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DOI: https://doi.org/10.32626/2309-9763.2023-75-83
УДК 37.01

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CHALLENGES IN CREATIVITY DEFINITION AND MEASUREMENT: EDUCATIONAL IMPLICATIONS

Abstract. The article examines the complex nature of creativity with the goal to project implications for educational settings, starting from its historical evolution, and the challenges associated with its definition and measurement. The study aims at reviewing the main approaches to defining the concept of creativity with a particular focus on educational settings application. Creativity, once attributed to divine sources, is now recognized as a multifaceted human capacity encompassing cognitive, conative, and environmental factors. The research spans various definitions and assessments, including personality and biographical inventories, behavioral tests, and both objective and subjective evaluations of creative outputs. Creativity theories are highlighted, emphasizing creativity's presence across multiple domains. Despite the plethora of testing methods, the paper critiques the dichotomous view of creativity as

simply present or absent, advocating for a nuanced understanding that encompasses its varied degrees and dimensions. The study further stresses the importance of considering individual traits and contextual factors as part of a dynamic interplay that influences creativity. For educators, these findings underscore the need for professional development that addresses the broad scope of creative competencies, encouraging a holistic approach to fostering creativity in students. The paper concludes with recommendations for developing clear operational definitions for creativity that can lead to more consistent and reliable assessments within educational research and practice.

Key words: creativity; creativity measurement; process-oriented person oriented and product-oriented approaches to creativity; education; personality tests; biographical inventories; behavioral assessments.

1. INTRODUCTION

Teacher creativity is an essential facet of education, fostering innovative teaching methods and encouraging student creativity [5]. However, the research on this topic faces challenges, definitional disagreements, and presents diverse findings, ranging from the development of children's creativity in education to the debate on the methods of assessing creativity. First, the attempts to define the concept fail to apply commonly accepted approaches or the criteria further used in assessing or measuring creativity in persons of various age groups, though unanimously emphasizing the importance of recognizing and nurturing it from an early age. The ambiguity stems from whether creativity should be identified with specific features of a product, person or thought processes, or whether it should be defined by the observer's response to a product, person or thought processes. In most publications creativity is portrayed as a complex, multifaceted construct that includes cognitive, conative, and environmental factors. Assessing creativity poses its own set of challenges. Traditional methods include personality inventories, biographical inventories, and behavioral tests. Each of these methods aims to capture different facets of creative personality and behavior. This complexity suggests that fostering creativity in teachers requires a comprehensive approach that considers various aspects of their professional preparation and development.

2. AIM AND TASKS

The study **aims** at reviewing the main approaches to defining the concept of creativity with a particular focus on educational settings application. The research methods of historical and conceptual analysis of approaches applied to creativity definition, generalization, and systematization of the obtained data in relation to the study of creativity measurement have been used.

https://doi.org/10.32626/2309-9763.2023-35

3. RESEARCH FINDINGS

Approaches to the definition of creativity

Historically, creativity was associated with divinity and myth, not considered a human act, as in Greek mythology with the Muses [2, p. 5]. During the Renaissance, creativity began to be seen as a human act, but still with divine or spiritual connotations [2, p. 6].

The formal studies treating creativity as the subject of research debate (evolving with the emergence of statistical methods) can be classified according to the approaches to defining this concept: *process, person, and product approaches*.

Early definitions focused on *the creative process* itself, with notable contributions from Watson, Koestler, and cognitive and Gestalt psychologists, emphasizing thought processes (cognitive processes) and problem-solving as central to creativity (suggesting that creativity involves restructuring a problem to see it in a different light, exploration, analysis, and sometimes sudden insight or trial-and-error sequences), often deriving creative thinking from Piagetian transformations [3, p. 18].

Koestler, for example, having introduced the concept of "bisociative process" which was claimed to combine unrelated ideas to produce new insights, suggested that creativity doesn't just come from random ideas. Instead, he believed it's about purposefully connecting two unrelated ideas or "matrices of thought" to come up with something new and insightful. He explained that this involves shifting our focus to notice things we didn't see before—things that were irrelevant in the old context but are important in the new one. By doing so, we can find hidden similarities that lead to creative discoveries [10, p. 119].

The person approach (typical of humanistic psychology) emphasized creativity as a significant individual asset, contributing to the understanding of self-actualizing personalities. This approach defines creativity by focusing on the individual and has been the implicit basis for the majority of practical research studies on creativity [13]. It focuses on self-report questionnaires that inquire about personality traits related to creativity, focusing on behavioral traits like aptitudes, interests, attitudes, and temperamental qualities: attraction to complexity, high energy, behavioral flexibility, intuition, emotional variability, self-esteem, risk-taking, perseverance, independence, introversion, social poise, and tolerance to ambiguity. These traits are considered indicative of an individual's potential to act creatively.

