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Practice of Universal Design in Administration Staff in Higher Education

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Abstract

In the current information era, while there is availability of plenty of information, it also gives rise to the technical, and ethical issue of making IT accessible and usable for everyone. Digital media plays a vital role in the field of education, with access to e-books and online tutorials. The role of internet is not only limited to learning but also during the administrative tasks such as admission, course information and examination. The administration staff involved has an integral role in ensuring that the vital information, news, notices concerning to students such as information regarding exams and results, events, seminars conferences, and holidays are available to everyone. This research was involved administration staff in incorporating universal design procedure and practices in the above-mentioned tasks which are part of their responsibilities. This case study comprised of qualitative analysis by conducting semi-structured interviews with a total of 16 participants where 8 were the administrative staff and 8 were the students with one of the higher education institutions in Norway. The collected data was analyzed by doing a thematic analysis. The observations of this research were that the staff members displayed positive attitude towards accessibility, and they were motivated to include it in practice. Currently, they relied on word processing tools to provide information to the students and were not aware of any specialized tool to improve accessibility. There is a need to provide formal training to the staff to increase awareness among them. Students although were positive about accessing information through university website, they stated that information on learning management tool is overwhelming and can be a distraction while using it.

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1 Introduction

Extensive research has shown that lack of accessible learning material is the biggest hurdle which prevents students from fully utilizing the information to their learning benefit (Anderson et al., 2008; Bedrossian, 2018; Bowman, 2016). The research has been focusing on teaching methodologies and providing accessible learning materials in digital learning environments. However, accessibility issues in education are not only limited to the learning materials but also administrative procedures like admissions, examinations, enrolment for studies and choice of subjects. Digital interaction presents difficulties for many students, due to various reasons such as e-literacy, language, and disability. To provide accessible administrative services to students, it is essential to raise awareness among administrative staff about accessibility.

Under the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD), educational institutions have the responsibility to provide education for all. Article 24 ensures education for everyone, including persons with disabilities, it states,

"States Parties recognize the right of persons with disabilities to education", *"To realize this right without discrimination and on the basis of equal opportunity, States Parties shall ensure an inclusive education system at all levels and lifelong learning"* (UNCRPD Article 24 – Education, 2008).

The countries that have ratified the UNCRPD have obliged themselves to implement it in the country's legislation. Moreover, the UNCRPD is legally bound only to educational institutions in countries that have ratified the UNCRPD and incorporated the UNCRPD in their laws. Article 9 of UNCRPD also ensures accessibility in education, transportation, ICT devices and environment.

To ensure equal access to the services, the universal design of ICT is an approach that is widely used,

"Universal design means the design of products, environments, programs and services to be usable by all people, as much as possible, without the need for adaptation or specialized design". "Universal design shall not exclude assistive devices for particular groups of persons with disabilities where this is needed" (UNCRPD Article 2 – Definitions, 2008). The concept

was initially introduced in the field of architecture, encouraging architects to design buildings and structures which encompass the basic principles of Universal Design and enables both abled and disabled to move freely, and easily access the building from outside as well as navigate inside it (S. Burgstahler, 2007). This research aims to bring light to the administration staff who may have a key role to publish the learning materials and other vitally important information accessible and usable to the students. In the advent of universal design, the emphasis on laws, that aims at accessibility and usability of web platforms with information and learning materials, as well as looking into the roles of administration staff who are involved in this process is vital. A shift in attitude combined with education and training of administrative staff is paramount for their incorporating universal design procedures in their daily job activities with respect to students, especially for the students with disabilities.

Norway has enacted that all open ICT solutions must be "universally designed" as Norway passed the Anti-Discrimination and Accessibility Act in 2008.

"Any digital ICT solutions should be available and accessible for the overall population must be all around planned" (Moderniseringsdepartementet, 2013).

But now this law has been replaced by the Norwegian Act relating to equality and a prohibition against discrimination ("The Gender Equality and Discrimination Act," 2018). The regulations that administer the universal design of ICT solutions in Norway is from 2014. This implies to all-new content published online in Norway must adhere to guidelines of universal design of ICT.

"Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 and its 2008 amendments require postsecondary institutions to make their course accessible and extend the institutes services for the disabled students who are enrolled in these institutions" (Health & Services, 2006).

Web Content Accessibility Guidelines (WCAG) 2.0 is the guideline for online systems. In any event, a base dimension of availability and comprehensiveness quality confirmation must be available in structure and advancement. Further, existing arrangements must comply with the law and regulations within January 2021 (Malin, RØMEN, & STERRI, 2016).

World Wide Web Consortium (W3C) issued web accessibility guidelines (WCAG) to ensure accessibility on the internet. WCAG provides guidelines and suggestions to implement these guidelines, to provide accessible content and services for the consumers. The WCAG compliant website has three levels from A to AAA, where A is minimal compliant to AAA as highly compliant. Most of the countries include Norway require a public services provider including education, to ensure the AA level of accessibility on their websites. Often in education institutions, administrative staff are responsible for publishing the information on the internet. It, therefore, becomes both relevant and vital to discuss the role of administrative staff in making online learning and services accessible in higher education. A shift in attitude combined with education and training of administrative staff is paramount for their incorporating universal design procedures in their daily job activities concerning students, especially for the students with disabilities.

Following research studied the practice and issues related to universal accessibility in administrative processes in higher education. Existing literature was reviewed to study accessibility on the web, in online learning for higher education and online services. There were some fascinating and informative studies in the domain of accessibility, but there were not sufficient in the part of accessibility in administrative services in higher education. The selected research methodology was qualitative, where the researcher conducted interviews with the administrative staff and students. In a semi-structured interview, administrative staff were asked about the practices they follow to ensure accessibility in administrative processes. Similarly, students were asked about the issues faced by them while they search for information or perform any administrative task online. The responses were later analyzed manually and using NVIVO software for qualitative analysis.

1.1 Problem Statement

To get quality education in this era of globalization, students come to higher education institutions from different places and backgrounds with diverse cultures, languages, along with various abilities. There is diversity among students, this diversity could be based on various abilities and disabilities of the students. In contrast, designing the applications, less attention is given to make them accessible to a variety of users, this causes barriers for users

with a disability to access the services provided by these applications because the system is not designed for people with a variety of abilities. While efforts are made to digitize the services, it is equally vital that these are available to each member of society. Education is one of the sectors which has rapidly moved towards electronic services. To provide the learning content and related information, applications, websites and web portals are the most commonly used mediums. Now there is a growing awareness to provide accessible learning materials, including eBooks and MOOCs (Massive open online courses). Apart from online learning, administrative services such as admission, examination, and results are also going online, and it needs to be accessible for everyone. The responsibility of accessibility in these services is with administrative staff, and hence it is important for them to know about various barriers faced by users. Poorly designed systems, inaccessible documents, lack of knowledge among staff and other faculty, causes barriers in equal access to information by students with different abilities, and they must be addressed by administrative staff.

The proposed study is to assess the administration staff's awareness and attitude towards incorporating the universal design of ICT in the roles pertaining to specifically making information platforms and materials accessible and useable to students. Interacting with information, administration staff, and other students with the student portal or website is not easy for all students the feedback from students and concerns they face while communicating or extracting information from the portal or website. Students require a friendly environment online as well as on a personal basis that promotes communication between administration staff and faculty to facilitate the propagation of information and study materials. In the preliminary analysis of the university websites, there were some barriers discovered by the researcher while searching for information such barriers are language translation, site map, online forms and so on. Thus, to understand the role of administrative staff and practices followed by them to implement the universal design on the internet, the following research questions were devised.

