# AN INDAGATION ON EXPERIENCES AND AWARENESS OF DIGITAL FOOTPRINT AMONG PUPILS OF HIGHER EDUCATION

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## ABSTRACT

*Digital identities have become important in an era of ever advancing technologies. Transactions completed in online environment constitute individuals' digital identity which then affect them professionally and personally. Digital identities are needed to be developed and regulated properly to protect the individuality of people. Digitized learning has moreover necessitated the cause to explore aspects of digital footprint with special emphasis on students. In this light, the study examined digital footprint experience, digital footprint awareness and attitude of pupils (teachers and students) of higher education towards online education. For this, an online survey form was developed titled "Awareness of Digital Footprint and Digital Experience in higher education". The study group consisted of 142 pupils of higher education from 13 universities of India. Pupils participated for the survey voluntarily. The findings of the research revealed a moderate level of digital footprint experiences ($\bar{x}$ = 3.1727) and high level of digital footprint awareness ($\bar{x}$ = 3.613) among participants. A higher sense of digital etiquettes was reported in pupils of higher age group. Pupils shared a strong reliance on electronic literature whereas they reflected a moderately favorable attitude towards online education.*

**Keywords**: digital identities, digitized learning, digital footprint experience, digital footprint awareness, pupils of higher education

## INTRODUCTION

Digital world has become an indispensable element of individuals' day to day life. With the advancement in twenty-first century, it has expedited every sector known to the human mind. Digi-electronics has transformed itself from being an 'item of luxury' to an 'essential commodity'. Both advancement in accessibility of electronics and improved services drove this radical transformation. It turned out as an 'alternate' to natural world. For instance, being bored in lockdown - due to the covid-19 pandemic, you choose to play an online game, surf videos, or enjoy online entertainment platform. Natural world is important for sustainability of digital world but latter has begun influencing infrastructural ideas (privacy, democracy, etc.) and institutions (individual and state) of great importance. Its influence can be categorized as positive or negative impact on society. It is here that the concept of Digital Footprint and other cybernetic concepts plays a vital role in developing a realistic understanding of threats, opportunities and responsibilities regarding Digital environment.

> *"Digital footprint is the aggregate of data derived from the digitally traceable behavior and online presence associated with an entity (maybe a person or firm)"*
> *- Kligiene, August 2011*

Initially, digital footprint was called *"slug trail"* - Negroponte,1996. The digital footprint was also named as *"exhaust"* by Tim O' Reilly. Gradually the word *'Digital Footprint'* came in existence denoting the leftover data after a visit on any website.



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This section of the paper is divided into three major sub-sections. Section (1) comprises of the definition of major concepts related to the article. Section (2) sketches a detailed understanding of the digital footprint. Section (3) reflects the nexus between digital footprint experiences and digital footprint.

**Personal data**: Personal data is any information that relates to an identified or identifiable living individual. Different pieces of information collected together can also lead to the identification of a particular person constitute personal data. (European Union commission).

**Digital etiquette / Netiquette:** Digital etiquette refers to a responsive awareness of behaving with a suitable, principled, and responsible approach in the digital environment. It includes the setting of an individual's digital reputation / footprint (cyber safety, CBSE; 2020) thus crafting responsible netizens.

**Doxxing:** It refers to publicly releasing a person's identifying information, including full name, date of birth, contact number, and picture typically retrieved from the social network site profile. (Federal Bureau of Investigation, US).

**Net-neutrality:** Net-neutrality refers to an objectively equal treatment of all data traffic, by the service provider. It debars the prioritization of traffic in the Internet access service (European Union commission). Also, traffic management by the provider should be independent of origin or destination of traffic and any commercial consideration.

Digital footprint is a trace that remains after an entity's interaction with the digital environment including the use of TV, Mobile, Internet, Music Player, or other services. Personal identity or Bank account number are not included in digital footprint still exhaustive data array such as (Address of frequently visited websites or an opened file) sketches a person's identity (liking, hobbies, etc.) true to great extent. Lambiotte and Kosinsai (2014) defines digital footprint as *"numerical footprint left by individuals in an electronic database with their online and offline activities." "Digital footprint is recorded between humans and the cyber world."* (Chen,C., Chen,X., Wang, L., 2017).

According to literature concerning digital footprint, there are two types of footprint**, passive** and **active** while passive prints are left interacting with an infrastructure that provides input to location records such as GPS enabled mobile, active prints are made explicitly by the user when they reflect their location or other crucial data in photographs, message, and sensory measures. (Girardin, Calabresa, Dalfoliore, Ratti and Blat, 2008).

Individuals witness a variety of experience digitally. Therefore, digital footprint can neither completely be portrayed as a threat nor an individual can completely diminish its digital footprint. It plays a crucial role in providing an individual with both the most relevant searches and advertisements. Without a properly developed algorithm say, a person searching for a restaurant might get an advertisement for the recruitment. Such conditions would be a state of loss both for seller and buyer, increasing the cost of internet accessibility and of accompanying services. In the same way, digital footprint help individuals to get acquainted with people like them across various social networking platforms or their reliance on Google for movie list is by a large based on their (search activities) digital footprints.

Contrastingly digital footprint poses a great challenge to liberty of individual or sovereignty of institutions as it targets individuals based on their past online behavioral tendencies. Individuals do encounter online advertisements for clothes after an online shopping or other instances of equivalent case.

In April, 2010 Facebook launched its "Open Graph" API (Application Programming Interface). It was launch for developer to make social object on its platform. Every tangible



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object or ideas put on Facebook are categorized under Social object. These social objects connect different users connected all over the world on Facebook through 'like' button. Therefore, Facebook brings each real-life entity online. An enormous amount of digital footprint is created when users of these online entities are connected by likes. The data hence created cannot only be limited to users as their footprint but it also creates a print of the social object connected with users. For instance, consider if majority of Facebook users of one region say, Gujarat is liking a luxury car (Ferrari) feeded as a social object. The users could definitely be categorized but reach of Ferrari can also be detected in that particular market. Here chiefly user's active footprint constitutes its digital footprint. For example, if a user like a social object called Samsung it generates an active digital footprint which express about user liking the particular product but it also generates passive digital footprint in the background (without user's cognition). It may contain information like user's geographical location, age, gender, profession details which then generate a new digital footprint with a combined footprint of the user of the same genre and this newly generated digital footprint can tell, about people of what age group or a profession is liking Samsung. Complexity of Digital footprint increases with an increment in users and connectivity among them. For example, consider a Facebook user from Spain and another Facebook user from Bangladesh completely unknown to each other can be categorized together based on passive footprint created by their active footprint (their liking or post on some Social object).

