



ADAMA SCIENCE AND TECHNOLOGY UNIVERSITY

SCHOOL OF ELECTRICAL ENGINEERING AND COMPUTING

DEPARTMENT OF COMPUTING

**FRAMEWORK OF KNOWLEDGE TRANSFER ON PREVENTION AND
CONTROL OF HIV/AIDS DISEASE FOR UNIVERSITY STUDENTS IN
HAWASSA UNIVERSITY**

By:

Abdu Amde

January 2018

Adama, Ethiopia

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Name of Candidate: Abdu Amde



A THESIS SUBMITTED TO DEPARTMENT OF COMPUTING OF SCHOOL
OF ELECTRICAL ENGINEERING AND COMPUTING IN PARTIAL
FULFILMENT OF THE REQUIRMENTS OF THE DEGREE OF MASTER OF
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CASE OF HAWASSA UNIVERSITY**

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Name of Advisor: Genet Shanko (PhD Candidate)



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DECLARATION

This thesis is my original work, and it has not been presented for a degree in any other university.
All source of materials used for the thesis have been acknowledge.

Abdu Amde Shkur

This thesis has been submitted for examination with my approval as university advisor

Genet Shanko (PhD Candidate)

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DEDICATION

I would like to dedicate this thesis work to my parents next to the almighty lord without whom not all this be possible.

ACKNOLEGMENT

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LIST OF ACRONOMY AND ABBRIVATION

HIV/AIDS	Human immune deficiency virus and Acquired immune deficiency syndrome
TB	Tuberculosis
HEW	Health Extension Workers
HEP	Health Extension Programs
TV	Television
ICT	Information Communication Technology
E-healthcare	Electronic Healthcare
HAPCO	HIV/AIDS Prevention and Control Office
KM	Knowledge Management
KT	Knowledge Transfer
KTMS	Knowledge Transfer Management Systems
PDA	Personnel Digital Assistance
SMS	Short Message Service
Ethio-telecom	Ethiopian Telecommunication
UNAIDS	United Nation program on HIV/AIDS
SP-I	Strategic Plan -one
SNNP	Southern Nation, Nationalities and People
G.C	Gregorian calendar
DSR	Design Science Research
RH	Rhesus blood Type
STI	Sexual Transmitted Infections
UNICEF	United Nation International Children Emergency Fund
IT	Information Technology
IS	Information Systems

Ms-Visio	Microsoft Vision
E- Drawer	Electronic Drawer
UML	Unified Modelling Language
WAMPP	Window Apache, MySQL, PHP and Perl or Python
SDK	Software Development Kits
JDK	Java Development Kit
JRE	Java Runtime Environment
IDE	Integrated Development Environment
AVD	Android Virtual Device
HE	Health Education
PHP	Hypertext Processor
MySQL	My Structured Query Language
DKT	Charitable non-profit Organization
LIFE 101	A book of real story about College Life
VCS	Voluntary Counseling's Service
TemariNet	Ethiopian College and University Students Network
PLHIV	People Living with HIV
CDC	Centers for Disease Control and Prevention
UNFPA	United Nation Population Fund
LIA	Live Impact Area
IFHP	Interim Federal Health Program

ABSTRACT

Most of the researches in knowledge management focus on the expansion of knowledge management systems, managing how knowledge is accessible and transferred. There are only a small number of studies on knowledge management, mainly knowledge transfer, in the different domain area such as business environment, agriculture, disaster management, university and industry. Hence, there is a need to further develop an appropriate understanding of knowledge transfer framework for health area and specifically for disease prevention and control.

The objective of the research is to design a framework for knowledge transfer about HIV/AIDS to enhance the prevention and control disease services among University students specifically in Hawassa University. To achieve this end, design –oriented research methodology is used. As a data collection and analysis techniques, qualitative method is used.

The study has two knowledge contribution, the first one is the proposed knowledge transfer framework that developed by integration different factors with knowledge transfer process in health sectors specifically for disease prevention and control service. The second is the mobile base application developed for practitioner to facilitate their work by taking HIV/AIDS knowledge transfer.

Finally based on the designed framework the study demonstrate to show how the designed framework work and evaluated by end user.

Key words: Knowledge, knowledge transfer, health education, HAPCO, frameworks.

CHAPTER ONE

1. INTRODUCTION

1.1. Background

Ethiopia is the second most populated country in sub-Saharan Africa with a population of about over 94.35 million [1]. Similarly, the number of health care sectors also increased. Currently, Ethiopia has taken important steps towards the spreading out of public health care center through the different regional states of the country. Over the past two decades, Ethiopians made impressive progress in the expansion of primary health care service coverage reaching most communities and house hold in need [2].

In order to achieve the millennium development goal of the country, the government tries to perform different tasks by organizing health extension program and make placement of health extension workers in different rural and urban area to ensure the demand for health care service and enhance awareness of health related issues in the whole community. Ethiopia organized the Health Extension Program in 2003 G.C, this program track by trained female health extension workers who deliver a package of 16 integrated community-based services, forms the pillar of primary health care [3]. The health extension program which is organized over 38, 000 Health Extension Workers both in rural and urban areas (Kebele) and the formation of the Health Development Army provided a unique commitment to ensure that health requirements of communities are encountered [2].

Currently, the health extension program provides different service to make awareness about healthcare services to the community [4]. For example, to control the distribution of communicable disease (HIV/AIDS and TB) and to make awareness about the non-communicable disease in the communities. The healthcare centers use different ways to transfer knowledge such as: radio, TV, template, posture and so on. So these all communication are very important for disease prevention and control however, not sufficient and suitable to teach and be accepted in the majority of the community [2].

In our community, way of knowledge transferring about health for the community is included in health education and promotion program. The health strategies and policies of Ethiopia has established and promoted the preventive interventions coupled with basic medical services integrated within the Health Promotion and Disease Prevention General Directorate as one of the major health program areas [2].

Ethiopia is one of the HIV/AIDS greatly affected countries in sub Saharan Africa, mainly because of vulnerable heterosexual exercise with irregular partner [5]. One of issues contributing to increased risk of HIV/AIDS between youth, particularly young women university students are lack of comprehensive knowledge about HIV/AIDS [4].

In addition to these, there are factors contributing to increased risk of HIV/AIDS among youth, particularly young university students. These are shortage of suitable counseling, deficiency of dialogue about HIV/AIDS. As [6] put this risk especially among students in Hawassa University due to practicing sex carelessly with societies outdoor the university campus, high prevalence of HIV /AIDS infection and unintended pregnancies between these students are also included in his study.

Therefore this study plan to design a framework on ways of transferring HIV/AIDS knowledge to prevent and control this disease. The researcher reviewed literature review and collected data from Hawassa University about current status and designed conceptual framework using selected knowledge transfer process, designed prototype to develop demonstration that show how to transfer knowledge about HIV/AIDS through ICT-Technology to students.

1.2. Statement of Problems

Most of the researches in knowledge management focus on the expansion of knowledge management systems, managing how knowledge is accessible and transferred [7]. There are only a small number of studies on knowledge management, mainly knowledge transfer, in the different domain area such as business environment, agriculture, disaster management, university and industry. Managing knowledge happens within a complex organized social background. There are social and human factors in the acquiring and transferring of knowledge which is established in the organizational culture and nature. “Given the role of technology in transferring knowledge, a true picture of knowledge is one where people voluntarily search, practice and implement

knowledge in the best interest of their organization” [8]. Educating people by transferring knowledge is the starting point of social, political and economic development serving as a basic tool to bring desired change in knowledge, attitude and skill to achieve development goals [9].

Hence, there is a need to further develop an appropriate knowledge transfer framework on the health sector especially on the disease prevention and control service. In Ethiopia there is no adequate guideline and sufficient framework that leads the expert to transfer knowledge to the university society about prevention and control different communicable and non-communicable diseases. In general in the Ministry of health disease prevention and control service is organized as a directorate in Federal Minister of Health of Ethiopia.

The Federal Minister of Health of Ethiopia started the Health Extension program including health education workers, trained to work mainly in disease prevention and health education on communicable(HIV/AIDS ,TB ,Malaria) and non-communicable disease to different part of community [10] . The program is expected to help accelerate the country’s progress in meeting Millennium Development Goal and reduce HIV/AIDS, TB, Malaria and other disease. Therefore transferring knowledge is the best alternative to change positively the individual’s concept, belief, behavior and practice to control many of the health problem in the community. One of health issue in Ethiopia is Communicable disease such as HIV/AIDS, TB, and Malaria.

As [2] put “Although general knowledge about HIV/AIDS is generally high (97% women and 99% of men), comprehensive knowledge is surprisingly low (19% of women and 32% men)”. According [11] about one half of all HIV infections universally happen between people aged 25 years and under. University students are the most susceptible group for HIV infection due to their feeling to be engaged in unsafe sexual behavior and their sense of resistance. As [6] put on his paper Hawassa University students, are active sex unwisely with people outdoor the university campus.

According to [12] absence of comprehensive knowledge about HIV/AIDS and sexual reproductive health issues and lack of appropriate counseling one of risk factor for university student. As [2] suggested on transferring of knowledge, there are different problems those are inadequate number of health education experts, insufficient strategic guidance that track health education intervention, insufficient experts in behavior change communication, poor empowerment of students to take health education in to their hand, low engagement of media and technology in health education,

lack of health education and communication skills of health extension workers, limited activities in identifying ,documenting and transferring practice for health ,limited adaptation and use of technology for health education and inadequate resource allocation for health education.

Therefore the purpose of this study is to design framework to enhance ways of knowledge transfer on prevention and control of HIV/AIDS in Hawassa University, as a prototype the study develop mobile phone base application .

1.3. Research Question

- Which knowledge transfer process step is suitable for health education to enhance disease prevention and control service in public university?
- What are the factors that affect the process of knowledge transfer on HIV/AIDS?
- How can the proposed knowledge transfer framework be designed in the way that can improve disease prevention and control service in public university?
- How the developed prototype can be evaluate by end user?

1.4. Objectives

1.4.1. General Objectives

The general objective of this research is to design knowledge transfer framework to enhance disease prevention and control services among University students specifically in Hawassa University.

1.4.2. Specific Objectives

- Conduct literature review to identify the gaps in previous related works.
- Collect data from research domain area.
- Identify factors and process of knowledge transfer to design framework.
- Develop prototype and demonstration to user.
- Nearby end user evaluate the developed system and end with some finding.

1.5. Scope of the Study

The research is delimited to only on knowledge transfer base healthcare application at the university level. Private universities and other healthcare service in the public university are not included. Besides these, the research is limited to address the knowledge transfer and prototype development using mobile technology at public university level for disease prevention and control service. In addition to this, the develop prototype shows only the way knowledge transferred for students about HIV/AIDS disease.

As a methodological approach, the research uses qualitative data collection and analysis method with design oriented approach. The data was collected from Hawassa University.

1.6. Limitation of the study

Furthermore, the study didn't include intelligent system, e-healthcare and other telemedicine related health care service. In addition to this the user is limited on mobile android technology to get transferred knowledge through android application.

1.7. Significance of the study

The major significance of this study is to transfer comprehensive knowledge to University students. And this study benefits health education expert/health extension worker in the way that transfer common knowledge on the HIV/AIDS and saving time and cost to transfer knowledge to the students. Students also benefit in getting comprehensive knowledge anywhere and anytime to improve their knowledge on prevention and control that help them to be safe. Finally, the study can benefit the expert to study knowledge transfer and related problem. Therefore to achieve the goal of this research a factors and process of knowledge transfer are identified and framework is developed which mainly gave mandate for health education expert/health extension workers to transfer HIV/AIDS knowledge. After all, the result of this study would be useful to students, health education expert and HAPCO directorate. In order to achieve the millennium development goal of the country the government to reduce the prevalence of HIV/AIDS.

1.8. Methodology of the Research

The methodological approach is at the highest level of complexity, where the actual methods, techniques and their underlying philosophies are articulated. A research methodology, therefore, refers to a collection of methods, techniques, assumptions and values regarding their use in a given research context [13].

1.8.1. Approaches

The dominant approaches appropriate with the positivist in IS research are the qualitative research approaches. A choice of a methodology is informed by the research problem, a research question, and type of data, data sources, format of sought answers and the required procedures of analysis [14]. For this research a combination of qualitative and design oriented research method are used for data manipulation and to evaluate the functionality of the prototype.

