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Gender and Semester-Based Variations in Creativity: Evidence from Young Adult Students

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Abstract

In this study, the differences in the creative trait motivation were explored among the undergraduate students in regard to their gender and semester levels. A sample of 200 respondents was chosen in this cross-sectional study at the University of Gujrat to fill demographic details and Creative Trait Motivation Scale. The results of independent samples t-test showed that female students were significantly more motivated to be creative as compared to male students. The outcome of one-way ANOVA further showed that there was a significant difference in semester levels and the creative motivation increased gradually between semesters. The greatest source of creative motivation was seen in the case of senior students, the present results indicate that academic life and learning was a critical aspect in the development of the creative skills. It means that the gender and academic progression are important predictors of their creativity among young adults. This is reminiscent of the significance of a positive learning context, instructor-focused instruction, and mentorship activities that also add to and reinforce creative involvement during the course of university education.

Keywords: Gender difference, Semester –based Variations, Creativity Thinking, Creativity, Graduated Student.

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Introduction

Numerous biological, psychological and contextual factors such as personality, previous learning experiences, and horticultural expectations among others determine creativity. Nonetheless, the current research is narrowing down to the two factors, gender and semester level of study as predictors of creative thinking among young adult university students. People are highly motivated to be creative in their thoughts, explore new ideas, and continue working on innovative tasks, no matter the situation. This is referred to as creative trait motivation. It demonstrates a tendency to inspiration on a long-term basis, but not a creative state on the short-term level. (Ahmed, 2025) Highly creative motivated people constantly avoid repetitive tasks, activities, and course topics, and they can think outside the box. It is also linked to productivity, flexibility, and health, which is good to the individual as a member of this institution (Matud et al., 2007).

Creativity

The definition of creativity as the capacity to generate new ideas, products, or solutions, which can be valuable and novel, is given in (Gluck et al., 2002). The authors underline that creativity is extremely situational. Creative qualities that characterize a creative person are also different in accordance with the sphere of activity and constraints that a person may face. The individuals understand creativity in various ways, and it is either free painting or restricted, as in architecture. Simply put, we can describe creativity as a quality to come up with a new and meaningful idea or solution (Al-Ababneh, 2020). In various theories and models, the two qualities have been the fundamental cornerstone of the thing that makes something creative. Although such other attributes as surprise, authenticity, or quality could be involved in the manifestation of creativity, they are not compulsory. The common consensus in the literature is that the notion of creativity entails the creation of something that is novel and purposeful (Green et al., 2024).

Types of Creativity

Artistic or Free Creativity is creativity is that of individuals who have much freedom in terms of choice of subject matter, materials, style and timing. They include painters and sculptors. It is generally taken as a tedious and premeditated act, as opposed to a spontaneous one.

Constrained or Professional Creativity is in areas where the work is constrained or limited by specific requirements, like architecture or graphic design. It is in this instance that creativity is directed rather at problem solving, productive results, and working within the limitations that are compelled by the external environment. It is usually measured by the achievement of set objectives, time limits or consumer satisfaction. Implicit or Contextual Creativity reflects on the fact that various individuals have contrasting definitions of creativity, as far as their respective field is concerned. According to this opinion, creativity has been limited to the same entity. Instead, it is dictated by demands, opportunity and freedoms associated with the specific situation in which one operates.

Divergent creativity merely involves the capability to arrive at a very large range of possible thought, options or solutions to a problem. Initial studies by Guilford had already determined that divergent thinking is the fundamental element of creativity with the top abilities being producing a high number of ideas at a short time, fluency, perspective shifting with ease and developing a new idea (originality). As it was later established in a study conducted by Finke et al., 1992, the same kind of thinking is further supported by the

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fact that people can pursue various avenues successfully in the creative problem solving process.

Therapeutic support facilitates to open individual creative potential by strengthening their faith in their capacity to produce creative outcomes. Tierney and Farmer (2002), in their study, developed a theory of creative self-efficacy that is the belief in the ability to be creative and this belief according to Bandura, is a consistent predictor of creative performance. Their research indicates that this self-efficacy is increased by such supportive means as positive feedback, encouragement, and chances to be engaged in creative projects. This increase, in turn, causes a high level of motivation and increases creative outcomes. The support system (e.g., counseling, mentorship, guided thoughts) assist people in developing confidence and inner strength that make their creative confidence firm. This process aligns with the principles of self-efficacy theory which stipulates that the empowerment of self-belief may directly affect the actions, the resilience and the achievements of a person. As Bandura pointed out, people accomplish their goals through innovation when they have a stronger belief in their abilities and the self-efficacy has an effect on the way people think, feel and behave during stressful circumstances (Bandura, 1997).

