T. R.
VAN YUZUNCU YIL UNIVERSITY
INSTITUTE OF NATURAL AND APPLIED SCIENCES
DEPARTMENT OF STATISTICS

THE INTERNET OF THINGS TECHNOLOGY IMPACT ON SOCIAL MEDIA USAGE BY UNIVERSITY OF DUHOK STUDENTS ON COLLABORATIVE LEARNING IN NORTH OF IRAQ

M. Sc. THESIS

PREPARED BY: Bashir Ali Saleh SALEH
SUPERVISOR: Assist. Prof. Dr. Recep ÖZDAĞ

VAN-2020

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ACCEPTANCE AND APPROVAL PAGE

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This thesis entitled "The Internet of Things Technology Impact on Social Media Usage By University of Duhok Students on Collaborative Learning in North of Iraq" presented by Bashir Ali SALEH under supervision of Assist. Prof. Dr. Recep ÖZDAĞ in the department of Statistics has been accepted as a M.Sc. thesis according to Legislations of Graduate Higher Education on 03/01/2020 with unanimity / majority of votes members of jury.

Chair: Prof. Dr. H.Eray Çelik Signature:

Member: Assist. Prof. Dr. Recep ÖZDAĞ Signature:

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This thesis has been approved by the committee of The Institute of Natural and Applied Sciences on ...../...../..... with decision number .....

Signature

Prof. Dr. Suat ŞENSOY

Director of the Institute

THESIS STATEMENT

All information presented in the thesis obtained in the frame of ethical behavior and academic rules. In addition all kinds of information that does not belong to me have been cited appropriately in the thesis prepared by the thesis writing rules.

Signature

Bashir Ali Saleh SALEH

ABSTRACT

THE INTERNET OF THINGS TECHNOLOGY IMPACT ON SOCIAL MEDIA USAGE BY UNIVERSITY OF DUHOK STUDENTS ON COLLABORATIVE LEARNING IN NORTH OF IRAQ

SALEH, Bashir Ali Saleh
M.Sc. Thesis, Department of Statistics
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The Internet of Things (IoT) is a transformation procedure in many aspects of our daily life. The universities future is about how the university adapts to the changing needs of future acquaintances, the future of employment and the economy. This study investigated Internet of Things technology impact on social media usage by university students on collaborative learning and explores emerging trends in social media on collaborative learning by students and explores the potential future impact of the Internet of Things and the Internet of Things in higher education. Independent t-test, one-way ANOVA, the Mann-Whitney U and Kruskal Wallis were used to analyze data. 200 questionnaires were obtained from students and faculty members at Duhok University in north of Iraq. The dependent variable is the various dimensions and their corresponding items such as; social benefits of using IoT (SB), psychological benefits of using IoT (PB), academic benefits of using IoT (AB) and general perception towards IoT (GP). The independent variable includes faculty, academic educational level and occupation. The result shows no statistically significant differences ($p>0.05$) existed on influence of Internet of Things technology impact on social media usage by university students on collaborative learning in SB, PB, AB and GP factors with respect to faculty of the students. Concerning the perceptions of students on IoT and collaborative learning on social media with respect to occupation, statistically significant differences existed amongst GP dimensions. This study has shown the various factors that cause students and faculties for usage of IoT on collaborative learning. Hence, there should be more awareness on usage of IoT on collaborative learning to all levels of faculties irrespective of their department or regions, and further work should be investigated this subject area.

Keywords: Collaborative learning, Internet of Things (IoT), Social media, Students.

ÖZET

KUZEY IRAK'TA DUHOK ÜNİVERSİTESİ İŞBİRLİKÇİ ÖĞRENME ÖĞRENCİLERİ ÜZERİNDE NESNELERİN İNTERNETİ TEKNOLOJİSİNİN SOSYAL MEDYA KULLANIMINDAKİ ETKİSİ

SALEH, Bashir Ali Saleh
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Nesnelerin interneti, günlük yaşantımızın bir çok noktasında dönüşüm prosedürüdür. Üniversitelerin geleceği, üniversitelerin ekonominin işe alımın geleceğinin değişen ihtiyaçlara nasıl adapte olduğuyla ilgilidir. Bu çalışma, işbirlikçi öğrenme öğrencileri üzerinde sosyal medya kullanımında nesnelerin internetini incelemiş ve işbirlikçi öğrenme öğrencileri arasında gelişen trendleri ve nesnelerin internetinin yükseköğretimlerde potansiyel gelecek etkilerini keşfetmistir. Bazı nesnelerin interneti yükseköğretimlerdeki zorluklar üzerinde çalısmaktadır. Verileri analiz etmek için Independent t-test, one-way ANOVA, the Mann-Whitney U and Kruskal Wallis kullanılmıştır. Toplam 200 anket soruları kuzey Irak'ta duhok üniversitesinin fakülte üyesi ve öğrencisi tarafından cevaplamakla elde edilmiştir. Bağımlı değişkenler; Nesnelerin İnternetinde (Nİ) genel bakış açıları, akademik yararları, sosyal yararları gibi çesitli boyutlar ve karşılık gelen cevaplarıdır. Bağımsız değişkenler ise, fakülte, akademik eğitim ve iş seviyesi gibi şeyleri içermektedir. Sonuçlarda çok büyük bir fark olmadığı gözlenmiştir. ($p>0.05$). Nesnelerin İnternetinin üniversite öğrencileri üzerindeki etkisinin tam olarak anlaşılması için bağımlı ve bağımsız değişkenlerle birlikte Kruskal Wallis ANOVA uygulanmıştır. Nİ öğrencileri ile İşbirlikçi öğrenme öğrencilerinin bakış açıları arasında tüm boyutlar göz önünde bulundurularak büyük bir fark bulunmaktadır. Bu çalışma, İşbirlikçi öğrenme öğrencilerinin Nİ kullanmasına sebep olan ve bunu etkileyen faktörleri incelemiştir. Bu sebeple, bu bölgede farkındalık artırma çalışmalarının fazlalaştırılması ve tüm fakültelerin bilgilendirilmesi gerektiği düşünülmektedir.

Anahtar kelimeler: İşbirlikçi öğrenme, Nesnelerin interneti, Sosyal medya, Öğrenciler.

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Bashir Ali Saleh SALEH

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ABBREVIATIONS

Some symbols and abbreviations used in this study are presented below, along with their descriptions.

Abbreviations	Definition
IOT	Internet of Things
SPSS	Statistical Package for Social Scientists
SB	Social Benefits
PB	Psychological Benefits
AB	Academic Benefits
GB	General Perception
SD	Standard Deviation
TAM	Technical Acceptance Model
CSCL	Computer-Assisted Collaborative Learning
SLT	Social Learning Theory
MBTI	Myers-Briggs Type Indicator
LSI	Learning Style Inventory

1. INTRODUCTION

The Internet of Things technology is a concept that enables all the devices to communicate with each other through the internet. All the connected devices which are in a vast network can collect and share information about the usage and environment of the operated devices. Any gadget with any sort of internet sensors which has the capacity of gathering and moving information over a system without human intercession, can be considered to be a 'Thing' in Internet of Things technology. The installed innovation in the item causes them to connect with inner states and the outside condition, which thus helps in choices for making process. Thusly, every one of you gadgets will get the information from the experience of different gadgets, as people usually do. Internet of Things technology is attempting to extend the association in human, for instance, contribution, cooperation, working together to things.

The Internet of Things (IoT) technology is a procedure of change in numerous zones of our day by day lives. IoT technology innovation varies from past advancements; since they are universal and urge answers for be keen and independent. The improvement of the Internet of Things technology is a noteworthy key innovation pattern. The pervasive sensor and its capacity to fill the hole between the physical world and the machine world are viewed as theoretical systems for new learning models. The thought behind this significant change in outlook is the capacity to put sensors in any item and use machine-to-machine (M2M) correspondence to associate billions of articles/gadgets to existing Internet foundation. The whole physical world is quickly in line.

The Internet of Things technology is advancing quickly and is turning into a developing issue that prompts fervor and tension around the globe. There are numerous signs that the Internet of Things technology will change numerous divisions, including advanced education organizations, particularly colleges. Colleges presently have the chance to deal with the innovation improvement and advancement model of the Internet of Things technology and to build up future Internet of Things technology pioneers and address TIPPSS dangers, for example, trust, personality, security and insurance. Security identified with the Internet of Things technology.

The Internet of Things technology is a worldwide physical system that associates gadgets, items, and articles to the Internet foundation to impart or collaborate with interior and outside conditions as appeared in Figure 1.1 and to trade data through data detecting gadgets, as proper. Contract. Accordingly, IoT technology can interface anything anyplace, whenever, whenever, utilizing any system or any administration to insightfully recognize, screen and oversee something. As appeared in Figure 1.2, it is an augmentation and expansion of the Internet-based system that expands correspondence between individuals (H2H), individuals and things (H2T) or things (T2T).

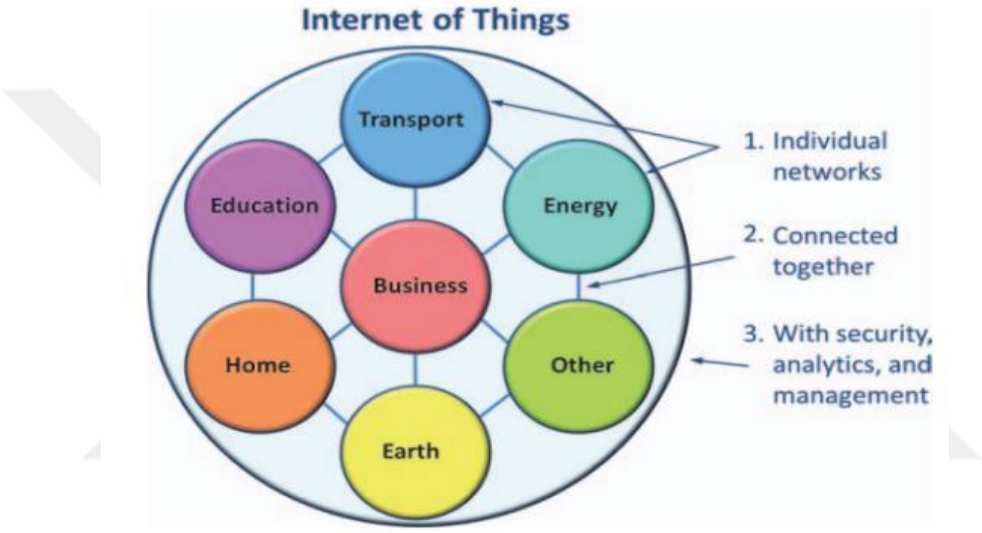

Figure 1.1. Global network view of IoT. Technology (Source: Aldowah et al., 2017).

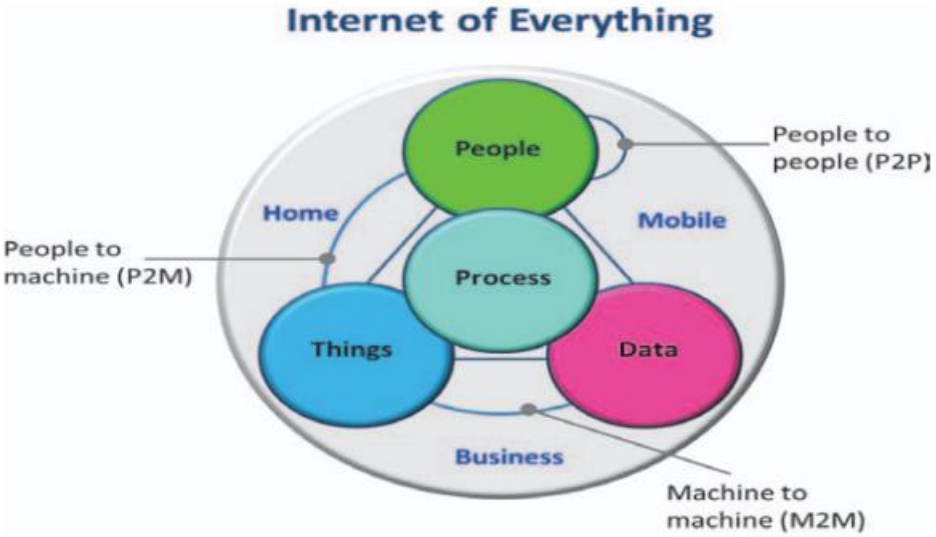

Figure 1.2. Internet of everything Technology (Source: Aldowah et al., 2017).

Many research establishments and experts have anticipated the eventual fate of the Internet of Things technology and its potential effect on the Internet: billions of physical gadgets spread to the world through advanced sensors and associated together utilizing any system. As indicated by an investigation led by Juniper Networks, it was associated with an expected 13.4 billion gadgets in 2015 and is relied upon to arrive at 38.5 billion gadgets by 2020, which speaks to an expansion in the worldwide populace around then. The chance to cooperate with an enormous number of everyday things associated with the Internet enables people to get to boundless data at whatever point and any place they need. This vision opens up new skylines of idea and advancement that exploration researchers and researchers think (Aldowah et al., 2017).

The premise of the vision of the Internet of Things is that the powerful improvement of microelectronics, correspondence and data innovation, which we saw for this present year, will proceed to a not so distant. The Internet of Things application has been actualized in regions, for example, human services and client administration. Presently colleges and schools are joining the gathering. While there are a few manners by which the Internet of Things can profit by training, others are less open (Agarwal and Pati, 2016).

The utilization of social media is expanding in individuals around the globe. There are 2.5 billion individuals on the Internet utilizing the Internet, and 8 billion of them have accounts on social media locales. As of late, it has turned out to be basic to utilize social media in Turkey and on the planet. In 2015, the quantity of Internet clients represented 55.9% of the whole populace of Turkey. 80.9% of Internet clients in Turkey use for social systems (family Information Technology Usage Survey, 2015). The quantity of Facebook clients has about 40 million out of 2015 and Whatsapp, Facebook Messenger and Twitter; he utilized it as the most famous social stage in Turkey. The normal time a Turk spends on social media is 2 hours and 56 minutes of the day.

As of late, this escalated utilization of social media has entered all parts of our lives. Specifically, numerous organizations and analysts have researched the utilization of social media in instruction. Most colleges around the globe utilize social media as a methods for correspondence for present and future students and graduated class. It is additionally utilized as a help apparatus for social media learning. There are numerous models in the writing wherein social media is utilized in instructive situations and

enhances correspondence and collaboration in the study hall, figure 1.3 illustrates a collaborative environment for social media learning.

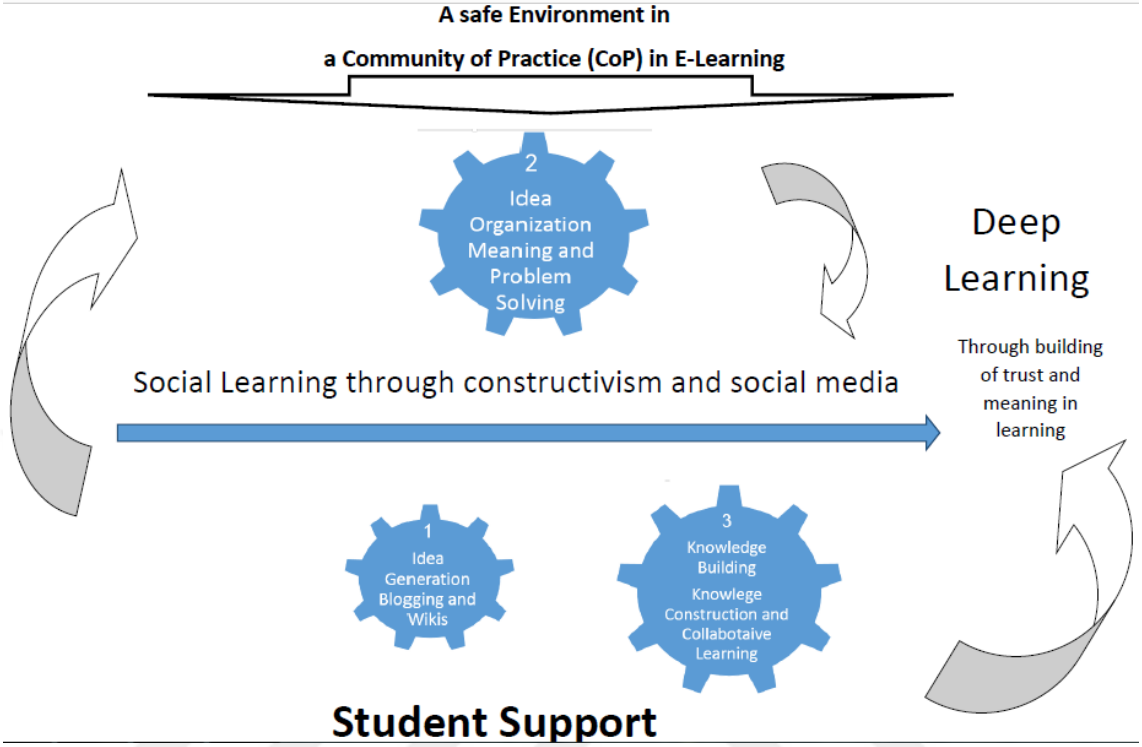

Figure 1.3. Using social media in e-learning (Harasim, 2012).

The fate of the college isn't the utilization of existing innovation. The University's learning is about its capacity to adjust to the eventual fate of workers, the fate of business, and the changing needs of the economy. This article gives a diagram of the Internet of Things for advanced education establishments, specifically colleges, and shows the potential effect of investigating the future patterns in advanced education and the Internet of Things in advanced education as it is shown in figure 1.4. What's more, explore a portion of the difficulties related with IoT in the advanced education segment (Bozanta and Mardikyan, 2017).

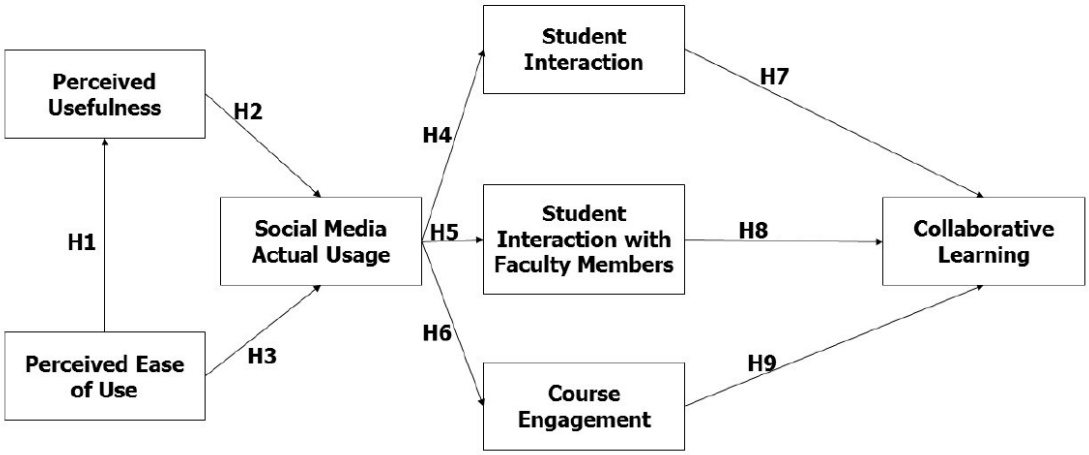

Figure 1.4. Collaborative Learning in Social Media (Bozanta and Mardikyan, 2017).

The IoT technology innovation is not the same as past updates since they are pervasive and advance area knowledge and self-sufficiency. The improvement of the Internet of Things is a significant key pattern. The encompassing sensors and the acclaimed extension between the physical world and the machine world are the system for understanding the new learning model. The thought behind this real change in outlook is to utilize machine-to-machine correspondence to conceal the feelings everything being equal and to consolidate a huge number of items/gadgets with existing Internet framework. The whole physical world is on the web.

As per the Citrix 2020 Technology Situation Report (2015), IoT innovation will improve the learning background in a few different ways throughout the following five years. The learning background will keep on being considerably all the more stunning, students will pick up information and learning in new ways, and instructors will adapt better. Learning will be an incredible encounter for educators and students, guided by information and offering new thoughts and answers for the world. Simultaneously, students will adjust to future examinations and future investigation desires (Aldowah et al., 2017).

Today, the Internet of Things is getting to be one of the primary patterns influencing the innovative improvement of the ICT business. The Internet of Things, the ecological insight, which communicates a delicate and touchy advanced condition to human presence, increased reality in which physical clients and augmented reality are united, Semantic Web. Permits web administrations to give any administration that

scaffolds the virtual world to this present reality; Cloud Robotics is utilized for distributed computing, PCs and offload on interest Wireless sensor organize that associates spatially circulated independent sensors to give administrations to improve the usefulness of the robot, screen physical or ecological conditions, and send information over the system; Applications, for example, home apparatuses give online virtual administrations and Web-Squared, an expansion of Web 2.0, intended to incorporate systems administration and location advances (Hu et al., 2012; Dargie and Poellabauer, 2010; Plauska and Damaševičius, 2014).

The hypothetical foundation of the Internet of Things for Education is Norman's essential hypothesis of activity that characterizes the seven phases of exercises from idea to arrangement: 1) objective setting, 2) purpose making and 3) deciding activity groupings, 4) Perform activities, 5) deciphers the state and assesses the framework state as indicated by the targets and expectations. Another hypothetical idea is vivid learning that takes after the Internet of Things and can be joined with the Internet of Things in an Internet-based instructive condition (Callaghan and Buzz-Boarding, 2012).

Thoughtfully, IoT resembles object-oriented programming (OOP): "things" have states and speak to true elements that must be gotten to through interfaces ("administrations"). At present, OOP is overwhelmed by software programming. Be that as it may, students often face challenges when attempting to comprehend the idea of OOP. There are a few different ways to enable students to comprehend programming ideas by learning to envision substance, apparatuses, and materials, including programming conditions, for example, picturing system code structures, or by utilizing profoundly dynamic visual programming dialects (VPLs) that utilization vision. Components instead of machine guidance. VPL is progressively appealing for non-professional or novice software engineers in light of the straightforward recognizable proof of the area and the immediate visual criticism as opposed to the content language (Bentrad and Meslati, 2011).

Then again, there is a solid propensity to build the job of robots in instruction. Apply autonomy is a mind-boggling field that incorporates implanted frameworks, constant frameworks, computerized reasoning, mechanics, kinematics, route, sensors, correspondence and control conventions, and equipment and software segments that

require a top to bottom comprehension of robot programming dialects(de Cristoforis et al., 2013; Lye et al., 2013).

Different researchers approach different researchers to empower the utilization of the Internet as an instructive apparatus, stressing its key job in training and a vital piece of the present instruction. As of late, students and scholastics have utilized social media apparatuses, for example, Facebook, Twitter, YouTube and blog writes as of late. For instance, it is accounted for that educators use Facebook and YouTube to show classes in the study hall and in the homeroom, for example, transferring instructional recordings or learning materials for students. Devices, for example, Twitter enable educators to impart data and assets to students; It is accepted that IM and Wikiwiki bolster co-activity among friends, while it is accepted to help co-activity with companions (Hrastinski and Aghaee, 2012).

Research has demonstrated that students appreciate utilizing on the web social media destinations to figure out how to finish and improve their learning exercises since learning exercises are steady and enhance their learning encounters. Furthermore, social media apparatuses are liked, and e-learning courses are liked, particularly for simple correspondence among students and scholastics, and as an instrument for brisk and simple correspondence among students and scholastics. In any case, it may not be expected that all students will profit by social media in view of their various foundations, or distinctive learning styles may not be suitable to recommend that social media can be helpful to each understudy, as students often originate from various foundations. The most significant thing is to have various methods for learning (Veletsianos and Navarrete, 2012).

Specialists in the field of training have created different speculations about changes in the manner students learn. When all is said in done, A-learning style often alludes to an individual's favored learning style. Students' learning strategies are often identified with their scholastic execution and are in this way thought about determinants of scholarly accomplishment. In this manner, it is significant for instructors to see how students adapt, particularly with the rise and across the board utilization of social media devices. In an ongoing survey by the Pew Research Center, Facebook is the most prevalent social systems administration website with 71% Internet clients on Facebook, trailed by LinkedIn (28%), Pinterest (28%) and Instagram (26%) and Twitter (23%). A

portion of the study results demonstrate that clients are progressively taking an interest in the cooperation of Facebook clients. Albeit numerous examinations have concentrated on the utilization of social media apparatuses and instruction, notwithstanding, the understudy isn't impacted by conduct expectations. There is a hole and the expectation of utilizing social media for learning has not yet been considered (Roblyer et al., 2010; Kalpidou et al., 2011; Junco, 2011; Balakrishnan, 2014).

