ACADEMIC ACHIEVEMENT AMONG UNDER GRADUATE STUDENTS OF PROFESSIONAL/ NON-PROFESSIONAL COURSES STUDYING IN DIFFERENT STREAMS IN RELATION TO USAGE OF MOBILE APPLICATIONS

Harpreet Kaur
Assistant Prof., Batala College of Education, Batala**.**

Abstract:
This study investigates academic achievement among under graduate students of professional/ non- professional courses studying in different streams in relation to usage of mobile applications. Random sampling was employed on the sample of 800 students of 1st, 2nd, or 3rd year of graduation classes of Professional and Non-Professional courses studying in Science and Social science streams with high and low usage of mobile apps. No significant difference was found in Usage of Educational Mobile Applications between under graduate students studying in Professional courses and non- professional courses; while a significant difference in Usage of Non-Educational Mobile Applications between under graduate students studying in Professional courses and non- professional courses.A significant difference was revealed in Usage of Educational Mobile Applications between Science and Social Science streams undergraduate students, but no significant difference was found in Usage of Non-Educational Mobile Applications between Science and Social Science streams undergraduate students.The different levels of usage of educational mobile application as well as of non-educational mobile application (high, average and low) were not found having affect on the scores of academic achievement of Undergraduate students.A significant interaction effect of Usage of Educational Mobile Applications/ Usage of Non-Educational Mobile Applications and stream of under graduate students studying in different courses was found on the scores of Academic Achievement.

Introduction:
Using technology is an inevitable part of modern life. Simple call and text message features replace this form of technology with features like internet access, e-mails, camera applications, and multimedia services (Lefebvre, 2009). Norries, Hossain, and Soloway (2011) viewed that when students use mobile learning devices, including smartphones, during learning time, students' achievements increase significantly; as when they have the device in hand, the time-on-task completion increases. The success of technology is proved in different streams by many authors. Al-Hariri & Al-Hattami (2017) found that student success in Physiology courses was directly linked to the use of technology. Students' usage of technology and their success in geography courses is strongly linked; as use of animation technology may have a greater impact on academic attainment in a given area than the absence of such technology (Inceday, 2018). While the others view that many college students perceive the cell phone primarily as a leisure device, and most commonly use cell phones for social networking, surfing the Internet, watching videos, and playing games (Lepp, Li, & Barkley, 2015; Lepp, Barkley, Sanders, Rebold, &

Gates, 2013).Masiu&Chukwuere (2018) put that in the 21st century smartphones have vastly increased due to its exciting features such as accessing emails, biometric, accessing social media platform and many more. There is also a growing tendency among members of the academic community to use mobile devices in their daily activities (Oliveira et al., 2017),Many college students perceive the cell phone primarily as a leisure device, and most commonly use cell phones for social networking, surfing the Internet, watching videos, and playing games (Lepp, Li, & Barkley, 2015; Lepp, Barkley, Sanders, Rebold, & Gates, 2013).

Paul et. al (2012) found a negative relationship found between time spent on OSN and academic performance. Lepp et. al. (2015) explored increased cell phone use was associated with decreased academic performance. Although more research is needed to identify the underlying mechanisms, findings suggest a need to sensitize students and educators about the potential academic risks associated with high-frequency cell phone use. D'Souza et.al (2018) established that Instagram addiction was more widespread among non-professional students than among paramedical students. Joseph and Varghese (2021) found 20% to 40% of pupils are at high risk of developing Internet Addiction. Hossainet.al. (2019) investigated the impact of variety-seeking (VS) intention on students' academic performance as a result of mobile phone usage (AP). Saritha and Abhinaya (2019) found that addiction to social media leads to affect the academic performance.