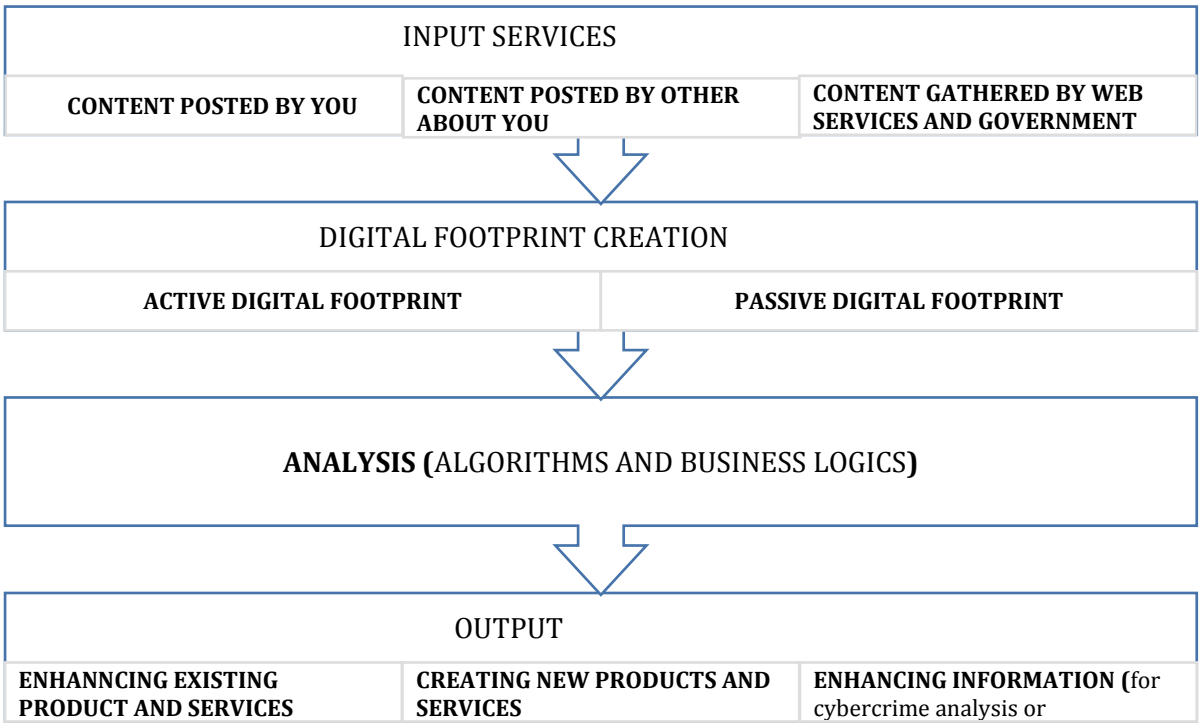


**Figure 1.** Creation of digital footprint (source: Arakerimath,R,A, et al. ;2015).

Individuals visit 100s of the website in a day or two with such frequency privacy or cookies policies of visited websites are read very rarely, the frequency is less also because of onerous language of policies. This behavior of users is aptly reflected in Microsoft's 2013th privacy survey results were just 23% of citizen of United States and 22% of citizens residing in European union reported of reading Terms and Condition in its entirety.

Studies on digital footprint show that the people can be persuaded from their digital footprint, which may allow us to reach considerable personal information such as their world view,



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political view, religious belief, personality characteristics, education and address (Garfinkel, 2010; Kosinski, Stillwell & Graepel, 2013; Madden, Fox, Smith & Vitak, 2007)

Hence, Digital Footprint has become a rapidly growing market; as the received data are reliable assuring the success. Digital Footprint can affect people both individually (affecting occupation or socio - economic experiences) and collectively (raising a campaign, to making a government fall or persuading people during elections) based on nature of data stored and interpreted. In such scenario individuals should understand the risks and responsibilities involved and should adopt proper measure in regulating their Digital footprint at their benefit.

Tony Fish (2007) hinted on the concept and possible danger of digital footprint in his book "Digital Footprint". It explains how data algorithms can build digital footprint based on social data and the controller of the data of social digital footprint can determine purchasing behavior of mass. In October 2012, there was research a paper published on the topic “Private traits and attributes are predictable from digital records of human behavior”. It explains how an individual persona can easily be predicted through its online exchange kept as digital records.

Camacho, Minelli, and Grosseck, (in 2019) studied on digital footprint with 135 undergraduate students. It draws attention to critical questions about digital identity, personal development, social relations, and lifelong learning. The study contains important results concerning how a digital environment shapes the identity of students and how students perceive the situation. Ozbek, Coklar, and Gundus (2016) worked with high school students to determine the digital footprint awareness and experience of high school students. 316 high school students participated in the study in which it was observed that students using the Internet for educational purposes had a higher level of digital footprint and lower level of negative experiences on this matter. Surmelioglu and Seferoglu (2019) conducted an exam on digital footprint awareness and experiences among 508 students of higher education. In the research level of digital footprint awareness was found to be higher in comparison to moderate digital footprint experience.

**Importance of Study**

> *"Digital footprint of India is one of the fastest-growing in the world with the potential to become a trillion-dollar economy by 2025."*
> - page12, National Policy on Software Research, (2019).