1.2 Research Questions

- What knowledge does administration staff have regarding Universal Design of ICT?
- What tasks related to Universal Design of ICT does administration staff carry out in

their day to day duties?

- What methods are being incorporated by administration staff to implement procedures of Universal Design of ICT with regards to user diversity?
- What is the student's opinion about accessing the information on the university's website?

2 Literature Review

Research has been conducted on various aspects of universal design, both for instruction and learning procedures, student's behavioral responses as well as the role and attitude of faculty which are discussed in this review. The subsections are relevant studies discussing implementation of the universal design in online learning, experiences from faculty members and administrative staff in order to provide accessible information for the students.

2.1 The History of Universal Design

The term Universal Design was first used by Ronald Mace. A Universal Design is the design that is accessible, understandable, and useable to the maximum degree by all people regardless of their age, size ability or disability. A good design cannot be completed if it's not built on the principal state. The seven principles of universal design were developed at The Centre of Universal Design at North Carolina State University by a group of professionals from different walks of life that includes engineers, architects, designers, and environmental design research, by National Disability Authority. These standards is not just for the people with abilities, everybody benefits.

The first principle mainly states that the design should be useful and attractive to all the people regardless of their abilities or disabilities. The second principle is about the flexibility in the use of a design that should suit a broad spectrum of people's inclination and abilities. In the third principle is focused on simple and intuitiveness. No matter what the user level is, the design has to be without unneeded intricacy and easily understandable. In fourth, despite the user's sensory abilities, imperative information can perceive adequately by the users. Fifth covers, all the features in the design should be fail-safe along with warnings and eradicate the hazardous elements. The sixth principle focused on the low physical efforts that mean, the user can easily and efficiently use the design with the minimum physical effort. Proper size and space to be accommodated comfortably for any user either seated or in the standing condition of any size is the seventh principle of universal design.

2.2 Universal design for instruction

The Center for Inclusive Design and Environmental Access (IDeA Center) focuses on

research, development, education, dissemination, and design projects related to universal design. It provides 8 principles to incorporate Universal design in teaching (Universal Design in Instruction, n.d).

The 8 principles are as given below:

A. Promote a welcoming class climate.

B. Make learning interactive.

C. Pay attention to the physical environment and course materials.

D. Consider employing multiple delivery methods to access the content.

E. Ensure that information resources and technology are accessible and provide them in multiple formats.

F. Provide feedback to students on a regular basis.

G. Regularly assess student progress using multiple accessible methods and tools.

H. Provide accommodations.

The above-mentioned principles emphasis the importance of providing accessible environment and accessible learning material to incorporate the universal design in learning. Apart from providing accessible learning content, it is also important to universally design administrative procedures.

2.3 ICT in Learning

Information and communication technology (ICT) have become an integral part of society to perform academic and social activities. ICT not only explore the education techniques but also reduced the gap in accessing the educational resources.

Design (2007), in his research mentioned that in designing courses (hybrid and online) the most vital and crucial area which needs a lot of time and development is the planning of course and its delivery. The planning phase for a particular course involves looking closely at what are the aims of the course? What is included in the course? And to assess the transference of information is suitable and sufficient for the student to achieve the course aim? Meanwhile, the course delivery is based on taking into consideration the existing knowledge level of the student, organization of the information and material accordingly, delivery as to engage the audience with the purpose to make the new information and

material easy to understand and finally feedback.

Due to the implementation of ICT on learning, developed, and underdeveloped countries advanced their usage of technology in the education field. Online learning provides an appropriate way to gain knowledge from the internet. It is the boon for the students living in the remote areas.

"ICT is helpful for the children with disabilities and Children can take advantage of online courses and subjects, and they can learn online about the desired educational resources" (Wu, Chen, Yeh, Wang, & Chang, 2014).

For example, a child with motor impairment can use the online library resources to read about different books instead of going to any physical library. Although, not all the students are getting full access of the educational resources that create the digital divide in the society. Wu et al. (2014) found in the experiment that the children with learning disabilities performed poor in some tasks as compared to children without learning disabilities.

2.4 Multiple Mediums of Learning

A study by R David Black, Weinberg, and Brodwin (2014), applied principles of universal design while teaching for students that included persons with disabilities. The methods as dealing with learners are called universal design for learners (UDL), which attempt to reduce the number of barriers or issues faced by students including the ones with disability in an attempt to study and learn.

The number of demands for reading resources is increasing in higher education, and students are exploring their educational process in different ways. The students with learning disabilities need a separate environment for learning about the specific course and library need to accommodate the appropriate environment for the special students. Universal Design for Learning (UDL) can furnish the suitable strategies for the library to come up with instructions for the students with learning disabilities. "National Center on Universal Design for Learning elaborating the three main principles of UDL (Zhong, 2012). The principles are mentioned below:

- Providing multiple mediums of accessing the information such as visual, graphic, or auditory.

- Provide different ways with which students can express their thoughts and learning experiences.
- Provide multiple ways in learning to keep the students involved in the learning environment.

In a paper by Rutherfoord and Rutherfoord (2008), different learning styles were introduced and explained with respect to teaching methods which can be adopted for transferring of information and knowledge to students.

The Universal Design procedures which adopted into instructions modes and methods have been aptly named as universal design for instructions. This study has shown that even though there are faculty members who have sincerely attempted to incorporate UDL/UID procedures in their courses and training methods. But still, there is a massive need for educational training of faculty members to educate them to the methods and how to interact with students with disabilities. Hartsoe and Barclay (2017), in their research, present a strong relationship using a statistical model on the study's results between a faculty member's belief and his/her know-how of universal design for instruction. Another factor affecting this relationship is the experience levels of the faculty members like Professors are more welcoming and open to course change to incorporate universal design principles, while Assistant Professors are resistant. Universal design instruction training can help faculty members to make the courses and curriculum accessible to varied audience, i.e. hearing impaired, motor deficiency etc., (Robert D Black, Weinberg, & Brodwin, 2015; Gradel & Edson, 2009; McWilliam & Dawson, 2008; Pace & Schwartz, 2008).

Another study was to create a curriculum for English Language Learners (ELL) at English speaking universities based on the universal design for learning (UDL) principles. The progress and results are analyzed iteratively on an annual basis while doing the necessary modification to improve the results. The final results gave the researchers reasons to state that ELL curriculum, which was designed on UDL is beneficial for a diverse student body (Allen, Berg, Dawson, & Leveridge, 2018).

A Role-playing game (RPG) was proposed by Langley-Turnbaugh et al. that incorporated universal design (UD) procedures in a professional development conference. By adopting

this interactive approach researcher attempted to highlight the benefits, universal design (UD) provides students in achieving success in their studies. This game incorporated the learning, know-how and implementation understanding of the principles of universal design (UD). Primary actor and participant of the role-playing game-based research, i.e. the faculty member, can assist in implementing and introducing universal design (UD) in on a non-traditional and non-residential student of a community college. This game encourages an open dialogue between participants on universal design principles (UD) implementation and how they can reduce the issues faced by the students who face disabilities.