Objectives:
1. To study the difference in Usage of Educational Mobile Applications between under graduate students studying in Professional courses and non- professional courses.
2. To study the difference in Usage of Non-Educational Mobile Applications between under graduate students studying in Professional courses and non- professional courses.
3. To study the difference in Usage of Educational Mobile Applications between Science and Social Science streams undergraduate students.
4. To study the difference in Usage of Non-Educational Mobile Applications between Science and Social Science streams undergraduate students.
5. To study the interaction effect of Usage of Educational Mobile Applications and stream of under graduate students studying in different courses on the scores of Academic Achievement.
6. To study the interaction effect of Usage of Non-Educational Mobile Applications and stream of under graduate students studying in different courses on the scores of Academic Achievement.

Sample of the study: Random sampling was employed on the sample of 800 students of 1st, 2nd, or 3rd year of graduation classes of Professional and Non-Professional coursesstudying in Science and Social science streams with high and low usage of mobile applications, studying in GNDU and its affiliated college of Amritsar District.

Tools used:
1. Scale on Mobile App Usage (constructed by the investigator).
2. Academic Achievement (Marks obtained in the previous class i.e.1st, 2nd, 3rd, year of graduation).

Analysis of significance of mean scores on nature of courses
For the comparison of usage of educational and non-educational mobile applications of undergraduate students with professional and non-professional courses, t-test was computed to find the significance of the two groups. The obtained scores of students studying in professional and non-professional courses have been given in the table 1.

Table 1: t-ratio for difference in means of usage of professional and non-professional Course students with educational mobile applications

Groups		N	Mean	SD	SE_D	t-ratio
Usage of Educational Mobile Applications	Professional Course	446	103.17	8.47	0.61	2.77**
	Non-Professional Course	354	101.47	8.74		
Usage of Non-Educational Mobile Applications	Professional Course	446	86.29	8.77	0.60	1.42
	Non-Professional Course	354	85.43	8.02		

** Significant at 0.01 level(Critical Value 1.96 at 0.05 and 2.58 at 0.01 level, df 798)

The above table indicates that the t-value 2.77 for the difference in the means of the two groups was found significant at the 0.01 level of confidence. The two groups viz. Professional and Non-Professional Courses Undergraduate students may be considered different on their level of usage of educational mobile applications. It leads to an inference that there is significant difference in the mean scores of the undergraduate students studying in Professional and Non-Professional Courses on educational mobile apps usage. Thus the Hypothesis No. 1: 'There exists no significant difference in Usage of Educational Mobile Applications between under graduate students studying in Professional courses and non- professional courses', is rejected.The revealed difference in favour of Professional courses students, it can be inferred that Professional courses students; make more use of educational applications. As these apps are becoming popular in all educational institutions and are doing great thing for the students, but the use is more popular among the professional courses students as they are using these for project works etc. No earlier work depicting comparison on the basis of nature of course is found; only KPMG (2017) mentioned the demandof online higher education dominated by MBA/MCA courses students.
Table 1 indicates that the t-value 1.42 for the difference in the means of the two groups on usage of non-educational mobile applicationswas found not significant even at the 0.05 level of confidence. The two groups viz. Professional and Non-Professional Courses Undergraduate students may not considered different on their level of usage of non-educational mobile applications. It leads to an inference that there is no significant difference in the mean scores of the Professional and Non-Professional Courses of Undergraduate students in usage of non-educational mobile applications scores. Thus the Hypothesis No. 2: 'There exists no significant difference in Usage of Non-Educational Mobile Applications between under graduate students studying in Professional courses and non- professional courses,' is not rejected.The result of the study are not in accordance to the earlier studies;the students in the medical and engineering stream had a lower prevalence of IA (29.5%) than basic Science and arts stream students who were enrolled in other streams (53.6%) based on the Y-IAT cut-off score of 40 (Joseph & Varghese et.al; 2021); a strong correlation exists between faculty use of social media for professional and pedagogical purposes (Laurie, 2019) prevails; and students pursuing non-

professional courses were found to be more addicted to Instagram than students pursuing medical courses (D'Souza & Sowmya; 2018).

Analysis of usage of educational mobile applications on streams

For the comparison of usage of educational and non- educational mobile applications of undergraduate students studying in science and social science streams, t-test was computed to find the significance of the two groups. The results are presented in the table 2.