The utilization of social media is a developing pattern for individuals around the globe. There are 2.5 billion individuals on the Internet utilizing the Internet, and 8 billion of them have accounts on social media destinations. Nonetheless, lately, the utilization of Turkish social media has been constrained to the entire world. In 2015, the quantity of Internet clients comprised 55.9% of the all out Turkish populace 80.9% of Internet clients in Turkey use for social systems. The quantity of Facebook clients has arrived at about 40 million out of 2015 and Whatsapp, Facebook Messenger and Twitter are utilizing it as the most utilized social stage in Turkey. The normal time a Turk utilizes social media is 2 hours and 56 minutes (Bozanta and Mardikyan, 2017).

Facebook, Instagram, Twitter, etc., as the social media networks can have great impact on the overall performance for collaborative learning of students, especially at the university stage; Therefore, by analyzing the using of them shows whether they have a direct influence or not. The concept is to state the reason behind paying attention of universities' students to using social media in learning. The social media networks can be considered as a key factor of enabling students for sharing information and having a better communication. Social media networks have significant features which motivate students and teachers to be more interactive and increase the academic performance value.

Student-central learning as an IoT technology collaborative model in social media networks is necessary to be used instead of knowledge transfer model. The Internet of Things technology influences in sharing idea and knowledge course presentations, personalized contents, and learning activities as aspects of education. The most important category of Internet technologies is Internet-of-Things technology. It enhance the teaching and learning in the following ways: 1- Ability of students to have access to the learning-materials from any device which is connected to the internet. 2- Using of smart devices in so-called smart-classes. 3- An important data can be collected

from portable devices and sensors and analyzing it after monitoring students' achievement and capabilities. 4- The advancement of software which is utilized in educational social in term of Internet of things, indicating to the Network-Services (SNS), Weblogs and Wikis which support activities using for collaborative learning. (Bagheri & Movahed, 2016).

The examination between the Internet, which is currently called Web 2.0, and the Internet, which we call 1.0, is accounted for to be better than the last regarding connection (Kaplan and Haenlein, 2010). Analysts likewise included that the Internet these days offers numerous intuitive undertakings, for example, Facebook, Blog and YouTube. As indicated by Bercovici (2010), students often utilize social media to interface intuitively in a social domain. As of late, conventional research, in the wake of stressing research networks, guides advanced education to the utilization of social media in instructing and learning. Anderson (2012) makes reference to conditions in which the utilization of social media can advance dynamic helpful learning in advanced education. These conditions are communicated by the impression of positive collaborative learning and psychological abilities and metacognitive inspiration.

Larusson and Alterman (2009) and Ertmer et al. (2011) revealed the constructive outcomes of social media on the learning procedure and improved their exhibition levels. For instance, Junco et al. (2011), the utilization of Twitter and websites and Novak et al. (2012) researched the utilization of different kinds of social media. They all accept that these devices assume a functioning job in improving students' presentation and empower dynamic collaborative learning in high co-activity. A large portion of the social media research utilizes a model called TAM. From other research viewpoints, it is accounted for that social media utilizes utilitarian or gluttonous systems dependent on the important TAM. The indulgent idea of social media is depicted in Al-Rahmi et al. (2014), Sledgianowski and Kulviwat (2008) and Hu et al. (1999) revealed the constructive outcomes of saw joy and saw usability on social media appropriation conduct. Then again, the utilitarian idea of social media is as yet misty (Ernst et al., 2013; El Rahmi et al., 2015). In like manner, ebb and flow research is viewed as an unprecedented exertion since it investigates TAM factors that impact collaborative learning to gain proficiency with the Qur'an and Sunnah with regards to the utilization of social media. At the advanced education level in Malaysia, ebb and flow research

endeavors to utilize social media to inspect the effect of collaborative learning on understudy execution. Despite the fact that the second piece of the present investigation incorporates research models and approves various presumptions, the third part plans to clarify the strategies connected and the information accumulation process. The last two pieces of the investigation are identified with the aftereffects of the examination and give a rundown of the central matters and results.

1.1. Use of Social Media in Higher Education

As of late, enthusiasm for advanced education has moved from concentrating on information and aptitudes to long haul learning that underscores abilities (Junco, 2012). One expertise that businesses give extraordinary consideration to is their joint effort aptitudes. The subject of dynamic helpful learning has pulled in the consideration of specialists and researchers. For instance, Dillenbourg et al. (1995) Define such learning as the procedure by which at least two students partake in learning new data. A portion of the assessed social media instruments, for example, MySpace, Facebook and Twitter are apparatuses that can be utilized for instructive purposes. The momentum research utilizes the term limited time for the full feeling of social media.

Utilizing social media in a learning situation, secondary school students will effectively acknowledge imaginative work, bolster companion graduates, and bolster one another. Different components identified with advanced education have been inspected in the writing. For instance, Al-Rahmi et al. Inspected the utilization of educators. (2014), Ajjan and Hartshorne (2008), Chen and Bryer (2012) and Roblyer et al. (2010) Although understudy cooperation Junco et al. (2012) and El Rahmi and Othman (2013). Furthermore, Junco (2012), Junco et al., Investigated the association with scholarly accomplishment. (2011) and El Rahmi and Othman (2013). In their investigation, Yang et al. (2011) found that intuitive web journals assume a significant job in friend cooperations among students and accomplish better scholarly accomplishment. In another examination, it was accounted for that college students were adversely influenced by Facebook time and negatively affected their exhibition. The association with class planning time is likewise powerless. Changing the individual learning condition into another training technique is one of the most potential advantages of social media and this move means to improve self-managed learning

(Dabbagh and Kitsantas, 2011). Through this progress, students will pick up the upside of controlling their learning exercises. Flickr, Wikis, and sites are instances of Web-based instruments that can be utilized to improve the learning condition.

1.2. Effective Use of Social Media

The capability of social media to make higher learning results through collaborative learning is obvious and upheld by writing research (Brown, 2012; Junco, Heiberger and Loken, 2011; Novak, Razzouk and Johnson, 2012). Indeed, even UNESCO's strategy reports bolster the capability of social media around there (Kommers, 2011) and recommend in-class encounters to feature its qualities and shortcomings. At present, the possibility of adequately utilizing collaborative learning through social media in schools and colleges is often alluded to as Web 2.0 (O'Reilly, 2007). This gives more communication, collaborative learning, and client change than Web 1.0 (Kaplan and Haenlein, 2010). Web 1.0 is known as an increasingly static asset that gives less cooperation (Naik and Shivalingaiah, 2008). Contrasted with normal sites, social media has unique applications that give an assortment of approaches to work together. It incorporates various apparatuses arranged by Kaplan and Haenlein (2010), including joint undertakings (Wikipedia), websites, content networks (YouTube) and social systems administration locales (Facebook). Social systems administration locales (SNS) have a solid scholarly culture incorporated with the online network (June 2011). Social media permits the exchange of data, yet in addition enables students to learn as associates, create understanding among students, examine with companions, speakers, increment information sharing and build up their alumni aptitudes (Redecker et al., 2010). A review of undergrad and graduate students demonstrated a critical contrast between the normal score (GPA) and learning time between Facebook clients and non-clients (Karpinski, 2009). This idea has been reflected in past research (Larusson and Alterman, 2009; Ertmer, Newby, Liu, Tomory, Yu and Lee, 2011). Also, as indicated by Meyer (2010), the utilization of social media to finish the task has prompted a more noteworthy learning that Bloom's scientific categorization claims, particularly in online dialogs. Proof of Twitter's potential

commitment, Weibo devices (Junco et al., 2011) and social clarification instruments for collaborative learning were additionally found (Novak et al., 2012).

1.3. Use of Social Media And Interaction with Team Members and Peers

Social media supports coordinated effort, energizes the improvement of connections among students, and gives immediate chances to the dispersal and headway of courses outside the genuine homeroom (Fewkes and McCabe, 2012; Junco et al., 2012; Top, 2012). Utilizing social media in school-related exercises, for example, dialogs, enables students to take an interest in discourses and substance collaborations (Patera, Draper and Naef, 2008). This single-position correspondence expands the learning capability of high students past the topic proposed by the arbitrator or instructor and makes ready for important exchange (Hurt et al., 2012; Al-Rahmi and Othman, 2013a; El-Rahmi et al.). 2014). In a related report, Liu, Liu, Chen, Lin, and Chen (2011) contend that social media advancement and data sharing ought to be comprehended as a device that empowers students to encounter a virtual network that they can get it. Make systems from various sources (Frye, Trathen and Koppenhaver, 2010). This open door prepares for different chances to improve understudy learning through connection.

1.4. Use of Social Media And Interaction with Supervisors and Lecturers

Educators and administrators utilizing social media ought to have the option to work with students to assume a functioning job. The purpose behind this is students have the duty to build their imagination, assess exercises and clarify mistaken assumptions emerging from substance territories and data creation so as to ensure the uprightness of the learning condition (Frye et al., 2010; Liu, 2011). A few teachers and managers are hesitant to utilize others, while others decide approaches to incorporate social media into their courses and courses (Fewkes and McCabe, 2012). In any case, it ought to be gone for the utilization of social media, ought to be proper for a domain reasonable for learning and the comprehension of specialists and students ought to rise (Liu, 2011). Social media can be utilized as a study hall update publicizing technique, yet as a basic interpretive and collaborative learning device (Fewkes and McCabe,

2012; Al Rahmi and Othman, 2013a; and Al-Rahmi et al., 2014; 2015). In this way, mentors and directors wishing to consolidate social media into their encouraging strategies ought to guarantee that the kinds of social media utilized are predictable with their learning results to improve scholarly execution. Chen (2015) demonstrated that members with "absorption" and "contrast" learning styles outflanked members with "versatile" and "incorporated" learning styles as they ended up social systems administration destinations, for example, Facebook. Pop can possibly work as an instructive device that empowers peer criticism, communication and learning in the social condition. Educators and administrators who need to utilize social media to help understudy learning and empower understudy learning in scholastic projects ought to be set up to assume a significant job in building up a collaborative learning network. We should accept that students effectively realize that the way around social media can negatively affect those less well-known who still need supervision and direction (Jackson, 2011; Valjataga and Fiedler, 2009; Al-rahmi et al., 2015c). For teachers, it is likewise critical to recognize the probability of parasites and overexcitation of specific sorts of social media (Chen and Bryer, 2012; Patera et al., 2008).

1.5. Focus on Using Social Media

Students' expectation to utilize social media organizes in collaborative learning is a key factor in the utilization of basic innovation (Venkatesh, Morris, Davis and Davis, 2003; Davis, Bagozzi and Warshaw, 1989). These speculations/models reach out from the crucial standards of TRA, which accept that the reason for utilizing the framework is a component of mentalities towards individual conduct and emotional standards. It at that point extended to incorporate plan and utilization of TPB hypothesis (Venkatesh and Bala, 2008). Seen delight is acknowledged as the conviction of significant clients subsequent to employing and can improve client fulfillment and expectation (Pelling and White, 2009). As indicated by Moon and Kim (2001), individuals who love arrange frameworks will effectively take a gander at their connections with the framework, and thusly have the expectation to utilize it to improve their collaborative learning (Al-rahmi et al. 2015b; El-Rahmi et al., 2014; Sanchez, Cortijo). what's more, Javed, 2014; al-Rahmi and Othman, 2013b).

1.6. Use of Social Media and Collaborative Learning

Shoshani and Braun (2007) guarantee that collaborative learning bolsters social media and eventually advances innovative learning. Helpful learning includes the cooperation and association of students and courses. For this situation, social media can grow the learning condition on the grounds that lone piece of the learning happens in the study hall (Chen and Bryer, 2012; Friesen and Lowe, 2012; Wodzicki, Schwämmlein and Moskaliuk, 2012; Al-rahmi et al., 2015a). In this manner, teachers should recognize successful approaches to help coordinate social media into the homeroom (Fewkes and McCabe, 2012). They can utilize social media to build up students' imagination and investigate the substance of the course (Frye et al., 2010; Lamb and Johnson, 2010). Through web journals, social media, YouTube and even digital broadcasts offer an assortment of choices for the advancement of genuine items and can likewise investigate content materials in the creation of new data (Lamb and Johnson, 2010; and Al-Rahmi and Othman, 2013a). By working together to address the issues of innovative students, they will most likely better balance their distinction and companion connections, which thus will prompt imagination (Garrett, 2011; Shoshani and Braun, 2007).

The collaboration among students in learning with social media utilization and procured a normal rate with regards to scholastic execution of understudies at College. Since it helps make the understudies feel sufficiently certain to exhibiting the social media by cooperative between friends, instructors and commitment inside the class (Chang Zhu, 2012; and El-Rahmi et al., 2014; 2015). At last, as far as the understudies' scholarly presentation with intuitiveness with instructors of using social media and obtained a Most minimal rate in some cases not permitted to speak with educators or modest understudies , yet are great since it gives those all the more understanding structure educators, and scholastic accomplishment in training (So & Brush, 2008).

There has been different diagram and feelings which perceived four significant points of interest of social media utilization in collaborative learning in advanced education. These incorporate, improving learning inspiration, offering customized course material, upgrading relationship, and creating shared capacities (Wheeler et al., 2008; Rifkin et al., 2009). This implies long range informal communication exercises have the plausibility of upgrading understudy contact and is utilized to improve their

support in class, especially where withdrawn understudies are included. Understudies can use social media applications in online collaborative learning, with less nervousness of expecting to bring up issues before peers at university (Frye et al., 2010).

1.7. Use and Participation of Social Media

With regards to social media, support makes a learning situation described by more prominent participation and correspondence through friend dialog and connection (Heafner and Friedman, 2008; Jackson, 2011; Liu et al., 2011). Likewise, past examinations (Arnold and Paulus, 2010; Dawson, 2008; Hurt et al., 2012; Al-Rahmi et al., 2014; Top, 2012) contend that social media opens the entryway to bringing issues to light of more understudy networks with a specific network. Subjects cooperate. What's more, social systems administration locales (SNS) give extra understudy learning joins through social capital and psychological well-being, scholarly support instruments, and upgrade connection with schools and the scholarly world (June 2011). From one perspective, students with experience are profoundly intelligent with social media, and social media is often seen emphatically by students and scientists and innovation suppliers. Turel and Serenko (2012) contend that stimulation can prompt positive results, for example, high support. All the more explicitly, Dawson (2008) contends that students' view of the network might be influenced by social systems and that students feel a higher feeling of network when speaking with their friends. Utilizing social media additionally gives students a feeling of network by giving customized profiles, including pictures and individual data, for example, Arnold and Paulus (2010), Stevens (2009) and Al-Rahmi and Othman (2013a). .). What's more, Facebook enables less dynamic students to expand their cooperation in learning exercises (Meishar-Tal, Kurtz and Pieterse, 2012). This personalization and coursework test at last lead to impression of learning by supporting the genuine association between students by empowering the sharing of information among students (Hurt, Moss, Bradley, Larson, Lovelace, Prevost and Camus, 2012; Top, 2012). Likewise, Elsweiler and Harvey (2014) contend that Twitter research is fundamentally an instrument for mental and social commitment and is additionally a methods for keeping up learning in the dynamic universe of learning that makes this new wellspring of data early site.

1.8. Use of Social Media and Student and Researcher Satisfaction

The utilization of social systems in advanced education gives a sufficient comprehension of exchange and improves understudy accomplishment (Vie, 2008). The evaluation time frame has been portrayed in the writing as a method for instructor understudy criticism to decide students' degrees of getting, fulfillment, and scholarly accomplishment (eg Foroughi, 2011; Al-Rahmi and Othman, 2013c). Also, records demonstrate that the selection of social systems triggers a positive connection between understudy accomplishment and fulfillment (Cao and Hong, 2011; Al-rahmi et al., 2015a; Al-rahmi et al., 2015b).

Ajjan and Hartshorne (2008) and El Rahmi et al. (2014) detailed the aftereffects of the study: Using social systems as a stage for collaborative learning forms, there is a noteworthy connection between understudy accomplishment and understudy fulfillment. Some workforce officials accept that some social systems administration instruments can improve understudy learning, communication with educators and different companions, composing abilities, and fulfillment and scholarly execution.

1.9. Use of Social Media and Academic Performance of Students and Researchers

In the study hall, students utilize social media to set up associations with companions contrasted with friends (Annetta, Minogue, Holmes, and Cheng, 2009; Jackson, 2011; Tomai et al., 2010). As per the examination (Jackson, 2011; Mazman and Usluel, 2010; Wodzicki et al., 2012), students can characterize and associate with comparable friends through social media. Moreover, it lessens class assorted variety through impartial zones and enables students to communicate with their companions (Junco et al., 2011; Pike, Kuh and McCormick, 2011; Al-rahmi et al., 2014). All the more significantly, students who figure out how to utilize social media will have a passionate association with their friends since they want to get help when they need it. These companion associations energize all students, particularly the individuals who are reluctant, to partake in up close and personal discourses (Arnold and Paulus, 2010; Junco et al., 2011; Rambe, 2008).

1.10. The Impact of the Internet of Things on Higher Education

Sooner rather than later, the Internet of Things will influence each part of society eventually. When all is said in done, advanced education foundations, especially colleges, can work interdisciplinary and lead to the improvement of IoT innovations, plans of action, moral and future monetary pioneers of the Internet of Things. For instance, college speakers in software engineering and designing drove IoT research facilities to create IoT innovation. Likewise, the College of Informatics can show you how to utilize the size of IoT information through TIPPSS. They can likewise work with business colleges to set up and plan IoT courses to make new plans of action. Therapeutic schools can give the Internet to medicinal things, and graduate schools can educate IoT morals, protection and approach. As indicated by Zebra innovation, advanced education foundations will almost certainly examine and oversee enormous information as they create and use arrangements, for example, radio recurrence ID (RFID) and distributed computing innovation with IoT innovation.

The Internet of Things can lead not exclusively to an innovation update and improvement in the segment, yet additionally to changes in the public arena all in all, including advanced education establishments. The Internet of Things will lead the change and change of advanced education organizations. As per, the Internet of Things will prompt instructive innovation, instructive change, change educating, learning change, change the executives, analysis and practice changes, grounds changes and changes in showing assets (Tianbo, 2012).

The forthcoming forward-looking practice with the improvement of the Internet of Things lies in three viewpoints: the evaluation of students' advancement, the joining of existing showing stages and the advancement of instructive layers (Zhiqiang and Junming, 2011). This change gives more accommodation to students and makes the showing procedure progressively powerful for educators and professors. The way toward connecting gadgets and advancements implies that instructors and professors can concentrate on viable learning, which is more valuable for students than performing ordinary undertakings.

What's more, the Internet of Things can upgrade the learning background by giving ongoing and appropriate data about understudy execution. Today, particularly college students are moving from course readings to new advances, for example, tablets

and workstations. Propelled e-learning applications enable students to learn at their very own pace and increase a similar learning knowledge both in the study hall and at home (Ghazal et al., 2015). Moreover, on account of IoT innovation, professors can gather information on understudy execution and figure out which needs more consideration and consideration. This information examination additionally causes instructors to precisely plan and plan future exercises. Likewise, associated gadgets enable instructors to fabricate dynamic classes. Rearranges mediation and records participation if students have wearable gadgets that can screen ECG designs. Likewise, these gadgets can coordinate students' consideration by offering warm-up exercises and activities. Likewise, EEG sensors can be utilized to screen students' psychological exercises on the course.

This vision and comprehension empowers partners to get students, associations and money related resources. This advantage insight empowers associations to settle on educated choices to improve students' information and learning background, operational skill, and grounds security. As per Zebra Technology (2015), by expanding resource insight, instructive organizations can build results by including an incentive in various territories, including: upgrading learning encounters and results, expanding operational effectiveness, and structuring more secure grounds.

Also, outside the study hall, colleges can utilize associated gadgets to screen students, staff, assets and hardware at lower working expenses (Yan-lin, 2010). Also, the advancement of portable innovation and the Internet of Things enables colleges to improve grounds security, increment access to data and applications, and screen basic assets, whenever and anyplace (Gubbi et al., 2013). The Internet of Things interfaces people, information and things to change the learning background of students.

1.11. The Future of Internet of Things in Higher Education

The college has since quite a while ago perceived the capacity of innovation to undermine educating, learning and assessment. Besides, on the off chance that cutting edge colleges need to recognize their students' scholastic execution, at that point specialized debasement, which can expand enlistment rates, increment instruction abroad, and accomplish perfect outcomes, is pivotal. In any case, it is exceptionally mind boggling to guarantee that students trust the universe of work. Solid scholarly

administration expects access to quality courses and substance, and open doors for students to utilize new advances successfully. With the improvement of the Internet of Things, numerous advanced education establishments started to focus on the pertinent innovations and uses of the Internet of Things (Fan and Guo, 2009). This activity is additionally utilized in colleges. The internet is profoundly established in colleges, and e-learning has turned into a typical practice in most college frameworks (Aldowah et al., 2015). Instruction is on this rundown (Fan and Guo, 2009) and the Internet of Things has numerous applications in colleges, and its effect on it is huge. The Internet of Things will increment operational proficiency in all learning situations. The Internet of Things can bolster study hall learning by improving learning settings, improving learning assets, improving learning strategies and systems, expanding the board effectiveness, and decreasing administration costs. The assets accessible for learning on gadgets, for example, digital books are progressively appealing and intuitive. Be that as it may, there is a proceeding with requirement for new advancements for learning procedures, for example, fast remote systems with transmission capacity for spilling sound and video exercises.

As per the Citrix 2020 Technical Landscape Report (2015), IoT innovation will improve the learning knowledge in the following five years in various ways. Learning encounters will keep on being progressively virtual, students will devour information and learn in new ways, and classes will adapt better. Therefore, learning will be a mind boggling background for educators and students, will quicken information and carry new thoughts and answers for the world. Simultaneously, students are set up for future examinations and desires for future investigations.

Innovation will consistently have a spot in every instructive control. The Internet of Things additionally has numerous open doors in the controls of science, innovation, building and arithmetic (STEM, for example, PC programming and physical processing. It is anything but difficult to anticipate how IoT highlights can be utilized in STEM orders, robots, and everything identified with the gathering of explicit information. It has the maximum capacity of the Internet of Things. At last, in any case, instructors need to characterize the correct innovation and have the option to precisely incorporate it into the study hall to find out about improvement. Despite the fact that the primary IoT innovation is right now hazy, the key is the aftereffect of another advancement

period of a large portion of the substance. Given the necessities of increasingly professional research, the foundation of the Internet of Things profession is moderately simple and suitable for alumni students. Notwithstanding, for college students, regardless they need a wide scope of essential courses, so it is difficult to make an autonomous IoT program like different majors (Sundmaeker et al., 2010). New instructive techniques for alumni ought to be explored. Various colleges must scan for suitable strategies as per their own qualities. Efficient strategies and course substance ought to be bit by bit created and created. Since the Internet of Things understands the merger between the virtual world and the physical world, numerous new instructive strategies and cross-cutting territories will be delivered later on.

Furthermore, the eventual fate of the Internet of Things economy can be molded by specialists and pioneers in the advanced education segment and by the training of students. The advancement of advanced education frameworks will imagine, improve and direct new mechanical developments. Along these lines, the advanced education area should work with business and modern parts to shape and manufacture the fate of the Internet of Things economy. What's more, the advanced education area has the chance to deal with the eventual fate of IoT innovation, particularly by planning courses for colleges, innovation and business pioneers, and by urging students and analysts to make new business techniques that utilization IoT innovation in a multidisciplinary way (Kortuem et al., 2013).

In 2016, IEEE, the National Science Foundation (NSF) and the Internet2 sorted out a class titled Güven Trust and Security in the Internet of Things, trailed by the IEEE Technical and Policy Expert Forum, specialists and members mentioning the Internet of Things Innovation and improvement is required : Researchers, professors, scholastics and students in the college and advanced education segment are in a remarkable spot to guarantee the development and improvement of IoT gadgets, frameworks, applications and administrations. They additionally focused on the need to create and investigate new interdisciplinary stages and thoughts to address a considerable lot of the issues and issues we face today. Furthermore, IoT and information investigation instruments can be utilized to create and improve grounds and social exercises and capacities, improve data catch, address security and protection issues, limit vitality use, dissect information, and give noteworthy bits of knowledge to comprehend advancement . Reinforce the

wellbeing part. To make such a framework vision, you have to cross the ranges of abilities and orders. What's more, scientists and specialists can make start to finish TIPPSS answers for the Internet of Things, and fabricate IoT gadgets and administrations with a savunma profound protection "methodology by including equipment, software, firmware, and security.