Langley-Turnbaugh, Blair, and Whitney (2013), included 16 faculty members where they incorporated for universal design for learning (UDL) in a 5-year training program. The aim was to highlight the benefits of understanding the principles of UDL and their incorporation in the studies. In facilitation of students with disabilities and providing them with the same opportunities to succeed as other students. Some key observations were that introducing technology does provide flexibility in the accessing methods of the information while maintaining the integrity of the course content and Knowledge. It was challenging to restructure of their content on the principles of the universal design for learning (UDL). The participating faculty members in the program created a tool based on the principles of the universal design for learning (UDL). It is to assess and evaluate the particular offered course's effectiveness of engaging students by providing varied methods to access information, participate and interact. At the end of each course, a questionnaire was administered to the class as to collect the feedback of the students about the course and content as well as the method of teaching based on the principles of the universal design for learning (UDL). This study has shown how critical it is that faculty members should be adequately educated and trained on incorporating the principles of universal design for learning (UDL) to provide a fair playing ground for to all and varied student population.

Rao (2013), mentioned that Universal Design educational models provide a suitable platform for course content creation consideration as well as for the online courses too, primarily to for the diverse and non-traditional student body. The study conducted by Higbee and Goff (2008), showed that providing universally accessible course content is

tedious task requiring a lot of insight and preparation. It requires additional time and resources and adds on to the stress for the instructor while in the design phase of a course. This study suggests employing universal design-based strategies incrementally which can make the processes overhead manageable while providing a platform in which future improvements can be incorporated and refined as required. Realizing that technology is an important tool in ensuring accessibility and achieving success by students with disabilities in the academic arena, University of Washington (UW) since 1992 is running a center named Disabilities, Opportunities, Internetworking, and Technology (DO-IT). This center designed and conducted an awareness project to promote about issues faced in Accessibility of information as well as incorporating universal design (UD) solutions in the methodology of learning employed by science, technology, engineering, and mathematics (STEM) to accommodate the students with disabilities.

According to Bowe (2000), in the teaching non-traditional students, the key concept on which the whole of universal design framework is based is that disability is defined as a construct created by the society based on race, gender and ethnicity not a defect or lacking in a person. It is argued that as a member of society we need to overcome these biases and attempt to understand other individuals where they are coming from, their experiences and their requirements to be able to function as a positive member in the society. Adaptation and implementation of universal design correctly can help achieve the purpose for all people. Universal design is not based on fulfilling the needs of only disabled people but to fulfil the needs of all the people. The purpose is that the environment or the product is developed considering individual requirements and needs of personals who will be a part of the experience or will be interacting with it. In agreement of above-discussed goal mentioned that in higher education institutions, universal design can assist in creating a model where students requirements can be catered for, and this model can be implemented across all higher education institution (S. E. Burgstahler & Cory, 2010).

Another qualitative study by Bowman (2016), was done on faculty members to gather data on their experiences and outcomes implementing universal design in higher education. It studied availability of supporting infrastructure in educational institutions to cater the needs

of students with disability. This study showed that incorporating universal design procedure and policies in higher education can improve the overall educational environment for all students, including students with disability. It is seen that the implementation of universal design has a positive and incremental effect on the grades achieved by the students.

2.5 Accessibility among administration.

A study conducted in China pointed out three major responsibilities of the administrative staff which should be considered for improvement to achieve success in the management of a higher education institute. These include their political and ideological abilities, ethics, and professional management. These are considered as the crucial capabilities to have in the administration staff of higher education institution while handling and managing the affairs of students, faculty, and overall institutes. Additionally, time management and operations, language skills and performance abilities are art skills mentioned and highlighted which are considered as an asset to be present in the person of administration staff a higher educational institution (Bin & Huimin).

Persons with different kind of disabilities can face multiple types of hindrances. By making and implementing relevant, accessible pedagogic content according to the guidelines and with the use of assistive technology it will be much easier for the all the people including students, faculty, and administrative staff. Assistive technology such as screen reader or braille display for visually impaired people, subtitles for the people suffering from hearing impairment provides alternate medium for accessing information (Driscoll, 2005).

Pitman (2000), in a study on improving the quality of services from administrative staff toward academics and students. The researcher enlightened an idea that by dealing academics and students as a student can certainly increase the provision of productive customer service as in normal case most of the time administrative staff unable to provide the quality services to the students. And there is a good amount of publications in recent years mainly identifying the lack of quality while dealing with students or newcomers. Here, the researcher suggested, there is a lot of work and research on improving the productivity of customer services as in a way the success of any organization depends on the process of getting care and support from the organization. What if administrative staff deals with

academics and students as a customer and follow all the SOP's to provide the quality service to them just like the commercial organizations do. This study mostly evolves around the practices of the administrative staff of Curtin University of Technology, Western Australia, where the admin staff that works in academic registrar office, the author is trying to examine the current practices and how to make them better. Recently, due to strict check and balance and social and economic accountability of educational institutions lead the need for improvements towards the customers' expectations and needs. Now, the focus is shifting towards the customer's choices, what they like, what they need, what they want to study instead of old orthodox ways where university administrative people were deciding what is better and what should be taught. In most of the education bureaucracy, these changes will be hard to consume as this is a new way to see the students as a "consumers" and it requires to make amendments in the pre-established relationship between the staff and the students. This structural change will certainly require increasing educational standards and teaching quality.

Universities and research institute that largely are associated with higher education and research-based activities certainly are unable to provide a proper solution to the productive role of the administrative staff. Unfortunately, this is not surprising as usually these institutions mainly focus on research and teaching, and the administrative role is to facilitate and provide an easy passage to achieve these tasks. Secondly, most research that has been done regarding these issues are conducted by academics and researchers; therefore, for them, the issues are mainly those that concern them. And at the end, as usual, the role and the actual purpose of administrative staff in organizational culture remain ignored or unaddressed. The researcher mainly focused on this phenomenological approach towards this research, as it was a new perception. Looking academics and students as customer or consumers, the way the commercial organizations look at their consumers and try to provide the best services to keep them affiliated. In this study, the author interviewed more than a dozen of the administrative staff of the "Curtain University", where the designation of the participant was Senior executive, senior management, middle management, and general administrative staff. The author conducted a semi-structured interview and asked the

participant about their insight regarding their role as a "Service provider".

The results of this study indicate that the administrative staff is aware of the educational culture. Still, their perception about looking student and academics as a "consumer" varies as their approach towards students was different as compared to academics. Secondly, study shows that admin staff believes that they provide vital services towards the successful education process of the university, but their consumers do not recognize their efforts, and they feel left-out, very small quantity of students recognize them and appreciate their efforts to make the educational activities possible.

Arzola (2016), conducted a study about the connection between library and student administration staff in higher education institutions. The author identified the issue with accessibility in a library and administrative staff in higher education institutions. The investigations were directed based on students' needs of accessibility of digital documents provided by both departments should work for assistive innovations to perceive and peruse how change is realized amid inside. It proposes that fruitful accessible usage in advanced education calls for cooperation with other departments.