1.8.2. Research design

Design activities are fundamental to most applied discipline [15]. Several researches in different field including engineering and architecture have a long history with design oriented research activities. However, in the field of computing and information technology later it start in the late 1940s had took many of ideas, methods and concepts of design oriented research approaches that have invented in these other disciplines. The design oriented research paradigm highly appropriate to information systems research because it directly indicate two of the key issues of discipline [16]. One is the central role of IT artifact on information system research and the other one is observe lack of professional relevance on information system research [16]. According to [17] Design oriented research follows reasonable research paradigm that lead to create several innovative artifacts to solve real-world problems. In information system design science research is one of the design oriented approaches its result includes socio-technical artifacts such as modeling tools, decision support systems, software system development and evaluation. It is also applicable on several information systems areas such as information security, medical information systems, telemedicine, database, ecommerce, knowledge management, network information systems and others. As [17] explained design science research researchers in the information systems field has dramatically increased over the past 30 years. Publication opportunities have extended in the top

IS journals and the top IS conferences feature tracks devoted to design science research scholarship.

The methodology engaged here is design science research approaches, which is fundamentally a problem solving paradigm, to show the effectiveness of the proposed framework of knowledge transfer on prevention and control of HIV/AIDS disease to university student in case of Hawassa University. The six stages of design science research methodology [17] followed in this thesis work are identification of problem, Identifying alternative solution, concept design, demonstration, evaluation, and communication of research. Each steps explained below.

1.8.2.1. Identification of Problem Relevance

It is useful to define the specific research problem, and current challenges on way knowledge transfer for university students to prevent and control HIV/AIDS disease. It is used to teach and make aware the user through different data collection methodologies such as interview, document analysis, literature review, observation and group discussion. From the time when the problem definition used to develop an effective artifact solution, it is useful to solve the problem conceptually so that the solution can capture the complexity problems. Justifying the value of a solution achieves two things: it motivates the scholar and the audience of the research to follow the solution and to agree on the results of study and it helps to understand the reasoning related with the scholar's understanding of the problem. Resources required for this activity include knowledge of the state of the problem and the importance of its solution.

1.8.2.2. Identifying Alternative Solutions

Knowledge transfer had different alternative process so the research identify that from the literature and propose as the best one as a proposed solution. The object definition helps to indicate the possible and feasible solution for the problematic situation identified at the first step. Most of the time the objectives of a solution have taken from the problem definition. The objectives should be taken rationally from the problem specification. Based on problem specification and again the user requirement identified from the Gender and HAPCO stakeholders, students, healthcare professional justification, knowledge transfer provider (health educators) and healthcare center managers at university higher health center level.

1.8.2.3. Design and Development

It is a stage of creating artifact solution. Such artifacts are potentially, with each defined broadly, constructs, models, frameworks, methods, or instantiations [17]. This activity includes defining the required functionality of artifact and its structural design and then creating the actual artifact. In this study, there is knowledge transfer framework and prototype design are developed to prevent and control HIV/AIDS disease by identifying different factors that affect knowledge transfer process and the prototype design also shows the actual framework of the study work. The resource required to design this framework and prototype design brought from previous two steps.

1.8.2.4. Demonstration

In this step the research demonstrate the artifact/framework developed in the third step that will show the way designed knowledge transfer system will work and suitable to the user. It demonstrate the application of the framework to solve the problem. This could contain its use in testing, simulation, a case study, proof, or other appropriate activity. Resources required for the demonstration include effective knowledge of how to use the framework to solve the problem. In this study the demonstration is developed by taking HIV/AIDS prevention and control service as a case and develop an application using android mobile application and web server to show how the proposed framework and prototype design work for user.

1.8.2.5. Framework Evaluation

At this stage the researcher measure just how the artifact supports a solution to the problem. This activity contains comparing the alternative of a solution to actual observed results from use of the artifact in the demonstration. Depending on the nature of the problem venue that is lack of guideline and insufficient framework to transfer knowledge in the health sector specifically prevention and control service and the mobile application developed evaluation could include such items as a comparison of the mobile application functionality with the solution objectives from step two above(is proposed knowledge transfer framework application using mobile technology), performance measures, such as evaluation of usability and usefulness of the developed mobile application by end user is performed . At the end of this activity the finding is reported. In addition, the study uses some software engineering testing method such as: component

testing and integration testing, to measure the performance of the prototype of mobile application and web server.

1.8.2.6. Communication

This step communicate the problem and its significance, the artifact, its usefulness and uniqueness, the consistency of its design, and its effectiveness to researchers and other relevant audiences, such as committed professionals, when appropriate. In academic research publications researchers might use the structure of this process to structure the paper, communication requires knowledge of the disciplinary culture. In this study we communicated with Gender and HAPCO Directorate, Health Education expert and some students who come from Anti HIV/AIDS club to get some comment on developed prototype.

1.9. Organization of Study

This thesis is structured as follow: literature review to see the existing situation and needs for knowledge transfer process on prevention and control HIV/AIDS in University, and other different related concepts are described in section two, this chapter end up by proposing knowledge transfer framework. Data collection and analysis discussed encompassed in section three. The way knowledge transfer framework is designed for Hawassa University HIV/AIDS prevention and control Directorate, its descriptions of the components included in the fourth section. Prototype design, demonstration and evaluation involved in fifth section. Finally, section six, contain conclusion, summary and future work.

CHAPTER TWO

2. LITERATURE REVIEW AND RELATED WORK

2.1. Overview

In this section general concept about knowledge is discussed. There are two type of knowledge. These are tacit knowledge and explicit knowledge. These types of knowledge can be expressed by their behavior such as embedded, embodies, embrained and encoded. Peoples interact each other's in different area this interaction create conversion of knowledge from one mode to other this conversion is socialization, externalization, combination and internalization. Any types of knowledge should be managed in order to access efficiently. In this section knowledge management is described in different perspectives. The component of knowledge management also discussed such as knowledge, people, process and technology. The process of knowledge management also included those are knowledge creation, knowledge organization, knowledge transfer and knowledge applications. Knowledge transfer is a process of transmitting a set of information from one part of knowledge storage to another. There are many knowledge transfer processes have mentioned by researcher in several area. In this study there are four process which are selected like, knowledge acquisition, knowledge conversion, knowledge implementation and knowledge dissemination. In addition to this factors that affect knowledge transfer is identified such as organizational factor, individual factor and technological factor in this research perspectives Gender and HAPCO Directorate, Health Education team and ICT Technology respectively are factors that affect the knowledge transfer process. Depend on these factors some elements are selected for each factors. Finally related work is discussed in this study. Different papers are reviewed and several gap is identified on knowledge transfer then proposed framework are designed.

2.2. Literature Review

2.2.1. Concept of Knowledge

Knowledge is defined as a “justified true belief” [20]. It can be the state of understanding and knowing of process or object and also the capability to use information properly. According to [7]

collection of information and skills are considered as knowledge that acquired by a person through education, experience and understanding theory or practical subject.

As [21] suggestion knowledge can be classified in to tacit (personal) and explicit (codified) knowledge. Explicit knowledge could be represented as information by capturing and codified to store on documentation and database. Explicit knowledge has less value than tacit one in organization. Tacit knowledge is personal knowledge which is resided within human mind and it is difficult to disseminate and codified. This kind of knowledge is not found everywhere in book, manual and database [22]. But explicit knowledge have great positive effect to increase the performance of student in education sector [23]. Knowledge created by University, local community, government organization, healthcare center by interaction of people with in firm. This interaction could be contributed for the conversion of knowledge from one mode to other [21]. According to [21] tacit knowledge which exist in individual move to another individual by interaction each other in tacit mode is socialization, on the other hand codifying and articulated tacit knowledge by embodies document and report this process is externalization. Combination refers to systematizing or updating explicit knowledge in to other form of explicit. Additionally, individual could be acquired different knowledge by reading, learning, searching using technology for their personal knowledge this kind of process is internalization.

Knowledge can be located in different locations within organization [24]. One of that is organization artifact those are organization procedure and rule, technologies (repositories in website, system, inter organization networking, electronic device etc.). People can get knowledge from those source to develop their tacit knowledge in organization.

Knowledge are suggested by [25] from Psychological and Behavioral perspective. Such as a knowledge which is explicit represented by theoretical knowledge that allow to understand by individual. For instance scientific knowledge, rule, universe, nature etc...referred to embrained Knowledge. On the other hand knowledge which is acquired by person as a tacit knowledge to work or doing something refers embodies knowledge. Encoded knowledge represented as explicit knowledge which store in database to access by every one for scientific problem. And also, a tacit knowledge which have common understanding and belief among people is embedded knowledge. These all knowledge should be managed accordingly to be effective.

2.2.2. Knowledge Management Concepts

Knowledge management could be describes in different perspective of knowledge [24]. As [26] “Knowledge management can be seen as a set of techniques and practices that facilitates the flow of knowledge into and within the firm”. It can be strategic ways of discovering, capturing and transferring of knowledge at the right time and right people to achieve the goal of organization [27].

According to [28], there are different components of knowledge management to manage the knowledge efficiently. We have tried to describe the first component of knowledge management is knowledge. The second component of KM is people. The ability to thinking creatively and connect with their experience and talent make the human valuable to the source of knowledge. Most of the time people need to get knowledge, learn and change by it in addition to this they are interested to teach others their innovation and promote to new knowledge. So people are most important component to organization success. The other component is process. It is logical or mechanical artifact that used to show how the organization work is conducted. The last component of KM is technology. KM can be developed through technological solution because it is a significant enabler and initial element of a KM plan. Technology by itself cannot be making people share knowledge but if they are interested it can be facilitate the process.

Knowledge management is important for organization to create, organize, transfer and apply knowledge [28]. As [29] introduce, in order to manage knowledge efficiently KM tool are very important. Most of the time two elements are mentioned that refers KM tools those are technological infrastructure (computer, network, mobile etc.) and software application. All of these tools very are very important to create, organize, transfer and utilize knowledge and enable faster and easier process of KM in organization. There are different software application that can be used to store, retrieve and transfer such as repositories, virtual space and search engine. But mostly those tools should be include some feature of mobility in order to access the user anytime and anywhere whenever network access is not available. The usability of KM tools also greatly important for end users because those tools should be readily available and user friendly in order to access by user in their daily life.

Another concept of knowledge management is process of KM [28]. According to [28] there are different step in the process of KM such as knowledge creation, knowledge organization, knowledge transfer and knowledge applications. One of important and essential feature of KM is knowledge creation [21]. It is an activity that be perform in our daily life at work or social setting thorough humanistic means , technical or technological mechanism such as use video ,audio ,application ,internet etc. [29]. Now a days the ability to creating knowledge in an organization is essential to survive within a marketplace [30]. After knowledge has created in an organization knowledge should be organized in appropriate way in order to easily retrieved and accessed by appropriate users. That means main objective of knowledge organization is to permit for its retrieval. Otherwise it's difficult to retrieve and access knowledge in organization. Therefore the organization should be spend on organizing and managing knowledge within organization [31]. As [31] describe at this time most organization focus on intellectual asset rather than physical asset to their competitive advantage. In order to increase intellectual asset organization work on theoretical and practical education and training for their employee. But the problem is when employee leave the organization they take all their knowledge and experience. So the organization should be facilitate on transferring knowledge and experience from organization or former employees to new employees how to work the task, rule and regulation and risk that have to be care by new employees. Therefore knowledge transferring is very essential for maintaining and managing knowledge in organizations. The last process of KM is knowledge application. In many organization there is knowledge management to achieve their goal. In order to achieve their goal employees applied at different level of their activity [30].

2.2.3. Knowledge Transfer

Knowledge transfer is one of the process in the area of knowledge management [7]. As [32] introduce Knowledge transfer issues have attracted the attentions of many academic discipline such as health, education, marketing, management etc. The term KT is an activity that are undertaken to move from one interested individual or organization to another. Another researcher [33] has be defined the KT is “the process through which one unit (e.g., group, department, or division) is affected by the experience of another” for example KT is occur when a person buy a medicine from pharmacy pharmacist teach to user how to use medicine and what the patient should be care before and after medicine has taken. The process of knowledge transfer are enable as

knowledge experts or experienced persons in organization assist the less experienced or unaware person by teaching their skill and knowledge to help them by exciting certain tasks.

