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Investigating the scientific area of vocation exhibited by higher secondary students of science stream in relation to gender

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Abstract

This study's primary goal is to look into how higher secondary science stream students' scientific areas of vocation relate to gender. The purpose of this study is to compare the scientific areas of vocation of male and female higher secondary students as well as to identify the scientific areas of vocation of students generally. For the current study, the researcher used a survey approach. To assess the scientific area of vocation, the researcher employed the Vocational Interest Record (VIR-K) that Dr. S. P. Kulshrestha offered. Which include ten different professions in total. One of them is a career in science. We can determine the interest area of vocation of our kids by looking at the twenty jobs/vocations/assignments listed for each of these areas in the Manual of Vocational Interest Record. One hundred and one hundred male and female higher secondary students, representing the sample for this study, were selected at random from five different colleges in the city of Aurangabad. The t-test, mean, and S.D. are used to analyse the data.
The findings indicate that the scientific field of vocation has a mean value of 6.45 and a standard deviation of 4.35. The average value and standard deviation for the scientific field of vocation among female higher secondary students are 7.47 and 4.14, respectively. The average value in the scientific field of vocation for male students in higher secondary school is 7.42, with a standard deviation of 4.48. The null hypothesis will be accepted since the obtained t-value of 0.08 is smaller than the table value of 1.98 at the 0.01 level of significance, indicating that there is no significant difference between the mean values of the male and female groups.

Keywords: Scientific area of vocation

Introduction

Today, we constantly require scientific concepts in order to obtain benefits and find solutions to the problems we face. The domains of science and technology are crucial in determining the future of our quickly changing world today. Every nation's educational system ought to place a high value on children's scientific abilities and advancements for this reason. The decisions made by youth regarding their career paths have a significant influence on society's overall development as well as the advancement of the individual. One of the things that man has created to satisfy some of his needs and desires is science. The intellectual growth of a person should be the main objective of education. With science's growing significance in our society, it has grown in importance as a component of general knowledge. The best way to promote scientific education is to include it into a larger focus on intellectual pursuits.

Research on the scientific area of vocation in higher secondary school science streams can be important for several reasons: like, Career Preparation, Curriculum Development, Skill Development, Teacher Training, career guidance, Industry Collaboration, Continuous Improvement, In summary, research in the scientific area of vocation in higher secondary school science streams can lead to more targeted and effective education, better career preparation, and improved alignment between students' interests and future employment opportunities.

The adolescent stage, which is a time of stress and storms, is about to begin for secondary school students. They need to be properly guided and counselled during this time to avoid the issue of maladjustment. According to Singh (1988), Scientific Attitude is a collection of sentimentalized beliefs about science and scientific methodology that are either directly or indirectly connected to the scientific education literature's course of action. Qualities of mind like intellectual curiosity, a passion for the truth, respect for the evidence, and an understanding of the need for open communication in science are all included in the term "scientific attitude." Therefore, having an open mind, seeking knowledge, believing that procedures will yield accurate information, and anticipating that problem-solving will be accomplished through the application of verified knowledge are all characteristics of a scientific mind-set.

In light of the significance of comprehending students' preferences for careers in scientific fields, this research study examines the connection between gender, academic program, and the career choices of upper secondary school students in Aurangabad. The career options available to students in higher secondary are greatly influenced by their choice of study stream, such as science or arts. It is imperative to look into whether students' preferences for science and technology careers are influenced by the streams they choose to study. By understanding the connection between career choices and stream selection, educational institutions can better support students' interests and goals by customizing their outreach programs, counselling services, and curricula.

By shedding light on senior secondary school students' preferences for "scientific area of career" in relation to gender of studies, this research paper adds to the body of knowledge already in existence. The results will help career counsellors, schools, and educational policymakers create focused interventions and support systems that advance gender equality and inspire students to seek careers in science and technology.