The study investigations center around how a joint effort between the library and administrative staff can work to comprehend documents accessibility issues. It likewise uncovers that students with disabilities and students with no disabilities are skilled with current portable patterns and innovation, and should be, for profitability in school. It will be significant to faculty, students, staff, and other departments of higher education institutions that work with students with disabilities. Librarian in higher education institutions libraries and students' undertakings experts backing and add to the improvement of students learning in today's advance educational institutions. They each start community-oriented associations with faculty staff to help students with disabilities. They are a characteristic fit as accomplices to connect academic and social encounters for students with various abilities. It is likely important for different administrative departments to collaborate to discuss and overcome the accessibility issues related to student's needs. Arzola (2016), also mentioned that students with disabilities in higher education institutions use technology and digital assistive technology as cunning approaches to recover data for education

purpose purposes. Students utilize cell phones, for example, smart mobile phones, tablets, and workstations to get to applications, programming, websites and distributed storage to recover notes, assignments and lectures. The expansion being used of innovation presents complex access issues for students with visual, physical, sound-related and learning disabilities. Each may experience various encounter challenges with technology if these resources are inaccessible, especially for students with disabilities. Students suggested that higher education institutions websites and databases for lectures, notes, assessments, and other educational resources should be accessible. They likewise suggested the whole grounds making all documents accessibility and availability should be flexible for all students. A fundamental dialogue point raised by students with disabilities at the gathering was digital documents accessibility provided by administrative staff and library department. PDFs documents that have been photocopied, at that point, checked and transferred are out of reach to students who use screen readers (JAWS – Job Access with Speech) and content to-discourse programs (Say Text, Voice Dream). Students prescribe that administrative staff and library staff should use accessibility guidelines to develop the digital documents rather than picture records or photocopies or when sending records by email. Students related digital documents that were new to the custodian as far as innovation and information accessibility. Universal Design (UD) of ICT was a solid, basic subject at the Accessibility of digital documents. UD passes on accessibility for everybody advancing value in advanced education for all students.

According to Center (2012) "Planning with UDL does not assume a one-size-fits-all approach; instead, it takes into account the variability of all learners".

Arzola (2016), identified that the library, administrative staff, and students conveyed needs and issues to each other that would somehow, or another have not been researched, found, or comprehended. Students viewpoints on the utilization of assistive technologies are not habitually uncovered. It is apparent that students with disabilities and without disabilities can teach and give accommodating, down to earth proposals to improve accessibility through congregations, gatherings, discussions, and different projects together with each other. Its usage can result in expanded efficiency for students learning outcomes. This can

be upheld by improved technology and staff advancement for the workforce and higher education institutions. In a perfect world, this can come full circle being developed of an all-inclusive structure for getting the hang of, bringing about improved study accomplishment by expanding access to instructive materials and administrative digital documents, which can likewise help with new assistive technologies.

Although the mentioned studies are highly relevant for the purpose of this research, they did not provide us with the answers to the research questions discussed earlier. Taking the course from the existing literature, it served as foundation to this research. The research has primary focus on attitude and practices of administrative staff to ensure universal design in online processes. This study is closely related to study by (Chen, SANDERSON, & Kessel, 2018; Pitman, 2000).

3 Research Methodology

This section presents the research methodology adopted in this research. The approach and methods used how the data were collected considering the ethical aspect. And the method used to do the analysis.

The research consists of qualitative analysis by conducting semi-structured interviews with administrative personnel and university students.

3.1 Qualitative

In general, Qualitative methodology is a widely used research technique which is used to explore perceptions, values, opinions, and behaviors of individuals. How all these affect the decision or the approach of that individual to the given question.

It is safe to say that, it is an investigative approach to get answers to the questions by using predefined protocols or procedures, so the researcher could collect the evidence or produce the findings that can be applied beyond the boundaries of the research study. It has the ability to provide the researcher with complicated textual findings of how individuals approach the given research scenario. It provides insight into the problem and helps the researcher to reach the point where he or she can develop a hypothesis for further quantitative research.

3.2 Quantitative

Quantitative methodology is a research method which is used to quantify the issue or a problem by generating usable statistical data. Quantitative research is a data orientated research; it uses measurable data to formulate facts and uncover patterns in research. The data collection methods we use in quantitative research are way more systematic and structured than the methods we used in qualitative research. In quantitative analysis, usually, closed-ended questions are asked as they can give us more quantifiable answers.

3.3 Hybrid

Hybrid is also known or called as the Mixed methodology, that is a systematic integration of Quantitative and qualitative research techniques. In mixed methodology, the researcher combines the element of quantitative and qualitative research methodologies. It involves gathering the data, analyzing it, and then its integration, like quantitative (surveys,

experiments, etc.), qualitative (focus groups, interviews) techniques. This methodology provides a better understanding of the problem, which allows the researcher to come up with a better solution. When we are dealing with complex real-life problems with high impact, and we want to validate and compare the results of both qualitative and quantitative approaches, then we can use a mixed or hybrid methodology to get an in-depth understanding.

3.4 Approach

Two approaches were considered for this study; this section describes what and why it was chosen.

3.4.1 Case Study vs Ethnography

Both ethnology and case study research techniques are the same up to some level, but there are some important differences. Like case studies, ethnographies also rely on multiple types of data to confirm observations. Both techniques are personal, time-consuming and based mainly on the context being studied (Angrosino, 2007). The context usually differentiates these research methods from methods such as surveys, experimental design, and other methods. The main focus of understanding in ethnography is based on context.

3.4.2 Case Study

We have a different way to define a case study as the research approaches. Firstly, It is a method to observe the characteristics of individual entity such as a person, a group or an identity, in order to analyze different phenomena in relation to that unit of study (Cohen & Manion, 1989) as cited in (Bassey, 1999). Another description is written by MacDonald and Walker (1975) that case study is quoted the study of the instance in action. In response to this argument, Kemmis (1980) as cited in Bassey (1999) explains that case studies consist in the imagination of the case and the invention of the study that are cognitive and cultural processes. Later, Stenhouse (1981) as cited in Bassey (1999) states that the task of the case study is to produce reports of experience and to offer evidence, not to deal with generalization.

In a qualitative research approach, we understand the given case might be an individual or could be a combine group or organization, and it can be lengthy, complex, or simple in

nature. In an individual case, there can be a child, man, women, a student, a teacher, a human's personal experience or a particular phase of life. But the collective case is different; it could be a working place, organizational culture a neighborhood or a region.

Stake (2005) defined three different types of case studies, intrinsic case study, instrumental case study, and the final is a collective case study. Intrinsic case study defines the intrinsic interest of the study, the purpose of this study type is to allow the researcher to get in-depth understanding about the case, an example of this type could be classroom activities or some curriculum. According to stake's classification, the other type of case study is Instrumental case study that allows the researcher to take care of the other interests. It provides a deep understanding of the other relevant issues or problems about the particular case. The last type in this classification is multiple case study, unlike other types multiple case study contains different cases so it could allow further exploration of the certain phenomenon (Suryani, 2013).

Using Case study as a Qualitative research approach has many benefits. It allows us to get an in-depth understanding of a particular phenomenon. For example, it may contain narrative and specific description of a specific activity. Secondly, this approach allows people to share and understand their behavior and social experiences. The case study provides holistic interpretation about the context; it does not involve other fictional and self-made or manipulated social settings, which can allow researchers to get natural data about the peoples' real-life phenomena (Suryani, 2013). If you go deep into the basics of this technique, you will find some limitations about this qualitative research approach, just like Yin (2003) has pointed out the boundaries and limitation. During a case study, it is common practice that the researcher can be biased, and they don't need to follow the systematic structure that may have consequences. Because if the observer is not neutral, there are chances that we could not get proper facts or natural data in reporting. In the case study, there is a possibility that the researcher might not be able to cover all the aspects of the issue because researchers tend to have fewer grounds with limited evidence as compared to a quantitative approach.

3.4.3 Ethnography

Ethnography is the most used qualitative research methodology right now, especially for user experience professionals. One social scientist defined ethnography as the art and science of describing a human group, its institutions, interpersonal behaviors, material productions, and beliefs (Angrosino, 2007). In this technique, we indulge with the targeted people, environment to understand the desired goal, culture, value, motivation. Same in cultural Ethnography technique where researchers participate within a culture, often for years! Rather than relying on interviews or surveys, you experience the environment first-hand, and sometimes as a participant-observer (Sauro, n.d).