In recent literature description when the activity of knowledge transfer have been planned, we should consider five elements of KT [34] [32]. The first element is Audience. In order to transfer a knowledge effectively it should identify target need and behavior of target audience also understand specific problems that face on audience on their daily activity to give solution [32]. When we define target audience as [34] suggest the performance of audience to act on knowledge and how can they influence on their task should be consider. Second elements of KT is message. As [35] mention message should be clear, concise, consistence, compelling and continuous before disseminating to audience. When we are ready to transfer a message we should be consider the language of message as well as which information is most useful for audience. Effective message could show practical application of knowledge for the audience. The third element is Method. Its plan choose depend on audience and message to transfer knowledge [34]. The fourth element of KT is messengers. It is organization, person or group that transfer the knowledge to audience using different technological or non-technological methods. The trust of messenger is most important issue to transfer message effectively [35]. As [36] suggest in order to getting respect and trust form audience and good interaction with them messenger should be familiar with behavioral competency such as: patience, listening, humidity and flexibility. The last element of KT is evaluation. At this element the expected result have seen after transferring knowledge to audience. In order to get result we should be measure using material and tools that fit with audience and KT activity [34].

2.2.3.1. Process of Knowledge Transfer

Knowledge transfer is a process of transmitting a set of information from one part of knowledge storage to another. In order to say knowledge is transferred efficiently knowledge should be able to use and access by receiver [37] . According to [38] many knowledge transfer processes have mentioned by researcher in several different area. The process are discuss below.

The knowledge transfer process involved in [39] to enhance organizational learning process by transferring knowledge use five steps stages of knowledge transfer process acquisition, communication, application, acceptance and assimilation. Another researcher [40] follow four

steps of KT process initiation, implementation, Ramp up and integration for their intra-firm knowledge transfer model. Another four stage process of KT is use by [41] who aim to design KTMS (knowledge transfer management system) those are motivation, matching, implementation and retention. The paper written by [42] focus on inter-firm collaboration uses KT process by identifying source of knowledge to be efficient transfer process such as conversation , routing , dissemination and application. The process of KT in [43] paper consists Acquisition, Conversation, Application and Protection. The goal of paper is focus on measuring knowledge transfer success between ICT department and its clients. According to [42] KT process Conversion, Routing, Dissemination and Application are suitable to construct model for inter firm collaboration. It start by distinguishing the source of knowledge. A model that designed by [44] identify the process involved in knowledge transfer by using theory of translation and theory of communication. The processes are Awareness, Acquisition, Transformation, Association, Application, and Feedback. The five stage model of knowledge transfer for inter-firm in industries on the role of leader in the firms proposed by [45] and consists of knowledge transfer process such as Acquisition, Communication, Application, Acceptance and Assimilation. Another researcher [38] propose model to support disaster management uses different KT process that suitable with his study area such as Acquire , Convert , Implement and Store. He classified the process as pre-transfer and post-transfer. The pre-transfer processes are Acquire and Convert. The post-transfer processes are Implement and Store.

According to the [38], information the research tried to put all knowledge transfer process with their domain area by site their article to clear understand on knowledge transfer process on different areas. The process also classified in to pre-transfer and post-transfer.

Table 2.1 List of knowledge transfer process [36]

Construct			[46]	[45] [39]	[40]		[41]	[42]	[43]		[44]	[38]
		Pre-transfer construct										
Awareness										✓	✓	
Acquisition				✓					✓	✓	✓	✓
Transformation/Conversion			✓					✓	✓	✓	✓	✓

Communication		✓								
Initiation	✓		✓							
Implementation	✓		✓	✓	✓					✓
Motivation	✓			✓	✓					
Matching	✓			✓	✓					
Routing	✓					✓				
Search										
		Post- transfer construct								
Association								✓	✓	
Application	✓	✓				✓	✓	✓	✓	
Feedback								✓	✓	
Protection							✓			
Acceptance		✓								
Assimilation		✓								
Ramp-up	✓		✓							
Integration	✓		✓							
Retention				✓	✓					
Dissemination						✓				
Store										✓

According to the above analysis the flow of knowledge is not commonly defined. It differ depend on their domain area. It may make the transfer of knowledge unclear and complex for organization. In this analysis of KT process most researcher use Acquisition, Conversion, Implementation and Application as a common elements for their knowledge transfer model and the research select from

the above processes are acquisition, conversion, implementation and dissemination are suitable with our study. And designed as shown below in the figure1.

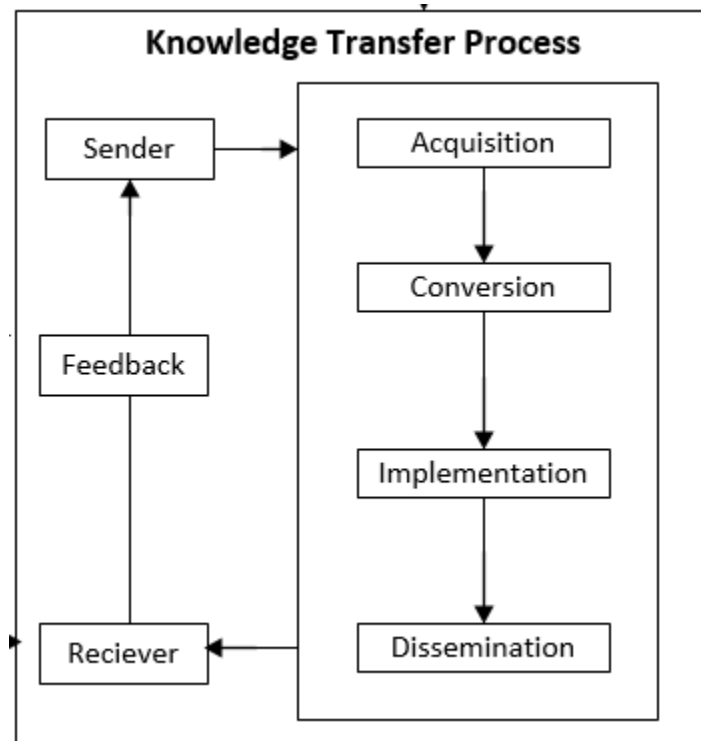


Figure 2.1. Knowledge transfer process adopted from [38]

2.2.3.2. Factors Affecting Knowledge transfer process

As stated by [47] there are different factor that affecting knowledge transfer process such as Individual, Technological and Organizational. When we come to individual factors, the process of knowledge transfer is affected by both transmitter and receiver [48] . According to [49] the influences of knowledge transfer practice are behavior, intension, attitude of transmitter and receiver. From the receiver side, [50] stated the receivers should know there is shortage of knowledge on their mind and expected to get knowledge from knowledge owners. Factors that influence to receivers are interest to seek knowledge, ability to ask question [50], ability to engage and apply knowledge, ability to deliver feedback to the sender [49] and sender- receiver personal relationship [51]. On the sender side some factors also available that influence on knowledge transfer practice [49] those are afraid of responsibility, job security [52], information privacy , ego [49], knowledge distribution skill and experience , shortage of resource and sender–receiver personal relationships [51].

Other factors that affect knowledge transfer practice on organizational levels are insufficiency of expert [53] , absence of clear policies [54] , inadequate motivational helps and misappropriate measurement methods, work with others [55]. The last factor affecting knowledge transfer practice is technology. This factors involved ICT application [56], ICT infrastructure [57], ICT experts and ICT policies [58].

2.2.3.3. The effect of ICT on Knowledge Transfer

The term ICT include any products that can receive, store, manipulate, retrieve or/and transfer information by electronic means in a digital form [59]. Additionally, ICT can transfer a wealth of knowledge to many learners, and enhanced the speed and style of knowledge consequently improving understanding. There are several types of ICT used to transfer knowledge among peoples such as computer, PDA and mobile. The major strength of mobile compare to other ICT device are their ubiquitous nature to facilitate knowledge transfer process [60]. Moreover their contribution on educational purpose already been recognized. Most students uses today PDA mobile phone so it's easy to transfer knowledge through mobile technology [61]. Mobile technology can facilitate knowledge transfer process by resolving place and time restriction. [62]. Some features and service that identified by [61] important to support knowledge transfer are voice, SMS, geo positioning, Mobile App. There is developing universal trend in connecting mobile phone technology for disease prevention and control, disease surveillance and behavioral change [63]. According to [64] in Ethiopia access to mobile phone technology is dramatically increased. The development of facilities in different rural area has made them a favorite way of communication. Ethio-telecom is the only provider of telecommunication service at the national level. It has been 85% of national coverage of mobile signal is expected to expand mobile phone across country. According to the organization in Ethiopia there are over 40 million mobile phone subscriber in July 2011 [65]. This indicates one third of Ethiopian people use mobile phone. It is because of easily accessible and widely accepted the number of mobile phone users increased [64]. Among mobile phone users, university students in different area consider their mobile phone as primary device. This device is essential for keeping in contact with their parents, to get emotional support and ask some advice, safety purpose [60]. The application of mobile phone is essential for different health interventions [66]. The function of mobile phone in health sector is for short text massage, reminders for People Living with HIV/AIDS, increased clinic attendance after missed appointments, increase access to health information and behavioral change, enhance the capacity

of health extension workers, disease prevention and control, disease surveillance, behavioral change and provide health information to the general public (health education) [66]. In addition to the practice of ICT such as Mobile technology in supporting knowledge transfer process, the use of ICT for purpose of disease prevention and control in organization are affected by many factors. These factors are ICT policy [67], ICT application [56], ICT infrastructure [58], ICT awareness [67]. ICT policy refers to and written or unwritten rules, regulation, procedures and a ways of accessing ICT infrastructure for the purpose of transferring health knowledge to prevent and control disease in organization, ICT infrastructure is ICT device and facility such as: server, PC, mobile device, network, internet and so forth the used to running knowledge transfer activity. Mobile device support health education to prevent and control disease and transferring health information [68]. ICT application generally refers to software used to enable ICT device to transfer knowledge [56]. ICT Application can be Android Application to enable mobile device to transfer health information. ICT skill refers to the ability of user to access the ICT technology [67].

2.2.4. Health Education

The health status of its people is one of the significant factors of a country's development. In developing countries there have been low health facility, consequently health problems of these countries are increase and their people are open to many health risks. Main causes of this problem is people lifestyle, harmful health behavior, attitude and practice, depending to this point health education in best choice to change the people belief, behavior, concept and practice positively to handle many health problem in the community [4]. As [69] defined health education is "A combination of learning experiences designed to facilitate voluntary actions conducive to health." Health education should be clear, measurable, applicable and current. Health education programs should be enrolled starting from existing health problems when planning health education programs. There are different activities on health education program some of them are enable people to get clear and accurate information and improve their ability to reach at exact decisions and enable the people to comprehend the objective condition of the problems, analyze the problems and put them in precedence order. As result, this activities generate opportunities and enable peoples to get solution for their own health problem, Encourages people to converse freely and honestly, counsel the people to use fully the available health services [4]. According to [69] most

of the time health extension worker are responsible to enable health education service in different setting such as communities, health care facilities, work site, prisons and universities.

2.2.4.1. Health Education in University

As [70] puts in 2014, University health education expert are increasingly worked with lecturing the serious health issues for university students using population-level, primary prevention strategies to create computable improvements in student's health behaviors and health status. Addressing students health issues concerning sexual health, use of alcohol and other drugs, unplanned and planned hurt and students' quality of life through chances to occupy in wellness improving behaviors is increasingly appreciated and supported by management. There are more participants to educate health and wellness than ever before and in turn there are more chances to create interactions to form a healthier setting and student body. In university health education is very significant to be able to identify the Practices that cause, treat, or prevent and control different disease like HIV/AIDS , TB ,Malaria and others infectious and non-infectious disease [69].

As suggestion of [71] on his blogs in Ethiopia ten years ago number of students who join universities 15,000. In 2012 this number is dramatically increased by many fold, at this time the number of students are increased. Most of students moved far from their family homeland with all implication of their sexual and reproductive health. So the chance to increasing prevalence of HIV/AIDS is higher than other disease. In order to solve this problem DKT Ethiopia promote social network some years ago called TemariNet.com and enhance the health education activities in universities. The site engaged not only HIV/AIDS, it give different service for students. Lastly there is some factors that affect the health education activity. According to [72] skill and experience of health education expert is one part of factors.

