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Open elective subjects under NEP 2020: A statistical analysis on student's opinion

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Abstract
NEP 2020 brought many major changes in curricula. Inclusion of open elective subjects for under graduate students is one of them. Students have to choose open elective from the discipline other than their core stream to explore interdisciplinary study. The present paper is a survey based research work where student's view is considered regarding various factors like the acceptance, interest, usefulness, method of assessment and some more. A statistical analysis using Chi-square test is done and significant association between those factors is discussed.

Keywords: Open elective, interdisciplinary, data analysis, chi-square test, SPSS software**,** significant association

Introduction
Society is changing rapidly in almost all life domains. As a result, students will increasingly need to develop new skills, tools and techniques to solve complex challenges in their work. These complex challenges are often influenced by multiple factors that are studied separately by different disciplines. A single disciplinary approach solves some single aspects of complex problems, however to arrive at comprehensive solutions, integration of knowledge and skills from different disciplines and knowledge domains is necessary for which an interdisciplinary environment is required (Spelt *et al*., 2009) [4].
The National Education Policy 2020 (NEP 2020) in India brings several significant changes from the previous one which emphasizes on multidisciplinary education. The idea of the introduction of the Open Elective (OE) Courses for the first four semesters in all the undergraduate programs is the reflection of that. It promotes a multidisciplinary approach to education, encouraging students to choose subjects across different disciplines and bridging the gap between arts, sciences, and commerce. The OE courses enable to give an exposure to the students to some other discipline or domain and nurture their proficiency or skill beyond the core discipline courses. It's a chance for students to gain skills wherever they are lacking or need to improve.

Literature review
In the past 20 years, discipline-based university education has undergone a great transformation towards interdisciplinary education. Interdisciplinary education and learning have become the focus of education and teaching today (Klaassen 2018) [3]. There has been growing interest in interdisciplinary education and the publications of interdisciplinary education research have increased significantly (Heikkinen and Räisänen 2018) [1].
Also Interdisciplinary learning empowers students to combine frameworks and concepts from multiple disciplines to examine a problem from different perspectives. In practice, students will gain the skill set to tackle complexity and change effectively throughout their careers (Kanmaz 2022) [5].
But the challenge is that under graduate students start recognising themselves as students of science, humanities or commerce and they are afraid of exploring other discipline. Also traditionally, college and university teachers who are specialists in their own discipline, expect a basic knowledge of the subject from students. The main pillars of the interdisciplinary courses are subject choice and framing of syllabus to bring a win-win situation for students and teachers both.

Keeping this in mind, colleges are giving various innovative options as Open Elective subjects which are interesting to study and at the same time useful for their career. According to NEP 2020, a science student has to choose some OE subject related to humanities or commerce, for a commerce student OE is from science or arts and same way a student of humanity will study from science and commerce as OE. Open Elective courses are of 45 hours with 3 credits. But OE with practical component will have 30 hours of theory (2 credits) and 30 hours of practical (1 credit).

Now it is too early to say, how effective is interdisciplinary education or to what extent, students have improved their interdisciplinary ability through OE. First step of any change is the well acceptance by all stake holders. The present research paper is trying to understand the fact that how the students of first year who are from the first batch to experience NEP 2020, accept open elective subjects.

Aims and Objectives of Studies

Aim of this study was to find

- About the significance of introducing Open Elective subjects under New Education Policy 2020 and opinion of students on this new subject.
- The significance of association between
- Gender of students and their satisfaction level in teaching of Open Elective subject in their colleges.
- The stream of students and the Open Elective subject in their colleges is new for them.
- The stream of students and the knowledge of their Open Elective subject will help them in their future.
- The stream of students and the seriousness of teaching in their Open Elective subject same as in Major / Minor subject in their colleges.
- The stream of students and their satisfaction level in teaching of their Open Elective subject in their colleges.
- The interest of students in their Open Elective subjects and the percentage of their attending lectures in this subject in their colleges.
- The interest of students in their Open Elective subjects and the factors motivating them to attend the lectures in it in their colleges.
- The interest of students in their Open Elective subjects and their satisfaction level in teaching of their Open Elective subject in their colleges
- The interest of students in their Open Elective subjects and continuation of same Open Elective subject by them with different topics in their semester II
- The factors motivating to attend the lectures in Open Elective subjects and their percentage of attending lectures of Open Elective subject.