Table 2: t-ratio for difference in means of science and social science stream with usage of educational/ Non-educational mobile applications

Groups		N	Mean	SD	SE$_D$	t-ratio
Usage of Educational Mobile Applications	Science Stream	392	101.08	8.36	0.60	4.37**
	Social Science Stream	408	103.71	8.69		
Usage of Non-Educational Mobile Applications	Science Stream	392	85.82	8.34	0.60	0.30
	Social Science Stream	408	86.00	8.57		

** Significant at 0.01 level(Critical Value 1.96 at 0.05 and 2.58 at 0.01 level, df 798)

The above table indicates that the t-value 4.37 for the difference in the means of the two groups was found significant at the 0.01 level of confidence. The two groups viz. Science Stream and Social Science Stream of Undergraduate students may be considered different on their level of usage of educational mobile applications. It leads to an inference that there is significant difference in the mean scores of the Science and Social Science Stream of Undergraduate students in their usage of educational mobile applications scores. Thus the Hypothesis No. 3: 'There exists no significant difference in Usage of Educational Mobile Applications between Science and Social Science streams undergraduate students', is rejected. The results of study coincide with earlier work; Hossain & Rehman (2017) revealed the percentage of internet usage among the students coming from Business Studies, Science and Arts disciplines is 100%, 92% and 90% respectively. The Studies (Furnham, Batey, Booth, Patela&Lozinskaya, 2011; Hartley & Greggs, 1997; Williamson, 2011; Wong & Cheung, 2011) have indicated that there are differences in preferences and abilities of Arts and Science students pertaining to matters related with learning and thinking styles.

The table 2 indicates that the t-value 0.30 for the difference in the means of the two groups on usage of non-educational mobile applications was not found significant even at the 0.05 level of confidence. The two groups viz. Science Stream and Social Science Stream of undergraduate students may not be considered different on their level of usage of non-educational mobile applications. It leads to an inference that there is no significant difference in the mean scores of the Science and Social Science Stream Undergraduate students with usage of non-educational mobile applications scores. Thus the Hypothesis No. 4: 'There exists no significant difference in Usage of Non-Educational Mobile Applications between Science and Social Science streams undergraduate students,' is accepted. The results do not coincide with Saritha & Abhinaya (2019) revealed impact of social media among arts and science college students as 52.8 per cent of the respondents belong to Science discipline in comparison to 47.2% of Arts discipline; and Hashim, Al-Sharqi et.al (2016) Science group having interest in students' contribution to society while the Arts group emphasizes on participation in group decision making.

Analysis of variance on academic achievement and usage of educational mobile applications
Analysis of Variance on Academic Achievement and Usage of Educational Mobile Applications in Relation to Stream
3X2 factorial Analysis of Variance on the scores of Usage of Educational Mobile applications in relation to stream of Undergraduate Students on Academic Achievement
The mean and S.D. of Usage of Educational Mobile Applications of Undergraduate Students studying in different courses, F-value has been calculated and presented in the Table 3 below:

Table 3: Mean scores of Undergraduate Students studying in different courses of Usage of Educational Mobile Applications

Educational Mobile Apps Usage level	Stream	Mean	S. D.	N
Usage of High Educational Mobile Applications	Science	73.77	10.11	82
	Social Science	69.26	11.37	134
	Total	70.98	11.10	216
Average Use of Educational Mobile Applications	Science	70.15	11.19	179
	Social Science	72.42	13.84	189
	Total	71.32	12.66	368
Low Use of Educational Mobile Applications	Science	70.98	10.83	131
	Social Science	75.86	12.61	85
	Total	71.65	12.03	216

Table 4: Summary of Two-way ANOVA of Under-Graduate Students studying in different courses of Usage of Educational Mobile Applications on Academic Achievement

Sources of Variation	Sum of Square	df	Mean Sum of Square	F-Ratio
Usage of Educational Mobile Applications (A)	645.07	2	322.53	2.28
Educational Stream (B)	139.22	1	139.22	0.98
Interaction (AXB)	2458.60	2	1229.30	**8.68****
Error Term	112395.38	794	141.56	