2.2.5. HIV/AIDS Prevention and Control Office in University

In recent time HIV/AIDS is the major public health anxiety in the world especially Sub-Saharan African region most seriously affected by this virus. There are over 34 million people were living with HIV virus in the world [5] [73]. Ethiopia is one of the Sub-Saharan Africa country which strictly affected by HIV/AIDS pandemic. Over 1.2 million people are living with this virus among them young people mostly affected. According to [5] the prevalence rate HIV/AIDS in adult

people are 1.3% with 0.9% of male and 1.7% of female and also 2.9% among young people are the age range among 15-24 year. Due to physical, social, psychological and economical attribute young people are more susceptible to HIV/AIDS disease [5].

As [74] [75] describe University students are most vulnerable because of their age, the place where they are living and spend far away from advising and supervision of their family. Most of university students are occur at fire age so it pull to follow their sense with naked eye due to this most student enter in risky sexual practice by commercial sex without using condom. The place where universities are located have effect on students' life style. Most of the time around university different business start to serve students but some business part are dangerous to students for example selling chat, cigar ate, alcohol, cocaine, nightclub, pension, tourist etc. All of those are problems that can change the life style and behavior of students. In addition to this their friends who live with them also have effect on the goal of ethical students' especially female students by showing expensive cloth, makeup, jeweler etc. The students fool by this material and decide to start sexual relationship with men outside university environment to fulfill their financial need and facilitate their comfortable life.

In order to struggle the prevalence of HIV most governmental and non-governmental organization like UNAIDS uptake movement on prevention and control of HIV/AIDS [5]. According to report of [76] in Ethiopia there is strategic plan start from 1998 and for three connective years five year strategic plan and framework prepared by government for example SP-I(2004-2008), SP-I(2010-2014), SP-I(2015-2020). Federal Minister of Health has been open the office of HAPCO at federal level under Disease Prevention and Control Directorates and this office also delegate its responsibility to regional HAPCO office like Addis Ababa, Amhara, Oromiya, Tigray and SNNP etc. And uptake in each governmental and non-governmental organization like Healthcare center, University, Business Center. Hawassa University HAPCO directorate establish in 2007 G.C. So as to organize and activate the whole activities and efforts of HIV/AIDS prevention, control and care and support program of the university [77]. HAPCO directorate have different responsibilities on their activities those are recommends strategy, procedure and policy on university HAPCO affairs, control the whole HIV/AIDS issues in university shared with vision of the university management team, plan the overall direction the university HIV/AIDS activities, promotes and makes awareness on the HIV/AIDS issues to the university students, create HIV/AIDS resource

center and link with other national resource center , support the continuing HIV/AIDS education activities , upgrade and strengthen HIV/AIDS and sexual reproductive service , establish social market to promote use of condoms correctly and concisely , support the student by conducting monitoring program to become successful in their campus life , use social media and public health message [78]. HAPCO directorate work with Health education team to create awareness to the university students, most activities worked by health extension worker who work in Health education office [77].

2.3. Related Work

Vito Albino [45] investigated Knowledge transfer to referring customer–supplier relationships in industrial districts. The components Knowledge transfer process also described. The model also proposed to improve the success of knowledge transfer by analyzing how can it modify the nature of knowledge and adopt several type of supply relationship by leader-firm of industrial distinct. The proposed knowledge transfer process model include acquisition, communication, application, acceptance, assimilation. In addition to those component of KT process they include actors, context, content, and media that can be express also influence the knowledge communication between two or more actors.

Chong Mahn Ling [79] identifies key factors affecting cross-border knowledge transfer on participation of employees. Based on focusing study area selected companies from several development region of Iskandar and there are ten hypothesis are raised. Using ten independent variable (Individualism/collectivism, power distance, uncertainty avoidance, affective/neutral, achievement/ascription, and monochronic/polychronic, trust, attitude, social support, and facilitating conditions) and one dependent variable (Participation in cross-border knowledge transfer) comprehensive research framework is developed. Finally the hypothesis of study is tested by distributing some questioner from different targeted companies. The study used additional questioner and targeted company to test hypothesis effectively.

Nguyen Duy Toan [80] investigate the role of ICT in small business of Vietnam to process knowledge transfer and identify factors that affect knowledge transfer including characteristics of small business and some factors that related to ICT. ICT based knowledge transfer framework is suggested that support small business manager to plan and implement the strategy of ICT on

knowledge transfer. Using qualitative research methodology, the research select three different size of small IT retailer as a case and employed approach of case study with several case strategy. The study also use semi-structural interview, reviewing ICT artifact and analysis documents of company as form of data collection. The result of interview are analyzed with case study to test and refine the suggested framework. Finally the research conclude as the suggested framework could be provide an understanding of ICT and assist manager to forming ICT strategy to transfer knowledge. The researcher also mention some future work such as to test a framework widely on additional small ICT retailer industry, by developing practical method assess and measure the level of the knowledge transfer practice in small business.

The work done by Sulfeeza Mohd Drus [81] attempted to understand the challenges of university student in managing their organization and knowledge transfer framework are proposed that support students to transferring knowledge in structural manner dividing in to six phase identification , planning , Execution ,Build-up , Institutionalization and Documentation. The research also accepted qualitative research methodology using semi-structural interview to collect a data from different member of student organization. Finally the paper present applicable knowledge transfer framework that can be implemented by appropriate students in organizing the fresh elected office carriers of student organization in employing their role and responsibility

In the study of Kamarul F Hashim, [46] conceptual knowledge transfer model is suggested for flood management in Malaysia. The study also use methodology in three phase, first propose Knowledge transfer model, validate and finally evaluate the model. In this study knowledge transfer models are integrated to represent multi-interaction process between stakeholders. Those stakeholders are expert , victim and agencies with their own knowledge transfer process model, then finally conceptual model of knowledge transfer are proposed that include conversation ,routing , disseminate and application. The proposed model useful for stakeholders to understanding the process of knowledge transfer and disseminated different information involved in flood management of Malaysia. The study also intends to develop robust knowledge management systems for organization to managing disasters as a future work.

The aim of Bedman Narteh, [42] paper is to develop theoretical model of knowledge transfer between developed- developing country based firm. Massive literature on knowledge transfer in inter-firm collaborations has been revised. Depend on the result of review knowledge transfer

model are proposed that could be distinguishes the sources of knowledge to be transferred and the previous knowledge transfer model from the transfer process. The framework presented arrange for a vast understanding of the characteristics of sender and receiver as well as their communication and the effect knowledge transfer across firm borders. The study also put conversation, routing, dissemination and application as knowledge transfer process.

The purpose of Champika Liyanage, Taha Elhag, [44] paper to propose knowledge transfer process model using theory relating knowledge transition and communication. The study use gaining for innovation and knowledge transfer as research methodology. According to model which developed for knowledge transfer process involved six phases Awareness, Acquisition, Transformation, Association, Application and Feedback. The proposed model is the combination of two theories such as knowledge transfer process act as communication to communicate and consult actively to teach others what they know and Knowledge transfer process act as translation to change shape, form and appearance at the receiving end.

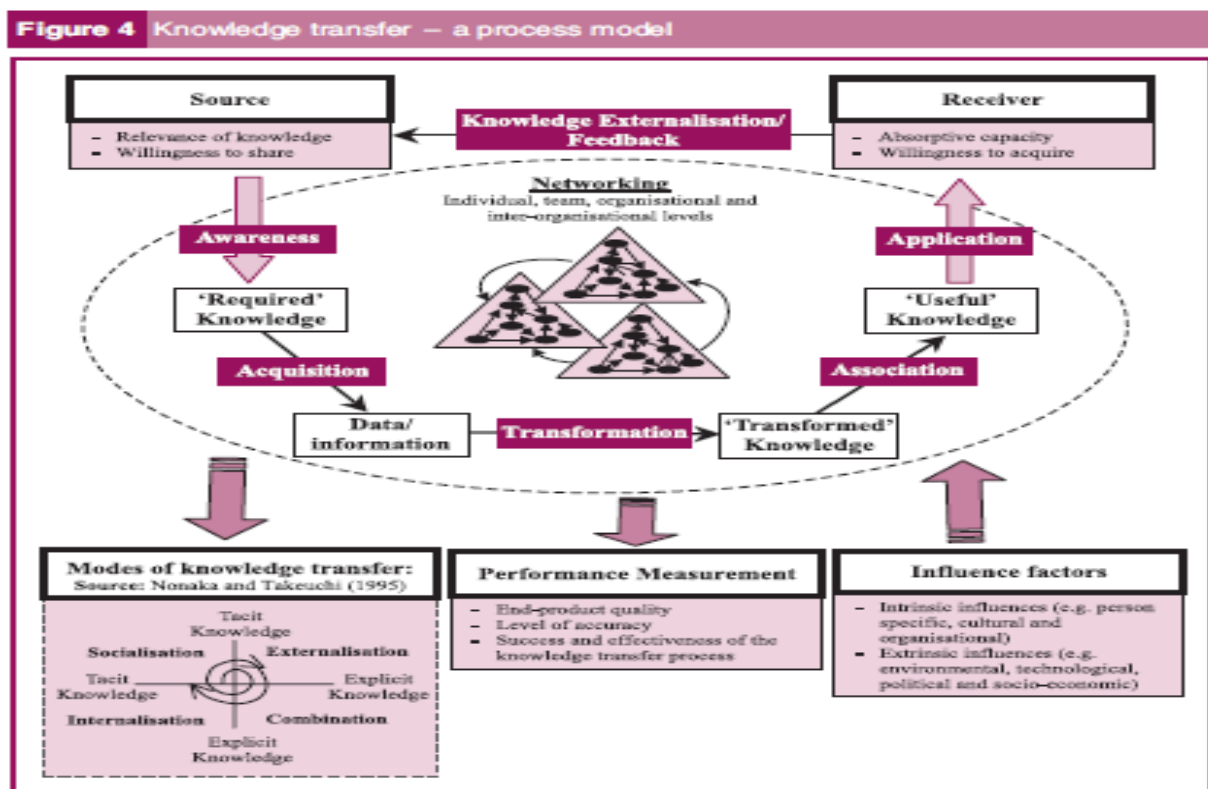


Figure 2.2. Knowledge transfer model cited from [44]

The aim of Hasniza Yahya [38] is identify common and essential process in implementation of knowledge transfer from multiple sender to a receiver. This study extract the real process from literature review and present model. The processes are identified as: acquire, convert, implement and store. The study proposed model using identified process. This process expected to enhance the correctness of knowledge transfer which will lead to enhance decision making.

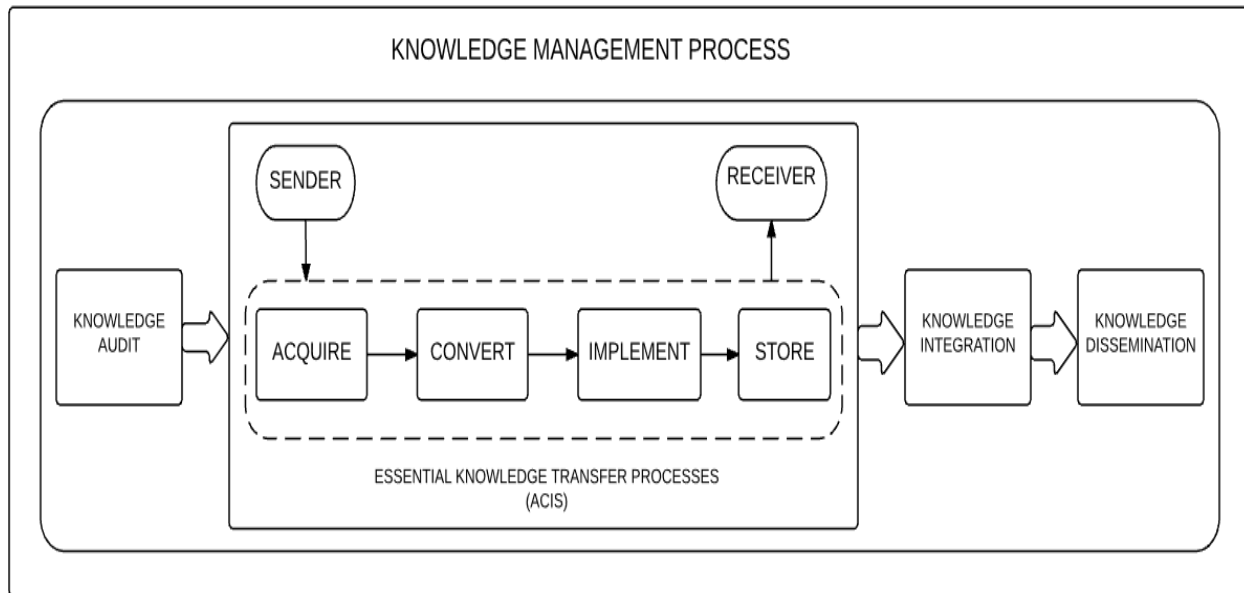


Figure 2.3. Knowledge transfer process model cited from [38]