Research Methodology

An online survey was conducted by using Google form to collect the primary data for this research purpose. Target respondents were the students presently studying in first year of graduation in aided and self-financed courses in the senior colleges where New Education Policy 2020 have been implemented in the academic year 2023-24. 970 students from various colleges affiliated to University of Mumbai were participated in this survey. SPSS software is used to analyze the data. Descriptive statistics and Chi-Square test have been used to do that.

Results and Discussion: After analyzing the collected data from 970 students from various college affiliated to University of Mumbai, following results were obtained:

Table 1: Gender wise distribution of respondents

Gender	Frequency	Percent
Female	666	68.7
Male	304	31.3
Total	970	100.0

Table 2: Stream wise distribution of respondents

Stream	Frequency	Percent
Arts	201	20.7
Commerce	321	33.1
Science	448	46.2
Total	970	100.0

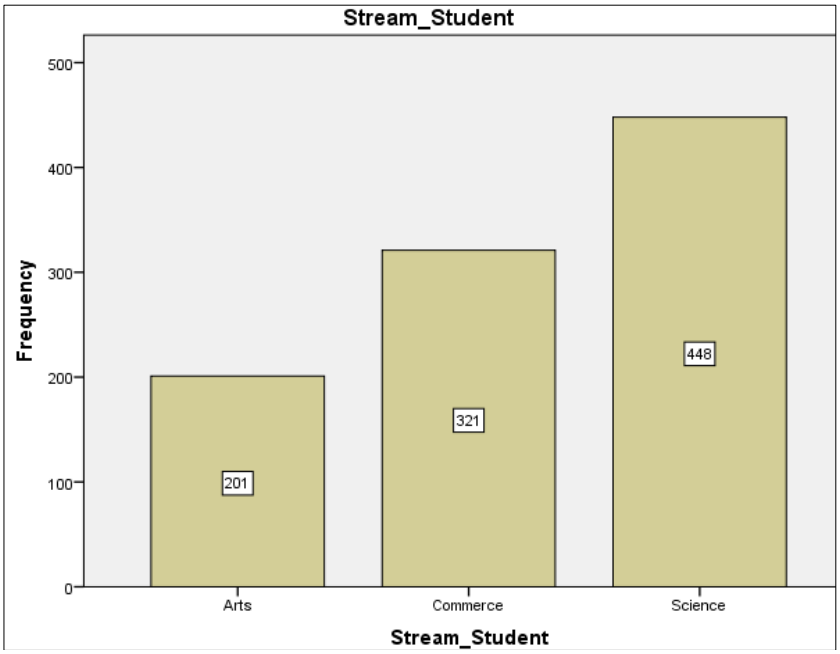

Fig 1: Stream wise distribution of respondents

Table 3: Various streams from where students selected their Open Elective subject

Students selected OE subject from stream	Frequency	Percent
Arts	229	23.6
Commerce	439	45.3
Science	302	31.1
Total	970	100.0

When were the students aware about Open Elective subjects?
Maximum 54% students are agreeing that they knew about Open Elective subject after commencing the lectures in their colleges, 33.6% students knew during the admission and 10.4% students knew before admission.

Did the colleges give freedom to the students to select Open Elective subject according to their interest from a list provided to them?
72.7% students agreed that college gave them freedom to select Open Elective subject from the list provided by their colleges, 7.5% students denied it while 19.8% students are saying that colleges gave freedom them up to some extent.