Although creativity research has often implicitly focused on the individual, the explicit definitions tend to highlight *the creative product* as the hallmark of creativity. For instance, P. Jackson and S. Messick [9] argued that creative products provoke specific aesthetic reactions in people, such as surprise, pleasure, inspiration, and a sense of depth. In a similar vein, T. Amabile [3] emphasized the impact that creative products have on observers, considering a creative product to be anything that evokes surprise signaling the elements of novelty and suitability in a creative product. The product-based approach highlights the possibility of measurement of creativity products and entails having experts assess the creativity shown in a person's work across various fields such as literature, art, music, science, or math. One widely employed technique is the Consensual Assessment Technique (CAT), in which domain-specific experts review and rate the creative works. The strength of this

approach lies in the specialized knowledge of the evaluators, rather than on any single theory of creativity, to determine the value of the creative contributions.

It can be summarized that previous research on creativity suggests that it was viewed as the concept of dichotomous nature, therefore, considered to be a characteristic that falls into one of two distinct categories – it is either present or absent (first implicitly proposed by J. Guilford [7], who was believed to have triggered a significant impetus to the psychological discussion on creativity in his address to the American Psychological Association), and then implicitly worded by B. Ghiselin [6, p. 37]: "This quality of uniqueness, recognizable and definable, either is present in full force or is absent entirely". In statistical terms, a dichotomous variable is one that has only two possible values. When applied to creativity, this means that there's no spectrum or range of creativity considered; rather, an individual's or product's creativity is evaluated in binary terms: creative or not creative. We believe this to be a simplified view which does not take into account the varying degrees and dimensions of creativity that are now the focus of academic attention. Furthermore, various theorists propose that creativity comes in multiple forms, such as in science, music, art, and language. This concept is a fundamental element of theories as varied as Koestler's (1964) theory of bisociation in creativity and J. Guilford's [8] theory of the structure of intellect.

After World War II, creativity gained significant attention as psychology expanded into new subfields. This era saw the development of new measurement strategies and statistical analyses for studying creativity. Advances in quantitative methods, especially psychometrics and historiometrics, enabled a deeper understanding of creativity. Psychometrics involved directly assessing creative thought processes, while historiometrics used historical data to study creative geniuses.

The review of creativity definition approaches demonstrates the evolution of the understanding and study of creativity, influenced by various psychological schools and methodologies. It reflects a shift from viewing creativity as a divine or mystical phenomenon to understanding it as a complex cognitive process amenable to scientific study.

More recent studies on creativity, especially in educational contexts, focus on the dynamic interplay between affective, cognitive, and contextual aspects in defining the concept. For example, T. Lubart & B. Barbot [4; 11], view creativity as a key XXI-century skill, defining it as a confluence of various resources such as intelligence, knowledge, cognitive style, personality, motivation, affect, and socio-cultural environmental contexts, at the same time, denying it to be a mere sum of individual components but an interactive ensemble of person-centered and context-centered factors.

Creativity measurement

The majority of practical research on creativity utilizes one of three main evaluation methods:

1) the focus on an objective examination of creative outputs;

2) the subjective evaluations to determine the creativity of products or individuals;

3) administering creativity tests, which are structured and conducted in a manner similar to traditional intelligence tests, with the latter being considered as the most common modes of creativity measurement.

Creativity tests are a primary tool in empirical studies of creativity and they are generally categorized into three types: *personality tests, biographical inventories, and behavioral assessments*.

Personality tests include both traditional inventories modified to include "creativity scales" and those designed specifically to identify traits of creative individuals. For instance, Gough's Creative Personality Scale for the Adjective Check List [17] distinguishes more creative from less creative individuals using 30 adjectives. Other tests like Torrance and Khatena's "What Kind of Person Are You?" use a forced-choice format to assess creativity [16].

Biographical inventories (initially created based on intuition and later refined) form the second type of assessment and involve the collection of extensive personal history data. They look at a range of factors from family background to personal interests and have been used to discern patterns in highly creative individuals, such as preferences for certain academic fields, social behaviors, and childhood environments.

Behavioral tests are similar to traditional intelligence tests and typically involve a series of tasks that are scored based on criteria like fluency, flexibility, originality, and elaboration. The Torrance Tests of Creative Thinking (TTCT) are the most recognized in this category, requiring various forms of responses and measured by the ability to produce unusual and clever ideas [1]. These tests are divided into nonverbal, verbal with nonverbal stimuli, and verbal with verbal stimuli, each assessing different creative components.

Despite their popularity, the use of creativity tests has been critiqued. They can be influenced by social and environmental factors and may not capture the full complexity of creativity. For instance, test scores can be affected by how the tests are introduced to the participants and the conditions under which they are administered. While creativity tests can provide insight into individual differences in creative abilities and attitudes, their validity and application in research have limitations. They are not universally indicative of creativity and should be interpreted with caution, particularly when used to understand the social and environmental influences on creative performance.

The objective analysis of creative products is a less commonly used method of assessing creativity, which involves the quantification of the intrinsic qualities of a product. Despite the scarcity of research in this area, one notable study by D. Simonton [14] managed to objectively quantify originality in musical compositions by analyzing the rarity of note transitions within a large sample of classical themes. This method's precision and objectivity are commendable; however, its limitations include the difficulty of application to less quantifiable domains and the inability to differentiate between truly creative works and those that are simply unusual. Simonton himself suggests that originality must be balanced with acceptability, acknowledging that the value or appropriateness of a creative product must also be considered, leading to the conclusion that a purely objective analysis is insufficient for fully assessing creativity without some form of subjective evaluation.