With 480 million internet users across India (2018, Statista) it has become a great market opportunity putting an open invitation to both data miners and algorithmic firms. India was ranked as the second largest online market worldwide in 2019 (Statista) such circumstance necessitates a study on responsible users and their level of explicit awareness, which is crucial to maintain both the privacy and true individuality of individuals. Therefore, this study is important in examining the awareness level of pupils(teacher/student) of higher education about their Digital Footprint Experiences and Digital Footprint Awareness. In a transformational period, such as today, the online availability of youth has a huge impact on their future (both professionally and in their social life). It necessitates an inspection of safety measure, individuals studying in higher education performs.

Digi-globalization has necessitated firms and recruiters to verify the digital footprint of candidates before recruiting them. Imagine your hobbies, liking/disliking being cross-examined by your clicks online. Digital Footprint has turned to be an easy and verifiable source for sketching personality of individual. A miss-managed digital footprint can negatively impact on real life of individual whereas an online reputation is as effective as health of individual in natural world. Gravity posed by digital footprint make this research



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more important as it reveals the level of awareness of digital footprint and digital footprint experiences of pupil related to Higher education who are assets to every institution. With circumstance leading to digitized learning the study also tends to interpret attitude of pupils towards online education in a country having diverse socio-economic pattern such as India. The study will also prove, an outset for further studies related to questions cybernetic future holds.

### Objectives of Study

1. Examine the status of digital footprint experiences among pupils of higher education.
2. Examine the status of the digital footprint awareness among pupils of higher education.
3. Examine the Variations in digital footprint awareness and experiences of pupils of higher education according to their: a) Gender and, b)Age.
4. Examine the attitude of pupils of higher education towards online education and electronic literature.
5. Examine the variation in time spent in Digital Environment according to their: a) Gender and, b)Age.

## METHOD

The study aims to determine digital footprint experiences, digital footprint awareness and attitude towards online education of pupils related to higher education is a causative comparison study. In a causative comparison study, researchers try to determine the reasons or results of present differences between individuals or groups (Fraenkel, Wallen & Hyun, 2003).

### Participants

Working group of study comprised of pupils (students and teachers) of higher education. A total of 150 individuals from 13 universities participated in the study based on voluntariness. However, 08 repeated response where omitted to normalize the data and analysis was conducted on data of 142 participants. Among the universities of participants prominent one are as follows- Central University of South Bihar 69.01% (98 responses), Calcutta University 5.63% (8 responses), Regional Institute of Education, Bhubaneswar 2.11% (03 responses), Ranchi University 8.45% (12responses). Table: 1 comprises of variables-wise distribution of participants.

**Table 1.** Represents variables-wise distribution of pupils

| Variables | Options | *f* | % |
|---|---|---|---|
| Gender | Female | 45 | 31.6% |
| | Male | 97 | 68.3% |
| | Total | 142 | 100% |
| Age | 18 to 22 years | 77 | 54.2% |
| | 22 to 30 years | 59 | 41.5% |
| | Above 30 tears | 6 | 4.2% |
| | Total | 142 | 100% |
| Occupation | Students | 131 | 92.3% |
| | Teachers | 11 | 7.7% |
| | Total | 142 | 100% |



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**Instrument Used**

Two form-set were developed for collecting the data for this research study. The primary set of data collected the personal information such as- Name, belonging institution, gender, age, occupation (teacher /student), stream, primary electronic device, and time spent in the digital environment which are necessary to complete the objectives of the study.

The second set of questioners had a total of 24 statements which were to be marked on Choice Based Options (CBO). Prepared Statements were divided in 5 categories, which are as follows:

(5) Statements concerning online study habits,
(4) Statements concerning advertisement,
(5) Statements concerning online habits.
(4) Statements concerning Netiquette.
(6) Statements concerning digital footprint awareness.

Out of twenty-four, eight statements were put for digital footprint experiences and sixteen for digital footprint awareness.

All items of the form-set were positive statements. Options for the statements were based on a five-point Likert-scaling system. The options were: 'Never, Seldom, Sometimes, Usually, and Always' and 'Strongly Disagree, Disagree, Moderately Agree, Agree, and Strongly Agree'. However, statements were not kept mandatory to be answered but statements were restructured and repeated to let volunteers consciously choose the option which would reduce the chance of good faking.

While preparing items for this survey, relevant research paper and literature were utilized to develop an understanding of methodology and content (Camacho et al., 2012; Madden et al., 2007; Ozbek et al., 2016; Surmelioglu et al., 2019; Kligiene et al., 2012; Lutz et al., 2018; Arakerimath et al., 2015). The adaptation was also made in the item-pool based on opinions and suggestions received from the three experts from the field.

With such procedure, the "Survey for Digital Footprint and Digital Footprint Experiences" was prepared consisting of 33 items in total. A pre-tryout was carried out on 10 students to review the validity and reliability of the items. Then, the survey was conveyed to pupils among Higher education.

Comprised of the procedure of identifying and collecting the most relevant statements from the survey. Eight responses, that were repeatedly recorded were omitted to attain the normalcy in the analysis of data. The level of digital footprint experience and awareness related to digital footprint was examined with frequency (f), percentage (%), and mean ($\bar{x}$) of recorded responses. Frequency (f), percentage (%) of data were used to show the highlighted trend of digital footprint experience and awareness according to age, and time spent in the digital environment. t-test was applied to examine the Digital footprint experience and awareness according to the gender of the recoded response. Statements such as concept of Netiquette, and concept of Digital footprint were directly analyzed with frequency (f) and percentage value (%).

The interpretation of the data concerning Digital footprint awareness and experiences consisted of a 5-point Likert item were based on 3 evaluation criteria as level of Low, Moderate, and High. Suitably the three evaluation criteria with scoring of 1-5 were evaluated as follows:

1. For interval ranging from 0 to 1.66 was labeled with Low level of Awareness or Experiences.



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2. The range of 1.67 to 3.33 was categorized as a Moderate level of Awareness or Experiences.
3. Range 3.34 to 5 was identified as a High level of Awareness or Experiences concerning digital footprint.

The quantitative data acquired in the study were analyzed both manually and through computer analysis program.

* Out of 142 responses few blank responses were collected. Overall percent (%) is calculated out of 142.