Is Open Elective subject according to the students choose?
69.9% students agreed to say that they got the Open Elective subject according to their choice, 9.2% students got it to some extent of their choice while 20.9% students do not agree to get it according to their choice.

Is your Open Elective subject interesting?
50.3% students agreed that their Open Elective subject is interesting, 30.5% accepting it to some times, 5.9% most of the times while 13.3% students are not getting their Open Elective subject interesting.

Are the topics of your Open Elective subject new to you?
51.5% students agreed that topics of their Open Elective subject are totally new for them, for 23.7% students it is sometimes, for 5.3% students it is for most of the times while 19.5% students are saying that it is not new for them.

Percentage of lectures attended by students in Open Elective Subject.
48.4% students agreed that they attended more than 75% lectures in their Open Elective subject, 42.1% students attended between 50% to 75% lectures, 8.4% students attended less than 50% lectures while 1.2% students have not attended any lectures of Open Elective subject.

Factors motivating to attend lecture of Open Elective subject.
47.9% students agreed that topics and contents motivate them to attend lectures in their Open Elective subjects, 47.5% students agreed that usefulness of OE subject in the growth of their career is main motivating factor.

Will the knowledge of Open Elective subject help in future of students?
57% students agreed that knowledge gained by Open Elective subject will help them in their future, 36% are saying that it may be while 7% students denied it.

Is seriousness in teaching of Open Elective subject same as in Major / Minor subject?
59% students agreed that there is seriousness in teaching of Open Elective subject same as in the subject of Major / Minor, 23% are saying that it is sometimes, 6% are saying most of the times while 12% students are denied it.

Are students satisfied by teaching of Open Elective subject in their colleges?
18.5% students are strongly satisfied, 64.6% students are satisfied, 11.6% are not satisfied while 5.3% students are strongly not satisfied by teaching of Open Elective subject in their colleges.

Methods of assessment of Open Elective subjects in colleges.
Maximum students (81%) are saying that their colleges use the pattern of assignment and test both to evaluate students in Open Elective subjects, 9.8% are saying only test, 7.1% are saying only assignment while there are very few students are saying that their colleges give them project, PPT presentation, etc.

Chi-square Tests to test the significance of association between various factors at 5% level of significance

Chi-square Test- 1: To test the null hypothesis
H_0: There is no significant association between Gender of students and their satisfaction level in teaching of Open Elective subject in their colleges
Here p value is 0.023 which is less than 0.05, so null hypothesis is rejected at 5% level of significance and we can conclude that there is a significant association between Gender of students and their satisfaction level in teaching of Open Elective subject in their colleges

Chi-square Test- 2: To test the null hypothesis
H_0: There is no significant association between the stream of students and the Open Elective subject in their colleges is new for them.
Here $p\ value\ is$ 0.00009 which is very less than 0.05, so null hypothesis is rejected strongly at 5% level of significance and we can conclude that there is a strong significant association between the stream of students and the Open Elective subject in their colleges is new for them.

Chi-square Test- 3: To test the null hypothesis
H_0: There is no significant association between the stream of students and the knowledge of their Open Elective subject will help them in their future.
Here p value is 0.002 which is very less than 0.05, so null hypothesis is rejected strongly at 5% level of significance and we can conclude that there is a strong significant association between the stream of students and the knowledge of their Open Elective subject will help them in their future.

Chi-square Test- 4: To test the null hypothesis
H_0: There is no significant association between the stream of students and the seriousness of teaching in their Open Elective subject same as in Major / Minor subject in their colleges.
Here p value is 0.018 which is less than 0.05, so null hypothesis is rejected at 5% level of significance and we can conclude that there is a significant association between the

stream of students and the seriousness of teaching in their Open Elective subject same as in Major / Minor subject in their colleges.

Chi-square Test- 5: To test the null hypothesis

H_0: There is no significant association between the stream of students and their satisfaction level in teaching of their Open Elective subject in their colleges.