Literature review

The study "Investigating Scientific Creativity Level of Seventh Grade Students" was carried out by Erdoğan USTA in 2014. This study aims to examine the scientific creativity level of seventh-grade elementary students. Furthermore, a relationship between students' scientific creativity and their attitudes toward science and technology as well as their beliefs about the nature of science were examined. 300 seventh-graders who attended Tokat schools in the 2011-2012 school year were the research participants; they were chosen using a stratified sampling technique. The researcher used the "Creativity in Science Test, CST," which she developed to gauge scientific creativity. Students' attitudes toward science and technology courses were evaluated using the "Attitudes toward Science and Technology Course Scale" (Akınoğlu, 2001). The 'Nature of Science Scale for the Primary School Students,' adopted by Elikdemir (2006), was also used to assess students' comprehension of the nature of science. The main study carried out in Tokat revealed a significant relationship between scientific creativity and attitude toward science classes. It was discovered that students' perceptions of the nature of science and their degree of scientific creativity differed significantly. Additionally, it was discovered that the scientific creativity of the students ranged from low to moderate, and that the majority of the test questions had answers that were ordinary rather than higher than expected.

In 2014, Dr. S. Govindarajan carried out research on secondary school students' attitudes toward science. One of the things that man has created to satisfy some of his needs and desires is science. The intellectual growth of a person should be the main objective of education. With science's growing significance in our society, it has grown in importance as a component of general knowledge. The best way to promote scientific education is to include it into a larger focus on intellectual pursuits. The adolescent stage, which is a time of stress and storms, is about to begin for secondary school students. They need to be properly guided and counselled during this time to avoid the issue of maladjustment. Adolescents will succeed in all facets of life and education if they are given the correct guidance and are inspired with the correct educational goals. Governments have been funding higher secondary education with billions of dollars. However, the outcomes do not match the costs incurred. Only between 40 and 60 percent of students succeed, and even these numbers reflect the influence of private schools. Stated differently, two thirds of the money spent on education is wasted. The findings of this study will assist educators, instructors, and students in changing the current situation because a large number of secondary school dropouts occur.

Stevanovic, Biljana (2014). "Girls in science and technology in secondary and post-secondary education: the case of France" was the study's stated goal. This article examines the evolution of female student enrolment in scientific streams in secondary and post-secondary education in France over a period of approximately 20 years, from 1985 to 2008, based on surveys conducted by the Direction de evaluation de la prospective et de la performance (Directorate of Evaluation, Forecasting and Performance) and the Institute national de la statistics et des etudes economies (France's National Institute of Statistics and Economic Studies). The goal is to investigate the trends and shifts in females' preferences for STEM education. The findings demonstrate that during this time, girls' preferences for studying science and technology have clearly changed. At the secondary level, these modifications have been beneficial; however, at the post-secondary level, they are less clear. There will be an evaluation of the good advances as well as the ongoing low representation of women in scientific fields.

The study, "A study of vocational interest of high school students of tribal area of Howrah district," was carried out by Dr. Rajib Monda in 2017. Every student in every district has a particular interest in a career in education. All boys and girls have different ideas about their plans for the future, their interests, and their profession or occupation in relation to their own struggles, abilities, and life hood. Similar to this, high school students in the tribal areas of the Howrah District have distinct career interests and options. Additionally, those students differ in terms of gender and medium of instruction. They look for guidance on their future careers.

Pardeep Dehal Singh. (2023) [6]. This study's primary goal was to find out which careers in science and technology senior secondary school students were most interested in. A total of 160 senior secondary school students made up the study's sample. The 160 students were divided 80 male and 80 female, from both urban and rural areas. The Career Preference Record (CPR), a tool developed and standardized by Vivek and Rajshree Bhargava (2001), was used to collect data. To gather the sample, a stratified random sampling technique was employed. Analysis of variance was used in the data interpretation process (ANOVA). The study's conclusions demonstrated that while senior secondary school students' preferences for STEM careers vary depending on their gender, they do not differ in terms of their chosen stream of study. At the 0.05 level of significance, there is no interaction between gender and stream of studies and senior secondary school students' preferences for careers in science and technology.