 *Significant at 0.05 level, **Significant at 0.01 level

Analysis of Variance on the scores of Use of Educational Mobile Application in relation to stream of Undergraduate Students
Main Effect

A) Usage of Educational Mobile Application
It may be observed from the table 4 that the F-ratio (2.28) for difference between the mean scores of academic achievement of high, average and low groups of Usage of Educational Mobile Applications of Undergraduate students was not found to be significant at 0.05 level of confidence. This indicates that different levels of usage of educational mobile application (high, average and low) do not affect Undergraduate students on the scores of academic achievement; meaning thereby there is no difference in academic performance of the undergraduate students with respect to their usage of educational mobile application. The results are not in consonance

with earlier study; the increased cell phone use was associated with decreased academic performance (Lepp, Barkley & Karpinski; 2015).

B) Educational Stream
It may be observed from the table 4 that the F-ratio (0.98) for difference between the mean scores on the scores of academic achievement of Undergraduate students from different streams of study (Science and Social Science) was not found to be significant at 0.01 level of confidence. This indicates that stream of study of Undergraduate students do not effect on the scores of academic achievement. The results of the study are in tune with the earlier work; undergraduate students pursuing B. A. courses do not differ significantly from the students pursuing B.Sc. courses in their attitude towards mobile phone for educational purpose (Halder et. al., 2015); no significance difference is there between the variable type of general secondary certificate b/w scientific / arts stream (Al-Takhyneh, 2018).

First Order Interaction
It may be observed from the table 4 that the F-ratio (8.68) for interaction between usage of educational mobile application (high, average and low) and Educational Stream (Science and Social Science) in comparison to table value was found significant; as the difference between the mean scores of high, average and low groups of educational mobile apps usage of Undergraduate students was found to be significant at 0.05 level of confidence. This indicates that different levels of usage of educational mobile application (High, Average and Low) and Educational Stream (Science and Social Science) does affect Undergraduate students on their scores of academic achievement.

Hence the Hypothesis No. 5, 'There is no significant interaction effect of Usage of Educational Mobile Applications and stream of under graduate students studying in different courses on the scores of Academic Achievement', stands rejected. Thus, it may be concluded that there was significant difference in the mean scores of Academic Achievement of undergraduate students due to interaction effect of usage of educational mobile application and Educational Streams. Meaning thereby that the Undergraduate students studying in different Educational Streams (Science & Social Science) with high usage of educational mobile application, scored better in their academic achievement than the Undergraduate students studying in different Educational Streams (Science & Social science) with low usage of educational mobile application irrespective of high, average and low levels of educational mobile apps usage.

Analysis of variance on academic achievement usage of non-educational mobile applications
Analysis of Variance on Academic Achievement and Usage of Educational Mobile Application in Relation to Stream
3X2 factorial Analysis of Variance on the scores of usage of Non-Educational Mobile Application in relation to stream of Undergraduate Students on Academic Achievement
The mean and S.D. of usage of Non-Educational Mobile Application of Undergraduate Students studying in different courses, F-value has been calculated and presented in the Table 5 below:

Table 5: Mean scores of Undergraduate Students studying in different courses and Usage of Non-Educational Mobile Applications

Usage of Non-Educational Mobile Application level	Stream	Mean	S. D.	N
Usage of High Non-Educational Mobile Application	Science	69.55	11.28	104
	Social Science	73.00	12.90	112
	Total	71.21	12.24	216
Average usage of Non-Educational Mobile Application	Science	69.90	11.50	184
	Social Science	72.10	11.99	184
	Total	71.63	11.79	368
Low usage of Non-Educational Mobile Applications	Science	69.93	11.26	116
	Social Science	74.72	12.90	100
	Total	72.14	12.26	216

Table 6: Summary of Two-way ANOVA of Usage of Non-Educational Mobile Applications of Under-Graduate Students studying in different courses on Academic Achievement