1.12. Internet Challenges of Objects in Higher Education

The Internet of Things brings colossal difficulties and open doors for advanced education. The unrivaled development of non-formal registering, the advancement of Internet of Things innovations, for example, distributed computing, huge information and examination not just help improve the basic beliefs of instructing and research quality, yet in addition add to the advancement of the Internet of Things people group and advance new computerized culture. With expanded web based permitting openings and consistent access to organized and unstructured substance, the Internet of Things carries computerized capacity to advanced education organizations. The Internet of Things is a noteworthy change in the customary showing worldview, while incorporating a more extensive scope of controls, including social sciences, to improve the estimation of enormous information given by social media. Some IoT challenges in the advanced education part.

1.12.1. Cloud computing

Numerous colleges utilize half and half mists as the business design to have the Internet of Things applications. Recent college grads, the most innovation disapproved of students at the college and the ascent of tablet and portable advancements, opened better approaches to build the viability of corporate engineering, instructional innovation, research and learning situations. With the pervasive PC, the cloud gives consistent network and administrations to data innovation administrations. At present, the institutional design of numerous advanced education organizations depends on mixture cloud framework and processing stages in private mists, while endeavor and instructive applications are steadily transforming into open mists. Corporate models in these associations need to decrease inertness because of expanded instructive innovation

content, expanded sound and video for instructive purposes, and the requirement for a functioning corporate system.

1.12.2. Instructional technology

Progressively, learning the executives frameworks, for example, Moodle and Blackboard are making a lot of organized and unstructured information, for example, LMS, sound and video content. Complex electronic classes with course catch frameworks and web spilling offer students the chance to access showing content whenever, anyplace (Jin, 2012).

1.12.3. Mobile application

IoT applications are progressively being utilized to coordinate versatile learning applications, evaluation and scoring frameworks. The perfect application enables students to profit by learning assets, overseeing assignments, and handling errands. Educators likewise utilize a portion of these applications to show exceptionally explicit ideas, complex material science, logical recreations, and social issues.

1.12.4. Security and Privacy

The execution of IoT innovation brings new special security and protection issues and difficulties. Tending to these difficulties and difficulties ought to be a key need to guarantee the security of IoT gadgets and administrations. One of the fundamental gauges of the Internet of Things is the need to consolidate powerful and solid protection and security systems. Advanced education is touchy to the security and protection of the IoT biological system (Agarwal and Pati, 2016).

Despite the fact that there is more prominent impulse for the security of the IoT foundation, there is no methodology to distinguish business dangers related with information breaks. Advanced education offices need to set gauges to guarantee the security of IoT rehearses. Since advanced education makes a great many specialists for the future, it must grasp IoT stages and frameworks while confronting the difficulties of IoT subsidizing, creating computerized instructing, preparing and interdisciplinary

research. Also, IoT applications ought to be morally and morally fused into the future workforce to address digital security issues as the network is progressively dependent on IoT rehearses. Subsequently, a collaborative way to deal with security and security is expected to create compelling and suitable answers for location IoT security challenges. Likewise, the majority of the Internet of Things potential depends on systems that consider human security. In this manner, so as to accomplish these chances, new procedures ought to be formed that consider singular security decisions and desires while advancing advancement in new advances and administrations (Agarwal and Pati, 2016).

1.12.5. Research computation

Advanced education keeps on profiting by the coordination of the Internet of Things. As equipment expenses have declined, interdisciplinary research has quickened in the course of the most recent couple of years. What's more, because of the accessibility of enormous information, much littler colleges can build their impression in interdisciplinary research and put resources into superior figuring (HPC), huge information stages, and examination. STEM preparing saw the need to utilize sensor innovation, unmanned aeronautical vehicles (UAVs) and microcontrollers to distinguish more extensive coordinated effort with the IoT biological system. The designing research center uses sound and video innovation, rambles, Raspberry Pi and open source frameworks (OSS) to advance development and improve the building procedure. Profiting by a lot of enormous information created by social media and universal PCs, social science specialists keep on utilizing appropriated figuring stages, for example, HPC, GPU bunching, Hadoop grouping, and huge information examination to create IoT inquire about.

1.12.6. Quality and ethics

As of late, the nature of on the web and grounds learning and the expansion in advanced education expenses are dubious. The Internet of Things offers a remarkable chance to offer advanced courses. Nonetheless, it likewise introduces difficulties for keeping up the nature of educating and assessing understudy work. IoT instructive

practices require educators, professors, and apparatuses and methods from mainstream researchers to improve examine quality and address moral issues in advanced education.

1.12.7. Finance

As far as substance and applications, the expense of data innovation builds each year. This application stacks keep on developing on a level plane and vertically as far as instructional innovation, investigate informatics and business innovation. Notwithstanding data innovation and lab costs, most colleges don't have a procedure of sharing expenses and deciding the all-out expense of responsibility for IoT framework. Advanced education should think of new plans to fund data innovation foundation and administrations.

1.13. Problem Statement

The Internet-of-Things, with the new concept, has a great significance to economic and language development, geography, and physical location. Utilizing the technology in the field of education play a big role in expediting the process of learning, develop the level of knowledge, and makes the students more qualified. But, the functional standard and model of any new concept appeared are not used widely and the universities are not ready to apply all the enhancements made to the education system by IoT technology.

The influence of Internet-of-Things in Higher Education, self-governed and special activates for solving problems, just as the methodology of a learning style dependent on record and gamification, and on intuitive coordinated effort with instructors and students, are viewed as the point of convergence of a learning procedure. Then again, teachers must become accustomed to present day advancements and techniques for correspondence and apply them in their present work, rather than underestimating themselves. So as to affect the university students better, the learning experience must be social, dynamic, and relevant. To accomplish this objective, educators can empower:

_ The collaboration among undergraduate students on social network sites;
_ The advancement of dynamic learning on social network sites;

_ The correspondence among instructor and university students social network sites;

This study aims to study the effects of technology on the use of social media for collaborative learning among university students. The main purpose of this study is to understand the perceptions of university students and academic staff about the effect of Internet technologies on collaborative learning about social technologies.

1.14. Important of the Study

The universities future is not about the use of technology. This is about how the university adapts to the changing needs of future acquaintances, the future of employment and the economy. This study will investigate the Internet of Things technology impact on social media usage by university students on collaborative learning and explores emerging trends in social media on collaborative learning by students and explores the potential future impact of the Internet of Things and the Internet of Things in higher education. In addition, some IoT are studying the challenges of higher education.

1.15. Aim of the Study

This study will investigate the Internet of Things technology impact on social media usage by university students on collaborative learning. Specifically, collaborative level between students while using the Social Media (Facebook, Twitter, WhatsApp, etc.) in the module in and out of the classroom. The study tends to answer particularly the following objectives;

- Assess the concept of using social media in an academic context
- Investigate the potential of social networking sites/tools in the university and how it affects student learning.
- Investigate college students' attitudes toward using social media for education and learning
- To measure the level of collaboration and engagement between students, instructors and tutors in and out classroom.

1.16. Thesis Outline

Chapter 1 gives general introduction on the Internet of Things Technology Impact on Social Media Usage By University of Duhok Students on Collaborative Learning in North of Iraq.

Chapter 2 will discuss the relevant related literatures in the said topic.

Chapter 3 will give overview of the research materials and methods, demographics information, etc.

Chapter 4 will describe the results and interpretation of the results and discuss with relevant articles.

Chapter 5 will conclude the study, with recommendation, limitations and future prospective.

References.

2. LITERATURE REVIEW

Mbodila et al. (2014) detailed that the utilization of Facebook strongerly affects understudy joint effort and mix. They additionally detailed that social media as an instructive device can be utilized to advance the working of colleges to empower students to learn and learn through social media.

Sarwar et al. (2018) Student agreeable learning and adjustment and utilization of social media from the point of view of learning results. By breaking down the outcomes with basic demonstrating systems, it was discovered that the utilization of straightforward and expected impacts found a huge positive association with the utilization of social media. Be that as it may, there is a negative connection between the revelation of preferences and the joy of learning. As an arbitrator, cyberbullying is viewed as a factor in the positive connection between agreeable learning and instructor execution.

Aldoa et al. (2017) In the coming years, learning background innovation will influence numerous viewpoints. The Internet of Things (IoT) keeps on assuming a significant job in ICT and social improvement. With the help of the Internet of Things, associations can improve learning results by giving convincing encounters, expanding operational productivity and increasing positive perspectives on preparing conveyance. The point of this examination is to investigate the capability of the Internet of Things from a higher viewpoint and to augment its advantages and decrease dangers. Also, there is a need to reveal the maximum capacity of IoT frameworks and advances. Accordingly, this article looks at the effect of the Internet of Things on advanced education, particularly colleges. The Internet of Things has experienced gigantic changes in the manner colleges work and has examined classes and students at all levels. It has incredible potential for colleges or other instructive organizations and is set up for the expansive and effective usage of pioneers, representatives and students. The Internet of Things requires an advancement that colleges can lead. Analysts, specialists and students have remarkable focal points in finding and creating IoT frameworks, gadgets, applications, and administrations. They are likewise exhibiting the fate of IoT in the following couple of years, which is relied upon to be given by many research establishments and organizations. Then again, the Internet of Things has brought

numerous higher instructions. Hence, this article likewise portrays the difficulties confronting the Internet of Things in advanced education.

As indicated by Labib and Mostafa (2015), the impacts of SN on educators', instructors' or graduate students' exhibition, communication, socialization, joint effort and basic leadership in agreeable learning were analyzed. In light of the consequences of this examination, different choices can be made, for example, perpetual learning or better utilization of SN in the field of learning. The Technical Acceptance Model (TAM) is utilized to accomplish investigate destinations. The nature of the exploration was examined and an organized survey was utilized to gather information from 300 Egyptian college students. Relapse examination and Mann Whitney U test were utilized for information investigation. The outcomes bolster all suppositions aside from the connection between the reason for SN and the understudy's utilization in agreeable learning. Moreover, there is no huge contrast in the structure of every single anticipated model among undergrad and graduate students. Existing inquires about are added to the writing in two unique ways. In the first place, testing and approval of TAM in a formative culture: Although twenty, TAM have been generally used to assess various advances, numerous investigations have been utilized to receive SN.

As per Bozanta and Mardikyan (2017), the utilization of social media has improved understudy cooperation and understudy the board and understudy instructor communication. Accordingly, peer communication and educational program the executives decidedly influence agreeable learning. The consequences of this examination can support students and training pioneers strive to help, move and propel activities in social media, incorporate schools, and give proper instructor instruction to build social media enrolment.

Social media is characterized as "an online administration that enables people to make open or semi-open profiles in a restricted framework, to plainly impart their associations with them, and to view and switch records. Interface and associate with other individuals in the framework" (Boyd and Ellison, 2008). Also, it is characterized as an Internet-based application and instrument that empowers the creation and trade of client produced content, including video, pictures and composed data (Li and Bernoff, 2008; Kaplan and Haenlein, 2010). Social media gives dynamic investment, availability, joint effort, and data and assessment sharing among clients (McLoughlin and Lee,

2007). These advantages from the social media are significant and important for the instructive condition. Along these lines, the utilization of social media in training is increasing increasingly more consideration from analysts. There are subjective and quantitative examinations in the writing to inspect the connection between social media and instruction.

Utilize diverse social media stages to look at the effect of social media destinations on instruction and joint effort. Bongdanovs et al. (2012) made social stages to quantify the effect of their social media stages on collaborative work. They were more powerful than a commonplace social system since they were made for a particular reason. A few examinations manage social media destinations and explore explicit or explicit sorts of effect with regards to training. For instance, in an investigation by Quincey et al. (2012), the impacts of social bookmark locales were inspected and observed to be extremely helpful for putting away, sharing and investigating assets. They likewise help assemble learning networks (Quincey et al., 2012). Weibo is another kind of research that was examined by Ebner et al. (2010) and found that there were new kinds of correspondence that could help learning outside the homeroom. Also, interviews with college students demonstrate that they utilize social media for instructive purposes, for example, subjective investigation of the utilization of social media in training, results, correspondence practices and sharing of archives, for example, scholarly data, experience, social help and correspondence and correspondence with partners (Hrastinski and Aghaee, 2012).

There is a positive and huge connection between the scholarly utilization of data innovation and the acknowledgment of collaborative learning, and the scholastic utilization of innovation has expanded the association among students and students and educators (Laird and Kuh, 2005; Junco et al.). (2013). Grosseck and Holotescu (2010) likewise stress that Weibo is a viable device for collaboration in an instructive situation. Also, it was expressed that there is a connection between the utilization of social media by students and their relationship (Rutherford, 2010; Rodriguez, 2011; Junco et al., 2013). In the investigation of Hung and Yuen (2010), when social systems administration destinations were utilized as a guide to educate, students felt increasingly about social associations.

Then again, thinks about led by Wiid et al. (2013) demonstrate that are "usability" and "availability" are the most significant components influencing the utilization of social media as a successful educating instrument. Al-Rahmi et al. (2014) utilized two factors innovation saw "convenience" and "saw advantage" and in the innovation acknowledgment model, and these factors were "support", "peer communication" and "Instructor collaboration". They likewise inspected the effect of collaborative learning and understudy fulfillment. At long last, they explored the impact of collaborative learning and understudy fulfillment on understudy accomplishment. All connections were observed to be altogether powerful for the pointer variable.

Early examinations, for example, researched the general accessibility of youthful students in advanced education in social media (Al-Rahmi and Othman, 2013). Essentially, (Hemmi et al., 2005 and Jones and Twidale, 2005) analyzed the utilization of social media and demanded that the utilization of social innovation was not a straightforward and reasonable procedure. At a more elevated amount of instruction, increasingly complex scholastic errands are performed and another age of students is perceived who comprehend that social media and social advances influence learning. Numerous early investigations have demonstrated that it takes endeavors to begin utilizing social media to impact instructive exercises. Be that as it may, the entire procedure of embracing a specific social media has not gotten enough consideration from analysts (Hamid et al., 2011).

Specialists accept that media combination has been generally empowered in educating and learning to encourage this procedure, especially in improving the consequences of researchers (McLoughlin and Lee, 2008; Tay and Allen, 2012). As indicated by McLoughlin and Lee (2008), students ought to deliberately look at and inspect the apparatuses they use, feel great and know the pertinence of their faith in the satisfaction of their scholarly undertakings. Regarding this, social help utilizing social systems can be given not in a solitary specific social innovation but rather in a blend of numerous social advances.

The past writing recognized the challenges of utilizing social media in advanced education (Jones et al., 2010). An exact investigation of the accessibility of social systems administration among college students in the UK. The examination incorporated a poll comprising of 76 members and 14 approved meetings. The

examination found that social systems have five key difficulties and their pertinence to learning, for example, inquire about inventiveness and data confinements on copyright issues. Instructors are some of the time obsolete and can't see how to coordinate and profit by social software. In view of another age of research at three Australian colleges, the aftereffects of this investigation affirm the early issues distinguished in (Kennedy et al., 2008).

Kennedy et al. (2008), recorded six issues encompassing the joining of training into innovation mix. These incorporate understudy learning decent variety, reasonableness and utilization of innovation courses, and scholarly uprightness staff improvement and limit building appraisal, and at last ICT framework. Despite the perceived advantages and difficulties, the investigation additionally proposes that educators who are not some portion of the new age are distrustful about social system combination in the study hall. Educators are urged to focus on the learning inclinations of various students while focusing on and utilizing social systems.

Moreover, researchers must pick the innovation we have to meet their vocations. Class experience can't fulfill their seeing, however it should likewise apply it in solid presence examines. Talk about social systems administration and collaborative learning thoughts, for example, Facebook, discussions, messages and sites, or any learning nearness; with the goal that students can comprehend and encounter dialogs between your students, mentors, specialists, officials and even entrepreneurs. Help scholastics to take exercises learned in a solid workplace. The significance of every close to home reason focuses to the way that analysts move collaborative learning to make a theoretical system for social systems to enable them to build up the comprehension of development (Yampinij et al., 2012).

Data society and new innovations significantly affect all degrees of the instructive network. Another age of individuals normally incorporates this new type of culture that guides and often guides us to the significance of their work in instruction, adjusting and overlooking numerous things that are currently extraordinary or not in any manner. The creator (Cifuentes, 2015) expressed that there are open doors for students to profit by ICTs in instruction to build up their thoughts and encounters in the field of learning.

As per the writer (Norazah et al., 2015), to advance the instructive procedure, it is essential to create from a casual (family, stimulation ...) instructive condition, and

schools ought to likewise incorporate new societies: computerized proficiency, data asset profitability apparatuses, course readings, psychological devices. Clearly, school students ought to be nearer to the present culture, not to yesterday's way of life. In this way, as a device, it very well may be utilized as a device for different purposes, (for example, cameras and TVs) for PC exercises: amusement, data, correspondence, instructing.

It is additionally imperative to take a gander at home, youngsters can profit by these procedures in the hands of their folks, yet this can be utilized notwithstanding the utilization of specialized instruments (in the study hall, at home ...), just as instructive exercises, profound exercise, insight, enthusiastic and social improvement, and new advances. increments. Model: Developing a homeroom arrange (inside the school's site) will help guardians present progressing exercises, photographs and exercise designs that enable a portion of the youngster's work to be discharged. (Norazah et al., 2015).

In any case, data and correspondence innovation (ICT) innovation is the primary switch for a remarkable change in this day and age. Truth be told, no other innovation has come about because of significant changes in the public eye, culture and economy. Because of the broad use and utilization of worldwide ICTs, individuals have essentially changed the manner in which they convey, engage, work, arrange, oversee and socialize. It is generally recognized that data and correspondence advances can help increment efficiency in different areas of business exercises and data economy and development, which was beforehand incomprehensible. Concerning individual conduct, new innovations upset the view of reality, while the Internet people group firmly uncovers the stun waves that trigger worldwide cooperations. (Yellow, 2016).

As indicated by the creator (Brun et al., 2014), mankind is at a defining moment in exceptional innovative change. Notwithstanding the data and correspondence innovation establishments that have occurred in the course of the most recent two decades, the "imaginative demolition parad and the new social worldview, the speculation of the data society and data, can pursue the hour of scattering and completely have new instances of potential and brilliance. In the investigation of the exploration, our center stage - the defining moment will be set apart by hesitation, vulnerability, the part of the bargain air pocket and institutional rebuilding. On the off chance that this remark is affirmed, our old foundations, for example, schools, colleges,

governments and organizations will be looked with profound weight from inert basic changes and changes, however on the off chance that information is the motor of the new economy, it is learning fuel. (Boranbayev, 2015) Therefore, long lasting learning has turned into the greatest instructive test for people and associations in the new century. As of late, the presentation of a data society by all sections of society is an undeniable truth. Long lasting learning is the way to common instruction in the 21st century. The achievement of the data society requires, from one perspective, a wide range of learning, and then again, every one of the capacities to adjust rapidly and successfully to evolving social, work and financial conditions. (Rascón-Moreno, 2014) Information and correspondence advances have perceived the possibility to help learning, the social structure of information, the improvement of aptitudes, and the capacity to adapt freely.

2.1. The Role and Shape of the Internet of Things in Education

The Internet of Things depends on the idea of "keen articles" or "things". Miorandi et al. (2012) distinguishing keen articles as physical substances, conveying (tolerating and answering to approaching messages), related with at any rate one name and address, related with in any event one name and address, fit for identifying physical occasions (sensor) or physical reality implies for setting off an activity influencing the (actuator). These highlights empower astute items to have setting mindful capacities; that is, canny articles can dissect information got from their sensors and use acknowledgment calculations to distinguish occasions and occasions and socially, that is, share their information, see one another and perceive one another. The state is astute and serves individuals and robots in a genuine setting (Moller et al., 2011).

Basically, the Internet of Things comprises of three primary layers of deliberation:

- Hardware (sensors, actuators and specialized gadgets) in light of the current worldwide Internet correspondence framework that interfaces physical and virtual administrations. Sensors empower clients to find out about their condition, enact new types of client association, and interface this present reality to data (Plauska and Damaševičius, 2014).

- Middleware (estimation devices) for information accumulation, gathering and examination. Auxiliary data from sensor information can be utilized to synchronize learning exercises with the physical condition and furthermore to utilize client criticism on the connection of articles with items (Plauska and Damaševičius, 2014).
- A layer of portrayal (or web administration) that enables articles to take an interest in the business procedure and enables them to question occupations and change their status and to help their perceivability (in this way, unique ideas to be seen and along these lines more obvious).

The fundamental test in building up a preparation IoT framework is to incorporate the capacities and/or assets given by insightful components into preparing administrations. This requires characterizing instructive IoT designs and models to flawlessly coordinate and incorporate shrewd article assets/administrations into students' instructive administrations (Guinard et al., 2012).

For instructive purposes, the IoT reference model can be utilized. The IoT Reference Model characterizes a typical IoT situation in which a client (individual or software operator) must connect with a physical element (a discrete, recognizable piece of the physical world). A physical substance can be spoken to by an extraordinarily recognizable advanced element in the electronic world (for instance a symbol, or even a social system account). Brilliant items are an augmentation of physical elements and related computerized operators. To speak to shrewd items in the brilliant and advanced world, it places or includes gadgets, for example, sensors or actuators that permit collaboration with or give data about physical resources. Clients can communicate with Smart Objects utilizing assets that serve clients (Serbanati et al., 2011).

2.2. Internet of Things Supports the Concept of Collaborative Learning

Computer-assisted collaborative learning (CSCL) alludes to the specialized condition where students effectively collaborate, share encounters, and produce learning (Roschelle and Teasley, 1995). Eye to eye CSCL gives an exceptionally animating learning condition that changes study hall elements and urges joint effort among students to accomplish great outcomes (Cortez et al., 2004). Counting preparing robots (MRSCL) in CSCL as portable robot bolster adds new substance to this learning

condition. While eye to eye collaboration jam participation and essential specialized help, preparing robots offer an approach to receive reality (Mitnik et al., 2004). This genuine condition (instead of the virtual learning condition normal in e-learning) gives students a typical arrangement territory wherein versatility can be investigated and submerged on the planet. Then again, robots with versatility and self-governing route are turning into another entertainer who can connect with the physical world and a gathering of students. Likewise, the MCSCL offers a helpful space for constructivism to make new data in the educator centered reflection process (Zurita and Nussbaum, 2004). Theoretically, robots have three jobs in the instructive Internet of an Object-based condition:

- Robot goes about as a portable "thing" cell phone. Make, improve, and reproduce data through associations between keen items. Learning materials and procedures can act naturally sorted out and balanced dependent on the understudy's continuous advantages and mental state. Things are executed as portable robots that can move and communicate between their surroundings (Turcu et al., 2012).
- Robot as a Service (RaaS) enables the vehicle to make the automated resource work. The robot turns into the administration endpoint of the client direction.
- The robot goes about as a learning object (RaLO) that stretches out the LO idea to the physical space (learning content) outside the virtual space (the physical procedure of robot equipment and equipment portrayal) (Burbaite et al., 2013).

Connecting learning administrations and materials to sensor-rich physical articles is the subsequent stage in the advancement of learning items and e-learning situations. As Specht (2009) states, the association among advanced and physical articles offers ascend to new seeks after future learning. The commitment of the Internet of Things to instruction is as per the following:

- Provide a specialized foundation for logical learning by including innovation (devices, gadgets, sensors, and so on.) to the regular habitat where learning happens. It improves the learning knowledge by synchronizing the foundation and learning substance of the learning exercises with the foundation and impression of the students. Contextualization is a significant advance in the personalization of the arrangement of learning administrations, that is, the Internet of Things rises as a customized innovation stage (Specht, 2009).

- In request to make the understudy plunge, the understudy does not associate with the outer learning condition, in certainty in the learning condition, the robot moves around the insightful physical portable learning object. The key part of effective learning is immediate criticism in these rich intelligent situations. In a constant domain, each activity of the robot software engineer and client can trigger immediate input and after that intelligent reasoning procedures. Vivid learning can enable you to make new information dependent on prior understudy learning (Specht, 2009).
- Increase understudy support by utilizing physical, not virtual things. This contribution assumes a significant job in the improvement of abilities in light of the fact that physical conduct gives immediate input to enable students to gain data and right mistakes [39] and the calculation positively affects thinking (Liu et al., 2013).