The table below tries to summarize the main paper related to our research work

Table 2.2. Summary of Related Work

Author and Year	Title	Methodology and Technique	Finding and Result	Steps used in KT-Process
Vito Albino (1998)	Knowledge transfer and inter-firm relationships in industrial districts: the role of the leader firm	Qualitative representation Techniques	Develop a Model to increase the effectiveness of Knowledge Transfer	• Acquisition • Communication • Application • Acceptance • Assimilation

Nguyen Duy Toan(2013)	Using ICT for knowledge transfer in small businesses: A Vietnam Case Study	Interpretive and Qualitative Research Approach (Semi structural interview , Document Analysis and Reviewing ICT Artifact)	Design a Framework of Knowledge Transfer in Small Business	• No Knowledge Transfer Process • It use Method to use ICT
Sulfeeza Mohd Drus (2015)	Formulation of a Knowledge Transfer Framework For University Student Organizations	Qualitative Research Approach(Semi Structural Interview)	Design a Framework	Combination of components rather KT-process • Identification • Planning • Execution • Build-Up • Institutionalization • Documentation
Chong Mahn Ling (2015)	Framework for Effective Cross-border Knowledge Transfer	Qualitative Research Approach	Develop Framework	Combination of Dependent and Independent variables
Hasniza Yahya (2016)	Essential Knowledge Transfer Process Model to Support Disaster Management	Design Science Research Methodology	Develop Knowledge transfer Model for disaster Management	• Acquire • Convert • Implement • Store

Even though attention in knowledge transfer research has increased in current years, there still happen numerous issues which is need to be further studied. There are only a small number of

studies on knowledge management, mainly knowledge transfer, in the different domain area such as business environment, agriculture, disaster management, university, industry. Furthermore, as previously discussed, framework and models are designed for all the above domain. Hence, there is a need to further develop an appropriate understanding of knowledge transfer on the disease prevention and control issues. Former researchers focused on the design and develop only framework using knowledge transfer process rather design prototype, and all researchers use different knowledge transfer process that suitable for their domain area. Finally, most of the previous researcher attempt to examine lightly the factor affecting the process of knowledge transfer by technology rather than examine the factor of technology like mobile phone.

This study attempted to fill in the above gaps by providing practical understanding of the knowledge transfer process on disease prevention and control issues for university students , specifically on the HIV/AIDS disease because most young students are sexually active , so they are near to fall on this disease. More specially, the overall aim of this study is to develop a framework of knowledge transfer on disease prevention and control for university students using mobile application in order to transfer a comprehensive knowledge about HIV/AIDS disease. In addition to this knowledge transfer process is proposed such as Acquisition, Conversion, Implementation and Dissemination and feedback. The descriptions of this proposed knowledge transfer process.

Table 2.3. Description proposed Knowledge Transfer Process elements

Essential Process	Description	Pre/Post Transfer
Acquisition	The ability to get the appropriate knowledge from the sender [38]	Pre transfer
Conversion	The ability to convert different term in to common term understood by all parties [38]	Pre transfer
Implementation	The ability to transmit knowledge using ICT-Channel [38]	Pre transfer
Dissemination	The ability to distribute knowledge to receiver	Post transfer
Feedback	The ability of response from receive to sender	Post transfer

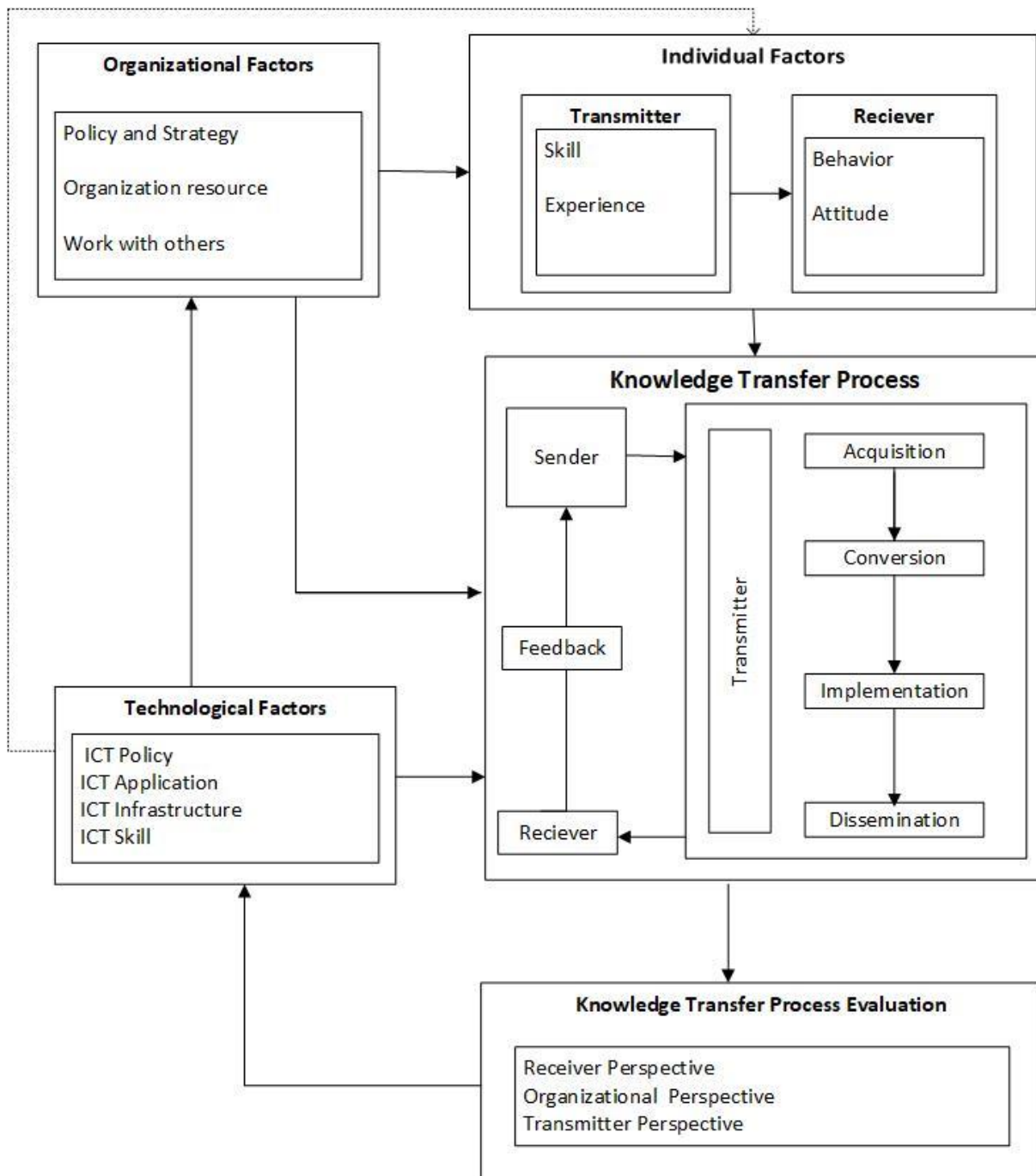


Figure 2.4. First Proposed Knowledge transfer Framework

CHAPTER THREE

3. RESEARCH METHODOLOGY

3.1. Overview

The research methodology is the organized way to solve the research problem [16]. In this study different method, related researches and background concepts have been reviewed through literature review and selected accordingly.

In this section the data collection, data analysis and tools and techniques used for sampling are briefly discussed. In addition to this tools and techniques also discussed in this section. Finally we are included the first and the second steps of design science research are discussed such as identification of problem and alternative solution respectively.

3.2. Sampling techniques

Sampling implies the selection of representative units of observations from an otherwise larger and unmanageable research population [13]. Depending on the type of research population, a researcher chooses between probability and nonprobability sampling methods.

Under probability sampling, research subjects are selected from a research population whose number and identities are known to, and reachable by, the researcher [14]. This method is used “to make relatively few observations and generalize from those observations to a much wider population” [13]. The random selection of participants from a known list of population elements is often appropriate under this method. The number of elements that make up research populations of experts of the area and students in Hawassa University is not in a single non-shifting location in known fixed numbers. Hence probability sampling techniques are not appropriate for this thesis. The non-probability sampling method, on the other hand, is based on the selection of the Not-readily identifiable subjects of observation, from an identified research population [82]. As such, participants are selected using “non-probability Techniques relying on the judgment of the researcher...” [14]. A number of Non-probability sampling techniques purposive sampling is applied in this thesis.

3.2.1. The Purposive Sampling Technique

The purposive technique is used according to the researcher's judgment and aim of the study, to "select units that are representative of the population" [82]. The technique is applied mostly when a researcher has clear characteristics of the participants needed. These characteristics are used to target a small representative subset that will enable a reasonable element of generalization about the target population [13]. Under this technique, the researcher only goes to the populations that are most likely and prepared to supply the required information [83]. For this thesis, the Gender and HAPCO Directorate, Health Education experts and students in local universities (Hawassa University are identified as the research populations). Accordingly from each the study select using purposive sampling to make an interview.

3.3. Data Collection

Data collection techniques in qualitative research include simple observations, participant observations, basic individual interviews, in-depth interviews and focus-group interviews [82]. Participant observation offers an insider perspective of the investigation because the researcher becomes a member of the group being observed [13]. This level of intensity in an observation is necessary when emotional and psychological determinants of behavior that cannot be fully understood through outside forms of observation, are observed. In contrast, simple observation that includes the viewing of personal documents, actual observance of people's activities and recording them. In this thesis, basic individual interview performed with Gender and HAPCO Directorate, Health Education expert, and students.

The secondary data is selected from the university higher clinic and Gender and HAPCO Directorate annual report, articles, different broacher, template, working manual and internet. Firstly, all the annual report of University Higher Clinic (Health Education office) and Gender and HAPCO Directorate with in Hawassa University covering years 2007-2015 G.C provided useful information about the process of transferring knowledge about health and student behavioral change. Lastly, we observed for more information about the way of transferring health information through the ICT technology. These secondary data can support our primary data.

The primary data is collected over three interviews with these particular responder. After selecting the samples of research, the study planned the direction of interview in the easy of the proposed framework (**table look on appendix-1**). As indicated above, these interviews are designed as semi-structured interviews, which is one method of qualitative interviewing. The researchers designed a list of question covering several specific mater [84] [85].

Whist basic interviews can only scratch the surface in terms insight depth. For a deeper understanding of the dynamics of usage and limited usage of HIV/AIDS service by students Hawassa University, interviews are held with selected samples of students in the university. The sampling of student's participants per department. Twelve Students are selected across the university in the Hawassa University to interview between August 05 and August 10 2017.

The responses to interview requests from the majority of a students at the University of are not positive. This was largely due to the timing, as the interviews clashed with exams of summer students and the vacation of regular students. Therefore it was difficult to secure a substantial number of interviews. Only 2 students, from the anti HIV/AIDS club the (selected on the basis of they are member of the club), and one from Gender and HAPCO Directorate and one from Health Education expert, were interviewed at Hawassa university main campus.

1. Health education experts: we manage to communicate with health education experts have knowledge about HIV/AIDS.
2. Gender and HAPCO coordinator: in this context there are two types of coordinators. First, health professional who work on HIV/AIDS disease knowledge and second expert who work on gender issues.
3. Anti HIV/AIDS Club: those are students who get detail training from health education and Gender and HIV/AIDS Directorate and transfer their knowledge to the remaining students.

According to the interview guideline, the interviews ongoing with introduction with the purpose of the study and asked for the personal information of the interviewees such as working years and educational background. Afterward, the interviewers continue by starting our research problem and described our research purpose to them. Then, the interviews were directed by asking 9 open questions which enclosed different parts of our proposed framework (**table look on appendix-1**). We were unable to ask all of these questions in each interview because sometimes the response of

interviewees' covered several questions and some interviewees' were not concerned the question because of their profession. To manage with that, we continued the discussion with new question created during the interview. This is also the condition considered in the semi-structured interview. This method is flexible for unexpected answer [84] [85]. The interview guide aided us managing the process of interview and motivated our interviewees to talk about a lot of significant problem. All of these data abstracted in our experimental data and some key sentence of interviewees cited directly. All interview was conducted in the interviewers primary language – Amharic, which took on the average 30-40 minute and the response are written. Considering the experience of interviewer which influences the full of answer and question, we also use secondary data to fulfill the data collection.