Need of the research

Researcher felt the need to investigate the scientific area of vocation in higher secondary school students of science stream for several reasons:

1. **Career Preparation:** Understanding the specific needs and interests of students in science streams can help tailor the curriculum to better prepare them for future scientific careers, improving their readiness for higher education or employment.
2. **Curriculum Development:** Research can inform the development of vocation-focused courses, ensuring that students receive relevant and up-to-date training in fields like biology, chemistry, physics, computer science, or engineering.
3. **Skill Development:** Identifying the skills and competencies required for scientific vocations can guide educators in designing practical and hands-on learning experiences that develop these skills effectively.
4. **Teacher Training:** Research can highlight the need for specialized teacher training to deliver vocation-oriented education effectively, ensuring that educators are equipped with the necessary expertise.
5. **Career Guidance:** Research can provide insights into career opportunities within science streams, allowing school counsellors to better advice students on potential career paths.
6. **Industry Collaboration:** Collaboration with local industries and research institutions can be facilitated by research findings, creating opportunities for internships, apprenticeships, and real-world experiences for students.
7. **Continuous Improvement:** Regular research and evaluation can lead to continuous improvement in the curriculum and educational practices, adapting to changing demands in the job market.

In summary, research in the scientific area of vocation in higher secondary school science streams can lead to more targeted and effective education, better career preparation, and improved alignment between students' interests and future employment opportunities.

Purpose of the study

Purpose of the study is to Investigating the scientific area of vocation exhibited by higher secondary students of science stream in relation to gender.

Objectives

1. To ascertain the higher secondary students' field of study in science.
2. To ascertain the scientific specialization of female students enrolled in upper secondary education.
3. To ascertain the male students' area of specialization in science in upper secondary school.
4. To compare the scientific fields of study chosen by male and female students in upper secondary education.

Hypothesis

1. Higher secondary students have a strong interest in science.
2. A high percentage of female students in higher secondary pursue careers in science.
3. Male students in higher secondary education have a strong interest in science.
4. There are no appreciable differences between male and female students in the science stream of the higher secondary school.

Methodology

For the current study, the researcher used a survey approach. To test the scientific area of vocation, he researcher used the vocation interest record (VIR-K) that Dr.S.P. Kulshreshta provided.

Sample

There are 200 higher secondary students in the sample for this study; 100 are female and 100 are male, and they were selected at random from five different colleges in the city of Aurangabad.

Statistical Measures

In order to analyse the data, t-test, mean, and S.D. are utilized.

Finding and Discussion

The findings table is shown below.

Group	Mean	S.D	t-value (at 0.01 level of significant)
Female	6.45	4.35	0.08
Male	7.47	4.14	

The findings indicate that the scientific field of vocation has a mean value of 6.45 and a standard deviation of 4.35. The average value and standard deviation for the scientific area of vocation among female higher secondary students are 7.47 and 4.14, respectively. The average value in the scientific area of vocation for male students in higher secondary school is 7.42, with a standard deviation of 4.48. The null hypothesis will be accepted since the obtained t-value of 0.08 is less than the table value of 1.98 at the 0.01 level of significance, indicating that there is no significant difference between the mean values of the male and female groups.

Conclusion and Recommendation

An educator can ascertain a student's areas of interest within the scientific field with the aid of this study. Do they have a preference for computer science, physics, chemistry, biology, or another field?

Institutions of higher learning ought to make an effort to establish a friendly atmosphere that inspires and helps both male and female students who want to work in the scientific fields. Setting up mentoring programs, outreach campaigns, and scholarships for underrepresented genders may be necessary to achieve this.

It becomes imperative that educational establishments allow students to explore Science and Technology beyond the confines of their chosen fields of study. Students can be introduced to STEM (Science, Technology, engineering and mathematics) possibilities and applications through extracurricular activities, workshops, guest lectures, and elective courses. By expanding their exposure to science and technology, students can make informed career decisions based on their interests and aptitudes instead of being constrained by their original field of study.

In higher secondary education, keep in mind that pursuing a scientific subject can be enlightening and inspiring, as it may lead to the discovery of your true passion.

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