Here p value is 0.042 which is less than 0.05, so null hypothesis is rejected at 5% level of significance and we can conclude that there is a significant association between the stream of students and their satisfaction level in teaching of their Open Elective subject in their colleges.

Chi-square Test- 6: To test the null hypothesis

H_0: There is no significant association between the interest of students in their Open Elective subjects and the percentage of their attending lectures in their Open Elective subject in their colleges.

Here p value is 0 which is too much less than 0.05, so null hypothesis is rejected strongly at 5% level of significance and we can conclude that there is a strong significant association between the interest of students in their Open Elective subjects and the percentage of their attending lectures in their Open Elective subject in their colleges.

Chi-square Test- 7: To test the null hypothesis

H_0: There is no significant association between the interest of students in their Open Elective subjects and the factors motivating to attend the lectures in their Open Elective subject in their colleges.

Here p value is 0 which is too much less than 0.05, so null hypothesis is rejected strongly at 5% level of significance and we can conclude that there is a strong significant association between the interest of students in their Open Elective subjects and the factors motivating to attend the lectures in their Open Elective subject in their colleges.

Chi-square Test- 8: To test the null hypothesis

H_0: There is no significant association between the interest of students in their Open Elective subjects and their satisfaction level in teaching of their Open Elective subject in their colleges.

Here p value is 0 which is too much less than 0.05, so null hypothesis is rejected strongly at 5% level of significance and we can conclude that there is a strong significant association between the interest of students in their Open Elective subjects and their satisfaction level in teaching of their Open Elective subject in their colleges.

Chi-square Test- 9: To test the null hypothesis

H_0: There is no significant association between the interest of students in their Open Elective subjects and continuation of same Open Elective subject by them with different topics in their semester II.

Here p value is 0 which is too much less than 0.05, so null hypothesis is rejected strongly at 5% level of significance and we can conclude that there is a strong significant association between the interest of students in their Open Elective subjects and continuation of same Open Elective subject by them with different topics in their semester II.

Chi-square Test- 10: To test the null hypothesis

H_0: There is no significant association between the factors motivating to attend the lectures in Open Elective subjects and their percentage of attending lectures of Open Elective subject.

Here p value is 0.001 which is too much less than 0.05, so null hypothesis is rejected strongly at 5% level of significance and we can conclude that there is a strong significant association between the factors motivating to attend the lectures in Open Elective subjects and their percentage of attending lectures of Open Elective subject.

Conclusion

These are the following conclusions after analyzing the data: There is a significant association at 5% level of significance between

- Gender of students and their satisfaction level in teaching of Open Elective subject in their colleges
- The stream of students and the Open Elective subject in their colleges is new for them.
- The stream of students and the knowledge of their Open Elective subject will help them in their future.
- The stream of students and the seriousness of teaching in their Open Elective subject same as in Major / Minor subject in their colleges.
- The stream of students and their satisfaction level in teaching of their Open Elective subject in their colleges.
- The interest of students in their Open Elective subjects and the percentage of their attending lectures in their Open Elective subject in their colleges.
- The interest of students in their Open Elective subjects and the factors motivating to attend the lectures in their Open Elective subject in their colleges.
- The interest of students in their Open Elective subjects and their satisfaction level in teaching of their Open Elective subject in their colleges.
- The interest of students in their Open Elective subjects and continuation of same Open Elective subject by them with different topics in their semester II.
- The factors motivating to attend the lectures in Open Elective subjects and their percentage of attending lectures of Open Elective subject.

Suggestions

From the above studies there are few suggestions to make OE subjects more effective.

1. Very few students had an idea about their OE subjects before admission. Colleges can publish the list of OE subjects in the prospectus so that students will aware of availability of subjects and accordingly they can choose that during admission.
2. Though most of the students are happy with the content and way of assessment of OE subjects, there is always a scope of innovation and improvement to frame the syllabus and way of teaching to make OE more student's friendly.
3. Some effective measure should be taken to increase the attendance to the class and convince them about the benefit of OE subject to their career.

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