The main focus when data are collected are the following. Ways of knowledge transfer activities on to make detail awareness for students in their campus, their most unique contribution on knowledge transfer activity, how they adjust their knowledge transfer style to less-motivated students, tools they used to transfer HIV/AIDS knowledge, their thinking about the contribution of ICT- Technology, the main challenge they faced during their activities and the technology that they require for their knowledge transfer activities if its implemented. Knowing those elements help to build the bench mark for our Knowledge transfer Framework.

The interview also focused on importance of transferring detail knowledge about HIV/AIDS to students , what effort are done , how the university concerned bodies work on knowledge transfer activities , in terms of technology used and transfer techniques applied.

3.3.1. Interview with the Gender and HAPCO Directorate

Some insight are found from Gender and HAPCO Directorate of Hawassa University. Even though they used some methods like mentoring technique, organizing HIV/AIDS resource center, broacher, pamphlet and books on different students celebration days like HIV/AIDS day, Gender Day, Color Day, and Culture Day, Fresh welcome day by preparing other ceremony like music and dance program. But they cannot transfer detail knowledge to student due to time issues and resource shortage.

As we have asked Gender and HIV/AIDS Directorate which is countable for University president about the role of directorate and how they are working together with other team and students on prevention and control of HIV/AIDS in main campus. They answered directorate office was established in 2007 G.C to coordinate and mobilize the overall activities on HIV/AIDS prevention, control and support program in the campus. They have objective on capacity to manage the HIV/AIDS pandemic, implementation of prevention program and activities, development of teaching appropriate skill on HIV/AIDS and mainstreaming HIV/AIDS in all activities of the university. They also use tools to transfer knowledge about HIV, STI and RH and prepare resource like AIDS resource center (free broad band and wireless internet service), magazines, brochures, posters from different partners and distribute among university community. They also work with health education professional on the practical training and some counseling service for student and they work with Anti HIV/AIDS club by selecting some students for mentoring service, they also work with student council and mini media to promote their program for the whole students. External collaborator is Federal HAPCO, SNNPR health Bureau, UNICEF, DKT Ethiopia etc.

3.3.2. Interview with the Health Education Expert

Student higher clinic has a health education worker team who worked on make awareness for students about different disease prevention and controlling methods. It is interesting work, in which the team collaborated with gender and HAPCO Directorate to transfer different practical knowledge for students. This collaboration is done that, Gender and HAPCO directorate bring their request to health education team to give some training for students and the team ask them on which part of their activity the team focus. After the requests are accepted, the team think about how can they train the students and prepare training that suitable for students. But in the training the participant students are very less and it is too short time.

The health education experts also asked about their resource from where they got their knowledge, they got their resource from past education book, Gender and HAPCO Directorate resource and internet. According to experts they use internet to prepare training guideline to train mentor students. The students also informed us that they got their knowledge from training, AIDS resource center and internet. Most of the time they accessed HIV/AIDS resource center to get more knowledge about HIV/AIDS.

The main challenges that they faced during health knowledge transfer activities most of the time the students don't want to spend their time on HIV/AIDS training and they are afraid to attend this kinds of program. They focus on social media rather than reading different books and pamphlets and also they thought sex issues. From the expert point of view some resource are available manually and technological based like the journey LIFE 101 different part book , pamphlet , brochures and temari.net web site in resource center but the problem is student cannot take some of resource to their dorm due to shortage of resource.

3.3.3. Interview with Students

Mentor students who work in anti HIV/AIDS club in Hawassa University are interviewed. Based on sampling technique participant are chosen and extending to others by asking how they are getting knowledge about HIV/AIDS by whom and how they are transferring this knowledge to students. First by raising the knowledge they got from health education expert in different practical training. Second by reading from HIV/AIDS resource center and finally they make awareness to students in dorm, café and class at leisure time by discussing with students.

3.3.4. Overall of interviewee

The next point discussed about the interviewee comment on the effectiveness and functionality of their knowledge transfer process in general. Most of them respond this question that it's poor because they cannot get many students at anytime and anywhere to transfer detail knowledge about HIV/AIDS and most of students don't want to spent their time on training and hearing about this kind of information.

Another question we raised for the whole interviewee is that what they think if ICT- Technology is implement as tools for their knowledge transfer activities, is it difficult or helpful? All of interviewees respond that it is without doubt very help full. In addition to this we asked them which kind of technology you are used currently, Temari.Net is accessible in the campus but most students not used this site because they do not trust the source and it is accessible for all people. As they recommend as solution if there is mobile application for each university which students get specific and detail information about status of their campus and teaching resource like audio, video and book prepared by campus. As they told us they asked SMS technology to transfer some message through student mobile number but university ICT- policy does not allowed only for us.

It is necessary that the request need to be from the other 10 directorate office to implement this technology.

3.3.5. Organization Document Review

According to document reviewed [86] Hawassa University has an approved, full fledge organized HIV/AIDS Prevention and Control strategy since 2010 G.C. The strategy document guides on how to include typical HIV/AIDS education in every domain of the university main activities like student curriculum. Hawassa University has a well-established and clearly rank organizational structure for HIV/AIDS program with the President at the top of the structure. Directly under the President Office, there is HIV/AIDS prevention and control directorate (but now named as Gender and HIV/AIDS Directorate). Further down, each campuses have HIV/AIDS Prevention and Control Office responsible for Gender and HIV/AIDS Directorate. Finally, the structure is further organized by having Anti-AIDS clubs in each campus.

3.4. Data Analysis

After we collecting data through semi- structure interviews and sampling. All interviews are written, which referring has been too repeatedly to ensure no valuable information is lost. We summarized the data into numerous parts based on the theoretical framework. The different level of revision on transferring health information to students in Hawassa University are understood during the interview. Furthermore, some key issues might be exposed in the process of summarizing data. In addition, we observed at the secondary data match some key events interviewees stated during the interviews that are related to the student's behavioral change, facility of technology, also all these data is openly abstracted from secondary data and primary data. We did not improve anything throughout the process of merging the primary and secondary data.

Based on the interview we made, with health education expert, Gender and HAPCO directorate and student who work in anti HIV/AIDS clubs, it is found that there is shortage of health education expert, Volunteer student and Material resource. These all shortage are obstacle to transfer a comprehensive knowledge about HIV/AIDS to the students.

Table 3.1. Analysis of Human resource for Knowledge transfer

No	Type of Resource	No of resource
1	Health education Expert	7
2	Volunteer Mentor student	40
	Total	47

It can be seen from the above table, the human resource is highly less. It is 47 in number and the number of students who live in that university is over 10,000. Because of this shortage of human resource it is very difficult to transfer comprehensive knowledge for all students. And there is only one AIDS resource center, students access this center by hour (one student use this center only for one hour).

According to the information from most student and health education expert, the knowledge transfer on HIV/AIDS is expressed by the following table.

Table 3.2. Analysis of Identified Problem

No	Identified Problems
1.	Different student life experience and challenge is not documented in art way
2.	Practical training and skill are not documented to transfer for the whole students in the form of book, video, audio etc...
3.	There is only one AIDS resource center for over 10,000 students
4.	Training chance for being a mentor is given only for HIV/AIDS club members.
5.	When mentor students transfer HIV/AIDS knowledge they don't show in a practical way they only communicate orally with the students
6.	Health education expert and HAPCO communicate with many students only at the time of celebration and when student come to clinic for diagnosis.

When health education expert are interviewed, it is observed that health education expert transfer HIV/AIDS knowledge in two different ways:

- VCS (Voluntary counseling's service) when students come to clinic for diagnosis.
- By prepare training detail practical and skill training and train selected mentor student.

Gender and HAPCO directorate also transfer HIV/AIDS knowledge in different ways:

- Preparing different brochures, pamphlet, book,
- Organizing resource center,
- Preparing different ceremony to get students as a whole and
- Hang different quotation on different place.

According to the interview made, most of the health education expert and Gender and HAPCO directorate are belongs to the first category of knowledge transfer process. And as they said sometimes knowledge transfer process affected by communication gap which is language difference between students and health education expert and also skill and experience of health education expert. It is difficult to understand easily.

3.5. Tools and Technique

To accomplish this research, Microsoft office has been used for preparing the document and UML tools for designing phase (Open Office, Ms-Visio and E- drawer). The main reasons for using UML are: using standardized notion without sacrificing model data, increased domain and design framework reuse, increased customer understanding of problem.

The prototype is built using open source Android Studio SDK , SQLite database that integrate with Android Studio , WAMPP used as web service on Web Server to store and transfer data from web server to SQLite android user and 000webhost which is online free host and server that used to access web service online. The prototype that is used to demonstrate communication mechanism of the architecture implemented by the PHP based framework that has been developed and tested. The web protocol are used to provide service.

3.6. Description of the Data Collection Result

The problem is transfer of comprehensive knowledge on HIV/AIDS for university students to enable the students get those information everywhere and anytime when they want to get

information. Three most important points are constructed by the researcher during conducting interview with health education expert and Gender and HAPCO directorate and systematic observation.

- There is no properly documented communication of Gender and HAPCO Directorate with Health education expert, It simply informal way of communication.
- There is poor knowledge preservation and documenting different detail practical training for mentor student in order to transfer for other non-mentor student.
- There is shortage of resource like human resource (Health education expert and mentor students), material resource (different book about HIV/AIDS) in resource center.

So, the issue is focused on achieving the transfer of comprehensive knowledge on HIV/AIDS for students to enhance prevention and control of disease. The other important issue is knowledge transfer should mainly focus on students driven framework. That means students collaboration and participation should be in place to make this system more meaningful and effective.

The main objective is to look for a new approach to find the way how to solve this critical knowledge transfer process problem using technology. Knowledge transfer approach is proposed to solve the problem through involvement of some participants like health education expert and Gender and HAPCO directorate. This proposed framework gives more attention to health education expert and their knowledge transfer process used without technology to transfer comprehensive HIV/AIDS knowledge. This help to approach the students to understand and get comprehensive knowledge about HIV/AIDS from experts using mobile technology. Comprehensive HIV/AIDS knowledge is transfer by health education expert to mentor students and the students transfer to remaining students. Principles of cooperative system are (1) letting health education expert prepare training for mentor students then students disseminate for other students (2) participating health education expert and Gender and HAPCO Directorate Director in design process because they know what they want to be included in the system. (3) Allowing member users to ask and answer question regarding with Prototype application. Once information about how they transfer knowledge for students is obtained from health education expert and HAPCO through participatory approach, the next is choosing technology like application software and hardware device. Based on the benefit over the other technology, Mobile phone and Android

Studio has been chosen to transfer compressive HIV/AIDS knowledge to students to get knowledge anywhere and anytime.

Generally, from the point of view of health education expert, mentor students and Gender and HAPCO Directorate, they used non-digital material to transfer knowledge for students. They used broacher, pamphlet, quote message on the road, books (Journey to LIFE 101), Temari.Net Website with limited resources.

On the other hand, Gender and HAPCO Directorate Director select and organize university students to involve in training, educating, capacity building and youth dialog sessions. In addition to this Gender and HAPCO and Anti HIV/AIDS club collaborate with university mini media and theatrical art club prepare dance and music festival to transfer different HIV/AIDS related information for audience students. In Hawassa University Temari.NET website is implemented but most of the students are not using the website. As Gender and HAPCO directorate informed to us that the reason of the development of the site is to serve the students but now it is public website and application due to this students are not interested to access this website. They also informed us that “if mobile application is developed which can be accessed by specific university and transfer from specific university about students HIV/AIDS issue is better, like Hawassa University HIV/AIDS issue information for Hawassa University students”.

Due to the nature of students' life style, behavior, ways of communication some health education expert and mentor students cannot prepare training that is suitable with students. Sometimes the problem of transferring knowledge is misunderstanding the interest and behavior of students. As a solution during knowledge transferring process the resource and information have to convert to appropriate knowledge for student.