Sources of Variation	Sum of Square	Df	Mean Sum of Square	F-Ratio
Usage of Non-Educational Mobile Application (A)	118.08	2	322.53	0.81
Educational Stream (B)	48.80	1	139.22	0.33
Interaction (AXB)	1824.08	2	1229.30	**12.46****
Error Term	62647.06	794	141.56	

 ***Significant at 0.05 level, **Significant at 0.01 level

Analysis of Variance on the scores of Usage of Non-Educational Mobile Application in relation to stream of Undergraduate Students
Main Effect

A) Usage of Non-Educational Mobile Application
It may be observed from the table 6 that the F-ratio (0.81) for difference between the mean scores of academic achievement of high, average and low groups of usage of non-educational mobile application of Undergraduate students was not found to be significant at 0.05 level of confidence. This indicates that different levels of usage of non-educational mobile application (high, average and low) do not affect Undergraduate students on the scores of academic achievement. The results do not coincide with the earlier studies of Students use social media especially Facebook, myspace, and Twiter during academic classes. The social media could negatively impact on the students' academic progress and that timed-off software should be installed in the classes (Akubugwo, 2013);Paul, Baker and Cochran (2012) found that the time spent on online social networks (OSN) was found to be heavily influenced by the attention span of the students; Kirschner and Karpinski (2010) found that Facebook users reported having lower Grade Point Average (GPAs) and spend fewer hours per week studying than nonusers.

B) Educational Stream
It may be observed from the table 6 that the F-ratio (0.33) for difference between the mean scores on the scores of academic achievement of Undergraduate students from different streams

of study (Science and Social Science) was not found to be significant at 0.05 level of confidence. This indicates that stream of study of Undergraduate students do not affect the scores of academic achievement.

First Order Interaction
It may be observed from the table 6 that the F-ratio (12.46) for interaction between usage of non-educational mobile application (high, average and low) and Educational Stream (Science and Social Science) in comparison to table value was found to be significant; as the difference between the mean scores of high, average and low groups of usage of non-educational mobile application of Undergraduate students was found to be significant at 0.05 level of confidence. This indicates that different levels of usage of non-educational mobile application (high, average and low) and Educational Stream (Science and Social Science) does affect Undergraduate students on their scores of academic achievement.

Hence the Hypothesis No. 6, 'There is no significant interaction effect of Usage of Non-Educational Mobile Applications and stream of under graduate students studying in different courses on the scores of Academic Achievement', stands rejected. It may be concluded that there was significant difference in the mean scores of Academic Achievement of under-graduate students due to interaction effect of usage of non-educational mobile application and Educational Streams. Meaning thereby that different levels of non-educational mobile apps usage (high, average and low) in addition to Educational Stream does affect the Undergraduate students on the scores of their academic achievement.

Findings:
1. No significant difference was found in Usage of Educational Mobile Applications between under graduate students studying in Professional courses and non- professional courses.
2. A significant difference was found in Usage of Non-Educational Mobile Applications between under graduate students studying in Professional courses and non- professional courses.
1. A significant difference was found in Usage of Educational Mobile Applications between Science and Social Science streams undergraduate students.
2. No significant difference was found in Usage of Non-Educational Mobile Applications between Science and Social Science streams undergraduate students.
3. The different levels of usage of educational mobile application (high, average and low) do not affect the scores of academic achievement ofUndergraduate students.
4. The different levels of usage of Non-Educational mobile application (high, average and low) do not affect the scores of academic achievement of Undergraduate students.
5. A significant interaction effect of Usage of Educational Mobile Applications and stream of under graduate students studying in different courses on the scores of Academic Achievement.
6. A significant interaction effect of Usage of Non-Educational Mobile Applications and stream of under graduate students studying in different courses on the scores of Academic Achievement. This paper has implication for college/ university students, academicians, educational administrators and educational policymakers. One can provide constant exposure to instant online or offline access, live apps should be accessible by a single tap to students. Additional information should be stored in the apps and it should be loaded even without internet access. Moreover, timed-off software should be installed in the classes; Akubugwo (2013).

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