Research has shown that the fulfillment of the three inherent psychological needs, which are autonomy, competence, and relatedness stimulates human well-being and optimum performance according to the Self-Determination Theory (Deci and Ryan, 2000). It is this that leads to intrinsic motivation which has been deemed to be a very important driver to creativity (Rafique at al, 2022). People who are intrinsically motivated are more likely to be exploratory, take risks intellectually and stick to ambiguous activities. This can be utilized by education and therapeutic environments through providing an environment that fosters autonomy, competency, and relatedness, such as through offering choice, nurturing professional skills, and giving encouraging feedback. The motivation of creative work and its outcomes is directly increased by the support of these human needs (Ryan and Deci, 2017). SDT would be practical in evaluating the interdependence of gender and semesters in creativity because the academic environment alters with varying challenges and opportunities that satisfy these core human needs in dissimilar ways. Some practical applications of SDT-like methods of teaching that facilitate student autonomy, scaffold-based instructional techniques have so far resulted in an amplified student involvement in creative activities (Gagné and Deci, 2005).

Gender Base Creativity

Students are different in their backgrounds, motivation, learning attitudes and reaction to classroom settings, therefore research in the area of creativity is particularly significant to education. Gender difference in creativity is one of the multifaceted and trending topics, where researchers are struggling to explain why women are still underrepresented in most creative and technical disciplines. Recognition of this issue, its reasons usually misinterpreted, and girls and women are still underrepresented in such fields as science and technology. Thus, to enhance learning practices, it is necessary to study the aspects of diversity in the creative thought (Potur and Barkul, 2009). Gender differences in creativity is the manner in which men and women can vary in their creative performances, expressiveness and results of different tasks, activities, and developmental stages. Studies of this subject have given contradictory findings: some studies demonstrate the advantage of males in some domains, and the other studies have established that females are better

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than males especially in verbal or divergent thinking. These results indicate that gender variations in creativity are a complicated issue that is influenced by cognitive style, socialization, education experience, and nature of creative activity. In general, creativity is not always gender-specific and depends on the situation and type of the task (Ülger and Morsuenbuel, 2016).

Semester-Based Creativity

Another important factor is academic progression which is normally determined by year or semester the student is undertaking their studies. As students proceed in their university studies, they get subject matter type of knowledge, think with more cognitive maturity, and they grow more conversant with academic procedures, all of which may affect their ability to think creatively. In line with this, (Park et al., 2023) in a longitudinal study discovered that the creative abilities of students evolve with time under the influence of the personal characteristics of self-regulation and environmental conditions. This affirms the fact that creativity is dynamic during the academic path that a student is undertaking. Adding another argument to the point, (Selznicket al., 2022) also proposes that creativity is not something predetermined, but something that may also be cultivated under the influence of multiple educational experiences and exposure to diverse academic assignments. The study of the changes in creativity between semesters will allow teachers to learn how unique curriculum structure, teaching processes, and general atmosphere of the educational institution can promote the creative abilities of students.

Gap

Despite having made significant studies on creativity in different areas and in different sectors little studies have been made in relation to gender disparities and semester differences in creativity thought among young adults. The available literature concentrates on either domain or general scores of creativity without addressing the question of how creativity evolves throughout the academic developmental stages or the variance in creativity between male and female students. This is a significant literature gap and offers a solid justification of undertaking more research. The exploration of the topic of creativity relative to gender and semester level is also especially useful within the context of higher education since each semester presents students with new knowledge, experiences, and new learning challenges. Group projects, exposure to various courses, and hands-on activities stimulate students in coming up with new ideas, using creative problem-solving strategies, and other skills of critical thinking. Also, it is possible to observe the changes in creativity over semesters and thus understand how academic experiences lead to the increase in both the creative potential and the academic performance. Hence, the study of these factors, besides being relevant to our research on the development of creativity, provides a practical implication on the design of educational programs and the teaching environment that would foster a sense of creativity among young adult learners.