## ANALYSIS AND INTERPRETATION

### Digital Footprint Experience among Pupils

Digital footprint experiences among pupils (students and teachers) of Higher education. The following statements of the study were devised to determine the status of digital footprint experiences among pupils (Students and Teachers of higher education). In light of the above-mentioned objectives the frequency(s), percentage (%), mean ($\bar{x}$) of the data received from 8 statements of the survey were calculated. In the table concerning digital footprint experiences, grading was done as follow:

**Table 2.** Represents the data for experience of digital footprint

| S.N. | Statements related to digital footprint experiences | | 1 | 2 | 3 | 4 | 5 | Total | $\bar{x}$ |
|---|---|---|---|---|---|---|---|---|---|
| 1. | I have faced issue of explicit advertisement during 'screen-sharing', of my device(s). | % | 13.3 | 8.4 | 39.4 | 21.8 | 16.1 | 100% | |
| | | *f* | 19 | 12 | 56 | 31 | 23 | 142 | 3.169 |
| 2. | My Search - content are also encountered as advertisement in my device(s). | % | 6.3 | 10.5 | 36.6 | 30.9 | 14 | 100% | |
| | | *f* | 9 | 15 | 52 | 44 | 20 | 142 | 3.316 |
| 3. | Pop - up Advertisements are related to my search activity. | % | 12.6 | 16.9 | 30.9 | 33.8 | 7 | 100% | |
| | | *f* | 18 | 24 | 44 | 43 | 10 | 142 | 2.957 |
| 4. | I felt an increase in advertisement of Online Educational Platform and Applications in my device(s), for last one month. | % | 4.2 | 9.1 | 16.9 | 35.9 | 30.9 | 100% | |
| | | *f* | 6 | 13 | 24 | 51 | 44 | 142 | 3.718 |
| 5. | I realized that my Friends/Relative have found out my secret profile which I have on various digital platform. | % | 46.4 | 14.7 | 19.7 | 11.2 | 5.6 | 100% | |
| | | *f* | 66 | 21 | 28 | 16 | 8 | 142 | 2.084 |
| 6. | I consider Auto - updating of applications beneficial. | % | 19.7 | 7.7 | 27.4 | 23.2 | 21.1 | 100% | |
| | | *f* | 28 | 11 | 39 | 33 | 30 | 142 | 3.161 |
| 7. | I am concerned of my personal data leak in Digital Environment. | % | 9.1 | 4.2 | 26 | 19 | 38.7 | 100% | |
| | | *f* | 13 | 6 | 37 | 27 | 55 | 142 | 3.654 |
| 8. | I believe privacy can be best maintained by paid security applications. | % | 7.7 | 11.9 | 28.1 | 30.2 | 19 | 100% | |
| | | *f* | 11 | 17 | 40 | 43 | 27 | 142 | 3.323 |

*Average of Digital Footprint Experience = 3.1727, Whereas for all tables*

| Statements | Strongly Disagree | Disagree | Moderately Agree | Agree | Strongly Agree |
|---|---|---|---|---|---|
| | Never | Seldom | Sometimes | Usually | Always |
| Scale | 1 | 2 | 3 | 4 | 5 |



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Data in the table reflects that pupils have a 'Moderate level' of Digital footprint experiences ($\bar{x}$ =3.1727). Also, high mean ($\bar{x}$=3.654) calculated for statement number 07 [I am concerned of my personal data leak in digital environment] depicts about individuals' concern of personal data leak in digital sphere and indicate toward their awareness related to measures of digital footprint. On the other side, item number 02 {my search content is also encountered as an advertisement in my device(s)} display a moderate digital footprint experience ($\bar{x}$ = 3.316) among pupils. However, maximum percentage of responses in statement number 04 (30.2%pupils) 'Strongly Agreed' and a higher level of the mean ($\bar{x}$ = 3.718) indicate that individual has encountered a sharp growth in advertisements of online educational platform and applications, in the period of lockdown due to covid-19.

The interpretation also loosely tally with the study conducted by Surmelioglu,Y.; Seferoglu,S.,S.(2019) where a low level of digital footprint experience was encountered among students of higher education.

**Digital Footprint Awareness among Pupils**

Subsequent items of the study were devised to ascertain the status of awareness about the digital footprint among pupils of Higher education. By examining the same, frequency(s), percentage (%), and mean ($\bar{x}$) of received data were analyzed. Data of 18 statements related to digital footprint awareness of the survey were analyzed. Received responses were graded in the following way.

**Table 3.** Represents the data for awareness of Digital Footprint

| S.N. | Statements related to digital footprint awareness | | 1 | 2 | 3 | 4 | 5 | Total | $\bar{x}$ |
|---|---|---|---|---|---|---|---|---|---|
| 1. | I rely on Digital Content for my studies. | % | 1.4 | 3.5 | 26 | 52.8 | 16.1 | 100% | |
| | | *f* | 2 | 5 | 37 | 75 | 23 | 142 | 3.788 |
| 2. | I depend on authentic and legitimate source for my content of study. | % | 0.7 | 2.1 | 19 | 36.6 | 40.8 | 100% | |
| | | *f* | 1 | 3 | 27 | 52 | 58 | 142 | 4.126 |
| 3. | I prefer online video - conferencing tools for attending E-lectures. | % | 4.2 | 14 | 30.9 | 28.1 | 22.5 | 100% | |
| | | *f* | 6 | 20 | 44 | 40 | 32 | 142 | 3.507 |
| 4. | Content shared by me in digital environment is genuine. | % | 2.1 | 6.3 | 19 | 40.8 | 32.3 | 100% | |
| | | *f* | 3 | 9 | 27 | 58 | 46 | 142 | 3.971 |
| 5. | I thoroughly review my articles (style and spelling) before posting it digitally. | % | 3.5 | 4.2 | 14 | 27.4 | 50.7 | 100% | |
| | | *f* | 5 | 6 | 20 | 39 | 72 | 142 | 4.176 |
| 6. | During this pandemic I have prioritized study over security. | % | 11.9 | 10.5 | 28.8 | 28.1 | 20.4 | 100% | |
| | | *f* | 17 | 15 | 41 | 40 | 29 | 142 | 3.345 |
| 7. | I consider reading the package before installing new update of applications in my device(s). | % | 13.3 | 10.5 | 25.3 | 22.5 | 28.8 | 100% | |
| | | *f* | 19 | 15 | 36 | 32 | 41 | 142 | 3.450 |
| 8. | I modify (timely) the privacy settings of online tools of my device(s). | % | 8.4 | 9.1 | 21.8 | 28.8 | 30.9 | 100% | |
| | | *f* | 12 | 13 | 31 | 41 | 44 | 142 | 3.626 |
| 9. | I keep 'pop - up ' off in my search engine. | % | 8.4 | 15.4 | 21.8 | 26 | 27.4 | 100% | |
| | | *f* | 12 | 22 | 31 | 37 | 39 | 142 | 3.464 |
| 10. | I imply to the concept of 'Netiquette'. | % | 7 | 4.2 | 42.2 | 28.1 | 16.1 | 100% | |