2.3. Social Media Form and Type

Social media often enables clients to make, offer, and offer information with others. Facebook, Twitter and YouTube and other social media locales and administrations enable individuals from various foundations to express their thoughts and contact with different clients whenever (Lenhart et al., 2010). There are different sorts of social media to look over, from media and media sharing devices, for example, YouTube and Flickr to social systems administration destinations, for example, Facebook, Ning and LinkedIn. Others incorporate social bookmarking devices, (for example, Delicious and CiteULike), collaborative information improvement devices, (for example, Wikipedia) just as blog, (for example, WordPress and Blogger) and microblogging, (for example, Twitter) and other imaginative work instrument.

Facebook is a mainstream social systems administration site that enables clients to share pictures and data, just as associate companions as companions. Its clients' protection is likewise given by considering the security issues and empowering a few adjustable settings to different security settings for its clients (Everson et al., 2013). Curiously, notwithstanding enabling clients to interface and socialize outside a social systems administration site, Facebook additionally offers different highlights, for example, email, notice sheets and texting that gives this data clients can without much of a stretch encourage joint effort and scattering of data (Junco, 2011). Other social

media locales, for example, MySpace and Friendster, share a similar objective of uniting individuals with comparable social administrations, however are not as prominent as Facebook, particularly among undergrads. Roblyer et al. (2010) found that students in advanced education establishments will in general use Facebook and other comparable advances more often than educators who lean toward conventional innovation to help learning to help instructing and learning. Truth be told, they found that students want to get to data and reference materials by means of Facebook and email to get their references and data by means of Facebook and email contrasted with customary up close and personal communication. Yu et al. (2010) inspected the effect of Facebook's social systems cooperation and presumed that the constructive effect on college students' undergrad training demonstrates the constructive effect of online social systems administration exercises, just as assistance individuals associate with friends together, among the companions of students to pick up acknowledgment and adjust to the new college culture and culture. Others, for example, Bowers-Campbell (2008) can expand students' self-adequacy and autonomy by expanding their correspondence with Facebook educators and advancing independence, empowering autonomous learning.

Another mainstream social media locales Wikiswikis is that these site pages help advance the common effect of the acclaimed accumulation, group and collaborative work in the task (West and Williamson, 2009). Wiki clients, through joint effort update enables instructors to work with students in this condition, the participation of Keyihuode update together in a typical situation (watch 2008 Lundin, I guarantee all students and educators to guarantee that each other has information). What's more, Wikiswikis directed by enabling students to web based meetings to generate new ideas to urge students to think basically through a web based conceptualizing (Wang et al., 2014).

Blog creation, then again, is a content based online instrument. Web journals enable clients to effectively make web substance intended to permit speedy and simple web content creation, consolidate normal interfaces with remarks and messages, and add moment connects to data sources (Du and Wagner, 2007). Well known blog devices as of now incorporate WordPress, Blogger and Tumblr. An exploratory investigation of understudy application blog stages found that input to other people and their very own

online journals can help assess different web journals and get criticism on their web journals).

Apparatuses, for example, YouTube, Metacafe, and Flickr are known for online video sharing and online video sharing. For instance, YouTube permits, for instance, clients to rate video cuts, decipher and forward thoughts, and take an interest in exchanges (Everson et al., 2013). The utilization of multimedia components, for example, learning and video has demonstrated to be successful for learning exercises (Zahn et al., 2010; Krauskopf et al., 2012). Students can grow abnormal state thinking abilities, for example, basic leadership and critical thinking and utilizing YouTube for correspondence and joint effort (Greenhow and Robelia 2009).

Most research on social media and instruction investigates the probability of utilizing a portion of the well known social media devices of decision in instruction and preparing, given the prevalence of these apparatuses in youthful ages (Greenhow and Robelia 2009; Roblyer et al., 2010; Everson et al., 2013). Then again, the writing survey uncovers endeavor to create other social media instruments that must be utilized in instruction and preparing. For instance, the Edmodo eOne model is Edmodo, which consolidates a portion of the highlights of Facebook and Twitter to empower educators and students to impart and work together among instructors and students. Other instructive apparatuses incorporate Piazza, a Q and A web administration intended to serve students and scholastics, and Diigo, a social bookmarking webpage that enables clients to bookmark and label site pages. Socrative, Quizizz and Kahoot! Train teachers to evaluate students, direct tests, and take part in self-appraisals through preparing. Screencast-O-Matic enables instructors to make short preparing recordings for students and after that spare or transfer them to YouTube. Be that as it may, these instruments are not viewed as social media applications, however are named instructive innovation. Existing exploration centers around the utilization of social media, so just devices, for example, Facebook, Twitter, YouTube and Wikiswikis are considered (Balakrishnan and Lay, 2015).

2.4. Learning Methods

The which means of learning style depicts how students impart, learn or respond to enhancements in a learning circumstance (Shaw and Marlow, 1999). Understanding Insight's help with a grouping of learning styles is valuable for the two educators and students. Educators can structure and re-try instructional activities to even more reasonably address assorted learning style social affairs to help students' learning tries. In any case, for this gathering, the understudy's learning style requires a through and through examination of sound learning theory and the model should be considered.

The composition segments learning hypotheses into four general classes: - Behaviorism, Cognition, Humanism and Constructivism (Hung, 2001; Thompson, 2012). Behaviorism acknowledges that students are aloof and respond just to environmental redesigns (Ertmer and Newby, 1993). Regardless, the nonappearance of this social learning speculation makes a teacher centered instructional structure development for teaching and learning works out. On the other hand, scholarly understanding theory emphasizes and engages the criticalness of propelling powerful learning and incorporates students during the time spent acquiring data (Thurlings, Vermeulen, Bastiaens, and Stijnen, 2013). Humanism has made mental acumen speculation by focusing on students to fortify teaching and learning, seeing the need to give students an enduring learning condition to help learning to supporter instructing and learning and to engage students to develop socially and fundamentally. Thinking limit (Khatib, Sarem and Hamidi, 2013). Constructivist speculation immovably advocates self-learning: - Direct students and give the instruments to discover, understand and deal with issues to discover, appreciate and comprehend game plans (Ertmer and Newby, 1993). Social constructivism, which is one piece of constructivist learning theory, is social constructivism that urges learning not to be inert but instead to share in social activities for effective learning and acknowledges that students can comprehend noteworthy learning. Look into social activities (Kim, 2001).

Social Learning Theory (SLT) has starting late gotten balance from the in all cases usage of social media and compact developments, which fight that it is best when students are allowed to watch and participate with various students. Opportunities to learn or check out little examination social affairs are seen as more critical than various

students and discernments (Bandura, 1971, 2002; Gong, Zhang and Li, 2014). With the unfathomable usage of social media and flexible advancement, this theory has ended up being common.

Myers-Briggs Type Indicator (MBTI), Kolb's Learning Style Inventory (LSI) and Feld-Silverman Learning Style Dimension are three essential sorts. In addition, extensively refered to learning models. MBTI gatherings learning styles as shown by the character of the understudy and proposes four estimations: - bearing (extraversion or inside), acknowledgment (acumen: convictions and ordinary or natural: in perspective on impressions and strange), fundamental administration Production (thinking: objective and real or feeling: passionate) and tempers towards the outside world (evaluation: orchestrating and control or perception: suddenness and adaptability) (Carlson, 1985; Montgomery and Groat, 1998). Kolb's LSI hypothesis proposes four orders: - contrasts (slant toward social affair based conceptualizing), assimilators, (for instance, dynamic thoughts or considerations), blend, (for instance, sensible practice and basic reasoning), and controllers (Addicts) are data based and intuitive (Kolb) and Kolb, 2005).

Felder-Silverman five-dimensional learning model, perceptual (- a sort of information (eg visual and sound external points of view or inside visual information, for instance, appraisals)), input - (outside information, (for instance, representations, works and sounds).), Organization - (information configuration), dealing with - ((dynamic or smart) and system for planning information, for instance, understanding - (planning results, i.e., getting progress).

The data taking care of method engages students to understand the subject material is noteworthy for students to appreciate the system for getting ready essential information to the understudy, and thusly is furthermore huge in light of the fact that the middle is to choose the students' learning styles. Looking back at the composition and learning the speculation model reveals three learning styles of affirmation: - premium, self-governance and joint effort (Sadler-Smith, 1997).

2.4.1. Participatory

Felder and Silverman (1988) to arrange students into two classifications: dynamic understudy and understudy reflection. Dynamic students want to test, demonstrate that they want to process the examination to get learning to approve their thoughts as an apparatus for testing and approval (Dunn and Carbo, 1981). By and large, the interest of students implies that the students are occupied with the exertion gave to vitality or scholarly exercises (Kuh, 2009). Along these lines, the understudy look for the member learning style to effectively learn and comprehend the topic of the material, appreciate learning and be in charge of their own learning. Students with this learning style are bound to perform well in a web based learning course, which expects them to be progressively dynamic to buckle down (Umrani-Khan and Iyer, 2009), face the ordinary homeroom activity. This strategy for learning proposes that through learning exercises or investment in dialogs, students will in general effectively reflect data handling. Students have participatory learning style to keep on demonstrating them obligation towards learning and being friendly.

MBTI will in general pick extraversion dependent on discourses of extraversion exchanges or the Committee's meeting to generate new ideas, particularly as the outward-situated life direction and questions that the LSI classification recommends in Kolb; MBTI might be bound to take part in class exercises, subsequently, there might be a more grounded propensity to take an interest in the study hall, debates proposing outgoing life direction and Kolb LSI class. For instance, students and scholastics can build students' support in class and interest (Junco et al.,, 2011) as a feature of a course of concentrate together on Twitter. Further investigation of the highlights of participatory learning style, further investigation and found that they draw on social organizing (Kim, 2001) and SLT (Bandura, 1971). Subsequently, Facebook and YouTube and other prominent stages give students a chance to take an interest in learning, so students will have the chance to take part internet collaborating with companions, paying little respect to geographic area. Thusly, these students might be progressively disposed to utilize social media to learn in light of the fact that they can rapidly get the important data and criticism from friends or teachers through this platform.

2.4.2. Independent

In contrast to dynamic students, intelligent students often want to work alone in individual assignments they can work alone. These students need time to get data to mirror their depression, for example, to further comprehend their very own appearance or perception (Felder and Silverman, 1988) and give data. It can show a hypothetical capacity for the general work of the students, and hence, the students' average (ie a significant element of osmosis) definitions and will in general propose arrangements, specifically, to tackle the issue. Intelligent students are not uninvolved, not need or absence of activity; unexpectedly, it is free, a positive method to accomplish self-learning and comprehension of the body through its endeavors and activities (Boyd and Fales, 1983). Intelligent students like to flourish in the space of individual learning, and the gathering of taking an interest students incline toward the learning condition.

So as to energize students 'intelligent reasoning aptitudes, employees may pose intelligent inquiries or complete intelligent exercises in the homeroom to empower students' intelligent reasoning abilities (Davis, 2000). Research has demonstrated that students who often tackle reflection issues attempt to take care of issues that support appearance over the long haul and attempt to comprehend the subject better (Lee and Chen, 2009). Because of different requirements in the advanced education condition, employees will most likely be unable to consistently include students in basic intuition exercises because of different limitations. This additionally applies to grades in online courses that don't include eye to eye correspondence without up close and personal meetings. In the two cases, social media can fill in as a stage for students and staff to take part in such scholarly exercises (Saito and Miwa, 2007).

Or maybe, it is seen by students who utilize versatile innovation to access learning materials, anyplace and whenever, anyplace and whenever. In such a situation, students are free and self-coordinated to get assets (Hsieh et al., 2011). In this manner, students with autonomous learning styles can think about learning characteristics that can be a valuable preferred position in an omnipresent learning condition. These students need openings, autonomous investigations, self-study, or unique activities as indicated by their interests (in-Han and Iyer, 2009). Subsequently, these students might

be great at utilizing portable innovation and social media to design their learning and utilize social media to flawlessly learn and design their learning plans.

Autonomous students are often observed internal and mirror the constructivist worldview that best situates itself, advocates intelligent and test learning and learns through involvement and reflection (Montgomery and Groat, 1998). Interlaced autonomous students can utilize different types of social media for learning, particularly those that help the protection of their secrecy. For instance, Yammer is a devoted corporate social media site that enables educators and students to cooperate, team up, and sort out ventures in a Facebook-like way, yet without the need to design protection settings. Moreover, loners want to be affected by online correspondence instead of up close and personal outgoing people with new companions and can be scary and exasperating as opposed to outgoing (Orchard and Fullwood, 2010). Indeed, it has been discovered that they lean toward nonconcurrent types of correspondence, for example, online journals and posts, as opposed to synchronous types of correspondence, for example, talk (Ryan and Xenos, 2011). For this situation, contemplative students favor social media devices, for example, WordPress and Blogger, which are increasingly appealing to withdrawn students.

2.4.3. Collaborative

Panitz (1996) characterizes cooperation as coordinated effort and collaboration between people who structure groups and work together to accomplish shared objectives. Joint effort between students is believed to be successful in managing mind boggling and complex assignments (Jonassen, 1994). Various examinations have demonstrated that the key job of agreeable learning assumes a significant job in the improvement of basic reasoning aptitudes, social abilities advancement, aggressiveness advancement and maintenance of information in advanced education students (Yang and Chang, 2011). Along these lines, students who love collaborative exercises and testing errands can be grouped to reflect contrasts and learning qualities of agents (Kolb and Kolb, 2005). In this manner, students are empowered and supported in planning instructional teaching method, and gathering discourses and ventures, field trips, open

inquiries or gathering reports can energize and support students with a collaborative style.

Age Y and Z students are run of the mill of nature with different social media destinations or existing web innovations and are great at performing various tasks (Dede, 2005). Utilizing these apparatuses, they can share thoughts and get immediate and immediate input from companions and teachers in online group settings. Destinations like Google Drive offer numerous collaborative chances and are wealthy in locales like Google Drive, which is an extra favorable position of facilitating multimedia content on social media destinations like Facebook, Google+ or Yammer, for example, video websites. It can urge collaborative students to get more extravagant media through video sites (Wankel, 2009). In such a collaborative field of study, students can learn by taking a gander at the commitments of different students in the collaborative field of study and mirroring their very own commitments (Miyazoe and Anderson, 2010). Top (2012) found that educators upheld respectably the utilization of online journals for learning and demonstrated a positive familiarity with the usage of web journals in the study hall, since they built up a feeling of network in the homeroom and supported joint effort among students. Social media is additionally viewed as basic in empowering students' imagination, regardless of whether eye to eye collaborative endeavors or online joint efforts (Gaggioli et al., 2013).

Subsequently, students who like to cooperate can be viewed as outgoing. Prominent social media destinations, for example, Facebook, Twitter and YouTube bolster this coordinated effort, empowering students to talk about and share their thoughts and thoughts. On well-known social media locales like Facebook, Twitter and YouTube, you can support joins with companions and effectively take an interest in dialogs and trade of thoughts and thoughts. These instruments require students not exclusively to sign in, yet additionally to distinguish students who post messages or remarks or transfer recordings. A few people guarantee that obscurity isn't an outward worry that creates in a functioning social condition. In this way, well known social media sites can be utilized adequately to advance collaborative learning.

3. MATERIALS AND METHODS

3.1. Research Model

This study aims to study the effects of technology on the use of social media for collaborative learning among university students. The main purpose of this study is to understand the perceptions of university students about the effect of Internet technologies on collaborative learning about social technologies.

The dependent variable is the various dimensions and their corresponding items such as; social benefits of using IoT (SB), psychological benefits of using IoT (PB), academic benefits of using IoT (AB)and general perception towards IoT (GP). The independent variable includes gender, age, faculty, academic educational level and occupation (Figure 3.1).

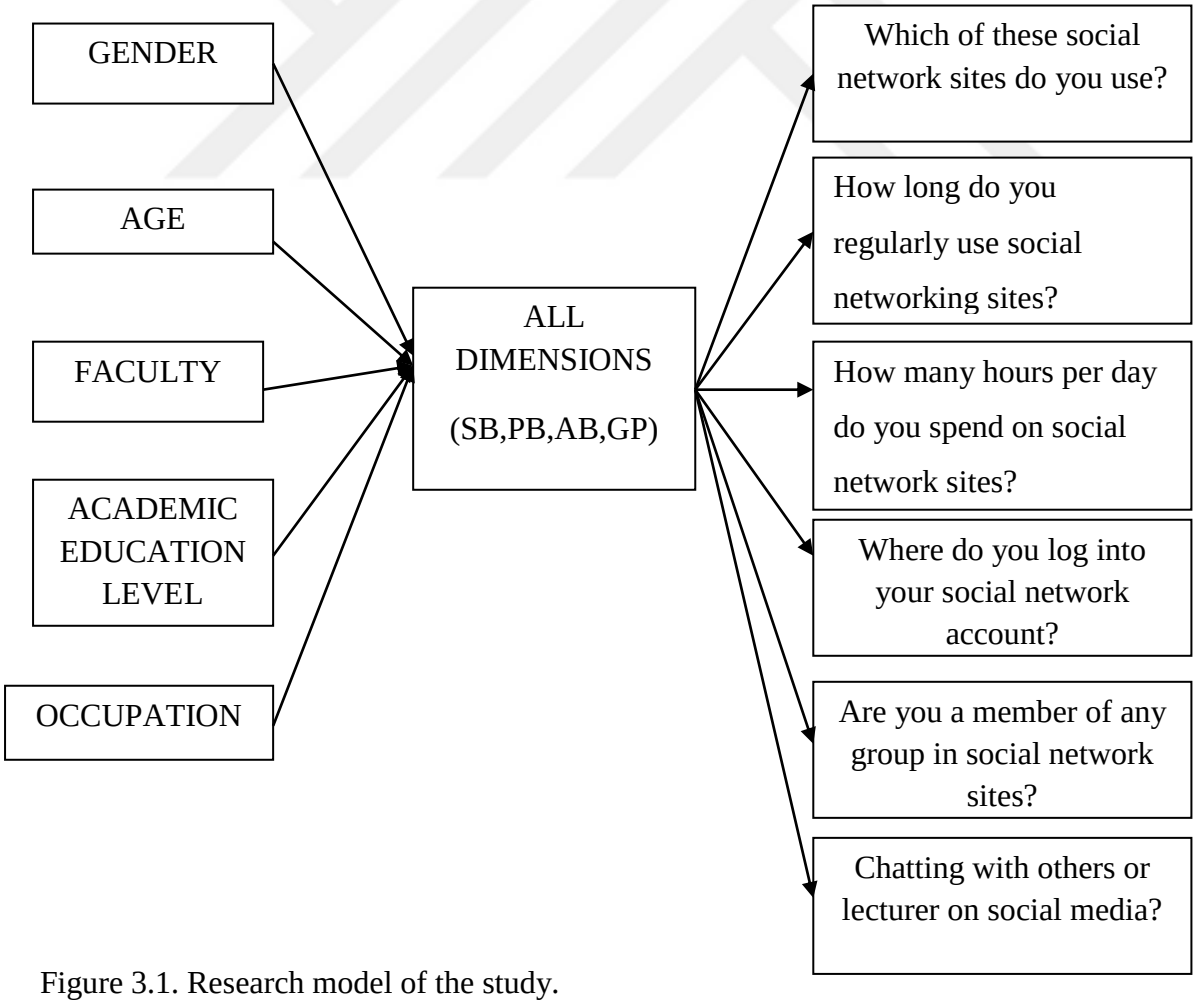

Figure 3.1. Research model of the study.

3.2. Participated Students

A total of 200 faculty members and students accepted the questionnaire and answered the questions correctly. 55.0% of respondents were men and 45.0% were women. 62.5% of participants were in the 18-25 age group, 16.5% in the 26-30 age group, and 21.0% in the 31+ age group. 40.0% of participants came from the Faculty of Science, 32.5% from the Faculty of Engineering and 27.5% from the Faculty of Medicine. 62.5% had a bachelor's degree, 23.5% had a master's degree and 14% had a PhD. Academic staff represent 20.5% of participants and students, 79.5% (Table 3.1).

Table 3.1. Demographic data of participants (N= 200)

Characteristics	**Frequency**	**%**
Gender		
Male	110	55.0
Female	90	45.0
Age		
18-25	125	62.5
26-30	33	16.5
31+	42	21.0
Faculty		
Science	80	40.0
Engineering	65	32.5
Medicine	55	27.5
Academic Educational Level		
Undergraduate	125	62.5
Master	47	23.5
PhD	28	14.0
Occupation		
Academic Staff	41	20.5
Students	159	79.5

The following table show the series of questions asked from students and academic staff to gather data and show the effect of Internet of Things in creating social systems which support collaborative learning, to state positive role of IoT in making variety understanding among understudies and academic staff, to illustrate the influence of IoT in creating a positive air for displaying and rehearsing collaboration

. Items : SOCIAL BENEFITS
1. IoT creates social support systems for learning.
2. IoT creates diversity understanding among students and staff.
3. IoT creates a positive atmosphere for modeling and practicing cooperation.
4. IoT creates better learning communities.

The following table illustrates three different questions asked from students and academic staff to gather data and depict the influence of Internet of Things with social network sites for collaborative learning in increasing students' self-esteem, to reduce anxiety, to make positive feeling towards academic staff members.

Items : PSYCHOLOGICAL BENEFITS
1. IoT increases students’ self esteem.
2. IoT reduces anxiety.
3. IoT creates positive attitudes towards teachers.

The questions in the table below show the academic benefits of deploying the Internet of Things in social network sites for collaborative learning, more specifically the result of this group of questions will examine the role of IoT technology in improving critical-thinking abilities. Besides, it will be investigated how the IoT innovation help in progress of study hall results. Furthermore, this group questions show how this new technology empowers personalization of collaborative learning. Finally, the beneficial of IoT in improving the learning experience for university students and academic staff will be examined.

Items : ACADEMIC BENEFITS
1. IoT technology improves critical-thinking skills.
2. IoT technology creates active participation in the learning process.
3. IoT technology aid in improvement of classroom results.

Items : ACADEMIC BENEFITS (continue)…
4. IoT technology aid appropriate problem-solving techniques.
5. IoT technology enables personalization of learning lectures.
6. IoT technology increases students' motivation.
7. IoT technology connectivity can improve my learning skills.
8. IoT technology can improve the learning experience for me and my colleagues.

The questions in the table below illustrate the general perception of influencing the Internet of Things in social network sites for collaborative learning, more specifically the answers from the participants in this study will analyze the utilize of social network for instructive purposes facilities discourse with peers. In addition to that the fun of using IoT based applications will be stated. Another more important question will be answered to investigate the prefer of connecting the mobile devices to new collaborative learning services especially in social network sites. At last, this questions will examine to know whether there is a negative results and interruptions of using IoT technology for collaborative learning in social network sites.

Items : GENERAL PERCEPTION
1. IoT encourages me to use the latest technology.
2. I prefer enrolling in a campus with IoT technology.
3. Using the social media for educational purposes facilitates dialog with peers.
4. I believe we are not yet ready for using IoT now.
5. IoT based applications would be more fun to use.
6. I would not use IoT because of privacy concerns.
7. I prefer my mobile be connected to new learning services on campus.
8. I prefer to have the lecture attendance automatically recorded.
9. I believe IoT can help me to learn more technologies.
10.IoT can have a negative consequence and distractions

3.3. Data Analysis

To analysis the data and test the study's hypotheses in the beginning, Cronbach's alpha used to examine the survey's components reliability, then statistical descriptive used quantitative illustrate the significant feature of the variables by standard deviation, and means.

The questionnaire was used to collect data and was analyzed and interpreted using the Statistical Package for Social Sciences (SPSS). Descriptive statistics including frequency were used to better understand all elements of the research work. Second, an Mann-Whitney U test between Gender in question 1 and each of the SB, PB, AB and GP, and between Occupation in question 5 and each of the SB, PB, AB and GP. Third, Kruskal Wallis Test is used between Faculty in question3 and each of the SB, PB, AB and GP, and also Kruskal Wallis Test is used between Academic Education Level in question4 and each of the SB, PB, AB and GP, and Kruskal Wallis Test between age in question2. Kruskal Wallis Test is used between Section2/Q2 and Section2/Q3 and each of the SB, PB, AB and GP and each of the SB, PB, AB and GP of the research.