Aim

The aim of the study is to explore the difference in creative trait motivation between genders and semester of study among undergraduate students. One of the key aims is to establish the existence of any interaction between creative thinking and gender as well as semester. I would like to carry out this study, including (a) the means of creative thinking measures of males and females at different points during the semester program. (b) Test the consistency of difference in the creativity score across the genders during the semester. (c) To assess semester-based creativity through analyzing the contribution of new

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academic programs, activities, and learning activities to the building of the student creative thinking.

The level of education can influence the relationship between the gender and creativity of a person. As of a study on 739 adults in the Canary Islands (Plucker and Makel, 2010), female persons who have a university degree scored higher in creativity tests compared to those who lacked the degree. In the case of men though, education did not play a crucial part in their scores. The disparities that were observed between men and women were usually minimal and subject to circumstances: the less educated men were sometimes more skilled in visual imaginations and the better educated women used words. In a nutshell, education plays a vital role in the sense of the relationship between gender and creative thinking.

Gender and cognitive style research have shown that the two variables make independent contributions on differences in the creative thinking of students. Creative thinking- (Piaw 2014) also found in a study of 216 lower sixth-form students that gender was significantly related to performance on creative thinking tests and that thinking style (right-brain thinking style) had positive correlations with all of the Torrance Tests of Creative Thinking (TTCT) items; such as originality, fluency, elaboration, abstractness of titles, and resistance to premature closure. Upon the control of ethnicity, academic major, and ability to think critically, the findings showed that gender as well as thinking style were still strong predictors of creative thinking but the interaction effect between the two was not significant (Piaw, 2014).

Rational

In the case of university students, it is the combination of sex and level of academic advancement that defines creative performance. As it has been evident, gender disparity in creative performance is based on the nature of the task at hand. Using the example, female students are assumed to score higher in the verbal type of tasks and males can score higher in the figural or visual type (Matud et al., 2007). Additionally, the thinking style is a significant forecasting method as right-brain thinkers also more often demonstrate better creative performance irrespective of gender (Piaw, 2014).The scholarly growth is also of importance. Students learn and acquire skills in their field, acquire cognitive maturity, and have a wider range of educational experiences, which support the realization of their creative potential during their semesters (Ahmed et al., 2023), (Qureshi et al ., 2019). All these findings put together, both gender and educational experience appear to support creative development as an independent variable. Nonetheless, the two variables which determine creativity of young adults are still not well understood particularly in South Asia. This is of relevance to investigate because the discovery of the connection between gender and the development of creativity in students will aid in the development of appropriate teaching methods and curriculum development that can optimally foster the aspect of creativity (Ahmed et al., 2023).

Objectives

1. To determine the effects of gender on the Creative Trait Motivation of undergraduate students.
2. To compare the performance of the students in terms of Creative Trait Motivation in various phases of their study programs (i.e., various semesters).

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Methodology

The purpose of the current study is to test whether there are gender and Semester-based Variations in the creative thinking skill of undergraduate students. Particularly, it will compare the male and female students in terms of creative performance in various semesters in course of their undergraduate studies, as well as investigating whether there is any possible interaction between gender and the academic progression in influencing the creative performance.

Research Design

The research design used in the study was cross-sectional, where the researcher gathered data at one time among students who were in various semesters.

Participants

In this study, 200 undergraduate students were included in the University of Gujrat. The sample comprised of male and female students who represented various semesters making it possible to compare creativity in different genders and their academic performance in various semesters. The inclusion criteria identified that, the participants needed to be the consenting undergraduate students of the university present during data collection. On the other hand, students were eliminated in case they had psychological disorders, a major learning difficulty, a major physical disability, as well as irregular attendance and also in cases where they indicated that they did not want to be involved in the research.

Sampling Technique

The convenience sample was used to select the participants. This implied that we called the students whom we could readily reach and those who were willing to take part in the study especially when they were in regular classes or when there was an event within the campus. This approach helped to easily gather data of students in various semesters. It was selected due to its usefulness as we were able to collect sufficient responses within the time we had.

Measure

The following tools were used to collect data provided by the respondents. A questionnaire was designed to receive sociodemographic information. These include; age, gender, semester in which the study occurs, level of education, family formation, employment, and the kind of residence. These variables were measured to depict the demographic attributes of the young adult students. The reason is that the Creative Trait Motivation Scale was used to examine creativity in young adults (Taylor & Kaufman 2021). The scale has 20 items, and it measures three subcontinents of creative motivation which include intrinsic motivation, extrinsic motivation, and motivation. Each statement is rated by the respondents using a 7-point Likert scale, where 1 (does not correspond at all) is provided on one extreme and 7 (corresponds exactly) is provided on the other. The scale has excellent psychometric characteristics with a high level of internal reliability and signs of construct validity (Taylor and Kaufman 2021).