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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *f* | 10 | 6 | 60 | 40 | 23 | 142 | 3.359 |
| 11. | I keep my Professional and Personal life separate in Digital environment. | % | 5.6 | 4.9 | 14.7 | 27.4 | 45 | 100% | |
| | | *f* | 8 | 7 | 21 | 39 | 64 | 142 | 3.950 |
| 12. | I am aware of the concept of 'Digital Footprint'. | % | 2.8 | 8.4 | 25.3 | 45.7 | 16.1 | 100% | |
| | | *f* | 4 | 12 | 36 | 65 | 23 | 142 | 3.598 |
| 13. | I update my liking, whereabouts and other personal detail on Digital media platform. | % | 17.6 | 13.3 | 33.8 | 22.5 | 10.5 | 100% | |
| | | *f* | 25 | 19 | 48 | 32 | 15 | 142 | 2.887 |
| 14. | I take necessary precautions to prevent others from using my Personal information. | % | 2.8 | 2.8 | 13.3 | 20.4 | 59.1 | 100% | |
| | | *f* | 4 | 4 | 19 | 29 | 84 | 142 | 4.260 |
| 15. | I feel reducing Digital Footprint is responsibility of an individual. | % | 1.4 | 11.9 | 28.8 | 38.7 | 16.1 | 100% | |
| | | *f* | 2 | 17 | 41 | 55 | 23 | 142 | 3.478 |
| 16. | I am aware of the concept of 'Doxxing' . | % | 10.5 | 28.1 | 24.6 | 23.9 | 9.1 | 100% | |
| | | *f* | 15 | 40 | 35 | 34 | 13 | 142 | 2.823 |

*Average of Digital Footprint Awareness = 3.613*

Presented data exhibit a 'High level' of awareness among pupils, related to the digital footprint ($\bar{x}$ = 3.613). Accordingly, trend determined in item number 14 {I take necessary precautions to prevent others from using my personal information} reveals, high level of awareness ($\bar{x}$ = 4.260) among people. It also builds an idea of individuals adopting a proper measure to put a check on their personal information, seeping in online world. However, mean evaluated for statement number 16 {I am aware of concept 'doxxing'} ($\bar{x}$ = 2.823) reflects moderate exposure of pupils with concepts related to digital footprint. Apart from high level of awareness ($\bar{x}$= 3.598) exhibited for the statement "concept of Digital footprint", partakers has also reflected high level of awareness ($\bar{x}$ = 3.450) for an action statement asked as item number 07 {I consider reading the package before installing a new update of applications in my device(s)}It implies that pupils apart from understanding their digital footprint also keep check on applications implanting them online .In addition, mean achieved for statement number 05 { I thoroughly review my article(s) (style and spelling) before posting it digitally} ($\bar{x}$=4.176) justify high level of universal mean. Assuring about high level of digital footprint awareness among pupils.

Previous researches in this field also confirm individuals using the Internet have a high level of digital footprint awareness (Camacho et-al., 2012 'Madden et-al.,2007 Ozbek et-al., 2016). A higher level of digital footprint awareness was also concluded among students of higher education (Surmelioglu, Y and Seroglue, S., S. 2019). According to Pew Internet Project (2002), Internet users are becoming more aware of their digital footprints' 47% have searched for information about themselves online up from 22% just 5 years ago. Considering such perspective, it can be comprehended that the data of the case study coincide with similar studies of the discipline of digital footprint.

**Variation of Digital Footprint Experience and Awareness**

Following section determines the third objective of the study. Variations related to digital footprint experience and awareness is studied on gender and age basis. t-score is calculated to interpret level of digital footprint experiences and awareness gender-wise. Moreover,



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interpretation of representative statement of survey is done on percentage of received responses.

**According to gender**

**Table 4.** Represents t-score of digital footprint experience

| | Gender type- Male and Female | N | Mean | Std. Deviation | t test |
|---|---|---|---|---|---|
| Scores of DFE | Female | 45 | 25.4222 | 4.90125 | -.605 |
| | Male | 97 | 25.9271 | 4.48212 | -.586 |

**Table 5.** Represents t-score of digital footprint awareness

| | Gender type- Male and Female | N | Mean | Std. Deviation | t test |
|---|---|---|---|---|---|
| Scores of DFA | Female | 45 | 58.8222 | 6.47825 | .569 |
| | Male | 97 | 58.0313 | 8.19557 | .619 |

As seen in table (table no.: 4.1 and 4.2), it was determined that male has high digital footprint experience ($\bar{x}$=25.9271) in comparison to female whereas level digital footprint awareness was found more in female ($\bar{x}$ =58.8222). Similarly, Seferoglu et al. (2019) evaluated gender and found that men had greater digital footprint experience, while gender related variation in digital footprint awareness was found insignificant.

**According to gender and age**

**For statement** *"I Thoroughly review my articles (style and spelling) before posting it digitally"* - Response received is negligibly affected by the variance of gender as both, 57.77 % of male and 45.36 % of female affirmed of 'Always' reviewing their article. However, concern for review of one's article increases with an increase in age. In comparison to 55.93% (of 22-30 years) and 66.66% (of 30 years and above) only 42.85% of pupils (of 18-22 years) opted of 'Always' reviewing their article before posting it on a platform.