Due to limitation of financial, material and health education expert, most of comprehensive HIV/AIDS knowledge is not transfer for whole students. It is mainly in practice and transmitted health education expert to mentor students and mentor students transmitted to remaining students. Even though getting knowledge from health education expert directly is very important for whole students, it is difficult to cover for all students once at a time.

CHAPTER FOUR

4. FRAMEWORK DESIGN

4.1. Overview

In this section, final framework of the study is designed depend on the proposed framework. All factors that affect knowledge transfer process are briefly described. In this study factors that affect knowledge transfer to prevent and control HIV/AIDS in Hawassa University are the university Gender and HAPCO Directorate, Hawassa University Health Education team and University ICT as organizational, individual and technological factor respectively. Knowledge transfer process which is used on prevention and control of HIV/AIDS in Hawassa University also discussed. These knowledge transfer process elements are Knowledge Acquisition, knowledge conversion, knowledge implementation and knowledge dissemination.

4.2. Framework Design

This study is concerned on how to transfer comprehensive knowledge. The main concern is to adopt the best approach to solve the problem of transferring comprehensive knowledge, technology used and mechanism to transfer HIV/AIDS knowledge directly from health education expert to students. To achieve the functionality of this collaboration knowledge transfer framework has been used as a core engine. Below are some reasons to implement Knowledge transfer framework to transfer comprehensive HIV/AIDS knowledge to students.

- Making broad awareness on HIV/AIDS disease and preventive and control methods.
- Using knowledge transfer process to enhance way of transferring HIV/AIDS knowledge to students.
- Creating HIV/AIDS and related training environment for whole students through technology at anytime and anywhere.
- Help to resolve an identified gap between health education expert and students.

Due to the nature of transferring HIV/AIDS knowledge which is transferred from health education expert to students in Hawassa university and limitation of resource, knowledge transfer framework pattern has been chosen, because knowledge about HIV/AIDS is transferred to whole university

students broadly and nature of knowledge transfer framework to transfer knowledge for entire students, knowledge transfer framework is the best candidate solution to apply comprehensive HIV/AIDS Knowledge transfer. This framework shown in the Figure 4.1 is designed by integrating organized factors that affect knowledge transfer process those are Gender and HAPCO Directorate Director , Health Education Expert team as individual factors and ICT related components as technological factors. Detail of each components are described below in the Figure 4.1.

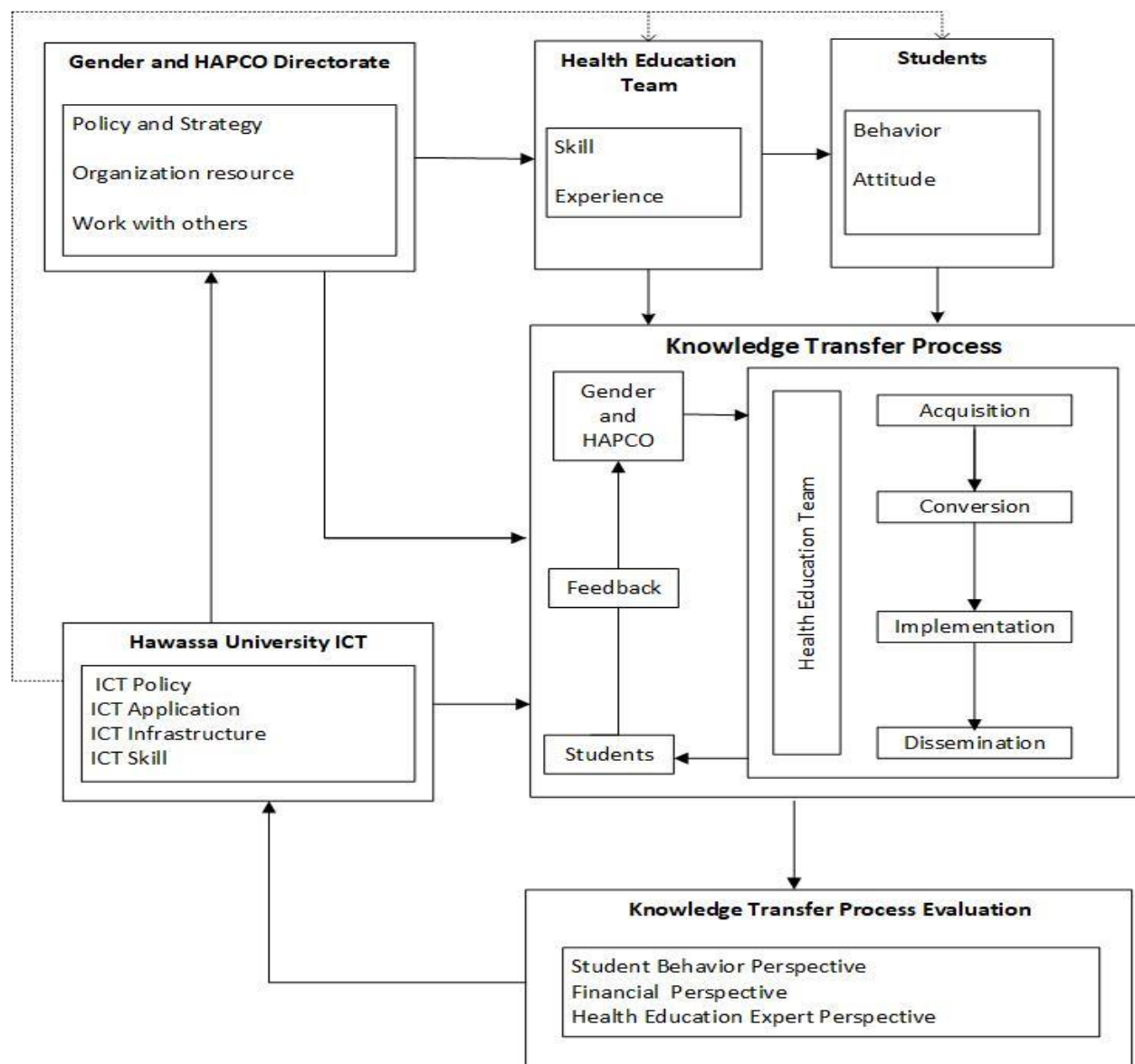


Figure 4.1 General Framework of Knowledge transfer to enhance prevention and control disease for university students

4.2.1. Gender and HAPCO Directorate Director

Hawassa University has a well-established and clearly leveled organizational structure for Gender and HAPCO directorate with the president at top of the structure (**see appendix-2**). Directly below the president office, there is Gender and HAPCO directorate director. Down the line, the structure contained HAPCO program and Gender Program. Horizontally connected to the association of PLHIV. Under this, each campus has HIV/AIDS prevention and control office accountable for HIV/AIDS programs. Finally, the structure is more organized by having Anti-HIV/AIDS clubs in each campus, but this study is dedicated on Main campus.

4.2.1.1. Policy and Strategy of Directorate

Hawassa University has an approved, full-fledge institutional HIV/AIDS Prevention and Control policy and Strategy since 2010 G.C. The policy and strategy document guides on how to mainstream HIV/AIDS in every domain of the university's major activity. They are activating the university students to involve in the training, awareness, youth dialogue session. All activities are performed by health education expert and volunteer youth group like mentor students. Gender and HAPCO also facilitate on formulating training program for selected students, the objective of the trainings are to deliver current HIV/AIDS information , familiarize trainees with manuals and strategies , to promote highest standard of HIV protection and care , to facilitate trainees provide quality service and also to train the students on VCT and treatment of HIV in campus , prevention and management of adaptable infections ,prevention of one person to another person transmission , STI, TB , HIV , nutrition and palliative care.

The University Gender and HAPCO directorate prepared orientation program which involve HIV/AIDS, gender-based violence, life in university, rules and regulation of campus and other interrelated issues for fresh students at the beginning of academic year. All fresh students are obligatory to attend in the orientation. The orientation period is the major opportunity through which the university able to reach out to all fresh students and increase their awareness on the above issues.

4.2.1.2. HIV/AIDS Resource

Hawassa University Gender and HAPCO Directorate organized AIDS resource center to provide a wide variety of knowledge transfer service on HIV/AIDS, STI and RH. This resource center comprise free broadband internet with many computers and carrying HIV/AIDS, STI and RH related magazines , books , brochures , posters from different partners and distribute among students. Although those all resource are available in the university there is shortage of resource to deliver for health education team and students. This can affect the health education team activities and knowledge transfer process.

4.2.1.3. Work with Others

University Gender and HAPCO Directorate works with students' clinic on different activities. One of this is health education activities on HIV/AIDS. It request health education expert to prepare student based comprehensive training on HIV/AIDS by supplying different resources to experts. It has also partnership with Federal HAPCO, SNNPR Health Bureau, Hawassa town administration Health Department, CDC, UNFPA, UNICEF, RATSON, LIA Ethiopia, and IFHP. The partnership with different organization and with the outside society has different importance. Among these getting fund for developing different resource a relation to knowledge transfer, to getting latest information about HIV/AIDS and related issues and to work cooperatively in prevention and control of HIV/AIDS disease etc. All of those partnerships have their own impact up on health education team activities and knowledge transfer process.

4.2.2. Health Education Team

In this study Health education team is a collection of health education expert who acquire HIV/AIDS resource which is reside from Gender and HAPCO Directorate to develop their knowledge on HIV/AIDS. Health education Expert convert this knowledge to another format which understandable by students, then submit their knowledge to the repository in the form of file, audio, video, image and other format to accessed by students through their smartphone and tablet. The advantage of ICT tools for health education experts enable to transfer a comprehensive knowledge easily for the whole students. Within this system, health education experts can disseminate, record and attach either textual, audio or document in the server.

Making health education expert as part of the system and users (students) participation in knowledge transfer are an important issue in acquiring and converting HIV/AIDS knowledge. Health education expert can easily transfer their knowledge to the server database and this enable students to get HIV/AIDS knowledge easily, but on processing of knowledge transfer between health education expert and students there are some factors:

4.2.2.1. Skill and Experience

According to [2] poor knowledge, skill and experience of health education expert is one of the factor that can affect knowledge transfer process. Health education expert have to own comprehensive knowledge on prevention and control of HIV/AIDS and need to be skilled and experienced person on ways of knowledge transfer activities. Health education expert may develop skill by referring different resource that acquire from AIDS resource center and different private web site work on HIV/AIDS and related issues . In addition to this skill the experience of health education expert can develop through practice, life experience, sharing from other staff. Lack of knowledge, skill and experience of health education experts can affect the acceptance and motivation of students to attend or follow their lecture. This can affect students' behavior on prevention and control of HIV/AIDS. Therefor knowledge, skill and experience of health education expert is necessary to conduct good knowledge transfer process.

4.2.3. Students

As [74] [75] describe University students are most vulnerable because of their age, the place where they are living and spend far away from advising and supervision of their family. Most of university students are occur at fire age so it pull to follow their sense with naked eye due to this most student enter in risky sexual practice by commercial sex without using condom. The place where universities are located have effect on students' life style. Most of the time around university different business start to serve students but some business part are dangerous to students for example selling chat, cigar ate, alcohol, cocaine, nightclub, pension, tourist etc. All of those are problems that can change the life style and behavior of students.

4.2.3.1. Behavior

Behavior refers to activities, changes, manner or roles of an individual or group towards other persons based on situation. Student have massive behavior in university like their color. Student's behavior in university change depend on their friends or environment. Health education experts change sexual behavior of students by educating different HIV/AIDS issue. The activity of health education expert highly change the sexual behavior of students on HIV/AIDS.

4.2.3.2. Attitude

Attitude refers to a person's mental view, concerning the way that thinks or feels about someone or something based on experience and observation. Student's attitude on HIV/AIDS is negative. They do not want to hear about HIV/AIDS. This affect knowledge transfer when health education experts educate students on HIV/AIDS.

4.2.4. ICT-Technology

ICT- Technology plays a significant role in knowledge transferring process, since it enables numerous of the technology and people-based activities accessible that are essential to knowledge transfer success [87]. Hawassa University ICT- Directorate established in 2009 G.C. The university has done different ICT oriented tasks like managing and developing university wide ICT infrastructure, developing appropriate application such as students online grade submission system and university official website, operation and maintenance of ICT resource, train end users of computer about basic computer skills, guiding and consulting the university management on the acquisition of ICT resource and related issues. The university ICT-Directorate has its own impact on knowledge transfer process through the following factors:

4.2.4.1. ICT Policy

ICT policy is one of the factor that affect the transfer of knowledge using ICT infrastructure. It is any written or unwritten rules, regulation, procedure and ways of transferring comprehensive HIV/AIDS knowledge in a university using the university ICT infrastructure. It represents the acknowledgement, intent and will power of Gender and HAPCO Directorate to access ICT in maximizing of knowledge transfer process efficiently [57]. In Hawassa University the ICT policy under some refinement, but still it is not fully implemented. So there is no finished policy for ICT

at Hawassa University. When it is applied the accessibility of ICT infrastructure like mobile phone, internet, Application software's are ruled on university ICT policy. It may affect the knowledge transfer process using mobile phone.