Procedure

The reason behind the choice of the participants in this study was through convenience sampling. Students who were willing and available were invited to participate in the study. We approached students in the classroom or at the university to join. The assured them that their responses would remain confidential and nobody would suspect they were them. The researcher presented themselves to the participants, gave them the reason of study and how to fill the surveys. Every individual proceeded to fill his or her own survey. We got the permission of people creator of surveys to utilize their questions. The average time of

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collecting all the surveys of everyone was approximately in one month. With the help of all the students we finally thanked them.

Data Analysis

Descriptive statistics, T- t-test, and One-Way ANOVA and descriptive statistics were used to analyze the data.

Result

The research subjects were primarily young adults who were enrolled in the University of Gujrat. The sample was composed of 200 students, most of which were females. Majority of them were aged between 18 and 24 with a majority of them pursuing various BS programs. Most of them were unmarried (single) and had parents of average (middle-income) income (they worked at different jobs). Living in small family groups (nuclear or small extended households) in urban areas (cities, towns) or semi-urban areas was mentioned by the students. All the participants were full-time students who willingly completed the study surveys. Such description is more or less the same as that of a normal group of young university students in Pakistan.

Table 1: ***Descriptive Statistics and T Test for Gender Differences in Creative Trait Motivation***

Gender	N	Mean	Std. Deviation	Std. Error Mean
Male	78	61.3718	15.17697	1.71845
Female	115	66.2522	10.86104	1.01280

The Group Statistics table shows the mean difference in the Creative Trait Motivation (CTM) scores between male and female students. The number of male students that engaged in the study is 78 and the number of female students that engaged in the study is 115. The mean CTM score of male students was 61.37 (SD = 15.17), and those of female students was 66.25 (SD = 10.86). This means that the female students were found to be more motivated with regards to creativity on average than the male students.

Table 2: ***Independent Samples Test***

CTM	Levene's Test F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% CI Lower	95% CI Upper
Equal variances assumed	5.985	.015	-2.604	191	.010	-4.88038	1.87427	-8.57730	-1.18346
Equal variances not assumed	—	—	-2.447	129.249	.016	-4.88038	1.99470	-8.82688	-.93388

The independent samples t-test was used to establish whether there was a significant difference in the scores of the men and women students in their Creative Trait Motivation (CTM) scores. The Test of Equality of Variances conducted by Levine had shown that variances were not equal between the two groups (F = 5.985, p =.015). Since the assumption of the homogeneity of variance was violated, the interpretation was performed using the t-test results when homogeneity of variance is not assumed. The outcomes indicated that there is a significant difference in the CTM scores between male and female students t

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(129.25) = -2.447, p =.016. The average deviation among the populations was -4.88 meaning that the female students were much higher on the scale of creative motivation compared to the male students. The statistical significance of the difference is confirmed by the fact that the 95% confidence interval of this difference (-8.83 to -0.93) does not contain the value of 0.

Table 3: ***Descriptive Statistics of Semester-Based Difference in Creative Trait Motivation***

Semester Level	N	Mean	SD
1st Semester	72	61.11	14.48
3rd Semester	33	59.88	11.23
5th Semester	18	67.11	7.78
7th Semester & Above	70	68.89	11.65
Total	193	64.28	12.97

A descriptive statistic was created to test the difference in Creative Trait Motivation (CTM) in different academic semesters. This was analyzed on a sample of 193 students. The 1 st semester students (n = 72) scored 61.11 (SD = 14.48) on CTM, which represents moderate motivation to be creative. The 3 rd semester group (n = 33) recorded an equal mean score of 59.88 (SD = 11.23), which is the lowest among all the groups. Conversely, students in the 5 th semester (n = 18) recorded a greater mean CTM score of 67.11 (SD = 7.78). Levels of the highest creative motivation were found among 7 th semester and above students (n = 70), and the mean score was 68.89 (SD = 11.65). All in all, the mean CTM score (SD = 12.97) of the entire sample (N = 193) was 64.28. These confidence intervals show that both groups have an upward trend in CTM according to the levels of academic performance, whereby senior students are more creative driven than the junior students.