Out of total, (50.7%) individuals reported that they 'Always' review their articles. 15 response were also received incorrectly filled (Name and Mobile number were auto-filled under the column of the institution and primary electronic device respectively). Therefore a higher mean for the statement affirm individuals' implicit understanding of their digital footprint whereas it also hint towards pupils' increased dependency on their digital device and services.

**For statement** *"I imply to concept of Netiquette"* **-** Tendency to perform manners is reported more in participants of higher age group. On the other side, digital etiquette is not affected by variance of gender as most percentage of male and female agreed that they 'Occasionally' perform manners of digital environment (40.20% and 44.44% respectively).

Major head of overall responses (42.8%) fall under 'Sometime'. It exhibits that the individual despite being aware of the concept less favorably performs manners of Netiquette.

**For statement** *"I keep my personal and professional life separate in digital environment"* – It reveals that 65.97% of male and 82.21% of female manage their personal and professional life distinctively. Also, effect of age growth is evident on data trend as 48.05% (18 to 22



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years), 35.59% (22 to 30 years) and 66.66% (30 years and above) responded of 'Always' maintaining a separate personal and professional life.

45% of overall recoded responses reported of having separate personal and professional life while just 10.5% individual opted 'Never' and 'Seldom' for the statement. It depicts the cause of an 'overall moderate' digital footprint experiences.

**For statement** *"I believe privacy can be best maintained by paid security applications"* - Data is affected both by variance of gender and age. 39.99 % females showed a moderate reliance on-paid security application for their privacy whereas a total of (35.05% +17.50%) of male reflects their faith on paid security applications. The graph tend to grow with growth in age as 39.99% (of 30 years and above) responded of 'Always' believing on paid security applications in comparison to 20.33% (of 22-30 years) and 7.79% (of 18-22 years of age).

Also, (51%) of the individual were in favour of relying on paid security applications to retain and regulate their digital footprint, consequently impacting their experiences. Microsoft's 2013' privacy survey results has exhibited that a total of 31% of peoples of United States agreed that the companies should protect a person's online privacy.

**For statement** *" I feel reducing digital footprint is responsibility of an individual"* - Contrastingly for age group of 18-22 years most percentage of response (36.36%) is recorded for 'Moderately Agree' whereas 48.88% of pupils (of 22-30 years) has 'Agreed' to reduce Digital Footprint individually.

Data is highly affected by the variance of gender. In comparison, 55.44% of female are in total support to bear the responsibility of limiting their Digital footprint individually, on contrary responses of male are loosely distributed among the three options (Moderately agree, Agree, strongly agree) 29.89%, 48.88%,19.58% respectively.

While (28.8%) of individuals 'Moderately Agreed' to the statement, a total of (54.8%) of individuals are in 'Total Favour' of keeping a proper check on their digital footprint consequently improving their digital footprint experiences. 2013' privacy survey of Microsoft has also revealed that a total of 46% and 30% (in the US and EU respectively) agreed that consumer should itself manage their online privacy.

**Attitude of pupils toward online education and literature**

This section answers the fourth objective of this study that is measuring pupils' attitude towards online education and digital literature. It basically collates pupil's dependency on electronic-literature with attending online classes. The data is interpreted on percentage of received response.

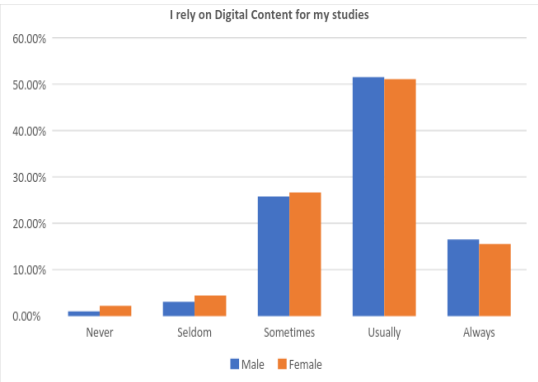


Figure 2.1

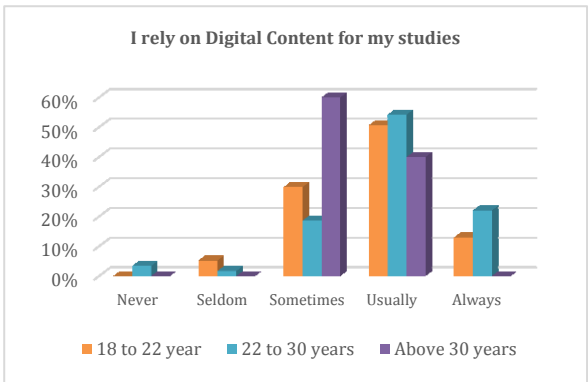


Figure 2.2



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In above presented figure (fig no: 2.1 and 2 .2). Data is not evidently affected by variance of gender, as 51.54% of male and 54% of female opted for 'Usual' reliance on digital content for their studies. Contrastingly a higher percentage of reliance (74.26%) is seen in age group (22-30 years); (63.58%) in comparison to age group (18-22 years). Pupils have demonstrated a high level of dependency on Digital literature ($\bar{x}$ = 3.788).