3.3.1. Independent T Test

It is a parametric test which discloses to you how critical the contrasts between bunches are; with different words, it informs you as to whether those distinctions (estimated in implies/midpoints) could have occurred by some coincidence. It is called T-tests, in light of the fact that the test outcomes are altogether founded on t-values.

In this study, the autonomous t-test, additionally called the two-sample-t-test is an inferential factual test was used to decide if there is a measurably noteworthy distinction between the means in two random gatherings.

T-values are a case of test measurements. A test measurement is an institutionalized value that is determined from a sample of data during a speculation test. The technique that computes the test measurement analyzes your information to what is normal under H0 (Null Hypothesis).

To play out a t-test computation we require three key information esteems.

- The Distinction between the mean qualities from every datum set (called the mean contrast),

- The standard deviation of each gathering
- The used data-values in each group

For H0(Null Hypothesis) for the mentioned test above, if there is no relationship between groups and means of them are the same.

H0: u1 = u2H_A: $u_1 \neq u_2$ ---- (1)

Much of the time, we are trying to check whether we can state that we can dismiss the H0 hypothesis and acknowledge the HA(Alternative-Hypothesis) , which is that the populace means are not the same:

HA: u1 ≠ u2 ---- (2)

We need autonomous variable which has two groups and another variable which is continuous dependent.

3.3.2. One Way Anova

Investigation of fluctuation (ANOVA) is described as a measurable procedure respect with the comparison of means for many samples. It tends to be thought of as an augmentation of the t-test for two independent-samples to multiple groups. The reason is to examine the significant differences between means, this is tested by investigation the variances.

The ANOVA trial of the speculation depends on a correlation of two autonomous appraisals of the populace change

When playing out an ANOVA system the accompanying suppositions are required:

- The surveillances are autonomous of each other.
- The normal distribution comes from observations in each group.
- Each group has the same population variances.

ANOVA is the most normally cited propelled look into technique in the expert business and monetary writing. This method is extremely valuable in uncovering significant data especially in deciphering test results and in deciding the impact of certain elements on other handling parameters.

In this study, the reason for a single direction ANOVA test is used to decide the presence of a statistically normality among the means of several groups. The test really utilizes fluctuations to help decide whether the means are equivalent or not. So as to

play out a single direction ANOVA test, there are five essential suspicions to be satisfied:

Every populace from which an test-sample is taken is thought to be typical.

The selection of all samples are independent and randomly.

The populaces are accepted to have equivalent standard deviations (or differences).

In one-way Annona test, in case of dividing the data into more than one group depending on one factor.

The factor is a clear cut variable.

The reaction is a numerical variable.

The Null speculation is basically that all the means of all groups in the sample test are the same. The elective theory is that in any event one sets of means is unique. For instance, if there are m gatherings:

H0: $\mu 1 = \mu 2 = \mu 3 = \ldots = \mu m$ ---- (3)

Ha: In any event two of the gathering implies $\mu 1, \mu 2, \mu 3, \ldots, \mu m$ are not the same.

3.3.3. The Mann-Whitney U Test

In this study, the Mann-Whitney U test is used to find the results as it is a non-parametric test. The function of it, is to test H0 hypothesis that two test-samples are from the same item (i.e. the median of them are same) or, otherwise, surveillances in one test-sample have a tendency to be greater than surveillances in another. In spite of that this is a non-parametric test, it does suppose that the shape of two distributions are same.

Assume we have a test-sample of nx surveillances $\{X_1, X_2, \ldots X_n\}$within one-group and a test-sample of N_y surveillances $\{y_1, y_2 \ldots y_n\}$ within another group.

The Mann-Whitney test depends on an examination of each perception xi in the principal test with each perception y_j in different sample. The all out number of pairwise-examinations is $n_x n_y$.

In case the median of the samples are same, the chance of each xi is equal, for instance, the probability is 0.5, for being smaller or larger than every y_j.

H0: $P (x_i > y_i)=0.5$ ---- (4)

H1: $P (x_i > y_i) \neq 0.5$ ---- (5)

We check the occasions a xi from test 1 is more prominent than a yj from test 2. This result is meant by Ux. Correspondingly, the occasions a xi from test 1 is not greater than or equal to a yj from test 2 is indicated by Uy. From the H0 speculation we would suppose Ux and Uy to be around equivalent.

Procedure for doing the test:

1. Orchestrate each of the perceptions arranged by extent.
2. For every perception, record X or Y to demonstrate which test they are belong to.
3. For every x, record the quantity of ys which are to one side of it; this demonstrates $x_i > y_j$. For every y record, the quantity of xs which are to one side of it; this demonstrates $y > x_i$

Include the all-out number of times xi > yj - mean by Ux. Include the all-out number of times yj > xi - mean by Uy.

4.Watch that $Ux + Uy = n_x n_y$.

5. Ascertain U = min(Ux, Uy)

6. Utilize factual tables for the Mann-Whitney U test to discover the likelihood of watching an estimation of U or lower. In the event that the test is uneven, it is a significant value; in case it is a two-sided-test, twofold this probability to acquire the significant value.

3.3.4. Kruskal-Wallis test

The Kruskal-Wallis test (KWT) is considered as a nonparametric (dissemination-free) test. It is also utilized when the suspicions of single direction ANOVA are not met. The single direction ANOVA and the Kruskal-Wallis test survey for critical contrasts on a ceaseless ward variable by a clear cut autonomous variable (with at least two gatherings). In the ANOVA, we accept that the needy variable is ordinarily appropriated and there is roughly equivalent fluctuation on the scores crosswise over gatherings. Be that as it may, when utilizing the Kruskal-Wallis Test, we don't need to make any of these suppositions. Along these lines, the Kruskal-Wallis test can be utilized for both nonstop and ordinal-level ward factors. In any case, as most non-parametric tests, the Kruskal-Wallis Test isn't as incredible as the ANOVA.

The KWT test is a nonparametric test that examine the comparison of at least three unrivaled groups. For playing out this test, Crystal first positions every one of the

qualities from low to high, giving no consideration to which bunch each worth has a place. The most modest number gets a position of 1.

The biggest number gets a position of N, where N is the all out number of qualities in every one of the gatherings. The disparities among the rank totals are joined to make a solitary worth called the Kruskal-Wallis measurement (a few books allude to this incentive as H).

The following question is answered by P-value :

On the off chance that the gatherings are inspected from populaces with indistinguishable conveyances, what is the opportunity that irregular examining would bring about a total of positions as far separated (or all the more so) as saw in this analysis?

In this study, the Kruskal-Wallis test is utilized to decide if the medians of at least two gatherings contrast when you have not symmetric data, for example, slanted data.

The Kruskal-Wallis test is a nonparametric option in contrast to a single direction ANOVA. The normality of data in the test is not required, but for the investigation, the rank of data can be used instead of the real values.

H0: The means of all items are equal for one group

H1: The means of all items are not equal for one group

4. RESULTS AND DISSCUSSION

4.1. Data Collection

This study was quantified in kind using a questionnaire prepared from Odeh et al. (2015) and Tashkent and El-Jabri (2015) study. Participants answered to items on 5 Likert Scale from "Strongly Agree" (5 points), “Agree” (4 points), ”Neutral” (3 points), “Disagree” (2 points) and “Strongly Disagree" (1 point). They responded to the items related to the scale. points). The selected items have been revised based on their comments and suggestions. The reliability of the questionnaire was calculated at 0.801 for 2550 points using Cronbach's alpha. Based on the reliability results in Table 4.1, it is indicated that Alpha is listed from 0.720 (AB) for each dimension of the scale in order to influence the effects of technology affecting the use of social media. Cronbach's Alpha on the use of social media for each dimension of the scale. by students on collaborative learning. According to this result, it was decided that the scale could be used because the reliability measures gave acceptable results. As a result of this study, the total items (scales) and reliability coefficients for all groups were greater than 0.8; our findings therefore indicate that the scales were reliable (Sipahi et al., 2010).

Table 4.1. Reliability test for subscales of the questionnaire

Dimensions	Cronbach’s Alpha Reliability
SB	0.672
PB	0.620
AB	0.720
GP	0.620
Total	0.801

To understand the perceptions of the influence of the technology of the Internet of Things on the use of social media by university students on collaborative learning in SB, PB, AB and GP factors. As shown in Table 4.2, statistically significant difference ($p< 0.05$) existed in this study. SB, PB, AB, and GP are not normaly distributed because the p-value from Kolmogorov-Smirnov for SB, PB, AB, and GP are less than the alpha=0.05.

Table 4.2. shows the significat value for SB, PB, AB and GP

	Kolmogorov-Smirnov		
	Statistic	Df	Sig.
SB	0.154	200	0.001
PB	0.112	200	0.001
AB	0.089	200	0.001
GP	0.069	200	0.022

The following table illustrates the mean and standard deviation in each items for all dimensions which comprises of items in Social Benefits, Psychological Benefits, Academic Benefit, and General Perception groups.

Table 4.3. Mean and Standard Deviation in each items for all dimensions

Items	**Mean**	**Std. Deviation**
1. IoT creates social support systems for learning.	4.1850	.78348
2. IoT creates diversity understanding among students and staff.	3.8850	.83982
3. IoT creates a positive atmosphere for modeling and practicing cooperation.	3.7350	.97958
4. IoT creates better learning communities.	3.9450	.96260
SOCIAL BENEFITS	**3.9375**	**.63540**
1. IoT increases students' self esteem.	3.6850	.98009
2. IoT reduces anxiety.	3.3950	1.21505
3. IoT creates positive attitudes towards teachers.	3.6500	1.01620
PSYCHOLOGICAL BENEFITS	**3.5767**	**.80736**
1. IoT technology improves critical-thinking skills.	4.0200	87374.
2. IoT technology creates active participation in the learning process.	4.0550	86354.
3. IoT technology aid in improvement of classroom results.	3.7050	1.06000
4. IoT technology aid appropriate problem-solving techniques.	3.8200	.96554
5. IoT technology enables personalization of learning lectures.	3.9650	.84697
6. IoT technology increases students' motivation.	3.8550	1.02431
7. IoT technology connectivity can improve my learning skills.	4.0650	.77055

Table 4.3. Mean and Standard Deviation in each items (continue)

8. IoT technology can improve the learning experience for me and my colleagues.	3.9500	.92291
ACADEMIC BENEFITS	**3.9294**	**.53204**
1. IoT encourages me to use the latest technology.	4.3450	.84828
2. I prefer enrolling in a campus with IoT technology.	3.8150	1.04221
3. Using the social media for educational purposes facilitates dialog with peers.	3.9350	.84519
4. I believe we are not yet ready for using IoT now.	3.0700	1.26614
5. IoT based applications would be more fun to use.	3.9200	.91531
6. I would not use IoT because of privacy concerns.	3.1550	1.25253
7. I prefer my mobile be connected to new learning services on campus.	3.8100	1.06280
8. I prefer to have the lecture attendance automatically recorded.	3.7000	1.19041
9. I believe IoT can help me to learn more technologies.	4.0850	.78156
10.IoT can have a negative consequence and distractions	3.3500	1.21030
GENERAL PERCEPTION	**3.7185**	**.48744**

In SB, Question1 had the highest mean value (M = 4.1850, SD = 0.78348) and the lowest average value was observed in the Question3 (M = 3.7350, SD = 0.97958). In PB, Question1 had the highest mean value (M = 3.6850, SD = 0.98009) and the lowest average value was observed in the Question2 (M = 3.3950, SD = 1.21505). In AB, Question7 had the highest mean value (M = 4.0650, SD = 0.77055) and the lowest average value was observed in the Question3 (M = 3.7050, SD = 0.06000). In GP, Question1 had the highest mean value (M = 4.3450, SD = 0.84828) and the lowest average value was observed in the Question3 (M = 3.0700, SD = 1.26614).

According to table 4.3 mean of Social Benefits group dimension is (3.9375) and Std. Deviation is (.63540) it is bigger than the average of other groups' dimension and the next is Academic Benefits group (mean = 3.9294 and Std. Deviation= .53204) after that General Benefits (mean = 3.7185 and Std. Deviation= .48744), then the final one is Psychological Benefits (mean = 3.5767 and Std. Deviation= .80736).

As indicated by the standard deviation in table 4.2, the high attention and concentration of the studied factories can be seen on General Perceptions items in contrast with other groups' items rehearses in this way, its dimensions can be masterminded like the following:

General Perceptions, Academic Benefits, Social Benefits, Psychological Benefits

The results indicate that all academic staff and students in all faculties have a good idea of the use of IoT on the use of social media on collaborative learning.

4.2. The Perceptions of Students on IoT and Collaborative Learning in Social Network Sites With Respect to Section1 Items

4.2.1. Gender

In table 4.4 a Mann-Whitney U Test showed that there was no statistically difference in SB, PB, AB and GP with Male and Female of using social network because p-values for all of them are higher than the significant level (α)= 0.05, with a mean rank SB score of 0.36 for Male and Female, and with a mean rank PB score of 0.52 for Male and Female, and with a mean rank AB score of 0.19 for Male and Female, and with a mean rank GP score of 0.53 for Male and Female.

Table 4.4. Mann-Whitney U Test between gender and each of the SB, PB, AB and GP

Gender		N	Mean Rank	Sum of Ranks	Mann-Whitney U	P-Value
SB	Male	110	103.81	11419.50	4585.5	0.36
	Female	90	96.45	8680.50		
	Total	200				
PB	Male	110	102.87	11315.50	4689.5	0.52
	Female	90	97.61	8784.50		
	Total	200				
AB	Male	110	105.39	11592.50	4412.5	0.19
	Female	90	94.53	8507.50		
	Total	200				
GP	Male	110	102.82	11310.50	4694.5	0.53
	Female	90	97.66	8789.50		
	Total	200				

From the result, it was observed as shown Figure 4.1 below, that only 55% of the participants were male who accepted and filled in the questionnaire questions from a population pull of 200 academic staff and students whom participated in the survey, 45% of the participated students and academic staff were Female. The number of academic staff members at the University of Duhok who are male is significantly higher than female. Therefore, it is obvious that the perception of male is higher than the perception of female.

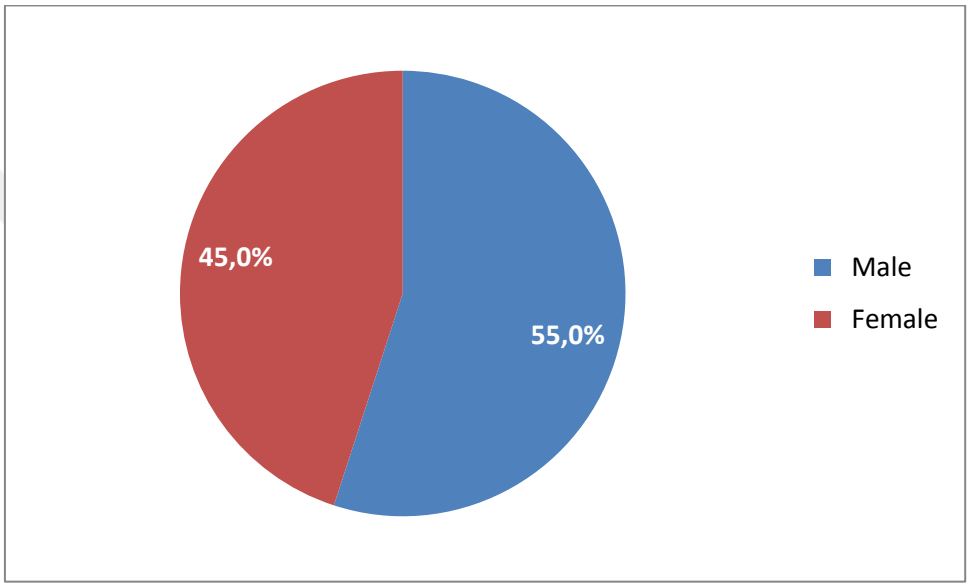

Figure 4.1. Percentages of participants from male and female.

4.2.2. Age

In order to understand the perceptions of the influence of the technology of the Internet of Things on the use of social media by university students on collaborative learning in the SB, PB, AB and GP domains with respect to age group, a Kruskal Wallis Test was used. Table 4.5, in this study, there was no statistically difference with SB, PB, AB and GP for age group from 18-25, 26-30, and 31+ on social network because p-values for both of them are higher than the significant level (α)= 0.05, with a mean rank SB score of 0.45 for age group between 18-25, 26-30, and 31+ and with a mean rank PB score of 0.28 for age group between 18-25, 26-30, and 31+, and with a mean rank AB score of 0.29 for age group between 18-25, 26-30, and 31+, and with a mean rank GP score of 0.35 for age group between 18-25, 26-30, and 31+.

Table 4.5. Kruskal Wallis Test between age group and each of the SB, PB, AB and GP

Age		N	Mean Rank	Chi-Square Value	P-Value
SB	18-25	125	102.69	1.61	0.45
	26-30	33	104.74		
	31+	42	90.65		
	Total	200			
PB	18-25	125	96.77	2.53	0.28
	26-30	33	114.62		
	31+	42	100.51		
	Total	200			
AB	18-25	125	104.48	2.49	0.29
	26-30	33	101.03		
	31+	42	88.25		
	Total	200			
GP	18-25	125	104.23	2.09	0.35
	26-30	33	100.58		
	31+	42	89.33		
	Total	200			

From the result, it was observed as shown Figure 4.2 below, only 62.5% of the participants were from 18-25 years old, 21% of the participants were starts from 31 years old, 16.5.% of the participants were from 26-30 years old who accepted and filled in the questionnaire questions from a population pull of 200 academic staff and students whom participated in the survey. The perception of younger students and academic staff was significantly higher than other two age groups because the knowledge of the younger people who use a new technology is much better than other groups of age. In addition to that the participants who are from 18-25 are students or the new graduated students from the university. For that, they need to utilize the new technology especially IoT in the field of collaborative learning among students and teachers to communicate with each other more easily which is a great way of saving time and money. Participants who are from 31 years old and above are more likely to be academic staff and have the desire to involve the using of IoT in social media for the purpose of collaborative learning as their new way of improving the level of knowledge and education level of students. The least perception of participants are from 26-30 years old.

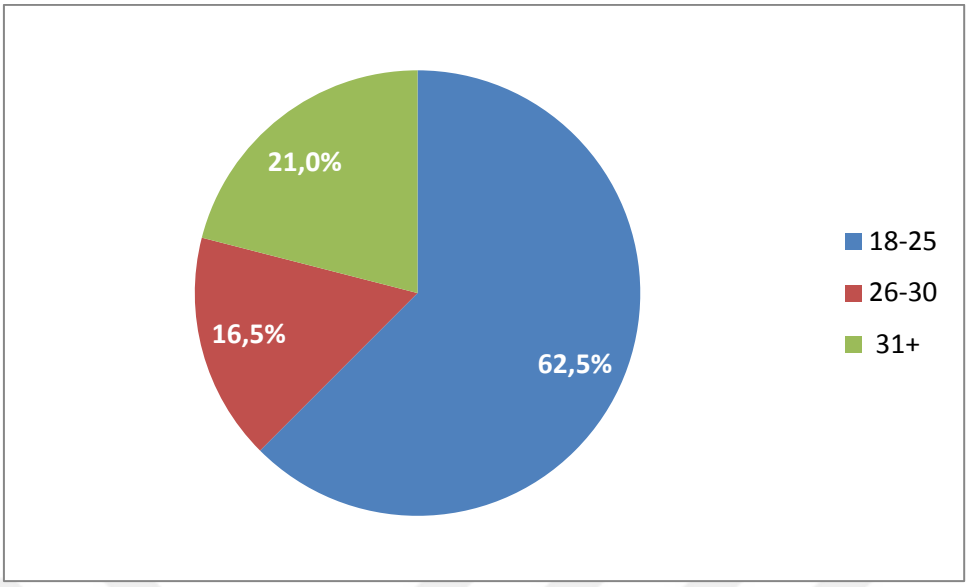

Figure 4.2. Percentages of participants from ages

4.2.3. Faculty

In order to understand the perceptions of the influence of the technology of the Internet of Things on the use of social media by Science Faculty, Engineering Faculty and Medicine Faculty on collaborative learning in the SB, PB, AB and GP domains with respect to levels academic training, a Kruskal Wallis One Way Anova for non-parametric test was used. Table 4.6, in this study, there was no statistically difference between SB, PB, AB and GP and Science Faculty, Engineering Faculty and Medicine Faculty on social network because p-values for both of them are higher than the significant level (α)= 0.05, with a mean rank SB score of 0.88 for and Science Faculty, Engineering Faculty and Medicine Faculty and with a mean rank PB score of 0.29 for Undergraduate, Master and PhD, and with a mean rank AB score of 0.12 for Science Faculty, Engineering Faculty and Medicine Faculty, and with a mean rank GP score of 0.08 for Science Faculty, Engineering Faculty and Medicine Faculty.

Table 4.6. Kruskal Wallis Test between Faculty and each of the SB, PB, AB and GP

	Faculty	N	Mean Rank	Chi-Square Value	P-Value
SB	Science Faculty	80	98.21	0.25	0.88
	Engineering Faculty	65	101.08		
	Medicine Faculty	55	103.14		
	Total	200			
PB	Science Faculty	80	107.08	2.41	0.29
	Engineering Faculty	65	92.20		
	Medicine Faculty	55	100.74		
	Total	200			
AB	Science Faculty	80	104.29	4.17	0.12
	Engineering Faculty	65	88.78		
	Medicine Faculty	55	108.83		
	Total	200			
GP	Science Faculty	80	89.51	4.91	0.08
	Engineering Faculty	65	106.38		
	Medicine Faculty	55	109.54		
	Total	200			

From the result, it was observed as shown Figure 4.3 below, that only 40% of the participants were from the college of science, 32.5% of the participated students and academic staff were from the college of engineering, 27.5% of the participated students and academic staff were from the college of medicine. The proportion of participants from the college of science fairly higher than other colleges as they are more engaged in using the technology in the process of study.

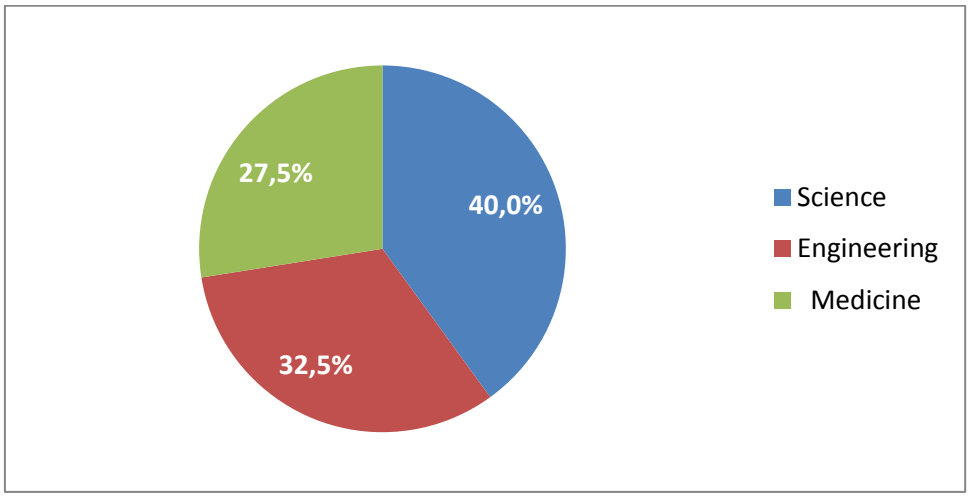

Figure 4.3. Percentages of participants from faculties.

4.2.4. Academic Education Level

In order to understand the perceptions of the influence of the technology of the Internet of Things on the use of social media by university students, Master and PhD on collaborative learning in the SB, PB, AB and GP domains with respect to levels academic training, a Kruskal Wallis Test was used. Table 4.7, in this study, there was no statistically difference between SB, PB, AB and GP and Undergraduate, Master and PhD on social network because p-values for both of them are higher than the significant level (α)= 0.05, with a mean rank SB score of 0.55 for and Undergraduate, Master and PhD and with a mean rank PB score of 0.07 for Undergraduate, Master and PhD, and with a mean rank AB score of 0.45 for Undergraduate, Master and PhD, and with a mean rank GP score of 0.47 for Undergraduate, Master and PhD.