Table 4: ***One-Way ANOVA Summary Table for Semester-Wise Differences in Creative Trait Motivation***

Group	Sum of Squares	df	Mean Square	F	Sig.
Between groups	2991.401	3	997.134	6.432	.000
Within groups	29299.490	189	155.024	—	—
Total	32290.891	192	—	—	—

The ANOVA was conducted on one way to determine the difference in scores of the Creative Trait Motivation (CTM) among four groups of academic years/ semesters. The results showed that there was a significant difference in CTM scores in the groups, F (3, 189) = 6.432, p <.001. This demonstrates that the motivation of students in terms of their creative trait varies enormously with the academic years/semesters, implying that the level of creativity in some semesters is higher than in others.

Discussion

Recent scholarly research examined intrinsic creative motivation differences between university students and the study took into account two important demographic variables: gender and academic status. The results indicated that the female students scored higher on CTM as compared to the male students and the motivation associated with creativity

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rose in academic semesters with the senior students showing highest levels of creativity motivation. Such results can be added to the current body of knowledge on the effect of gender and academic progression on creative thinking among young adults.

The fact that female students are more motivated towards being creative is a coincidence with prior studies. (Matud et al., 2007) One of the studies discovered that women usually perform better than men in activities that involve good verbal abilities and creative and imaginative thinking. These results are in line with the studies that indicate that female students tend to score higher in terms of creative thinking than male students (Ülger and Morsunbül, 2016). The researchers define Creative Trait Motivation (CTM) as a personality motivation that promotes the desire to experience something new and solve difficult problems (Taylor and Kaufman 2021). This motivation was found more frequently in the female students as compared to the male students in the present research. Such differences could be attributed to how boys and girls are brought up differently, expectations that the society puts on them and the schooling environment that can influence their self-belief and creativity (Ahmed et al, 2025). This conclusion can be justified by other studies, including one made by (Piaw, 2014), which also showed that the gender of a person is a great predictor of creative performance.

Semester-wise comparison showed that CTM scores rose gradually between the early and the advanced phase with the highest score recorded in 7 th semester and above. In fact, it is observed that innovative self-efficacy and an innovation-supportive college climate positively affect the creativity of students during academic year (Fang and Chang, 2023). A number of studies actually claim that the engagement and confidence in having creative abilities by the students grows with the course of the academic study which is in opposition to the stagnant character of innovative growth within higher education (Sharma et al., 2021). Contributions to this are personality and educational settings and this explains the fact that creativity can be developed and not just based on an inborn talent. Lastly, studies involving intervention have proved that deliberate instructional techniques, project-based learning, and active engagement in group activities could be helpful in developing creativity during the course of one school year (Natalia et al., 2025). All in all, these results indicate that university settings, curriculum development, and education experiences are significant in terms of promoting and strengthening creative motivation among students in the long run.

The overall findings of this research point towards the fact that gender and academic progression are important foretellers of motivation to create. The study by (Ahmed et al., 2023), indicate that gender and cognitive style effect on creativity and thinking, determines the performance in creativity. Their findings are in agreement with these findings. This paper builds upon the research studies of these factors in South Asian settings, where academic demands, gender roles, and cultural demands can have unique influences on creativity development. Research that studies the influence of gender on interaction is done on the semester level or qualitative studies that involve more insightful investigations on the lived experiences that relate to the motivating creative aspect of university students.

On balance, the results highlight the necessity of the educational approaches to the promotion of creativity in all academic research. Creativity support should be incorporated in all ranks of disciplines of the universities. Autonomy-supportive teaching can be used to promote creativity in universities; it promotes the ability to think independently and to

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think creatively in order to solve problems. It is also essential to have effective mentorship that develops creative self-efficacy in students. The strategies are useful to enhance creativity among every student and make sure the practice is maintained in the course of their studies.

Conclusion

The current study indicated that gender and academic progression was the predominant factor in creative trait motivation of undergraduate students. The motivation of female students was more creative, compared with male students and an increase in progressively motivated students was observed in each semester with the highest levels marked in the senior class. These results indicate that creativity is not only innate but it can be promoted through learning experiences, favorable learning conditions, and confidence-building interventions. To this end, universities ought to implement measures that will continuously develop the aspect of creativity amongst students during their academic lives by teaching them in an autonomy-supportive manner, undertaking group projects, and mentoring them.

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