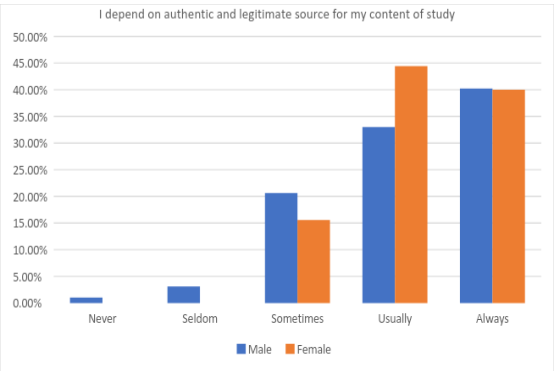


**Figure 3.1**

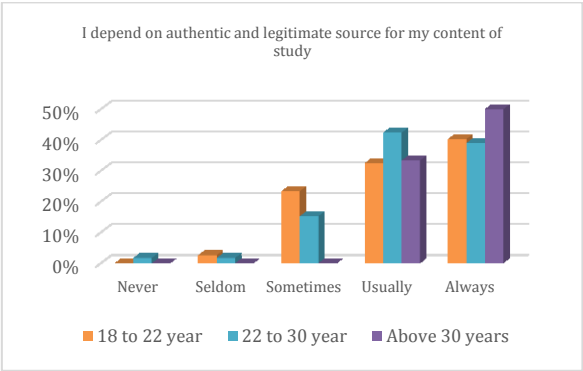


**Figure 3.2**

In graph demonstrated above (fig no: 3.1 and 3.2) 32.98% of male and 44.44% of female confirmed of their digital literacy in surfing for E-content online. Also, the data is unaffected by age-growth indicating towards respondents' proper knowledge of WebQuest.

Higher mean ($\bar{x}$=4.126) achieved for the statement confirms pupils' dependency on Digital literature and asynchronous content'. It also indicates towards pupils' proper understanding on 'WebQuest'.

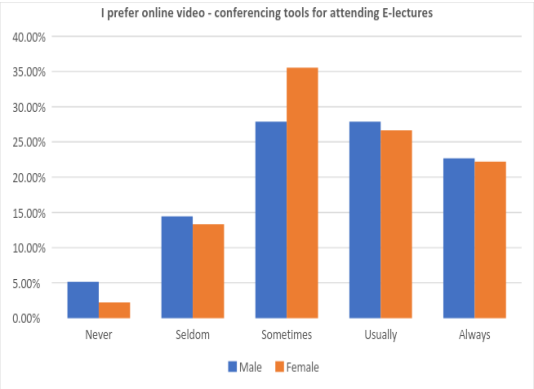


**Figure 4.1**

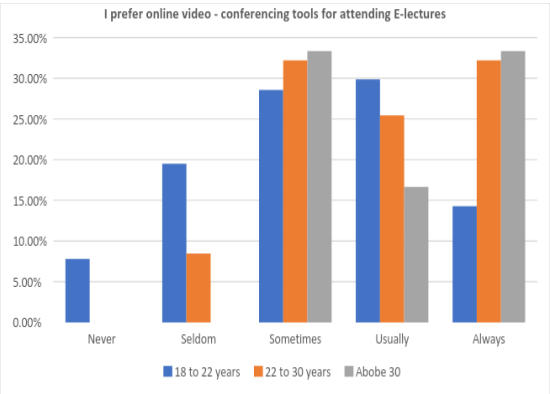


**Figure 4.2**

In the above presented figure (fig no: 4.1 and 4.2) while 35.55% of female reflected that they 'Occasionally' prefer online video conferencing tools for attending E- lectures; 27.87% of male responded that they more often prefer online video for attending E-lectures (in comparison to 26.66% of female). The data moves parallel to age, as 14.25% (of 18-22 years), 32.20% (of 22-30 years) and 33.33 (of 30 years and above) showed that they 'Always' on video conferencing tools for attending E-lectures.

Relatively less mean ($\bar{x}$=3.507) achieved for the statement indicate towards learners growing adaptability towards new circumstances.

## Variation in Daily Device Usage Pattern

Individuals' time spent in digital environment is studied in following section. Data is interpreted on the variance of gender and age. Following data represents percentage of received responses.



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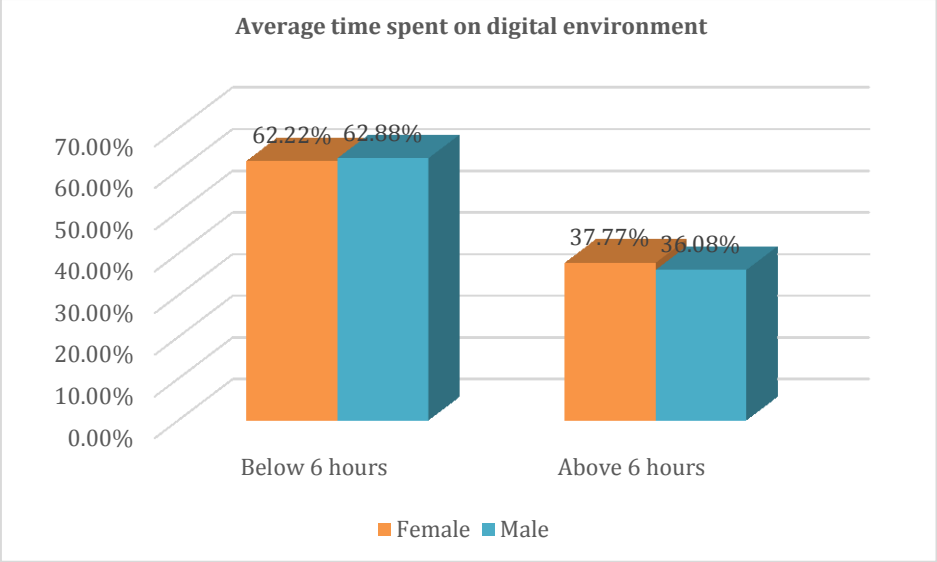


**Figure 5**

The above figure 5 presented above reflects a normal trend of both male (62.88%) and female (62.22%) being a moderate user (below 6 hours) while (37.77%) of female and (36.08%) of male reported themselves as being highly addicted (above 6 hours) to their device.