In Ethnography, the understanding of lengthy and complex human practices and contexts requires deep, relevant research knowledge. Some researcher often describes what they do in a way that is not accurate. This may be due to a lack of awareness of what they are doing, or individuals may report more socially acceptable actions than their actual actions (Blomberg, Burrell, & Guest, 2009) as cited in (Lazar, Feng, & Hochheiser, 2017). The critical thing to notice both ethnology and case study research techniques are the same up to some extent, but there are some important differences we will discuss in this paper.

Many researchers believe that ethnographic approach has the best potential to collect more real, accurate, reliable, and complete data to answer the given scenario questions. Also, the ethnographic approach considered the best source of data collection for comparative study and analysis (Edgerton, Britt, & Norman, 1947). Like case study, the ethnographic approach also relies on the participant observation as a vital source of data gathering, and if we add it together with other tools like interviews, group discussion and document analysis than we can find better and more reliable data.

Ethnographic research also has few drawbacks; in this technique, we are only able to investigate a few cases or most of the time one case. So Ethnographers should mention these cases because one particular case study and its findings cannot give us a general idea about the social contexts. Unfortunately, some of the times the researchers using this qualitative approach assume that their results and observations in the specific scenario are typical of what always happens all the time, which is not accurate generally. Secondly, this

qualitative methodology emphasizes that the researchers are the primary source of data collection. So the selection of the data relevant to the particular topic depends on ethnographer's argument so, concerning this issue, Hammersley (2006) suggests using the radical critique of interviews, he recommends that the researchers should not observe themselves and make inferences on what participants do and say during the interview.

3.4.4 Case Study vs Ethnography

As discussed above, both research techniques are the same somehow, but there are some important differences. Like case studies, ethnographies also rely on multiple types of data to confirm observations. In this research, the tool used to gather data was interviews, that falls into both Ethnography and Case Study methods. Still, ethnography method has some boundaries, and this approach mainly focuses on context and culture, whereas, the case study method focuses on organization, entity, individual etc.

According to this scenario, the Case Study method seems to be more relevant for this research study as the prime focus of this research study is about an educational organization providing higher education. And the core purpose of this research is to observe and find out about the knowledge and perspective of administration staff in regards to the universal design of ICT, how does administration staff practice and implement the universal design of ICT in their day to day tasks and operations.

3.5 Research Method

For this project, a qualitative research approach was adopted. There are many qualitative data collection approaches like surveys, focused group discussion and interviews etc. But in this research paper, we followed the semi-structured interview technique for interacting with users and conducted the semi-structured interviews for data collection.

Semi-structured interviews use a set of topic-related questions to provide structure to the interview and leaves the opportunity to ask to follow up questions depending upon the response of the interviewee. These questions also help to keep the interview on the track of the topic. These interviews contained mostly open-ended questions to get an in-depth understanding of the interviewee's perspective and issues faced by administration staff in implementing the universal design of ICT in higher education. Questions to check the level

of knowledge of universal design, its processes and procedure as well as their introduction in administration staff daily work. Other questions were to explore the administration staff's attitude and willingness to support by streamlining usable and accessible learning material and administration related information for the students. Furthermore, these questions also helped us how they accomplish their tasks in providing services to students with and without any disabilities. By asking direct questions, it allowed us to explore a wide range of concerns relevant to the problems faced by all students and other faculty staff. Most of the time, interviewees were allowed to answer the question that encourages reflection and consideration. The interviewees went deep in explaining, generating ideas and sharing insights that would have been lost to surveys or any other data collection technique, but was fruitful for us.

3.6 Data Collection

In the case study for this research, there was an opportunity to use different data collection tools like Interviews, reports, or observations etc. Qualitative data can be represented in different ways. Participants can give answers in the form of text, and they can explain their preferred choice and way with respect to the given topic. Video of participants can also be helpful to understand the interactions with the participants. Individual qualitative data can be obtained using questionnaires, and evaluations can be carried out using focus groups. There is always a need for checking the collected data, whether it is valid and unbiased or not. Good ideas can be extracted from the collected data to enhance the presentation results. The consequence of the study of qualitative preference data would be a textual rundown of the perspectives on the interviewees, focusing on their relative preference decisions (Purchase, 2012).

3.6.1   Interviews

Interviews are generally structured in a way to gather a richer source of information from the small number of people about the Subjects, behaviors, observations, feelings, opinions, and knowledge. In qualitative research, interviews become a more productive tool to get a better understanding of the research subject. We can use open-ended, close-ended and even mixed questions to collect the data we require to make assumptions especially the

proper use of open-ended questions could provide long and brief information about the subject, which is way better than close-ended questioning approach and even from surveys which are somehow limited in scope as the individual only can respond to asked question or given scenario.

Interviews allow us to go deep, by asking a question that can explore more concern about the issue and by allowing the free space to the interviewee researcher can collect the data which would have been impossible to capture otherwise. By given a free hand to answer questions that encourage reflection and consideration, the individual can go brief and to the extent where generating ideas and sharing new information that would have been lost to the other data collection approaches (Lazar et al., 2017).

For the purpose of data collection, better understanding, and to obtain rich and natural information from the administration staff and students, the semi-structured interview technique was followed. A set of topic-related questions were used and based on the answers from the interviewee, left the opportunity to go for the follow-up questions. To keep the interview on the track of the topic was another fundamental purpose of those questions.

3.6.2   Recruitment

With respect to data collection, selecting and recruiting the participants for an interview was another crucial task. It was the responsibility of the researcher to make eligibility criteria and ensure to recruit the participant according to the requirement. An email was composed in this regard with a brief description of the purpose of the study, about the approximate number of questions and duration it may take along with ethical considerations. The email was sent to the head of the administrative section at one of the faculties at the university. In response to my email, I was approached by the section head. The Section head asked in the department if anyone is interested in the interview, administration staff were briefed about the research topic, and the participants approached me for the interview. I agreed on the date and time for the interview with the participants, get their consent and did the interview on the agreed date and time with each participant. To get the students perspective, I approached students sitting in the library and the

university's common area. I gave a brief description of the study and requested them for the interview, and students agreed to participate.

3.7 Ethical Consideration

Data collection from different people and organizations is one of the aspects of research. Another critical factor in data collection is the approach and the behavior with the interviewee or respondent providing information. Questions asked by the researcher or interviewer has to be moral and ethical. In this era, the researchers are turning out to be progressively mature and acknowledge ethical issues. The aim of the research tells the goal that the researcher is trying to achieve and also features potential ethical problems. If a person imagines that conducting research is reasonably straightforward, but the fact is during a research process, several issues arise at various stages, and the researcher has to handle all those diverse issues together. A legitimate, genuine, and justifiable thought process is mandatory for a research project.

Recruiting a participant for data collection is another crucial phase of the research process. Usually, a researcher focuses on research aims, research questions, research design and data collection methods and then determine the target persons and the number of people to approach to collect data. At times researcher has to seek special permissions to approach participants to complete the data collection process, and in some case, a researcher might face few restrictions, and that may cause ethical impasse (Oliver, 2010).