Table 4.7. Kruskal Wallis Test between Academic Education Level and each of the SB, PB, AB and GP

Academic Education Level		N	Mean Rank	Chi-Square Value	P-Value
SB	Undergraduate	125	102.69	1.21	0.55
	Master	47	92.52		
	PhD	28	104.13		
	Total	200			
PB	Undergraduate	125	96.77	5.41	0.07
	Master	47	116.95		
	PhD	28	89.55		
	Total	200			
AB	Undergraduate	125	104.48	1.62	0.45
	Master	47	94.81		
	PhD	28	92.30		
	Total	200			
GP	Undergraduate	125	104.23	1.49	0.47
	Master	47	95.89		
	PhD	28	91.57		
	Total	200			

From the result, it was observed as shown Figure 4.4 below, that only 62.5% of the participants were undergraduate, 23.5% of the participants had a master degree, 14% of the participants had a PhD degree. This research is more concern with undergraduate students. For that the collected data from undergraduate students is higher than other participants following the proportion of those who have master degree and PhD degree respectively.

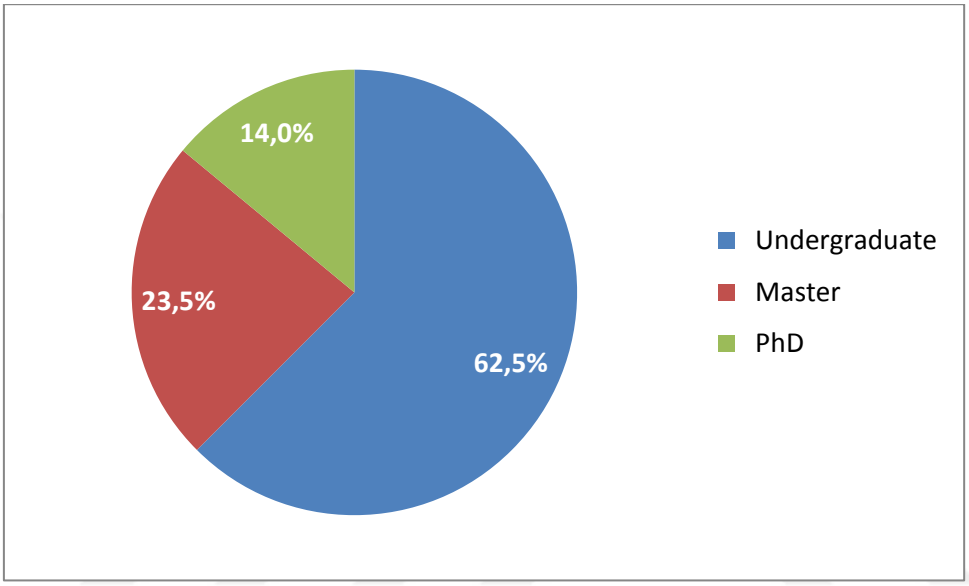

Figure 4.4. Percentages of participants from academic education level.

4.2.5. Occupation

To understand the perceptions of the influence of IoT technology on the use of social media by university students and academic staff on collaborative learning by SB, PB, AB and GP for occupations Mann-Whitney U tests were used. According to Table 4.8, regarding student perceptions of IoT and collaborative learning on social networks regarding occupation, statistically significant difference existed in GP dimension and not significant difference existed in all other dimensions.

In table 4.8 a Mann-Whitney U Test showed that there was a statistically difference in GP between Academic staff and Students of using social network, $\chi 2(5) = 14.02$, $p = 0.029$, because p-value is less than the significant level (α)= 0.05, with a mean rank GP score of 82.90 for Academic Staff, 105.04 for students.

There was no statistically difference in SB, PB and AB with Academic staff and students of using social network because p-values for all of them are higher than the significant level (α)= 0.05.

Table 4.8. Mann-Whitney U Test between occupation and each of the SB, PB, AB and GP

	Occupation	N	Mean Rank	Mann-Whitney U	P-Value
SB	Academic Staff	41	93.22	2961	0.361
	Students	159	102.38		
	Total	200			
PB	Academic Staff	41	105.51	3054	0.530
	Students	159	99.21		
	Total	200			
AB	Academic Staff	41	99.66	3225	0.917
	Students	159	100.72		
	Total	200			
GP	Academic Staff	41	82.90	2538	0.029
	Students	159	105.04		
	Total	200			

From the result, it was observed as shown Figure 4.5 below, that only 79.5% of the participants were students, 20.5% of the participants were academic staff. It is obvious that the students dedicate their time for learning particularly for collaborative learning. Unlike students the academic staff don't use social media for collaborative learning more commonly because they have less time for participating in such activities.

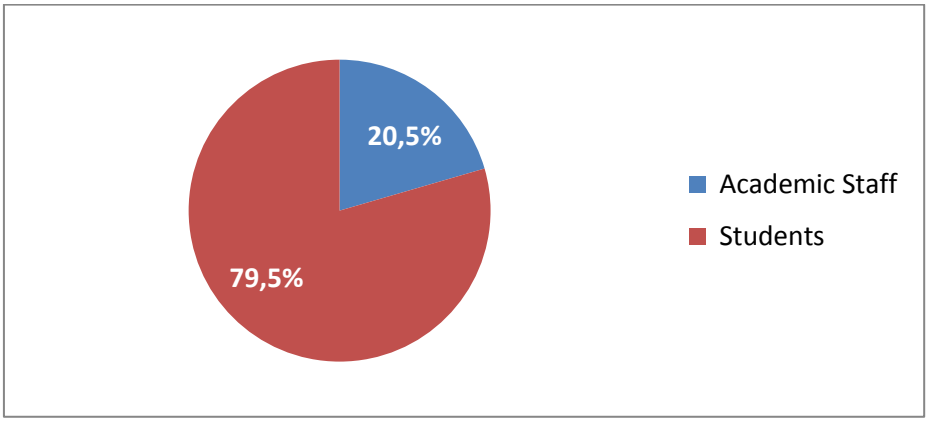

Figure 4.5. Percentages of participants from occupation.

4.3. The Perceptions of Students on IoT and Collaborative Learning in Social Network Sites With Respect to Section2 Items

4.3.1. Social network site usage

In table 4.9 a Mann-Whitney U Test showed that there was a statistically difference in PB between using and not using Facebook, $\chi 2(5) = 14.02, p = 0.03$, because p-value is less than the significant level (α) = 0.05, with a mean rank PB score of 75.87 for Academic Staff and students who don't use Facebook, 103.70 for students and academic staff who use Facebook as a social network for collaborative learning,

There was no statistically difference in SB and GP with Academic staff and students of using and not using Facebook as a social network because p-values for all of them are higher than the significant level (α)= 0.05.

Table 4.9. Mann-Whitney U Test between Facebook response and each of the SB, PB, AB and GP

Facebook		N	Mean Rank	Mann-Whitney U	P-Value
SB	No	23	97.00		
	Yes	177	100.95	1955.00	0.76
	Total	200			
PB	No	23	75.87		
	Yes	177	103.70	1469.00	0.03
	Total	200			
AB	No	23	103.78		
	Yes	177	100.07	1960.00	0.77
	Total	200			
GP	No	23	94.41		
	Yes	177	101.29	1895.50	0.59
	Total	200			

In table 4.10 a Mann-Whitney U Test showed that there was a statistically difference in SB, AB, PB and GP between using and not using Twitter as a social network site for collaborative learning, $\chi 2(5) = 14.02$, because p-values for all of them are higher than the significant level (α)= 0.05.

Table 4.10. Mann-Whitney U Test between Twitter response and each of the SB, PB, AB and GP

Twitter		N	Mean Rank	Mann-Whitney U	P-Value
SB	No	153	97.03	3065.00	0.12
	Yes	47	111.79		
	Total	200			
PB	no	153	97.80	3182.00	0.23
	yes	47	109.30		
	Total	200			
AB	no	153	97.87	3193.50	0.25
	yes	47	109.05		
	Total	200			
GP	no	153	98.60	3305.00	0.40
	yes	47	106.68		
	Total	200			

In table 4.11 a Mann-Whitney U Test showed that there was a statistically difference in SB, AB, PB and GP between using and not using Myspace as a social network site for collaborative learning, $\chi 2(5) = 14.02$, because p-values for all of them are higher than the significant level (α)= 0.05.

Table 4.11. Mann-Whitney U Test between Myspace response and each of the SB, PB, AB and GP

Myspace		N	Mean Rank	Mann-Whitney U	P-Value
SB	no	194	100.87	510.50	0.605
	yes	6	88.58		
	Total	200			
PB	no	194	99.70	427.00	0.263
	yes	6	126.33		
	Total	200			
AB	no	194	100.73	536.50	0.744
	yes	6	92.92		
	Total	200			
GP	no	194	101.89	311.50	0.052
	yes	6	55.42		
	Total	200			

In table 4.12 a Mann-Whitney U Test showed that there was a statistically difference in SB, AB, PB and GP between using and not using Instagram as a social network site for collaborative learning, $\chi 2(5) = 14.02$, because p-values for all of them are higher than the significant level (α)= 0.05.

Table 4.12. Mann-Whitney U Test between Instagram response and each of the SB, PB, AB and GP

Instagram		N	Mean Rank	Mann-Whitney U	P-Value
SB	no	121	95.45	4169.00	0.123
	yes	79	108.23		
	Total	200			
PB	no	121	101.38	4673.50	0.789
	yes	79	99.16		
	Total	200			
AB	no	121	97.90	4465.50	0.431
	yes	79	104.47		
	Total	200			
GP	no	121	102.67	4517.50	0.512
	yes	79	97.18		
	Total	200			

In table 4.13 a Mann-Whitney U Test showed that there was a statistically difference in GP between using and not using Snapchat, $\chi 2(5) = 14.02, p = 0.037$, because p-value is less than the significant level (α) = 0.05, with a mean rank GP score of 105.28 for Academic Staff and students who don't use Snapchat, 85.38 for students and academic staff who use Snapchat as a social network for collaborative learning.

There was no statistically difference in SB, PB and AB with Academic staff and students of using and not using Snapchat as a social network because p-values for all of them are higher than the significant level (α)= 0.05.

Table 4.13. Mann-Whitney U Test between Snapchat response and each of the SB, PB, AB and GP

Snapchat		N	Mean Rank	Mann-Whitney U	P-Value
SB	No	152	98.42	3331.50	0.360

	T 4.13		(continue)		
	Yes	48	107.09		
	Total	200			
	No	152	103.33		
PB	Yes	48	91.54	3218.00	0.215
	Total	200			
	No	152	99.91		
AB	Yes	48	102.35	3559.00	0.798
	Total	200			
	No	152	105.28		
GP	Yes	48	85.38	2922.00	0.037
	Total	200			

In table 4.14 a Mann-Whitney U Test showed that there was a statistically difference in AB between using and not using Skype, $\chi 2(5) = 14.02$, $p = 0.032$, because p-value is less than the significant level (α) = 0.05, with a mean rank AB score of 95.50 for Academic Staff and students who don't use Skype, 115.90 for students and academic staff who use Skype as a social network for collaborative learning.

There was no statistically difference in SB, PB and GP with Academic staff and students of using and not using Skype as a social network because p-values for all of them are higher than the significant level (α)= 0.05.

Table 4.14. Mann-Whitney U Test between Skype response and each of the SB, PB, AB and GP

Skype		N	Mean Rank	Mann-Whitney U	P-Value
	No	151	98.23		
SB	Yes	49	107.50	3356.50	0.325
	Total	200			
	no	151	100.10		
PB	yes	49	101.74	3638.50	0.861
	Total	200			
	no	151	95.50		
AB	yes	49	115.90	2945.00	0.032
	Total	200			
	no	151	99.09		
GP	yes	49	104.84	3487.00	0.545
	Total	200			

From the result, it was observed as shown Figure 4.6 below, that only 43.6% uses Facebook as their social network site, 19.5% uses Instagram as their social network site, 12.1% uses Skype as their social network site, 11.8% uses SnapChat as their social network site, 11.6% uses Twitter as their social network site, 1.5% uses MySpace as their social network site from a population pull of 200 faculties and students whom participated in the survey. The pie chart shows that the most popular social network site is Facebook as it was launched before all other social network sites which are used in this study and the people are much more familiar with it. In addition, it has a very attractive and powerful features including the powerful feature of its security feature which makes the number of people who using it goes high. Furthermore, making groups for collaborative learning is very easy with Facebook. Although Instagram was released after some other social network sites but it has an enormous number of users because of its ease of use and has also the feature of securing personal information. Skype is available for ages but it has some bugs which affect negatively in using it in the recent years. Recently, the users of SnapChat has been increasing rapidly as it almost used for entertainment purposes and is used by those who are young for sharing their moments with others. Myspace has a low popularity in Duhok as they are not familiar with using it.

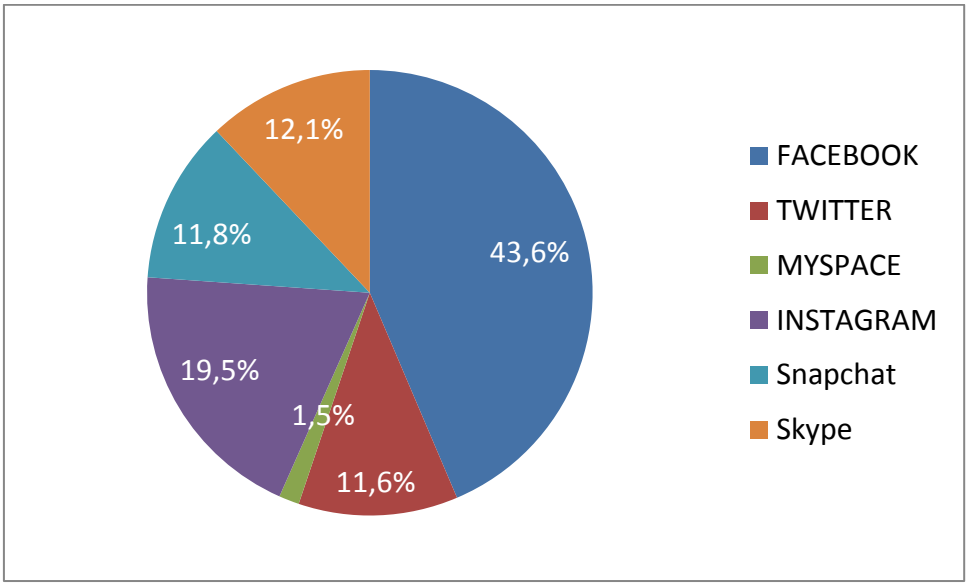

Figure 4.6. Type of social network site used.

4.3.2. Time frame of using social networking sites

In table 4.15 a Kruskal-Wallis test showed that there was a statistically difference in SB between the different duration of using social network, $\chi 2(5) = 14.02$, $p = 0.015$, because p-value is less than the significant level (α)= 0.05, with a mean rank SB score of 31.17 for 0-3 months, 79.39 for 3-6 months, 117.13 for 6-12 months, 79 for 1-2 years, 108.02 for 2-5 years and 104.04 for more than 5 years. Distributions of SB scores were homogen.

A Kruskal-Wallis test showed that there was a statistically difference in PB between the different duration of using social network, $\chi 2(5) = 11.28$ $p = 0.046$, because p-value is less than the significant level (α)= 0.05, with a mean rank PB score of 50.58 for 0-3 months, 59.89 for 3-6 months, 102.50 for 6-12 months, 94.10 for 1-2 years, 110.31 for 2-5 years and 101.28 for more than 5 years. Distributions of PB scores were homogen.

There was no statistically difference in both AB and GP with different duration of using social network because p-values for both of them are higher than the significant level (α)= 0.05.

Table 4.15. Kruskal Wallis Test Results for SB, PB, AB and GP among duration of using social network

	SECTION2_Q2	N	Mean Rank	Chi-Square Value	P-Value
SB	0-3 months	6	31.17	14.02	0.015
	3-6 months	9	79.39		
	6-12 months	4	117.13		
	1-2 years	15	79.00		
	2-5 years	69	108.02		
	more than 5 years	97	104.04		
	Total	200			
PB	0-3 months	6	50.58	11.28	0.046
	3-6 months	9	59.89		
	6-12 months	4	102.50		
	1-2 years	15	94.10		
	2-5 years	69	110.31		
	more than 5 years	97	101.28		

	Table 4.15. (continue)				
	Total	200			
	0-3 months	6	54.33		
	3-6 months	9	89.50		
	6-12 months	4	93.50		
AB	1-2 years	15	90.93	5.53	0.355
	2-5 years	69	106.91		
	more than 5 years	97	101.58		
	Total	200			
	0-3 months	6	51.92		
	3-6 months	9	113.56		
	6-12 months	4	137.63		
GP	1-2 years	15	87.53	9.61	0.086
	2-5 years	69	93.51		
	more than 5 years	97	107.74		
	Total	200			

Table 4.16 shows that SB provides us to take pairwise comparisons among the durations of using social network. Depending on table 4.16 we can notice that there is a statistically different between 0-3 months and more than five years. Also these are a statistically different between 0-3 months and 2-5 years. Pairwise comparisons were performed using Dunn’s (1964) procedure with a Bonferroni correction for multiple comparisons.

Table 4.16. Pairwise Comparisons' among duration of using social network for SB

Sample1 – Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
0-3 months - 1-2 years	-47.833	27.669	-1.729	.084	1.000
0-3 months - 3-6 months	-48.222	30.189	-1.597	.110	1.000
0-3 months - more than 5 years	-72.869	24.097	-3.024	.002	.037
0-3 months - 2-5 years	-76.855	24.380	-3.152	.002	.024
0-3 months - 6-12 months	-85.958	36.974	-2.325	.020	.301
1-2 years - 3-6 months	.389	24.152	.016	.987	1.000
1-2 years - more than 5 years	-25.036	15.892	-1.575	.115	1.000
1-2 years - 2-5 years	-29.022	16.318	-1.778	.075	1.000
1-2 years - 6-12 months	38.125	32.233	1.183	.237	1.000
3-6 months - more than 5 years	-24.647	19.960	-1.235	.217	1.000
3-6 months - 2-5 years	-28.633	20.301	-1.410	.158	1.000
3-6 months - 6-12 months	-37.736	34.421	-1.096	.273	1.000
More than 5 years - 2-5 years	3.986	9.021	.442	.659	1.000
More than 5 years - 6-12 months	13.089	29.225	.448	.654	1.000
2-5 years - 6-12 months	9.103	29.459	.309	.757	1.000

Table 4.17 shows that PB provides us to take pairwise comparisons among the durations of using social network. Depending on table 4.17 we can notice that there is no statistically different among durations of using social network. Pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons.

Table 4.17. Pairwise Comparisons' among duration of using social network for PB

Sample1 – Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
0-3 months - 3-6 months	-9.306	30.242	-.308	.758	1.000
0-3 months - 1-2 years	-43.517	27.717	-1.570	.116	1.000
0-3 months - more than 5 years	-50.700	24.139	-2.100	.036	.535
0-3 months - 6-12 months	-51.917	37.038	-1.402	.161	1.000
0-3 months - 2-5 years	-59.728	24.422	-2.446	.014	.217
3-6 months - 1-2 years	-34.211	24.193	-1.414	.157	1.000
3-6 months - more than 5 years	-41.395	19.994	-2.070	.038	.576
3-6 months - 6-12 months	-42.611	34.481	-1.236	.217	1.000
3-6 months - 2-5 years	-50.423	20.336	-2.480	.013	.197
1-2 years - more than 5 years	-7.184	15.920	-.451	.652	1.000
1-2 years - 6-12 months	8.400	32.289	.260	.795	1.000
1-2 years - 2-5 years	-16.212	16.347	-.992	.321	1.000
More than 5 years - 6-12 months	1.216	29.275	.042	.967	1.000
More than 5 years - 2-5 years	9.028	9.037	.999	.318	1.000
6-12 months - 6-12 years	-7.812	29.510	-.265	.791	1.000

From the result, it was observed as shown Figure 4.7 below, that only 48.5% are using social network site for more than 5 years, this means that the majority of academic staff and students have integrated the new technology with their learning and teaching process, 34.5% are using social network site for 2-5 years, 7.5% are using social network site for 1-2 years, 2% are using social network site for 6-12 months, 4.5% are using social network site for 3-6 months now and 3% are using social network site for 0-3 monthsfrom a population pull of 200 faculties and students whom participated in the survey. Although in Duhok city the internet is very poor and sometimes it is not easy to have access to the internet, a very low percentage of participants in this study which is

3% are using social network site for 0-3 months. This result indicates that using social network site and apps have a great role in making the process of education more facilitate and the communication between the students and teacher or among students much easier which result in having better results than not using them.

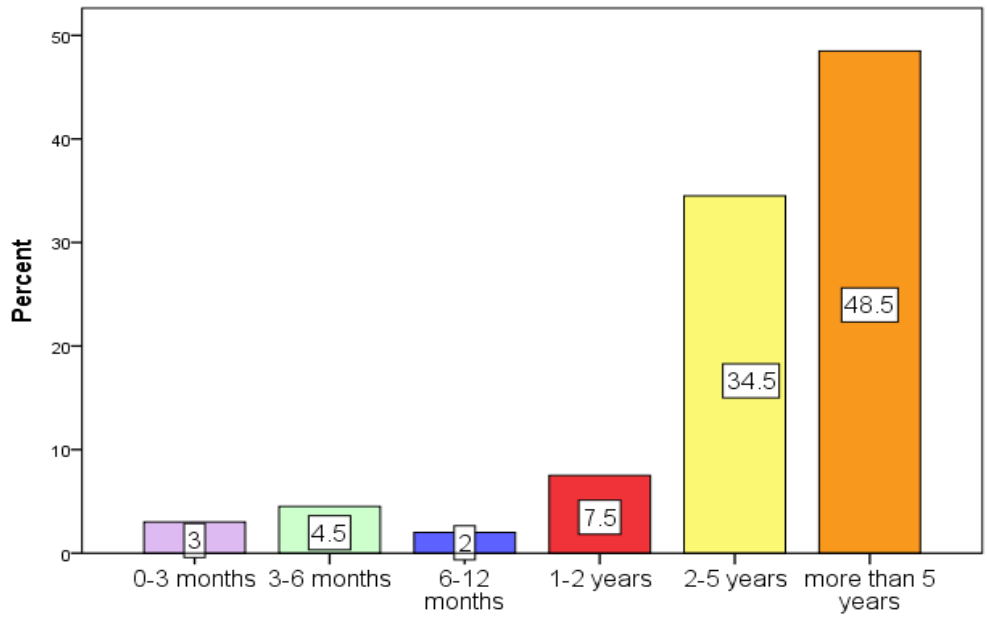

Figure 4.7. Time frame of using social networking sites.

4.3.3. Time spent using social networking sites

In table 4.18 a Kruskal-Wallis test showed that there was a statistically difference in AB between the hours of using social network, $\chi 2(5) = 14.02$, $p = 0.010$, because p-value is less than the significant level (α)= 0.05, with a mean rank AB score of 62.33 for 0-1 hours, 106.19 for 2-3 hours, 105.85 for 4-5 hours, 102.91 for 6+ hours. Distributions of AB scores were homogen.

A Kruskal-Wallis test showed that there was a statistically difference in GP between the hours of using social network, $\chi 2(5) = 14.02$, $p = 0.008$, because p-value is less than the significant level (α)= 0.05, with a mean rank GP score of 68.26 for 0-1 hours, 95.60 for 2-3 hours, 111.31 for 4-5 hours, 114.82 for 6+ hours. Distributions of GP scores were homogen.

There was no statistically difference in both SB and PB with different hours of using social network because p-values for both of them are higher than the significant level (α)= 0.05.

Table 4.18. Kruskal Wallis Test between hours of spending on social network and each of the SB, PB, AB and GP

		N	Mean Rank	Chi-Square Value	P-Value
SB	0-1	23	71.11	6.995	0.072
	2-3	82	103.38		
	4-5	62	103.69		
	6+	33	107.82		
	Total	200			
PB	0-1	23	85.74	6.9	0.075
	2-3	82	112.98		
	4-5	62	92.97		
	6+	33	93.92		
	Total	200			
AB	0-1	23	62.33	11.46	0.010
	2-3	82	106.19		
	4-5	62	105.85		
	6+	33	102.91		
	Total	200			
GP	0-1	23	68.26	11.96	0.008
	2-3	82	95.60		
	4-5	62	111.31		
	6+	33	114.82		
	Total	200			

Table 4.19 shows that AB provides us to take pairwise comparisons among the hours of spending on social network. Depending on table 4.19 we can notice that there is a statistically different between 0-1 hours and 4-5 hours. Also these are a statistically different between 0-1 hours and 2-3 hours. Pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons.

