



TO ASSESS THE CREATIVITY LEVEL AMONG ENGINEERING STUDENTS

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ABSTRACT

Creativity is the need of an hour in every phase of life. It has significant effect on today's youth. As one of the parameter for fetching the job for youngsters is creativity, so they need to be strong in this. Though creativity skill is perquisite for every profession but is specific to engineering profession. In this regard the present study is an attempt is to assess the creativity level of students as well as on the basis of gender. A standardized questionnaire is used to conduct the study among 115 Engineering students from an autonomous institution in Uttarakhand with the help of scale developed by (Pareek and Purohit, 2010). Data is analyzed through SPSS and result indicated that the engineering students were good at creativity and no significant relation exists between genders.

Keywords- Creativity, Challenge, Liveliness, Conflict, Risk-taking

Introduction

In the 21st century with the pace of knowledge based economies and sophisticated technology creativity has become significant factor for every individual whosever has to face this challenging environment. 'Creativity' means discovering new ideas, expressions and putting more value to it. In today's era intelligence of a person is not judged by the intellectual power but also assessed how creative the person to some extent. Creativity is a skill which can not only be inherited but can be enhanced. The person's thought process and imagination leads to enhancement of creativity. Robinson (2002, p.118), defines creativity as "imaginative processes with outcomes that are original and of value". Robinson (2001, p.211) who characterizes creativity as having four main elements: medium, expertise in or mastery

of the medium, the need to play and take risks and the need for critical judgment.

Each of these elements gives rise to important consideration for learning and teaching. Creativity is a solution for social, economic and educational problems. The term creativity is coined from the word "create" which means to produce something. Creativity is such kind of creation by which one produce something new, different from known which include individual way of problem solving and discovery of unknown. Creativity is a crucial factor for everyone but very significant for young budding students as they are the future of tomorrow so it is imperative to examine their creativity for enhancement.

Creativity among Students

It is a fact that success of a person depend

on many factors including high IQ, EQ and his or her creativity. So now day's parents are putting their best efforts starting from childhood to enhance the creativity of their child. In this context some changes has been made in education system in India so that the student's cognition process is directed more towards logic and analytical reasoning which leads to development of more creative mind and also encouraged to generate new ideas which leads to enhance their creativity. Students' creativity as a key competency is shown in many countries' education strategies. (Sternberg and Lubert) In India school education is governed by CBSE, ICSE and state boards which keep on upgrade their syllabus in such a way that there is abundant scope for students to incorporate their creativity. In the similar path the higher education in India is governed by UGC and AICTE which is focusing more on student creative skills as it is the pre-requisite in every domain whether business, market or corporate world. New strategies are required in higher education that will ensure our students to become better and effective creative thinkers. Although undoubtedly every profession requires creativity skills it may be architect, teacher or engineer. As there is dearth of research in engineering education in relation to assess the creativity of engineering students. The creativity ability is a crucial aspect of engineering, a better understanding of creativity in engineering student is needed. **(Chi-kuang chen, kuang yaio hsu 2006)**. The job of engineer would not only require technical and analytical skills but certain creative skills in developing websites and software and many other areas.

Therefore the present study is conducted to determine the creativity level of engineering student in colleges so that on the basis of results efforts could be made to enhance the creativity of students.

Research Study

Since youths of the country are the foremost in shaping the better world so brushing up their minds is very significant and in this regard determining the creativity level is of students is must This study is an attempt to rediscover the creativity level of engineering students for effective ways to enhance creativity.

Research Design

The correlation research design is used as the present study finds out the creativity level of students.

Research Objective:

The objective of the research is to determine the creativity level of engineering students.

Hypothesis

1. Creativity level of engineering student is higher.
2. Creativity level of female student is higher than males.

Research Tools Used

The data collection tool used in the questionnaire is "Creativity Assessment Inventory" (CAI) developed by (Pareek and Purohit, 2010). According to norms the test value for overall creativity assumed is 52. The questionnaire includes five creativity variables i.e challenge, freedom, liveliness, conflict and risk taking which are defined as follows:

- **Challenge:** A creative person

approaches challenges and difficulties energetically and enjoy them.

- **Freedom:** Choose to be independent and happy to take initiatives and express his or her ideas.
- **Liveliness:** Is happy and excited.
- **Conflicts:** Looks for helpful win-win compromises, which needs willingness to communicate with understanding and empathy.
- **Risk-taking:** Takes responsibility readily and is willing to act on new ideas.