Since the inception of this research study, the ethical issues were kept under consideration. Informed consent is another principle and core component of research ethics. The participants from the administration staff were timely informed about the purpose and importance of this study, and the student participants were informed before the data collection process. Moreover, participants were briefed about topics such as, how the data will be utilized, Whether the collected data will be disposed or not. If the data is supposed to be disposed of, then, what will be the retention period of the collected data, In which form the data will be kept or stored. On the whole, a simple, clear, and easy strategy was devised, especially how to handle the collected data, that help the participants to understand the research study. The data retention and disposal information were verbally

informed to the participants. Based on the aim and need for this research, the participants made their decision to participate in the research study.

Confidentiality is again a vital part of a research study, and the anonymity of the participants was kept. The private and confidential information was neither asked nor passed to others by any means. The data was not collected with the deceptive approach; data was recorded on the paper, audio and visual recordings were not used in the data collection process. No ethical issues arise during the process of data gathering.

All the above considerations were kept, and sensitive data was neither asked nor collected from the participants. To maintain the anonymity names were not mentioned, notes were taken during the interview and observation, and the consent form was created with the details. Therefore, permission from NSD was not required.

3.8 Method for Analysis

The qualitative approach of thematic analysis was chosen for the analysis of the data collection in this research work. As thematic analysis is one of the most used methods to analyze data in research. In a study by Boyatzis (1998) thematic analysis is a process used to analyze qualitative information, that facilitates researchers to use a broad range of data in a methodical manner that boosts the certainty and to analyze and understand the gathered information. It can identify and analyze data patterns as well as highlight them to be reported in each data sample. It is the most generic analysis technique employed for interview based qualitative research study approach. It is a process to encode qualitative information and to encode; certain codes are generated. This could be any theme, and the pattern found in the data is called a theme. Initially, the user's responses to the interview questions will be analyzed and then based on these codes are created, and themes are formed. While identifying the narrative for each theme it is important also to consider how it fits into the broader overall sketch of the collected data concerning the research question. This is to ensure minimum overlapping among the themes. Therefore, themes have to be examined individually and relatively with other themes. As with any other analysis process, the final phase comprises of report write-up. May it be for any publication or research work a write-up of the thematic analysis aims to apprise the intricate narrative of the collected

data in a way that the reader must be persuaded by the legitimacy of the analysis report (Braun & Clarke, 2006).

According to Ryan and Bernard (2000), *"the core of qualitative data analysis is to explore the data and recognize the themes, and themes are abstract, constructs that investigators identify before, during, and after analysis"*.

Analysis entails a continuous cycle where focus shifts between the entire data set, the coded extracts of data that is being analyzed, and the analysis of the data that is being produced. As mentioned earlier, qualitative analysis guidelines are not rules, following the basic precepts, will need to be applied flexibility to fit the research questions and data (Patton, 1990). Unlike linear processes analysis is a recursive process where you move back and forth between different phases as required. This process develops over a period of time and ought not to be sudden (Ely, Anzul, Downing, & Vinz, 1997). When working with verbal data such as interviews, television programs or political speeches, data has to be transcribed into written form. This is required for thematic analysis. This process looks like to be a time-consuming, frustrating, and at times boring, but is a fantastic method to begin acquainting with the collected information (Riessman, 1993). According to Boyatzis (1998), codes refer to the essential part or component of the collected data or information that can be analyzed purposefully regarding the phenomenon, but as per Tuckett (2005), data is being organized in worthwhile groups. Whereas the coding process is part of the analysis (Miles & Huberman, 1994). However, coded data differ from the units of analysis that are often broader. Data set is analyzed systematically, each data item is given the complete and same consideration. Compelling aspects should be carefully identified as these features form the basis of repeated patterns or themes throughout the data set (Braun & Clarke, 2006).

Braun and Clarke (2006) approach was followed, took the interviews and wrote their responses on paper, later on, all the interviews were transcribed on a word document, initially, it was tedious and time-consuming but later on, enjoyed doing it. First, by writing on paper and then read them to transcribe, so even before entering into the analysis process, acquired some pre-existing knowledge about the data and developed basic analytic interests and thoughts after familiarizing with data and have come up with an immediate

plan regarding the constituents of the data. The results from the previous phase initial codes are generated in this step. Codes identify data features that stand out and really are of interest to me or any other analyst. Coding can be done in several ways, either you code by using computer software or can be done manually. Initially, I imported all the collected data into NVIVO and created initial codes but later on used the manual approach coded the data by writing notes on the texts and used highlighters to show possible patterns.

At this stage, when all data have been gathered, transcribed, and coded. I segmented different codes into classes of potential themes and placed the similarly coded data extracts in one theme. They were analyzed to determine how codes can be combined to form an overall theme. After being done with initial coding, again reviewed and refined all the themes and forms a few sub-themes. The data pertaining to each theme is also further studied. Conducted a detailed analysis and wrote the final analysis report.

4 Results

This section sets out the results from the collected data. Thematic analysis was the way to analyze the collected data. For this research, interviews were used as a primary data collection resource, where semi-structured questions were asked from the participants. The objective was to find out how interviewee thinks about the practice of Universal Design of ICT, their knowledge, willingness to implement.

4.1 Participants

The participants from administration staff were from one university with various background and were at different positions and performing different roles, from necessary administration to advisor or senior advisor and up to project management role as well. By interviewing multiple employees form administration Staff, ageing between 30 to 55 years old, the majority of the participants belongs to the female gender. In total, six female participants were interviewed, whereas only two male participants were interviewed. Current students from a bachelor's degree program and international students from a master's degree program were also interviewed to collect data. Both male and female students were interviewed. Three female and five male students aged between 21 to 30 years were interviewed.

4.2 How Interviews were conducted

Semi-structured interviews were conducted. Prior to interview consent participants consent was also taken. The planned time for each interview was up to 45 minutes, but the duration of each interview lasts from 15 to 25 minutes. All the administration staff interviews were taken at their offices.

All the interviews were face to face interviews. The interviews were conducted in the English language, and all the participants were comfortable with the choice of language. Neither gift nor any kind of incentive was given to the participants for taking part in this study.

In total data is collected from sixteen participants, and out of sixteen eight participants were from administration staff and the remaining eight were students.

After taking those interviews, analyzed the trend about the practice of Universal Design of ICT. As it is an iterative process and after four iterations of thematic analysis, three main

themes and five sub-themes were finalized.

Result themes and sub-themes are as follows:

1. Awareness of Universal Design

2. Attitude to practice Universal Design in Higher Education

   a. Tasks

   b. Tools and Applications

   c. Methods for Accessibility Check

   d. Interaction with Students

   e. Willingness to Implement

3. Students Opinion

4.3 Awareness of Universal Design of ICT

The first theme, awareness of universal design of ICT section, covers the knowledge of administration staff regarding the universal design of ICT. And also, their understanding about the legislation being done for implementation of the universal design of ICT.

Only two participants from administration staff were aware of the universal design of ICT, while the rest of the administration staff claimed to be aware of the universal design of ICT. When asked to define the universal design, administration staff's definition was slightly different from the documented definition in the principles of universal design of ICT. Whereas one of the participants says, "any person who cannot use the services as everyone else, then it is not universally designed. For example, either a person is with any impairment, disability or an elderly person etc."

The understanding of two participants was to make sure that the published content or any other services must be according to the standards of universal design of ICT. The content must be accessible, readable, and understandable for all.

While one of the participants, only knows that it is an obligation by the law.

Another finding was the pressure and stress faced by the administration staff from both the teachers and students.

Overall, the administrative staff were aware that the students with disabilities require special arrangements to access the content and learning material, but they do not know

how to do it except two personnel from administrative staff. Out of these two, one participant actually demonstrated how to make an accessible document and publish it on the web.