Table 4.19. Pairwise Comparisons' among hours of spending on social network for AB

Sample1 – Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
0-1 – 6+	-40.583	15.673	-2.589	.010	.058
0-1 – 4-5	-43.529	14.088	-3.090	.002	.012
0-1 – 2-3	-43.863	13.615	-3.222	.001	.008
6+ - 4-5	2.946	12.434	.237	.813	1.000
6+ - 2-3	3.280	11.895	.276	.783	1.000
4-5 – 2-3	.334	9.711	.034	.973	1.000

Table 4.20 shows that GP provides us to take pairwise comparisons among the hours of spending on social network. Depending on table 4.20 we can notice that there is a statistically different between 0-1 hours and 4-5 hours. Also these are a statistically different between 0-1 hours and more than six hours. Pairwise comparisons were performed using Dunn's (1964) procedure with a Bonferroni correction for multiple comparisons.

Table 4.20. Pairwise Comparisons' among hours of spending on social network for GP

Sample1 – Sample2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.
0-1 – 2-3	-27-343	13.624	-2.007	.045	.269
0-1 – 4-5	-43.054	14.097	-3.054	.002	.014
0-1 – 6+	-46.557	15.684	-2.968	.003	.018
2-3 – 4-5	15.711	9.718	-1.617	.106	.636
2-3 – 6+	-19.215	11.903	-1.614	.106	.639
4-5 – 6+	-3.504	12.442	-.282	.778	1.000

From the result, it was observed as shown Figure 4.8 below, that only 11.5% spend 0-1 hours on social network sites, 41% spend 2-3 hours on social network sites, 31% spend 4-5 hours on social network sites and 16.5% spend 6+ hours on social network sites from a population pull of 200 faculties and students whom participated in the survey. Almost the academic staff, especially if they are married, spend less time on social media than students even if they use social media sites for collaborative learning purposes or teaching because they have a lot of engagements and duties in their daily life. But, students can have a big beneficial from using social media network site as a collaborative way of learning. 16.5% of them are using social networks for their leisure time and collaborative learning which shows that from now on the percentage of those who use social network sites for collaborative education are increasing steadily.

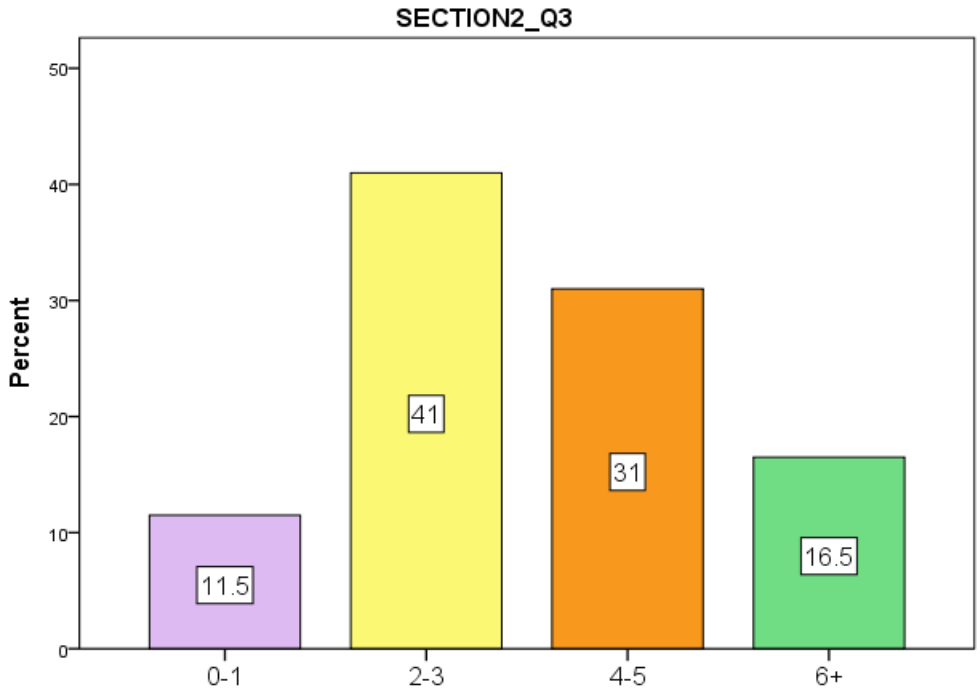

Figure 4.8. Time spent using social networking sites.

4.3.4. Device used for social networking sites

In table 4.21 a Mann-Whitney U Test showed that there was a statistically difference in SB, AB, PB and GP between using and not using personal computer for singing into a social network site for collaborative learning purpose, $\chi 2(5) = 14.02$, because p-values for all of them are higher than the significant level (α)= 0.05.

Table 4.21. Mann-Whitney U Test between Personal computer response and each of the SB, PB, AB and GP

Personal computer		N	Mean Rank	Mann-Whitney U	P-Value
SB	No	102	101.23	4924.00	0.855
	Yes	98	99.74		
	Total	200			
PB	No	102	98.06	4749.50	0.540
	Yes	98	103.04		
	Total	200			
AB	No	102	107.15	4320.00	0.097
	Yes	98	93.58		
	Total	200			
GP	No	102	105.28	4510.50	0.232
	Yes	98	95.53		
	Total	200			

In table 4.22 a Mann-Whitney U Test showed that there was a statistically difference in SB, AB, PB and GP between using and not using cell phone device for singing into a social network site for collaborative learning purpose, $\chi 2(5) = 14.02$, because p-values for all of them are higher than the significant level (α)= 0.05

Table 4.22. Mann-Whitney U Test between Cell Phone response and each of the SB, PB, AB and GP

Cell Phone		N	Mean Rank	Mann-Whitney U	P-Value
SB	No	20	93.00	1650.00	0.54
	Yes	180	101.33		
	Total	200			
PB	No	20	110.13	1607.50	0.43
	Yes	180	99.43		
	Total	200			
AB	No	20	83.23	1454.50	0.16
	Yes	180	102.42		
	Total	200			
GP	No	20	103.50	1740.00	0.81
	Yes	180	100.17		
	Total	200			

In table 4.23 a Mann-Whitney U Test showed that there was a statistically difference in SB, AB, PB and GP between using and not using Tablet for singing into a social network site for collaborative learning purpose, $\chi 2(5) = 14.02$, because p-values for all of them are higher than the significant level (α)= 0.05

Table 4.23. Mann-Whitney U Test between Tablet response and each of the SB, PB, AB and GP

Tablet		N	Mean Rank	Mann-Whitney U	P-Value
SB	No	183	98.92	1266.50	0.20
	Yes	17	117.50		
	Total	200			
PB	No	183	100.76	1508.00	0.83
	Yes	17	97.71		
	Total	200			
AB	No	183	99.78	1424.50	0.56
	Yes	17	108.21		
	Total	200			
GP	No	183	99.94	1452.50	0.65
	Yes	17	106.56		
	Total	200			

From the result, it was observed as shown Figure 4.9 below, that only 34% uses their personal computers to log into social network sites and 62.5% uses their cell phone to log into social network sites, 3.5% uses their tablets to log into social network sites from a population pull of 200 faculties and students whom participated in the survey. It is shown that the high number of users use their mobile cell phones for using social network sites, as it is portable and used by almost all people, so you can use them anytime and anywhere. In addition to their low weight, most of them are smart phones and social media apps can be installed in them and log into social network sites easily.

A very low number of those who participated in this study are not familiar with using tablets even though it is more appropriate for utilizing them in collaborative learning purpose. The personal computers are also used widely but they are used in the university campus most particularly in the lab.

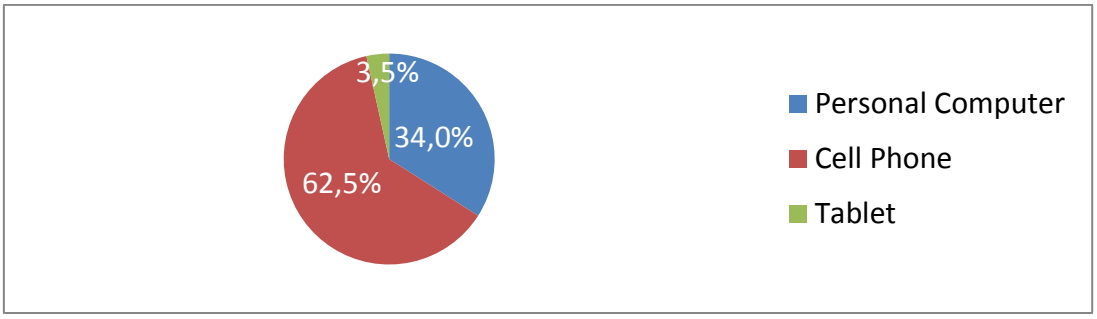

Figure 4.9. Device used for social network sites.

4.3.5. Social networking sites group membership

In table 4.24 a Mann-Whitney U Test showed that there was no statistically difference in SB and PB, Ab and GP with Yes and No between member group on social network because p-values for both of them are higher than the significant level (α)= 0.05, with a mean rank SB score of 0.325 for Yes and No, and with a mean rank PB score of 0.427 for Yes and No, and with a mean rank AB score of 0.787 for Yes and No, and with a mean rank GP score of 0.606 for Yes and No.

Table 4.24. Mann-Whitney U Test between member group on social network and each of the SB, PB, AB and GP

		N	Mean Rank	Mann-Whitney U	P-Value
SB	Yes	142	103.05	3756.5	0.325
	No	58	94.27		
	Total	200			
PB	Yes	142	102.56	3826	0.427
	No	58	95.47		
	Total	200			
AB	Yes	142	99.80	4018	0.787
	No	58	102.22		
	Total	200			
GP	Yes	142	99.15	3927	0.606
	No	58	103.79		
	Total	200			

From the result, it was observed as shown Figure 4.10 below, that only 71% are members of social network sites group and 29% are not members of social network sites group from a population pull of 200 faculties and students whom participated in the survey. Groups in social network sites are used for collaborative learning. The high rate of the participated people in this study are using groups within social network sites so that they can share their information and use them for collaborative learning. Unlike other IoT technology systems which utilize for collaborative learning, membership in social media groups lead to get knowledge easily without spending money, utilize it without needing for further software to be installed into your computer, and communicate with your colleagues and teachers without any restriction time. Another reason they use IoT technology feature in social networks for their collaborative learning purposes is that they are not familiar with other systems which use for the same objective.

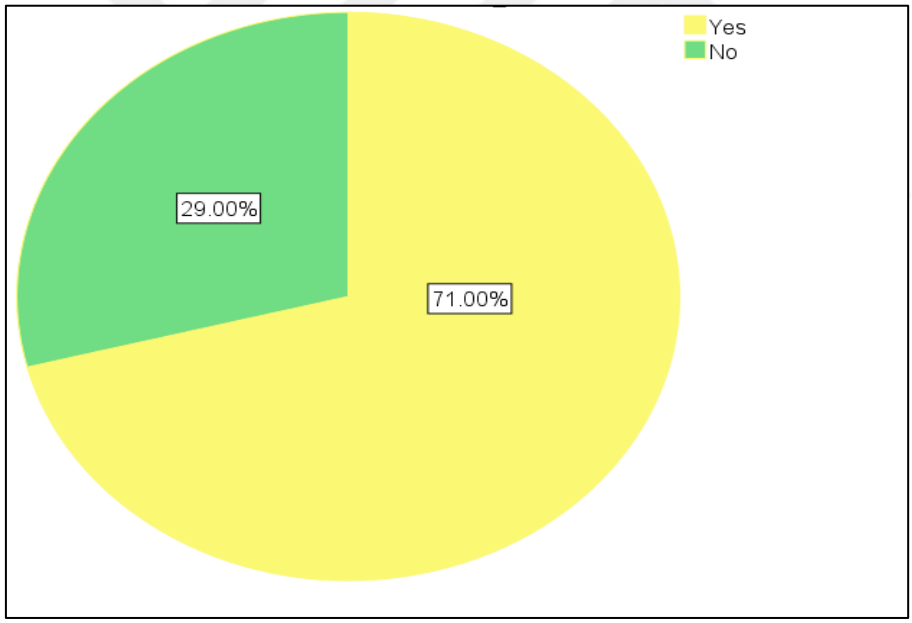

Figure 4.10. Social networking sites group membership.

4.3.6. Social networking sites chatting

In table 4.25 a Kruskal Wallis Test showed that there was no statistically difference in SB and PB, Ab and GP with Regularly, Sometimes and Never did of chatting on social network because p-values for both of them are higher than the

significant level (α)= 0.05, with a mean rank SB score of 0.68 for Regularly, Sometimes and Never did, and with a mean rank PB score of 0.62 for Regularly, Sometimes and Never did, and with a mean rank AB score of 0.98 for Regularly, Sometimes and Never did, and with a mean rank GP score of 0.52 for Regularly, Sometimes and Never did.

Table 4.25. Kruskal Wallis Test between chatting on social network and each of the SB, PB, AB and GP

		N	Mean Rank	Chi-Square Value	P-Value
SB	Regularly	55	104.25	0.76	0.68
	Sometimes	121	100.48		
	Never did	24	92.02		
	Total	200			
PB	Regularly	55	101.24	0.96	0.62
	Sometimes	121	102.29		
	Never did	24	89.79		
	Total	200			
AB	Regularly	55	101.17	0.04	0.98
	Sometimes	121	99.88		
	Never did	24	102.10		
	Total	200			
GP	Regularly	55	96.56	1.32	0.52
	Sometimes	121	104.10		
	Never did	24	91.40		
	Total	200			

From the result, it was observed as shown Figure 4.11 below, that only 60.5% are participants chat sometimes with others or lecturers on social network sites, 27% are participants chat regularly with others or lecturers on social network sites and 12% are participants never chat with others or lecturers on social network sites from a population pull of 200 faculties and students whom participated in the survey. In general, the participants consider using chatting in communicating with each other as a way of

improving their level of education. The number of those participants who use chat sometimes got peak because during the education process, the teacher and students as well don't have enough time to be online for a long period of time for chatting. The teachers have a lot of engagements in his/her daily life including supervising students' projects, preparing lectures, conducting researches, and participating in a myriad activities which make him/her to chat with students rarely. The most of those participants who chat regularly are likely to be students as they need it for collaborative learning. Overall, this result is a positive indication of using social network sites chatting in the process of education from now on.

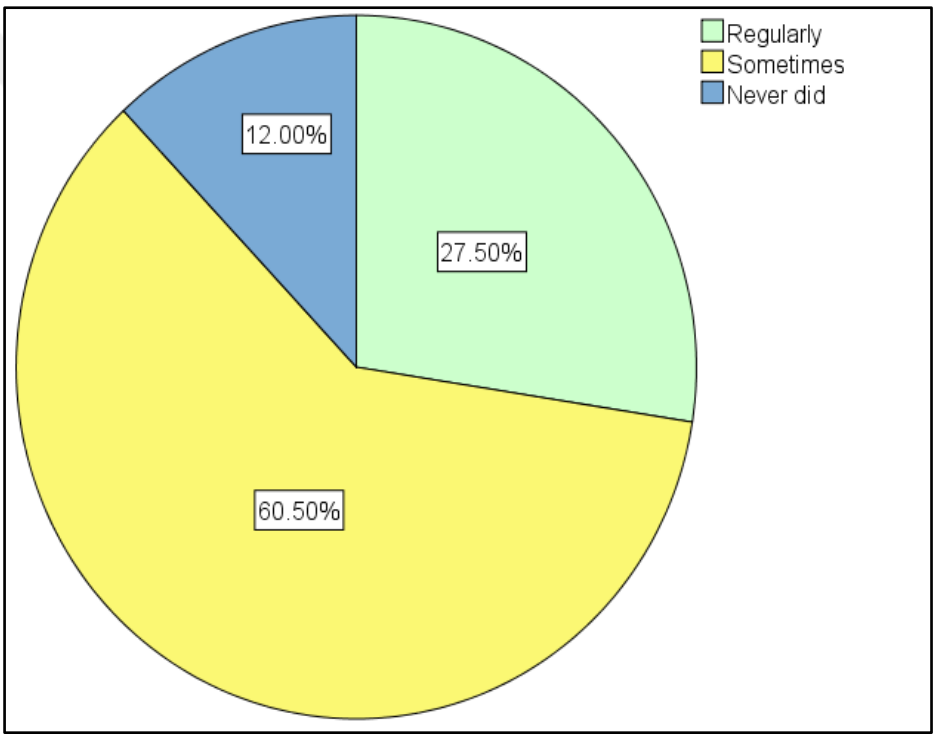

Figure 4.11. Social networking sites chatting.

5. CONCLUSION AND RECOMMENDATIONS

5.1. Conclusion

The Internet-of-Things, with the new concept, has a great significance to economic and language development, geography, and physical location. Utilizing the technology in the field of education play a big role in expediting the process of education, developing the level of knowledge, and making the students more qualified. The functional standard and model of any new concept appeared are not used widely and the universities are not ready to apply all the enhancements made to the education system by IoT technology.

This study is one of the first empirical studies conducted by Duhok University students to examine perceptions of the impact of IoT technology on the use of social media for collaborative learning in the North. of Iraq. Given the exploratory nature of the study and the limited number of participants, the authors are far from achieving generalizable results. However, the opinions of the participants in the cloud survey provide interesting results regarding the impact of the sample on the technology of the Internet of Things on the use of social media for collaborative learning of university students. Given that technology has considerable potential for superior institutions, the authors believe that greater efforts can be made at the national level to promote a better understanding and use of IoT in cooperative learning.

The results show the influence of Internet of Things technology impact on social media usage by university students and academic staff on collaborative learning in SB, PB, AB and GP factors with respect to faculty of the students. The result shows the perceptions of students and academic staff on IoT and collaborative learning on social media with respect to occupation, statistically significant differences existed amongst GP dimensions. This study has shown the various factors that cause students and faculties for usage of IoT on collaborative learning. Hence, there should more awareness on usage of IoT on collaborative learning to all levels of faculties irrespective of their department or regions, and further work should be investigated this subject area.

There was a statistically difference in GP between Academic staff and Students of using social network, because p-value is less than the significant level, Staff, with a

mean rank GP score of 82.90 for Academic 105.04 for students. A Kruskal-Wallis test showed that there was a statistically difference in SB between the different duration of using social network, because p-value is less than the significant level, with a mean rank SB score of 31.17 for 0-3 months, 79.39 for 3-6 months, 117.13 for 6-12 months, 79 for 1-2 years, 108.02 for 2-5 years and 104.04 for more than 5 years. There was a statistically difference in PB between the different duration of using social network, because p-value is less than the significant level, with a mean rank PB score of 50.58 for 0-3 months, 59.89 for 3-6 months, 102.50 for 6-12 months, 94.10 for 1-2 years, 110.31 for 2-5 years and 101.28 for more than 5 years. There was a statistically difference in AB between the hours of using social network, because p-value is less than the significant level, with a mean rank AB score of 62.33 for 0-1 hours, 106.19 for 2-3 hours, 105.85 for 4-5 hours, 102.91 for 6+ hours. There was a statistically difference in GP between the hours of using social network, because p-value is less than the significant level, with a mean rank GP score of 68.26 for 0-1 hours, 95.60 for 2-3 hours, 111.31 for 4-5 hours, 114.82 for 6+ hours. There was a statistically difference in PB between using and not using Facebook, $\chi 2(5) = 14.02$, $p = 0.03$, because p-value is less than the significant level (α) = 0.05, with a mean rank PB score of 75.87 for Academic Staff and students who don't use Facebook, 103.70 for students and academic staff who use Facebook as a social network for collaborative learning, with a mean rank PB score of 105.51 for Academic Staff, 99.21 for students, and with a mean rank GP score of 82.90 for Academic Staff, 102.04 for students. There was a statistically difference in GP between using and not using Snapchat, $\chi 2(5) = 14.02$, $p = 0.037$, because p-value is less than the significant level (α) = 0.05, with a mean rank GP score of 105.28 for Academic Staff and students who don't use Snapchat, 85.38 for students and academic staff who use Snapchat as a social network for collaborative learning. There was a statistically difference in AB between using and not using Skype, $\chi 2(5) = 14.02$, $p = 0.032$, because p-value is less than the significant level (α) = 0.05, with a mean rank AB score of 95.50 for Academic Staff and students who don't use Skype, 115.90 for students and academic staff who use Skype as a social network for collaborative learning.

5.2. Recommendations

This study has shown several factors that drive students and faculties to use IoT in cooperative learning. Therefore, regardless of department or region, there should be greater awareness of the use of IoT in cooperative learning at each faculty level.

A more extensive sample of understudies should be examined with various cultural backgrounds so as to improve the speculation of the outcomes. Another confinement is that only the perspective of University of Duhok students' and academic staff viewpoint was examined, yet future research should take the perspective of other university students and academic staff in north of Iraq into consideration. Furthermore, future investigations can help changing and broadening our examination model by adding different antecedents to clients' attitude towards unitizing the Internet of Things for collaborative learning in social network sites advancements.

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APPENDICES

APPENDIX 1: QUESTIONNAIRE

THE INTERNET OF THINGS TECHNOLOGY IMPACT ON SOCIAL MEDIA USAGE BY UNIVERSITY OF DUHOK STUDENTS ON COLLABORATIVE LEARNING IN NORTH OF IRAQ

Dear Sir/Madam

The questionnaire aims to investigate the Internet of Things technology impact on social media usage by university students on collaborative learning. Specifically, collaborative level between students while using the Social Media (Facebook, Twitter, WhatsApp, etc.) in the module in and out of the classroom. This survey is part of an M.Sc. thesis. The result of this questionnaire will solely be used for the analysis in the research report and will not be provided to any institution in any way and will be highly be kept in strict confidence.

Thanks in advance for taking time to answer our questionnaire.

Bashir Ali Saleh (Master Student)

SECTION I: Personal Information (please tick the box most appropriate for you)

1) **Gender**: **a)** Male **b)** Female

2) **Age**: **a)**18-25 **b)**26-30 **c)**31+

3) **Faculty**: **a)** Science Faculty **b)** Engineering Faculty **c)** Medicine Faculty

4) **Academic Education Level:** **a)** Undergraduate **b)** Master **c)** PhD

5) **Occupation:** a) Academic Staff b) Student

SECTION II: Social Network Site Usage (please tick the box most appropriate for you)

1) Which of these social network sites do you use? (You may choose more than one, use Yes or No for each one)

a) Facebook **b)** Twitter **c)** Myspace

d) Instagram **e)** Snapchat **f)** Skype

2) How long do you regularly use social networking sites?

a) 0-3 months **b)** 3-6 months **c)** 6-12 months

d) 1-2 years **e)**2-5 years **f)** more than 5 years

3) How many hours per day do you spend on social network sites?

a) 0-1 **b)** 2-3 **c)** 4-5 **d)** 6+

4) Where do you log into your social network account? (You may choose more than one, use Yes or No for each one)

a) Personal Computer **b)** Cell Phone **c)** Tablet

5) Are you a member of any group in social network sites? **a)** Yes **b)** No

6) Chatting with others or lecturer on social media? **a)** Regularly **b)** Sometimes **c)** Never did

SECTION III: Scale for the factors that influence the Internet of Things technology impact on social media usage by university students on collaborative learning (please tick the most appropriate to you)

Items	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
SOCIAL BENEFITS					
1. IoT creates social support systems for learning.					
2. IoT creates diversity understanding among students and staff.					
3. IoT creates a positive atmosphere for modeling and practicing cooperation.					
4. IoT creates better learning communities.					
PSYCHOLOGICAL BENEFITS					
1. IoT increases students' self esteem .					
2. IoT reduces anxiety.					
3. IoT creates positive attitudes towards teachers.					
ACADEMIC BENEFITS					
1. IoT technology improves critical-thinking skills.					
2. IoT technology creates active participation in the learning process.					
3. IoT technology aid in improvement of classroom results.					
4. IoT technology aid appropriate problem-solving techniques.					
5. IoT technology enables personalization of learning lectures.					

6. IoT technology increases students' motivation.					
7. IoT technology connectivity can improve my learning skills.					
8. IoT technology can improve the learning experience for me and my colleagues.					
GENERAL PERCEPTION					
1. IoT encourages me to use the latest technology.					
2. I prefer enrolling in a campus with IoT technology.					
3. Using the social media for educational purposes facilitates dialog with peers.					
4. I believe we are not yet ready for using IoT now.					
5. IoT based applications would be more fun to use.					
6. I would not use IoT because of privacy concerns.					
7. I prefer my mobile be connected to new learning services on campus.					
8. I prefer to have the lecture attendance automatically recorded.					
9. I believe IoT can help me to learn more technologies.					
10. IoT can have a negative consequence and distractions.					