Subjective assessments of creativity, though less common than creativity tests, involve evaluating the creative worth of individuals or their products based on the opinions of experts or historical eminence. For instance, D. MacKinnon's study [12] on architects and R. S. Sobel and A. Rothenberg's study [15] on artists used expert panels to assess creativity based on definitions and criteria specific to their domains. However, the reliability of subjective

judgments is questionable due to potential bias and lack of a clear operational definition of creativity. This approach often conflates creativity with other qualities like technical skill or aesthetics and tends to emphasize stable, individual differences over situational influences, thus limiting its usefulness in social psychological research. The need for operational definitions that can be empirically tested, alongside conceptual definitions for theoretical understanding, is highlighted as a crucial step in improving the assessment of creativity.

4. CONCLUSIONS AND PROSPECTS FOR FURTHER RESEARCH

The study of teacher creativity in education is crucial for promoting innovative teaching and nurturing student creativity. Yet, the field grapples with how to define and assess creativity, revealing a spectrum from individual traits to the impact of creative products. Historically seen as a divine trait, creativity has transitioned to a concept embodied by humans, enriched by cognitive processes, and influenced by both the creator and the observer's reaction. Traditional assessment methods like personality and biographical inventories, along with behavioral tests, aim to capture the various dimensions of creativity, emphasizing its multifaceted nature.

In the educational context, these insights underline the necessity for teachers to have multifaceted professional development to nurture creativity effectively. The historical perception of creativity as dichotomous, either present or absent, is challenged by the current understanding that acknowledges creativity's various degrees and dimensions. Theories like Koestler's bisociative process and Guilford's structure of intellect theory suggest that creativity manifests in multiple forms and contexts.

With psychology branching into new subfields, creativity became a significant focus, leading to advanced measurement techniques and a deeper understanding of creativity through psychometrics and historiometrics. Contemporary views in education consider creativity as an interactive amalgamation of individual and contextual factors, not just the sum of separate elements. These perspectives argue for the importance of a dynamic and holistic approach to creativity in education, considering affective, cognitive, and environmental aspects essential for the 21st-century learning landscape. Educators are thus encouraged to adopt a broad approach that includes fostering cognitive skills, personality development, and creating conducive environments, aiming to cultivate a well-rounded creative competence in students.

The discussion of research on creativity measurement suggests that in educational settings, there is a need for clearcut understanding of the challenges with creativity measurement calling for a balanced assessment strategies that consider both the intrinsic qualities of creative work and the personal attributes of the creator. It highlights the importance of developing clear operational definitions that can guide the measurement of creativity in a consistent, reliable manner. Educators should be cautious about over-relying on standardized tests and consider the context in which creativity is demonstrated, ensuring that assessments are sensitive to the nuances of creative expression and thought. Additionally, fostering an environment that encourages diverse forms of creative output and recognizes the subjective nature of creativity may be beneficial for a more holistic evaluation of a student's creative abilities.

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https://doi.org/10.32626/2309-9763.2023-35

ВИКЛИКИ У ВИЗНАЧЕННІ ТА ВИМІРЮВАННІ КРЕАТИВНОСТІ: ОСВІТНІЙ КОНТЕКСТ

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Анотація. У статті розглядається складна сутність креативності з метою спрогнозувати перспективи для освітнього середовища, починаючи з історичної еволюції поняття та викликів, пов'язаних з його визначенням та вимірюванням. Креативність, яку колись приписували божественним істотам, тепер визнається багатогранною людською здатністю, яка охоплює когнітивні, природні та середовищні чинники. Дослідження охоплює різні визначення та способи оцінювання креативності, в тому числі описи особистості та біографії, поведінкові тести, а також об'єктивні та суб'єктивні оцінки творчих результатів. Виділено теорії креативності, підкреслюючи її застосування в багатьох сферах. Незважаючи на безліч методів тестування, у статті критикується дихотомічний погляд на креативність, тобто її наявність чи відсутність, наголошуючи на розумінні різноманітних рівнів та вимірів. Дослідження також підкреслює важливість розгляду індивідуальних рис і контекстуальних чинників як частини динамічної взаємодії, яка впливає на креативність. Для педагогів ці висновки підкреслюють необхідність професійного розвитку, який стосується широкого спектру творчих компетенцій, заохочуючи цілісний підхід до формування і розвитку креативності в учнів. Статтю завершують рекомендації щодо розробки чітких операційних визначень креативності, які сприятимуть більш послідовному та надійному оцінюванню в освітній теорії і практиці.

Ключові слова: креативність; вимірювання креативності; процесно-орієнтований, особистісно-орієнтований та продукто-орієнтований підходи до креативності; освіта; особистісні тести; біографічні описи та поведінкові оцінки.

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