All the participants from administration staff mentioned about the awareness of the legislation and regulations passed by the government, and by 2021 everything must be universally designed according to the standards of universal design of ICT. Also asked about the United Nations Convention on the Rights of Persons with Disabilities but interestingly none of the administration staff saw or read the laws and regulations.

The administration staff believed and agreed on the implementation of universal design of ICT in the higher education system.

4.4 Attitude to practice Universal Design in Higher Education

This is the second main theme and entails about its subthemes. Sub-themes covers the tasks performed at work by the administration staff in daily routine. What methods were adopted by the administration staff? The tools and applications used by the administration staff. How they interacted with the students, their willingness and attitude towards implementing the universal design of ICT according to their roles and responsibilities in a higher education institution.

4.4.1　Tasks

Some of the main tasks of administration staff includes to provide user support, time planning or management of the canvas, along with to publish the content provided by the teachers. And to organize the work for translators, keep track on multicultural education. Furthermore, manage website and articles, Social media, also to advice municipality and higher education about the new arrivals(students) and also to train the teachers (train the trainers) and develop online resources for teachers training.

4.4.2　Tools and Applications

Mainly all the administration staff uses MS office applications but three out of eight from administration staff also uses some other applications including FSWEB (Web interface for common student system), Joomla (Content management system to publish web content), Final Cut-Pro (Video editing solution), Canvas (Learning management system) etc. And at

times, some administration staff do need the support of a technical person to use the office applications to complete the task.

4.4.3 Methods for Accessibility Check

The majority of administrative staff had either no or limited knowledge of assistive technology. When asked, about the utilization of the accessibility checker while creating a document or content, there was a mix response from administration staff. Three out of eight do use the accessibility checker, while the other three of them do not use the accessibility checker at all. In comparison, two personnel from the administration staff were very confident and did not use the accessibility checker. As both were sure that whatever they did in their routine tasks, was done according to the standards of universal design of ICT and also made a checklist for that purpose.

At times, the administration staff got very occupied and did not get time to correct the document or content and fix the accessibility issues, then the content or documents were sent back to the teachers to make those accessible. Only two personnel from administrative staff were experienced in making the content accessible, while three staff from administration just started practicing it and in the learning phase.

4.4.4 Interaction with students

Five out of Eight participants interact with students. The medium used for contact was email, and among these five participants, two also said at times, students just walked into the office for queries. In contrast, three participants do not interact with students at all. In most of the queries students enquired about the courses and course registration, some students enquired about exams, setting up a schedule, arranging classrooms, adjust students plan or why cannot see the subject and assignment. And usually, the PhD students wanted to get info about the project budget. On the other hand, administration staff were not aware of the problems faced by the students with a disability except one staff said about knowing the issues but did not mention the issues.

4.4.5 Willingness to Implement

Out of eight administrative staff, only two participants had attended a course on universal design of ICT. Based on personal interest in accessibility, another participant took part in one

training session about the universal design of ICT. While the remaining staff had neither attended any training nor any other information session on this topic. Five of the participants from administration staff reported that practicing the universal design is time-consuming, as first in learning and then to implement in practice. All the participants showed a positive attitude to include the practice of universal design of ICT in the higher education system. They were also of the opinion, as the administration that the content must be universally accessible, especially in the digital age where online learning is now a big part of the education.

This is a paradigm shift in their work environment but that will help all including the administration staff, faculty and especially the students in terms of usability and accessibility.

One of the administration staff commented that,

" It is fun also, and some of the teachers realize that the tips they got from us helped. We tell the teachers how important their work is for the students so and how little things can make an impact on how satisfied the students are in your class."

However, when asked about the teachers' attitude towards implementing the universal design of ICT, one of the administration staff said that,

"When we ask teachers to implement universal design in learning material, the teachers' response was that we as an administration office are not aware of teaching subjects so let the teachers decide how they want to present the learning material".

Administration staff demonstrated a keen interest in taking part in training on universal design of ICT and especially to focus on accessibility. They were ready, willing to put their best efforts in the implementation of universal design of ICT. And the practice of universal design of ICT in their respective roles and routine activities could be fully enforced.

4.5 Students Opinion

Students from different fields were not satisfied with the structure and accessibility of the information and content presented on the university websites. Students reported difficulties while searching for specific information and also complained that the website is overloaded with information. A few students described that they find the educational website more

inconsistent than other websites. The ignored aspect found during the analysis was primarily the student's point of view in terms of their need and requirements and the ease of access to the learning materials and other study-related administrative information.

5 Discussion

The main objective of this study was to understand the practice of universal design of ICT among administrative staff in a higher education institution. For this purpose, it was essential to get the perspective, their knowledge, and the tools used by them to perform routine tasks. It was also one of the goals to identify the issues and barriers and suggest resolving those issues and barriers. As rightly stated in a result of a study by Bowman (2016), that implementation of UD can have success if incorporated in higher education curriculum and institutions. Advancement in technology has empowered educational institutions to provide learning materials to the students in a way they can perceive it. For example, the content created could be switched to other language but at times, the content, organization, and the layout of the page changes when the language of the website switched from native language to English.

That means some universal design of ICT aspects may be lost in translation. With the effective use of technology in pedagogic, instructors can create accessible content that can be accessed by the students with various abilities, in different ways like, audio, video, text, animations etc., using assistive technology such as text to speech, reading pens, braille. Instead of creating the content, mostly the administration staff gets the content from teachers to publish online. The administration staff often had to give the content or the document back to the teachers to make it accessible. But at times it becomes very difficult to make people understand and its time taking too. It is not always easy for the administration staff, to teach the teachers when they are not a teacher, it is some kind of unbalance but also because there is a gap about this. And the administration staff mentioned and believed that most of the courses offered as part of study programs are not according to the universal design of ICT due to the teacher's incompetency and unawareness about accessibility issues.

Sarkar (2012), also stated that the content created for use is either of insufficient quality or designed poorly for the purpose of instruction on these ICT based learning platforms. Strategies need to be developed and implemented which ease the enablement to ICT technologies such as telecommunications for them to play an effective role when deployed,

in sustaining and scaling their infrastructure when required (technological changes or increased demand for ICT resources).

The administrative staff was under a lot of stress from their colleague as they get lot request to give priority to their tasks but mostly from teachers to give priority to their respective task. It is also stressful because there are more than a thousand teachers and in administration staff's opinion the digital competency of the level of the teachers is very low. Everything cannot be taught at once. Some administration staff tried to teach universal design, but again most of the teachers have very basic knowledge of IT. ICT development is too fast, and teachers cannot keep up. While making learning resources, we are already in an old way of thinking. According to Coughlan and Lister (2018), the timing of elements in an administrative process is often very important, and this may result in additional burden. Whereas according to Higbee and Goff (2008), universal design-based strategies must be done on an incremental basis, that can render overhead processes manageable, while offering a forum to incorporate, implement and refine potential changes as needed.

The results from this study revealed that awareness and the training came out to be the biggest barrier in terms of implementing the practice of universal design of ICT. Another probable barrier could have been the administration staff's attitude towards adopting and implementing the practice of universal design of ICT, but the result revealed that the administration staff showed a positive attitude and willingness to adopt this cultural change. In the case of a technological barrier, administration staff were asked about the available tools to check accessibility and based on their response, and administration staff were also informed about available online accessibility check tools to use.