APPENDIX 2: SPSS CODE

1-SPSS Code for table 4.1 Reliability test for subscales of the questionnaire

```
RELIABILITY
  /VARIABLES=SB PB AB GP
  /SCALE('Reliability test for subscales of the questionnaire') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE SCALE.
```

2- SPSS Code for table 4.2 shows the significat value for SB, PB, AB and GP

```
EXAMINE VARIABLES=SB PB AB GP
  /PLOT HISTOGRAM NPPLOT
  /STATISTICS DESCRIPTIVES
  /CINTERVAL 95
  /MISSING LISTWISE
  /NOTOTAL.
```

3- SPSS Code for table 4.3 Mean and Standard Deviation in each items for all dimensions

```
DESCRIPTIVES VARIABLES=SB1 SB2 SB3 SB4 PsyB1 PsyB2 PsyB3 AB1 AB2 AB3 AB4 AB5 AB6 AB7 AB8 GP1 GP2 GP3 GP4 GP5 GP6 GP7 GP8 GP9 GP10
  /STATISTICS=MEAN STDDEV.
```

4-SPSS Code for Table 4.4 : Mann-Whitney U Test between gender and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY Gender(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

5- SPSS Code for Table 4.5 Kruskal Wallis Test between age group and each of the SB, PB, AB and GP

```
NPAR TESTS
  /K-W=SB PB AB GP BY Age(1 3)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

6- SPSS Code for Table 4.6 Kruskal Wallis Test between Faculty and each of the SB, PB, AB and GP

```
NPAR TESTS
  /K-W=SB PB AB GP BY Faculty(1 3)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

7- SPSS Code for Table 4.7 Kruskal Wallis Test between Academic Education Level and each of the SB, PB, AB and GP

```
NPAR TESTS
  /K-W=SB PB AB GP BY Academic_Edu_Level(1 3)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

8- SPSS Code for Table 4.8 Mann-Whitney U Test between occupation and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY Occupation (1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

9- SPSS Code for Table 4.9 Mann-Whitney U Test between Facebook response and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q1A (1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

10- SPSS Code for Table 4.10 Mann-Whitney U Test between Twitter response and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q1B(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

11- SPSS Code for Table 4.11 Mann-Whitney U Test between Myspace response and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q1C(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

12- SPSS Code for Table 4.12 Mann-Whitney U Test between Instagram response and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q1D(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

13- SPSS Code for Table 4.13 Mann-Whitney U Test between Snapchat response and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q1E(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

14- SPSS Code for Table 4.14 Mann-Whitney U Test between Skype response and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q1F(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

15-SPSS Code for Table 4.15 Kruskal Wallis Test Results for SB, PB, AB and GP among duration of using social network

```
NPAR TESTS
  /K-W=SB PB AB GP BY SECTION2_Q2(1 6)
  /STATISTICS DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

16-SPSS Code for Table 4.16 Pairwise Comparisons' among duration of using social network for SB

```
ONEWAY SB BY SECTION2_Q2
  /STATISTICS HOMOGENEITY
  /MISSING ANALYSIS
  /POSTHOC=TUKEY ALPHA(0.05).
```

17- SPSS Code for Table 4.17 Pairwise Comparisons' among duration of using social network for PB

```
ONEWAY SB BY SECTION2_Q2
  /STATISTICS HOMOGENEITY
  /MISSING ANALYSIS
  /POSTHOC=TUKEY ALPHA(0.05).
```

18-SPSS Code for Table 4.18 Kruskal Wallis Test between hours of spending on social network and each of the SB, PB, AB and GP

```
NPAR TESTS
  /K-W= SB PB AB GP BY SECTION2_Q3(1 4)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

19- SPSS Code for Table 4.19 Pairwise Comparisons' among hours of spending on social network for AB

```
ONEWAY AB BY SECTION2_Q3
  /STATISTICS HOMOGENEITY
  /MISSING ANALYSIS
  /POSTHOC=TUKEY ALPHA(0.05).
```

20-SPSS Code for Table 4.20 Pairwise Comparisons' among hours of spending on social network for GP

```
ONEWAY AB BY SECTION2_Q3
  /STATISTICS HOMOGENEITY
  /MISSING ANALYSIS
  /POSTHOC=TUKEY ALPHA(0.05).
```

21-SPSS Code for Table 4.21 Mann-Whitney U Test between Personal computer response and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q4A(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

22- SPSS Code for Table 4.22 Mann-Whitney U Test between Cell Phone response and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q4B(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

23-SPSS Code for Table 4.23 Mann-Whitney U Test between Tablet response and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q4C(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

24-SPSS Code for Table 4.24 Mann-Whitney U Test between member group on social network and each of the SB, PB, AB and GP

```
NPAR TESTS
  /M-W= SB PB AB GP BY SECTION2_Q5(1 2)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

25-SPSS Code for Table 4.25 Kruskal Wallis Test between chatting on social network and each of the SB, PB, AB and GP

```
NPAR TESTS
  /K-W= SB PB AB GP BY SECTION2_Q6 (1 3)
  /STATISTICS=DESCRIPTIVES
  /MISSING ANALYSIS
  /METHOD=EXACT TIMER(5).
```

EXTENDED TURKISH SUMMARY (GENİŞLETİLMİŞ TÜRKÇE ÖZETI)

KUZEY IRAK'TA DUHOK ÜNİVERSİTESİ İŞBİRLİKÇİ ÖĞRENME ÖĞRENCİLERİ ÜZERİNDE NESNELERİN İNTERNETİ TEKNOLOJİSİNİN SOSYAL MEDYA KULLANIMINDAKİ ETKİSİ

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Ocak 2020, 109 sayfa

1. ÖZET

Bu çalışma, yükseköğretimde nesnelerin interneti ve onun gelecekteki potansiyel etkisini keşfetmek ve öğrenciler arasında yükselen bir trend olan sosyal medya kullanımının akademik personel ve öğrenciler üzerindeki etkisini incelemektir. Ek olarak nesnelerin interneti (NI)'nin yükseköğretimde karşımıza çıkardığı bazı zorluklar incelenmiştir. Bağımsız değişkenler, çeşitli boyutlar ve onların bağlantılarıdır. Nı kullanımının psikolojik yararları (PY) NI kullanımının sosyal yararları (SY), akademik yararları (AY) ve genel bakış açıları (GB). Bağımsız değişkenler fakülte, akademik eğitim seviyesi ve mesleği içerir. Toplam 200 anket soruları kuzey Irak'ta duhok üniversitesinin fakülte üyesi ve öğrencisi tarafından cevaplamakla elde edilmiştir.

Anahtar kelimeler: İşbirlikçi öğrenme, Nesnelerin interneti, Öğrenciler, Sosyal medya.

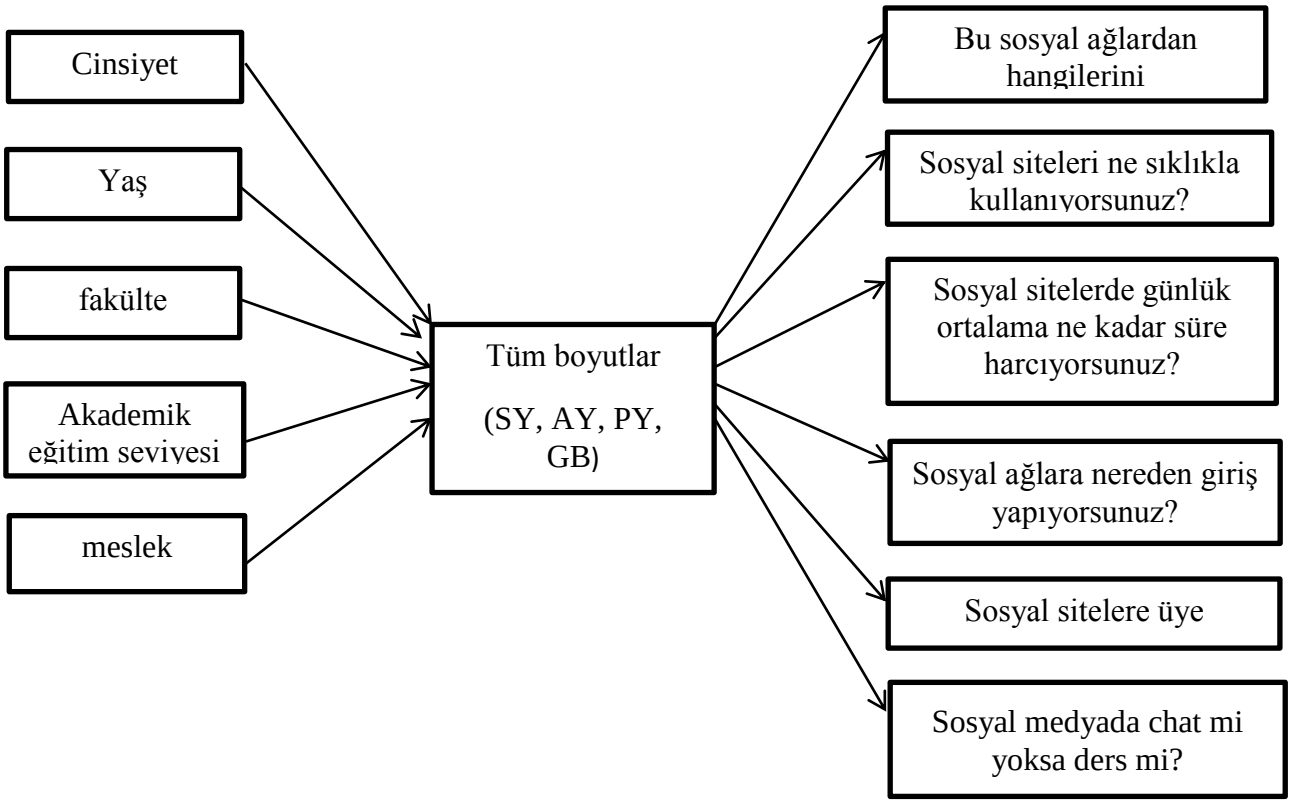
2. MATERYAL VE YÖNTEM

2.1. Araştırma Modeli

Bu çalışma üniversite öğrencileri arasında işbirlikçi öğrenmede sosyal medya ve teknoloji kullanımının etkilerini inceler. Çalışmanın asıl amacı sosyal teknolojiler hakkında işbirlikçi öğrenmenin ve internet teknolojilerinin bakış açılarını anlamaktır.

Bağımsız değişkenler, çeşitli boyutlar ve onların bağlantılarıdır. Nı kullanımının psikolojik yararları (PY) NI kullanımının sosyal yararları (SY), akademik yararları

(AY) ve genel bakış açıları (GB). Bağımsız değişkenler fakülte, akademik eğitim seviyesi ve mesleği içerir. Toplam 200 fakülte üyesi ve öğrenci anket sorularını cevaplamayı kabul etti ve soruları uygun şekilde cevapladı.



2.2. Katılan Öğrenciler

toplam 200 fakülte üyesi ve öğrenci ankete katılmayı kabul etti ve soruları uygun şekilde cevapladı. % 55 erkek katılımcı % 45 kadın katılımcı bulunmaktadır. %62,5 katılımcı 18-25 yaş grubunda, %16.5 26-30, %21 31 yaş ve üzerindedir. %40 katılımcı fen edebiyat fakültesi öğrencisi %32.5 mühendislik ve %27.5 tıp fakültesi öğrencisidir. %62.5 katılımcının mezuniyet belgesi, %23.5 master diploması ve %14 Phd belgesine sahiptir. Akademisyenler katılımcıların %20.5'unu geri kalanını öğrenciler oluşturur.

Sorular SY gruplarında veri toplamak ve işbirlikçi öğrenmeyi destekleyen sosyal sistemler yaratan NI etkilerini göstermek için akademik personel ve yardımcılarının farklı bakış açılarını anlamak amacıyla pozitif rol almak ve işbirlikçi öğrenmede NI nin pozitif bir hava oluşturduğunu göstermektedir.

SY grubu akademik üyelere karşı pozitif tutum geliştirmek, endişeyi azaltmak, işbirlikçi öğrenmede öğrencilerin özgüvenini artırmak ve NI kullanımının etkilerini

tahmin ederek öğrenci ve akademisyenlerden veri toplamak için 3 farklı soru sorulmuştur.

AY soruları işbirlikçi öğrenmede sosyal medya sitelerinin kullanımının yararlarını gösterir. Bu grubun soruları Nı kullanımında eleştirel düşünce gelişimine odaklanmaktadır. Bunun yanı sıra NI kullanımının okullardaki çalışma salonlarını nasıl geliştirdiği incelenmiştir. Dahası, işbirlikçi öğrenmenin kişisel gelişimi geliştirdiğini göstermektedir. Son olarak, Akademik personel ve üniversite öğrencileri arasındaki öğrenme deneyimlerine katkıları incelenmiştir.

Genel bakış açısı soruları sosyal sitelerde NI kullanımının genel algısını ortaya çıkarmak ve katılımcıların cevaplarından sosyal medya kullanımının öğrenme amacıyla kullanımı ve öğrenme ortamına olumlu etkisini ölçmek amaçlanmaktadır. Ek olarak eğlence amaçlı kullanımlar göz önünde bulundurulmaktadır. Başka bir soru yeni işbirlikçi öğrenme ortamı olan sosyal ağlara ulaşmak amacıyla cep telefonu kullanımına odaklanılmıştır. Son olarak, sosyal ağ kullanımında işbirlikçi öğrenme için NI kullanım sınırlılıkları ve negatif sonuçlar olup olmadığına odaklanılmıştır.

2.3. Kruskal- Wallis Testi

Bu test 3 ve daha fazla eşleşme olmayan grubu karşılaştırmak için kullanılan parametrik olmayan bir testtir. Bu testi uygulamak için Prism ilk olarak tüm değerleri düşükten yükseğe sıralamış ve hangi grubun hangi değere sahip olduğuyla ilgilenmemiştir. En küçük grup 1 rankını olur. En büyüğü N rankını alır. Tüm grupların toplam değeri N'dir. Rank ve toplamlar arasındaki uyuşmazlık Kruskal-Wallis istatistiği adı verilen tek bir değerde toplanmıştır. Büyük Kruskal istatistiği toplamlar arasında büyük uyuşmazlıklar demektir.

P değeri şu soruyu açıklar:

Eğer gruplar kimliksel ayrımı bulunan nüfustan oluşuyorsa, deneyde gözlemlendiği gibi rank toplamlarının uzak düştüğü rastgele örnekleme şansı nedir?

Eğer P değeri küçükse rastgele örneklemeden ortaya çıkan farkı reddedebilir ve farklı ayrımları bulunan nüfuslarla sonuçlandırabilirsiniz.

Eğer P değeri büyükse veri size bu ayrımı oluşturan hiçbir neden vermeyecektir. Bu ayrımların aynı olduğunu söylemekle aynı sonucu vermeyecektir. Kruskal testi

küçük bir güce sahiptir. Aslında toplam değer 7 ya da daha azsa Kruskal testi daima P değerinin 0.05den daha büyük verir ve grubun ne kadar farklı olduğunun önemi yoktur.

Bu çalışmada Kruskal testi medyanların en az iki değerinin zıt olması ve simetrik verinin olmaması durumu, eğimli veri durumuna karar vermek için yapılandırılmıştır.

Kruskal Wallis testi ANOVA'nın tek yönlülüğüne zıt olarak parametrik olmayan bir testtir. Testteki verinin normal olması gerekmez ancak gerçek veriler yerine sorgulamada rank verileri kullanılır.

H0: Bir grupta tüm durumların eşit olması

H1:. Durumların eşit olmaması

2.4. Anova'nın bir yöntemi

Dalgalanma araştırması (ANOVA) bir çok örneğin ölçülebilir karşılaştırılması olarak tanımlanır. Çoklu gruplarda 2 bağımsız örnek için t testi nin artışı olarak düşünülebilir. Araçlar arasındaki önemli farkları ölçmek ve varyansları incelemektir.

ANOVA denemesi yorumu nüfus değişiminin 2 özgün yorumunun korelasyonuna bağlıdır.

ANOVA uygulanırken aşağıdaki öneriler gereklidir:

- Gözetimler özgündür.
- Normal dağılım her grubun gözlemlerinden oluşur.
- Her grubun aynı nüfus varyansı bulunmaktadır.

ANOVA mali yazılar ve iş uzmanlığındaki teknikler üzerinde kullanılır. Metod özellikle diğer parametrelerin kesin element etkilerine karar verirken ve test sonuçları oluştururken önemli veriler sağlar. Bu çalışma, ANOVA testinin tek yönlü olmasını farklı gruplar üzerinde kullanmıştır. Test araçların eşit olup olmadığını değerlendirmek için önemli bir veri sağlar. ANOVA testinin 5 önemli noktası şöyledir:

2.5. Bağımsız t-testi

Bağımsız t testi örnekleri iki grubun sürekli değişken değerlerini normal değişkenlerle karşılaştırır. Bağımlı değişkenin farklılığını ortaya koyan model 2 gruba ayrılan bağımsız değişken faktörüne dikkat çeker.

T testi ailesi t testi ayrımına dayanır, çünkü normal değişkendeki farklı ayrımlar t ayrımına yaklaştırır. T testi bazen öğrenci testi olarak da adlandırılır. Öğrenci kelimesi 1908 yılında W.S. Gosset tarafından yayınlanan makalesinde kullanılmıştır. T ayrımı yerel bir hapishanedeli sol orta parmağın uzunluk ve yüksekliğiyle ilgili olarak bu kavram ilk kez kullanılmıştır.

T testinin bağımsız değişkenleri tek bir özellik üzerine 2 bağımsız grubun gözlem ve ölçümlerini karşılaştırır. Bağımsız değişkenli t testi örneği tekrar eden ölçümler olduğunda ya da eşleşen gözlemler olduğunda kullanılır. (genç, yaşlı kardeşler gibi.)

2.6. Mann-Whiney u testi

Bu çalışmada parametrik olmayan test sonuçlarını bulmak için kullanılır. Görevi H0 hipotezini aynı özellikteki 2 test örneği (medyanlar ortak)ni ya da bir tarafa doğru gözetim eğiliminin fazla olduğu durumlarda kullanılır. Bu parametrik olmayan teste rağmen, 2 ayrımın şekli aynıdır.

Nx sayısında bir grubun, Ny sayısında da diğer grubun gözetimleri olduğunu varsayalım.

Mann-Whitnet testi farklı örneklerle iki değişkeni de test eder.

Medyanların aynı olduğu durumlarda her xi şansı eşittir. Örnek =0.5 olasılığı her y'den büyük ya da küçük olma olasılığı.

H0: P (xi>yi)= =0.5 ----- (1)
H1: P: (xi>yi) eşit değildir =0.5 ---- (2)

3. BULGULAR VE TARTIŞMA

Bu çalışma Odeh et al, Tashkent ve El- Jabri (2015) tarafından hazırlanan anketi kullanarak niteliklendirildi. Katılımcılar 1 (asla katılmıyorum) 2 (katılmıyorum) 3 (kararsızım) 4 (katılıyorum) 5 (kesinlikle katılıyorum) şeklinde puanlar kullandı. Seçimler onların yorum ve önerilerine göre değiştirildi. Testin güvenilirliği 2550 puanlık Cronbach Alpha kullanılarak 0.801 olarak hesaplandı. 3.1 güvenilirlik tablosuna dayanarak, AY 0.720den başlayarak etkiler sıralanmıştır. Bu sonuçlara göre, skalanın kullanılabileceği düşünüldü çünkü ölçümler kabuledilebilir sonuçlar vermektedir. Toplam skalada güvenilirlik her grupta 0.8'den büyüktür, bulgularımız bu sebeple testin güvenilir olduğunu ortaya koyar.

Tablo 3.1. anketin ölçükleri için güvenilirlik testi

Boyutlar	Cronbach's Alpha
SY	0.672
PY	0.620
AY	0.720
GB	0.620
Toplam	0.801

Tüm faktörler teker teker incelenmiştir. Tablo 3.2de gösterildiği gibi $p<0.005$ gibi önemli bir fark bulunmaktadır. Kolmogorov-Smirnov da p değeri normal şekilde dağılmamıştır.

Tablo 3.2. SY, AY, PY ve GB 'nin önemli değerleri

	Kolmogorov- Smirnov		
	Istatistik	df	Değer
SY	0.154	200	0.001
PY	0.112	200	0.001
AY	0.089	200	0.001
GB	0.069	200	0.022

GB ve AY arasında istatistiksel olarak bir fark vardır çünkü p değeri önemli seviyede azdır. Akademisyenlerde skor 82.90 iken öğrencilerde rank skoru 102.04'tur. Kruskal testi SY değeri için farklı sürelerde farklı sonuçlar alındığını göstermiştir. Sy

skoru 0-3 ay arası 31.17 , 3-6 ay arası 79.39, 6-12 ay arası 117.13, 1-2 yıl arası 79, 2-5 yıl arası 108.02, 5ten fazlası için 104.04'tur. PY değerinde de farklı kullanım süreleri farklı sonuçlar vermiştir. 0-3 ay 50.58, 3-6 ay 59.89, 6-12 ay 102.50, 1-2 yıl 94.50, 2-5 yıl 110.31 ve 5+ yıl 101.28'dir. AY değeri için farklı kullanım saatleri farklı sonuçlar vermiştir. 0-1 saat 62.33, 2-3 saat 106.19, 4-5 saat 105.85, 6+ saat 102.91. GP değerleri, 0-1 saat 68.26, 2-3 saat 95.60, 4-5 saat 111.31, 6+ saat 114.82. facebook kullanımı arasında x2 (5)=14.02 p=0.03 farkı vardır (a)= 0.05 Facebook kullanmayan akademisyen ve öğrencilerin rankı 103.70 iken, PY ile 105.51 sonucuyla akademisyenler, 99.21 ile öğrenciler gözlemlenmiştir. Gy skorunda akademisyenler 82.90, öğrenciler 102.04. Snapchat kullanımı x2 (5)=14.02 p=0.037 level (a)=0.05) snapchat kullanmayan akademisyenler ve öğrenciler 105.28 85.38 kullananlar. Skype kullanımı x2 (5)=14.02 P=0.032 (A)= 0.05) Skype kullanmayanlar 95.50 kullananlar 115.50'dir.

4. SONUÇ

NI, yeni konseptleriyle ekonomi ve dil gelişimi,coğrafya, fiziksel konum gibi konular için büyük önem taşır. Teknolojiyi kullanmak özellikle eğitim alanında eğitimi geliştirmek için önemli rol oynar, bilgi seviyesini arttırır ve öğrencileri daha kalifiye hale getirir. Yeni konseptlerin fonksiyonel standart ve modelleri çok fazla kullanılmamakta ve üniversiteler eğitim sistemleri için NI kullanımna yeterli donanıma sahip olmadığından başvuru yapmaya hazır değildir.

Bu çalışma Duhok üniversitesi öğrencilerinin bakış açılarını (Irak'ın kuzeyinde İşbirlikçi öğrenmede Nı ve Sosyal medya kullanımı) ölçmek amacıyla yürütülen ilk deneysel çalışmadır. Verilen çalışmanın açıklayıcı doğası katılımcıların sınırlı olması ve yazarın sonuçları genellemeden uzak olması durumuyla karşı karşıyadır. Ancak buluttaki katılımcıların düşünceleri ilginç etkileri göstermektedir. Gelecekteki kurumlar için böyle teknolojilerin önemli bir yeri vardır. Yazar inanmaktadır ki, büyük çabaların işbirlikçi öğrenmede ulusal düzeyde daha iyi bir anlayış sağlanacaktır.

CURRICULUM VITAE

Bashir Ali Saleh SALEH was born in Zakho, North Iraq in 1985. He received B.Sc. degree in College of Science Department of Computer Science from Duhok University in 2011. He started to M.Sc. degree programme in Van Yüzüncü Yıl University (Van, Turkey) in 2017 under the supervisor Assist. Prof. Dr. Recep ÖZDAĞ.

UNIVERSITY OF VAN YUZUNCU YIL
THE ISTITUTE OF NATURAL AND APPLIED SCIENCES
THESIS ORIGINALITY REPORT

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