprehensive, systemic concept with the support of knowledge transfer activities initiated by the higher education institutions with their curricular, co-curricular, and extra-curricular actions and activities in Kazakhstan. The current study is the first to exclusively study the Kazakhstan business students' creativity assessment, which offers a valid base and authenticity to academia.

6. Conclusions, limitations, and scope for further research

In conclusions, creativity is a vital skill essential to every student in general and the business students' community in particular because of the more application orientation of the learned courses by executing their creative and innovative thinking skills. In an informal discussion with most of the business students, the scholars identified some discontentment with the deliverables of the designed curriculum by some faculty members who have identified

impediments in delivering their best because of their inexperience, lack of proper competent knowledge, research orientation, pragmatic approach with timely execution skills. Even though some demographic features, like age and working students, have identified specific challenges in developing creativity with the business curriculum introduced by higher institutions, with the introduction of a practical case study-oriented co-curricular and extra-curricular activities, business schools persistently supporting those students in improving their creativity and innovative skills. However, Kazakhstan's higher institutions' business students expressed their satisfaction with their curriculum based on the global changes; business schools should incessantly upgrade their current programme's curriculum and introduce new courses and programmes that enhance their students' creativity.

The present study has specific limitations. First, the current study covers only higher education institutions from the country's largest city, Almaty. It does not consider the opinions of business students of other Kazakhstan institutes in different parts of the large country. Secondly, the current research concentrated on knowing the creativity levels of only business students and did not consider other discipline students' opinions. The third limitation is that the current study was completed with only 288 samples, which is very meager, and there is the possibility of extending the survey to a considerably larger sample to get more valid results. Finally, Kazakhstan's higher education institutions and business programme students only studied and were never regarded as other institutes like secondary schools, separate business schools, training institutes, business consultancies, etc. There would be an immense scope for further research with a substantially sizable sample by considering students' opinions from the entire country. There will be a possibility of covering the views of separate business schools, training institutions, and secondary school students for further study extension and a mammoth scope to conduct similar research with other branches of students like engineering, other sciences, and social science students of the entire country.

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