By organizing seminars to raise awareness among administration staff and other teaching staff could encourage them to implement the practice of universal design of ICT. And everything needs to be designed and build according to the standards of universal design. This also implies to include how to make things accessible to be part of the training, that will help in creating the content or document efficient, understandable, and accessible. Everyone in the higher education system needs to be aware and get trained on universal design and accessibility. Simply by focusing on this aspect of administration, if improved, can

improve the overall perception and impact.

As there is not much awareness among the administration staff, who provide services. It might be hard for some students who are using mobile phones or using PC as the interfaces are different for both, and maybe someone faces difficulty. This also indicated the need to make solutions in consultation with the users as it might be less important for some but may be very important to others.

As stated in the results that most of the administration staff interact with the students, were aware of the issues faced by students. Both the administration staff and the students suffered in this regard, but not consulted in making things (content or processes) useable and accessible.

Sarkar (2012), also endorsed in a study that, research and trends have been observed that indicate an aspect that is overlooked when introducing ICT technologies in an educational institution, Firstly and mainly the student's perspective requirements are overlooked when implementing ICT based learning platform. Another accompanying factor is the ease of accessibility to the educational content. The primary stakeholder (faculty and students) in an educational institution are not involved in customizing and implementing the ICT based learning platform.

Students experience problems accessing the learning material, and the website filled with heavy content. The participants have usually indicated they do not like seeing unnecessary details on search interfaces. But did not mention about the unwanted content. As per Bedrossian (2018), accessing the information material by students is the biggest hurdle preventing them from fully utilizing the information to their learning.

In educating non-traditional students, the key concept on which the whole of universal design framework is based is that disability is defined as a construct created by the society based on race, gender and ethnicity not a defect or lacking in a person (Bowe, 2000).

It seems evident, based on the results gathered from the participants, that there is strong room for improvement. Higher education and the government should put some more efforts and collaborate with the private sector as they have resources, communications, and skills.

5.1 Limitations

The research carried out among the administrative staff of higher education institution was done with a comparatively lower number of participants and also a key drawback of this study. More participants from various institutions may have contributed to a greater understanding. Most of the participants had limited knowledge about accessibility, other assistive technology and about the principles of universal design of ICT. Only one participant was the expert and knew about the accessibility and universal design of ICT, as that participant elaborated how to implement accessibility in the document and on the web. Moreover, none of the participants had reported any kind of impairment, so this study lacked the point of view of the people with impairment.

6 Conclusion

This research was conducted with a total of sixteen participants. Out of sixteen, eight were administrative staff, and the other eight were students. The data were collected through semi-structured interviews and were analyzed manually and with software using thematic analysis. The results from the analysis helped answer the questions discussed in the research.

- *What Knowledge does administration staff have regarding Universal Design of ICT?*

Based on the results gathered from this study, the administration staff has limited knowledge and understanding of the universal design of ICT. Some of them were aware of Norwegian and EU anti-discriminatory laws but possessed limited knowledge about accessibility.

- *What tasks related to Universal Design of ICT does administration staff carry out in their day to day duties?*

The tasks for administrative included managing student information and e-learning system and publishing articles and content on the university website. Their interaction with students with different abilities is rare.

- *What methods are being incorporated by administration staff to implement procedures of Universal Design of ICT with regards to user diversity?*

The administrative staff relied solely on tools within Microsoft Word to provide accessible information to the students and were not aware of any other accessibility checking tools.

- *What is the student's opinion about accessing the information on the university's website?*

Students were broadly positive about the university website and access to information through it. One common issue among students was about e-learning management system Canvas, which they believed it is overwhelmed with information and feels crowded. Another problem was that sometimes it is difficult to find the relevant information, while some information was only available in Norwegian language and not in English.

It is clear through the results that the focus must be on creating more awareness by arranging seminars and training sessions, not just for administration staff but also for other

faculty members. This will provide realization to the staff members, what are the challenges faced by students in accessing the information on the internet.

n conclusion the focus must be on creating more awareness by arranging seminars and training sessions, not just for administration staff but also for other faculty members. Based on this study it becomes clear that it must be mandatory to have hands-on training, as the trainee must feel and realize the process, to have experience of that situation and that can change the perspective. On the whole administration staff, has limited knowledge and understanding of the universal design of ICT, they also heard about the legislation in this regard but have not read the law and performing their day to day tasks according to their roles and responsibilities.

Along with administration staff, teachers training is also a very crucial factor in making learning material accessible and according to the universal design of ICT. There is an accessibility checker in canvas, but participants do not know about it, it gives direction on how to make documentation accessible. Accessible and engaging content will support the efforts of faculty and administrative staff to provide universal education.

In future, it would have been good to include more participants from different universities. It would also be of interest to conduct this study in countries with different economic conditions. It will also be beneficial to observe both the administration staff and the students with various abilities while doing some practical task. By including the middle management of the higher education institutions in the research process, will also provide their perspective and plans towards the implementation of universal design of ICT. It is also proposed that the results in this paper be reviewed and in continuation, to this research, the new study be conducted based on this report.

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8 Appendices

8.1 Interview Questions

Questionnaire for administration staff of higher education institution.

- What is your age?

- What is your role/position in this department?

- How many years did you worked in this similar role/position?

- Do you know about the accessibility?

- Do you know about the legislation for the implementation of Universal Design of ICT?

- Are you familiar with the Universal design?

- What is your understanding of accessibility?

- Are you familiar with challenges faced by students and specifically by students with any kind of disability?

- What is your understanding of Universal design of ICT?

- Have you attended any training or seminar on universal design of ICT?
    - If Yes, in what way have these been useful or not useful to you?
    - If No, do you think training should be provided to you?

- Do you experience the tasks to be mentally demanding? If Yes, then
    - In what way the tasks are mentally demanding?

- How successful do you feel you have been in providing usable and accessible learning material and administration related information to the students with and without any disability?

- Any recommendations to improve the practice of Universal Design of ICT?

- What are the major tasks you carry out in day to day operations?

- Do you check accessibility of the document before you publish? e.g. MS Word, PDF (Depend on Role)

- What are the software tools you use at work?

- What practices do you follow to ensure accessibility for students with disability?

- Do you use accessibility checker in software like MS Word, PDF, WordPress etc. (Depend on Role)
- Do you experience any difficulties? If Yes, then ()
    a. What are the difficulties you face….?
- Do you need the support of a technical person to be able to create accessibility in your work? (If role of a person is to create accessible documents in word, pdf etc.)
- How do you interact with students?
    o Do you often get queries from students?
    o What are the most common queries?
    o Do You have suggestions to reduce queries?
- What do you do to ensure that you provide the same service to students with disabilities?

Questionnaire for students of higher education institution.

- Is it difficult to find the required information from university's website?

- Is the website and documents provided are understandable and easy to read?

- How often do you contact Administration staff to get their help or assistance?

- Any recommendations to improve the provided content and website or student portal?

8.2 Informed Consent

Informed Consent

Thank you for your interest in participating in the study about "Practice of Universal Design of ICT among Administration Staff in Higher Education".

The purpose of this study is to understand the knowledge and practice of Universal Design of ICT you have and to make information more accessible to the students. This study is part of Master thesis for program Universal Design of ICT with Oslo Metropolitan University. The duration of interview is 45 minutes involving 20 questions. This will be an anonymous study, you will be answering orally and responses will be noted by the interviewer.

Your responses will not be published in any form but only be part of group evaluation of collective information.

The interviewer will make notes from the questions and will be used only for analysis that extracts from the interview, from which you would not be personally identified.

By check marking the "Yes" checkbox consent is given for interview. Yes ☐ No ☐