Procedure of Data Collection

All the respondents were explained in detail about the basic purpose of this study and reasons for conducting these tests on them. 'As per availability of time and convenience of the respondents, questionnaire in the study contains 24 items on each variables of creativity.

Statistical Treatment of the Data

Descriptive statistics was employed to organize, summarize, interpret and communicate the quantitative data into some meaningful information. The one sample t-test and independent sample t-test has been applied to analyze the results through spss.

Sample

In the present study a sample of 115 respondents including both male and female students (75 males and 40 females) of state engineering college in Uttarakhand (Govind Ballabh Pant Institute of Technology, Pauri Garhwal) were taken as sample for study.

Sampling Technique

Random sampling is used for the study to ensure that adequate representation is given to respondents including male and female

students.

Review Literature

Sapna Parshar, Sameer pingle (2017): This paper studies the creativity of students and the faculty. The sample taken for the study was 21 management teachers and 31 management students. Findings of the study revealed that students scored low on creativity as compared to faculty.

M.Suresh (2016): The current study examines the level of creativity and problem solving ability among higher secondary students. The research was done on 160 higher secondary school students. Finding of the study revealed that there was significant positive relationship between creativity and problem solving ability. Finding revealed that there was no significant difference in the level of creativity between male and female higher secondary school student.

Dr V. Josephine Lourdes De Rose (2016): The study was done to analyze the impact of teachers on the creativity of students. Findings revealed the importance of attitude of the teachers in shaping the creative attitude of the student.

Kaycheng Son (2015): The study was done to analyze the creativity fostering teacher behavior around the world. The creativity fostering teacher behavior index was administered on 117 teacher in Singapore. Findings indicated that there was prevalent mood about creativity fostering.

Chi-Kuang Chen and Kuang-Yaio (2015): The present research paper examines the staff member's perception of creativity I Taiwanese engineering students. The

samples have been drawn from different educational group, academic disciplines. The sample size of the study was 175 academic staff. The result indicated that 21 creative characters were produce on five dimensions of creativity and certain elements of creativity that are needed by engineers have been identifies i.e observation and willingness.

Maria Jesus Garcia, Concepcion Gonzalez Garcia, Luis J. Fernandez, Jose-Luis Casado-Sanchez and Luisa

Martinez Muneta (2015): The present research was done to self-assess their creative competence from degrees of engineering Universidad politecnica of Madrid. The comparison was also made on the basis of gender of students to determine the level of creativity.

Badaruddin Ibrahim, Michael A.D (2016):

The objective of the research was to examine the relationship between creativity and engineering knowledge among undergraduate engineering students. The sample taken for the study was 88 from college of engineering at Colorado University. The result revealed that there was no significant relationship between creativity and engineering knowledge.

Selvi Narayanan (2017): The present study was done to investigate the relationship between creativity and innovation in teaching and learning activities towards student's academic performance in higher education. Results revealed that positive relation with student academic performance using teaching method.

Ekta Sharma, Amrut Mody (2015): The

goal of the research was to determine the creativity potential of the students pursuing higher Education. The sample consists of management students. The data was collected through the instrument developed by Prof. Uday Pareek. Result indicated that there was no difference in the creativity potential of the female and male students and the management students have high creative potential.

Discussion

The creativity level of the Engineering students is high. (Mean=56.51) Refer (Table 1). The students are good at conflict handling (Mean= 58.489) and risk taking (Mean=55.553). In fact (Table 4) shows the t-test of all the sub variables of the creativity taken into account for this research paper and it is evident from there that the engineering students are rated high on challenge, freedom and liveliness variables also. The Mean score of freedom (Mean=60.528) is highest followed by conflicts (Mean=58) which implies that the students are happy and excited about the task and tends to be independent and express their ideas, to certain extent but not to the optimal level.

In context to gender to assess the creativity for students it is seen (Refer table5) that freedom has highest mean score for males the reason may be that the males are considered to have more freedom in their nature specially in Indian settings because the kind of upbringing they get in their homes as compared to females. The results also revealed that the males were high on conflict, challenge and risk-taking as compared to females this may be because the males are more confident so they are ready to face challenging task as well they

possess conflict handling and risk-taking ability. Further findings indicates that females are only high on liveliness as compared to males which could be inferred that they are more happy and excited to do the task. The t test for males (Refer table6) revealed that they were high on creativity which would affect their thought process thus it could be said that they are more creative than females. Further findings revealed (Refer table7) that no significant difference exist between creativity level of engineering students i.e male and female students).