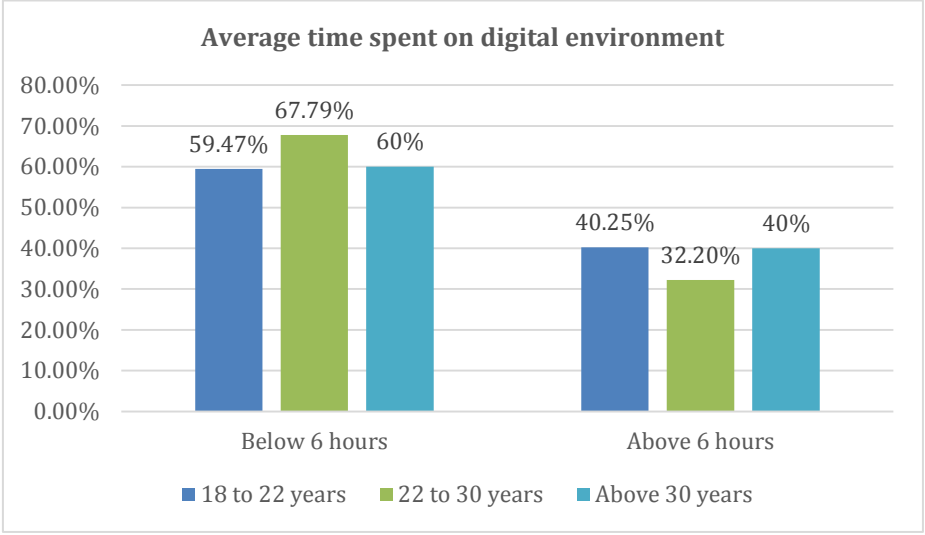


**Figure 6**

In the data shown above figure 6, a total of 59.47% (18-22 years of age), 67.79% (22-30 years) and 60% (30 years and above) has reported of moderately using their device (below 6 hours). Whereas 40.25% (18-22 years), 32.20% (22-30 years) and 40% (30 years and above) of individual reported of them being a high-end user.

## CONCLUSION AND SUGGESTIONS

Advance product and services have accustomed Individual of digital environment. Digital world emerged as a provider of universal service ranging from buying online groceries, to matching a date, to searching a house, or to recruiting an employee. Completion of each such online transactions lead to compilation of data points formed by active or passive footprint of person (either by direct feedback or by an indirect allowance leading to collection of data points). Therefore, individuals should assimilate their responsibility while performing Digital transactions. Thus, academician should research on Digital Awareness and its nexus which



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will increase awareness level demographically and reduce the risk of institution-shrinkage. Study should be more focused on students (as this section constitute most percentage of active Internet Users) to understand major trends and thus predict future trajectories in the field. In this light, the study determines level of Digital footprint experiences, Digital footprint awareness and attitude towards online education among pupils of higher education.

In the first result of the study, Digital footprint experiences was found to be 'Moderate'. Though a sharp growth in advertisement of online education platform and applications was evident still a moderate experience was interpreted for advertisement related to search activities of individuals. It proves how effectively market stakeholders are using digital footprint to provide best advertisement experiences to its users. Also, growth in digital footprint experiences moved parallel to growth in age

Continuing towards second aspect of study pupils shared a high level of digital footprint awareness. According to the interpretation, though individuals lacked on understanding of basic concept of Digital footprint; they were efficient in managing their Digital footprint responsibility. Pupils of higher education reflected an understanding of relationship between their online post and digital footprint, still they shared just a moderately favorable attitude towards netiquette (Digital etiquette). Awareness level for Digital footprint was found more in female in comparison to male.

According to evaluation concerning variables of gender and age; female shared a high level of digital footprint awareness than male. It indicate towards a more responsive awareness inculcated by them. At the same time male reported a higher level of digital footprint experiences in comparison to female. Moreover, old participants (of senior age group) implied more to digital etiquette in comparison young age groups. In same way both, concern for review of one's post and maintenance of separate digital life was also more evident in response of pupils of higher age group. Initial age-group reflected a more techno-friendly attitude. Concluding that pupils of lower age group are more frequent user while of higher age group manage their digital life better. On other side, while male showed more reliance on paid security applications, a major percentage of female agreed upon maintaining their digital footprint individually.

In context of objective concerning Digital habits for study, pupils of higher education were found to be more dependent on electronic literature but showed moderately less favourable attitude towards attending online lectures. Awareness related to digital literature and literacy was minimally affected either by variance of age or gender. Participants also had understanding of WebQuest. They relied on Electronic-content (mostly of readable format or asynchronize content) for their study. At the same time rise of demanding situation like of covid-19 pandemic reflected a gradually shift in participants attitude from Conventional classes to Digitized learning.

For the last objective of the research, a normal data trend was found. Maximum percentage of females and males were moderate users of digital appliances. Also, maximum pupils (of all age groups) were found as moderate users of their digital device(s). Majority (80.9%) of pupils of higher education reported of using Mobile (smartphones) as their own-hand device to connect to digital environment.

With such degree digital life has become a necessary evil to all its integrated domain. Digital footprint influences person's choice broadly on individual and collective aspects. Individually, unchecked digital footprint can lead to immensely negative digital experience ranging from (direct data theft to doxing) whereas a decently built digital footprint can reduce the degree of target advertisement. It will also increase employability chance of pupils (especially of higher



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education) as over 70% of employers revealed of using social networking sites to research job candidates (a survey by Career Builder, 2007). Today many firms are branding individual digital footprint, categorized under online reputation management (ORM).

On collective aspect, unregulated digital footprint can lead to shrinkage of institutions (as state) and ideas (as democracy). As persons liking disliking hobbies, faiths and belief, when deeply analysed can be boomeranged as targeted messaging to change its behaviour. Therefore, in the highly connected age of today individuals should be focusing to regulate their digital footprint to their advantage instead of trying to limit it.

Adaptability is key to survival. Pupils in India have started adopting to online education but such circumstance is especially demanding to raise students' (particularly of initial age group) digital etiquette to responsive degree. According to CBSE, India, "teenagers in age group of 14-18 years are the worst victims of revenge porn". Therefore, learning about medium and its appropriate usage should be equally focused along with focus on contents.

This paper will make valuable contribution to the literature of digital footprint awareness and experience. In this context future studies can be on:

1) Examine digital footprint awareness and experience in term of other variables.
2) Examine consequences of digital footprint in online education.
3) Research on relationship between digital footprint and employability of youth.
4) Research in field of digital literacy and digital inequality among students.

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