Implication

The ultimate aim of the engineering college students is to fetch the job through campus placement or move towards higher studies. To meet out the demand of the companies for placements, students should have creative bent of my mind and in addition to it the contribution is to be made by faculties as well as special trainers should be appointed to enhance the creativity of students. In this regard firstly the students should be made aware of about the relevance creativity skill for their career. Secondly the institution can bring changes in course curriculum as well as creativity development classes should be implemented to enhance the present study is an attempt to discover the students' creativity level as well as to examine the creativity of both male and female student.

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Data Analysis

Table 1- Descriptive statistics of creativity and its variables

	N	Minimum	Maximum	Mean	Std Dev.
Challenge	115	31.25	81.25	55.22	10.96
Freedom	116	31.25	100.00	60.53	13.54
Liveliness	116	25.00	100.00	52.75	12.52
Conflict	116	31.25	81.25	58.49	10.63

Risk-taking	116	31.25	91.00	55.55	11.20
Creativity	116	43.75	71.25	56.51	5.22

The above table shows the descriptive statistics of creativity variables reflecting the number of respondents with mean score and S.D of creativity and its variables.

Table 2- Mean creativity variables score

The above table depicts the mean score of creativity variables i.e. freedom which seems to be highest (60.53) followed by conflict (58.49), risk-taking (55.55), challenge (55.22) and liveliness (52.75). We could look at the creativity mean (56.51) to determine that our student's creativity

Test Value=52						
	t	df	Sign. (2 tailed)	Mean diff.	95% Confidence Interval of the Difference	
Creativity	9.299642	115	0.05	4.51	Lower	Upper
					5.56E-16	1.111E-15

mean is significantly larger than a value of 52.

Table 3-One Sample T test for Creativity

The above table depicts the t- test value of creativity level of student (1.111E-15). So, the current result of 1.111E-15 is actually very small for a p-value which is much less than 0 .05. We could say that our results statistically significant.

Table 4- p value for creativity variables

Variable	t Stat	df	Sign.(2tailed)	Mean	Lower	Upper
Challenge	3.17014	115	0.05	55	0.0009	0.00195
Freedom	3.17014	115	0.05	60	2.70451E-10	5.40903E-10
Liveliness	0.6472	115	0.05	52	0.2593	0.518752
Conflict	6.572	115	0.05	58	7.55182E-10	1.51036E-09
Risk-taking	3.417	115	0.05	55	0.0004	0.000874

The above table shows the p value of all the creativity variables of engineering students. It could be inferred that for challenge (p-value 0.001) which seems to be less than 0.05 is significant which is followed by freedom (p-value 5.409),conflict(p-value 1.510) and risk-taking (p-value

Variable	N	Mean	Std Dev.	Standard Error
Challenge	116	55.22	10.96	1.02
Freedom	116	60.53	13.54	1.26
Liveliness	116	52.75	12.52	1.16
Conflict	116	58.49	10.63	0.99
Risk-taking	116	55.55	11.20	1.04
Creativity	116	56.51	5.22	0.48

0.0008) though liveliness (p-value 0.51875) which does not seem to be statistically significant.

Table 5- Descriptive statistics of males and females creativity and its variables

	M	F	Males	Std Dev	Females	Std Dev
			Mean		Mean	
Challenge	75	40	55.29	11.31	55.10	10.34
Freedom	75	40	61.99	13.58	57.52	13.15
Liveliness	75	40	52.13	13.01	54.04	11.50
Conflict	75	40	58.83	11.29	57.79	9.24
Risk-taking	75	40	56.21	11.46	54.21	10.66
Creativity	75	40	56.88	5.43	55.73	4.73

The above table depicts the mean score and S.D of creativity variables i.e male and female students which shows that the mean score of freedom came to be highest for males (61.99) followed by conflict (58.83), challenge (55.29), risk-taking (56.21) and liveliness (52.13). In the similar manner the mean score of conflict came to be highest for females (57.79) followed by freedom (57.72), challenge (55.10), risk-taking (54.21) and liveliness (54.04).

Table 6- Male t test for creativity

	Mean	df	t stat	Lower	Upper
Male	56	77	7.943	6.560E-12	1.312E-11

In the above table the p value for male creativity is 1.312E-11 which is very small than 0.05. Hence male engineering student has high creativity.

Table 7- Male and Female t test for creativity

	Mean	t stat	Lower	Upper
Male	56	1.17	0.121486569	0.242973138
Female	55			

The above table depicts the p value for male and female which comes to be 0.242 is larger than 0.05. Thus there is no significance difference between creativity level of engineering student of male and female.