4.2.4.2. ICT Infrastructure

ICT infrastructure is also one of the factors that affect the transfer of knowledge to student efficiently. The infrastructure in our study is a mobile device which used to access the application. Students having smart phone can access the system anywhere and anytime, because the knowledge transfer system is loaded on smartphone and tablets. The other infrastructure is internet and network to enable a chatting system that connect health education expert with students. In addition to this performance, durability, storage capacity and device brand also should consider it accessible for only android mobile phone. ICT infrastructure support health education expert and students to get information and in the processing, communicating and enabling knowledge transfer efficient [87]. In Hawassa university network and internet access is very good as we have listed on their task, but number of mobile phone which accessed by students are not studied. According to the interviewee who work in Hawassa University said “almost over half of the students own smart mobile phones and smart tablet”. So it is better to implement mobile based knowledge transfer application for students to prevent and control HIV/AIDS and related disease. If the ICT infrastructure is not well organized it may affect the knowledge transfer process.

4.2.4.3. ICT Application

ICT application commonly refers the application software which change the process and ways of doing knowledge transfer activity. In our study ICT application can be basic office applications such as word processing, Adobe Photoshop, E-mail, Android Application, firebase etc.

4.2.4.4. ICT Skill

It is one of the factor that can affect knowledge transfer process and Gender and HAPCO Directorate activity. It is the literacy and skill of expert to develop and maintain different ICT infrastructure and application. ICT skill is essential to implement knowledge transfer process in to mobile application. ICT expert enable developing update application, maintenance, control and administer the application. Skill of ICT expert may affect the knowledge transfer process.

4.2.5. Knowledge Transfer Process

Knowledge transfer process is selected to extract HIV/AIDS and related knowledge from different resource and health education expert and to convert based on students understanding then finally transfer to students, to increase the accessibility of framework. The following knowledge transfer processes show how can HIV/AIDS knowledge can be organized and transferred on real situation.

4.2.5.1. Knowledge Acquisition

Resource on HIV/AIDS and related issues obtained from Gender and HAPCO directorate and Health education expert. It is captured in two ways. The first one is from Gender and HAPCO Directorate by uploading on the site. The second one is recording tacit knowledge of health education expert in audio and video format and through chatting system.

Table 4.1 Types of Knowledge

HAPCO AIDS resource center	Explicit knowledge
Health Education Expert	Tacit Knowledge

Strategy, tools and techniques to capture tacit knowledge are training, mentoring, peer-to-peer, structured knowledge acquisition from subject matter expert and educational technology. It is observed that health education expert most of the time transfer using storytelling training and mentoring technique. Storytelling is a good way of transferring life experience and other tacit knowledge acquisition technique because it is more effective as explained by.

4.2.5.2. Knowledge Conversion

Once knowledge has been acquired, it is essentials to be adapted into certain understandable form. The conversion method known in this section is not the way of transforming tacit knowledge to explicit knowledge or vice versa. The conversion method known here is the procedure of converting different terms that is common and directly related with student life, behavior, skill, economical, sexual and gender aspect that can be understood by all students who live in the campus. Purpose of knowledge transfer is making awareness to receiver on specific area of life. Knowledge from a source needs to be converted into a standard and understandable knowledge

used by the receiver in order to comprehensively understand the knowledge. According to [38] conversion process is important because it makes the knowledge accessible to other members.

In this study first after acquiring knowledge from Gender and HAPCO Directorate and health education experts, health education expert also convert the resource into student center knowledge. This conversion process have been done by classify HIV/AIDS and related knowledge that relate to students life, behavior and sexual need and gender.

4.2.5.3. Knowledge Implementation

The implementation process is the real process of transferring knowledge from the sender (Gender and HAPCO and Health education experts) to the receiver (Students), thus, it is the next process essential in the HIV/AIDS knowledge transfer framework. The implementation process is one of the more common process found in the existing knowledge transfer process. The purposes of implementation process is the receiver to be able to engage the acquired knowledge. As [41] described that the implementation phase occurs when the knowledge flow between the recipient and the source. The implementation phase has been finished when a receiver begins consuming the knowledge. As [40] stated that the implementation phase take place when the definite flow of knowledge occurs between a sender and a receiver. This process is done with the assumption that an applicable channel is in place and is in good working order, thus the transferred knowledge can be conducted easily.

Once the format of the knowledge has been standardized by health education expert with mentor students and Gender and HAPCO directorate. The actual transfer of knowledge can be done through mobile phone application technology. This implementation is done by Health education expert by entering all converted knowledge in to server and editing digital information, graphically design the knowledge that is interested to access by preparing animation, graphics, audio and video format.

4.2.5.4. Knowledge Dissemination

The process of disseminating the knowledge is the last important method known in this knowledge transfer framework. The process permits the forwarding of knowledge before the knowledge is accessed by the receiver. This process also enable the transfer of knowledge among the health

education expert and students the accessibility of knowledge in the system. This process is only used by [42] due to as [88] highlighted the significance of disseminating in any knowledge transfer activity. They introduced a framework that incorporates knowledge dissemination process within the knowledge transfer activities. Knowledge transfer activity should not be separate from knowledge disseminating and it is applicable for an organization to use ICT- tools to support the incorporated method of knowledge transfer [89]. As [88] suggest that knowledge dissemination is essential to be incorporated within the knowledge transfer process in order to deliver the knowledge.

In this study after ICT expert develop android application and Health education expert disseminate HIV/AIDS knowledge by changing all data in the mobile data format etc.

4.2.6. Knowledge Transfer Process Evaluation

On this part the researcher puts some expected results that gets from the process those are from student's perspectives, financial perspective with in organizations and health education perspectives. If the result is not positive, it may touch the ICT activity to enhance the process of knowledge transfer. So this affect the activities of ICT.

4.2.6.1. Students Behavior Perspective

According to [74] one of aim of health education expert and Gender and HAPCO Directorate in university is changing behavior of students on keeping themself from STI and HIV/AIDS and on life style of students. One of the cause of HIV/AIDS is student chosen to engage with smoking cigarette, drinking alcohol, unsafe sex, use common material in dorm and others. In order to achieve their goal students should get comprehensive knowledge on HIV/AIDS and related issues in campus. Health education expert and Gender and HAPCO Directorate have responsibility on transferring appropriate knowledge and preparing different facilities that enable students to get knowledge at anytime and anywhere on prevention and control of HIV/AIDS. So this framework provide suitable way of transferring comprehensive knowledge on HIV/AIDS to the students.

4.2.6.2. Financial Perspective

Financial perspective indicates whether the implementation of knowledge transfer process is saving the University from investing extra budget to transfer HIV/AIDS and related knowledge to

students. According to interviewee Hawassa University invest huge amount of finance to print different broacher, pamphlets, books and to conduct training , to prepare different forum , discussion , seminar and others on prevention and control of the disease but all of these can't cover the entire students. This framework can solve this problem reaching every students in getting comprehensive knowledge on prevention and control of HIV/AIDS at anytime and anywhere through their mobile phone. This can decrease the budget that can be invested to transfer HIV/AIDS and related disease knowledge.

4.2.6.3. Health Education Expert Perspective

Health education expert is one of participant on knowledge transfer process. They work on creation of awareness on prevention and control of the disease. This framework of knowledge transfer can solve different problem of health education expert such as: insufficient number of health education experts on behavioral change of students on STI and HIV/AIDS, poor knowledge and skill of health education expert, deficiency of health education and communication skill of expert, absent of emergency communication with student and inadequate monitoring and evaluation of students on prevention and control of HIV/AIDS. In addition to these the proposed process of knowledge transfer can save time, labor of expert by acquiring and transferring comprehensive HIV/AIDS and related knowledge at anytime and anywhere to enhance the knowledge of students on prevention and control of HIV/AIDS and related issues.

CHAPTER FIVE

5. PROTOTYPE DESIGN, DEMONSTRATION AND EVALUATION

5.1. Overview

In this section, prototype is designed to show the practical contribution of the designed framework. This prototype designed by including students who can use the mobile application, Gender and HAPCO Directorate , Health Education expert and ICT expert as actor of the system. In addition to this some application that can used to enable the communication between actors such as MySQL Database (Web server), Internet and SQLite of android application. The component of android studio also discussed those are Java (setup Java Development Kit) JDK, Android Studio SDK (Software Development Kit), Android Studio Android Virtual Device (AVD) and Android SQLite database. The prototype design also developed. The prototype is demonstrated with developing and integrated two sub systems these are mobile android application and Web based system. Finally the prototype also evaluated by using component testing, usability testing, integration testing and usefulness testing.

5.2. Prototype Design

5.2.1. Tools and Techniques

5.2.1.1. Android

As [90] define “Android is an open source and Linux-based operating system for mobile device such as smartphones and tablet computer”. It was also developed by the Open Handset alliance that run by Google and other companies. It compromises unified approach for mobile devices to application development, so many developers interested to develop only for android and their application may be run on different devices powered by android [91].

Android is a set of software for mobile device including, middleware, operating system, core application and new mobile platform of Google [91]. It is a full mobile platform based on LINUX

kernel that offers universal set of dominant operating system, compressive library set, rich multimedia user interface and phone application.

5.2.1.2. Development Environment

Java (setup Java Development Kit) JDK

Android application are developed in the java language using the android SDK. Alike, Android application are also developed using java. As a result, the Java Development Kit (JDK) is the first component that must be installed [92]. So for the purpose of Android development, the JDK must be installed. In this study the installation of version 8 of the standard Edition of Java Platform Development Kit in both development (JDK) and runtime (JRE) package for the purpose of our android development [91].

Android Studio SDK (Software Development Kit)

The android Software Development Kit (SDK) comprises a complete set of development tools. These include a debugger, libraries, a phone emulator, documents and trial code [90].

Now supported development platform comprise computer running Linux, Mac OS, window XP or advanced. The formal supported Integrated Development Environment (IDE) is android studio by means of the android development tools plugin. Moreover, developer may practice any text editor to edit Java and XML files, then use command line tools to create, build and debug android application as well as control devoted Android device [91]. Improvement to Android SDK go hand in hand with the whole Android platform development. The SDK also supports earlier versions of the Android platform in case developers wish to target their application at older device. In this study we used Android SDK 7.1 with android studio IDE version 3.0.1 in order to get additional version to enhance the quality of our android application [92].

Android Studio Android Virtual Device (AVD)

An Android application could be tested by installing and running it either on a physical device or in an Android Device emulator environment respectively [90].

AVDs are basically emulators that enable Android application to be tested without the requirement to install the application on an actual Android based device. An AVD could be designed to emulate a several hardware features with options such as memory size, screen size and the occurrence. As part of the typical Android Studio installation, a numeral of emulator prototypes are installed allowing AVDs to be organized for a range of different devices. Further template might be loaded or custom configurations created to match any actual Android device by stating properties such as processor category, memory size and the size and pixel of the screen.

Android SQLite database

According to [93] database is fundamental concept in which several design application require to store every information in the database. Therefore database is an important part of the computer system. Similarly it is an important part of mobile or smart phones because the speed of every application depend on the database and also to store the information in the mobile. Storing information in the mobile is very difficult because memory problem is big issue with the mobile databases [94]. We find that the SQLite Database that commonly used. Now a day for mobile application. SQLite database system is synchronized database system [95]. Which give support to the database for our android application at client side. It going to help store health education expert data and file. It is backend of client side android application. That means all data which fetch from server required for the mobile application to reside in the SQLite database. But the mobile memory is issue for the mobile [93]. So we tried to make the capacity of the data easily accessible with every mobile memory capacity. For security issue we tried to provide authentication to the users.

And also for accessibility we offer to access the database from inside and outside the mobile application.

Web server and MySQL database

A web server is a computer system that processes requests via HTTP, the basic network protocol used to distribute information on the World Wide Web. And also MySQL is a database which is reside within server to store different data.

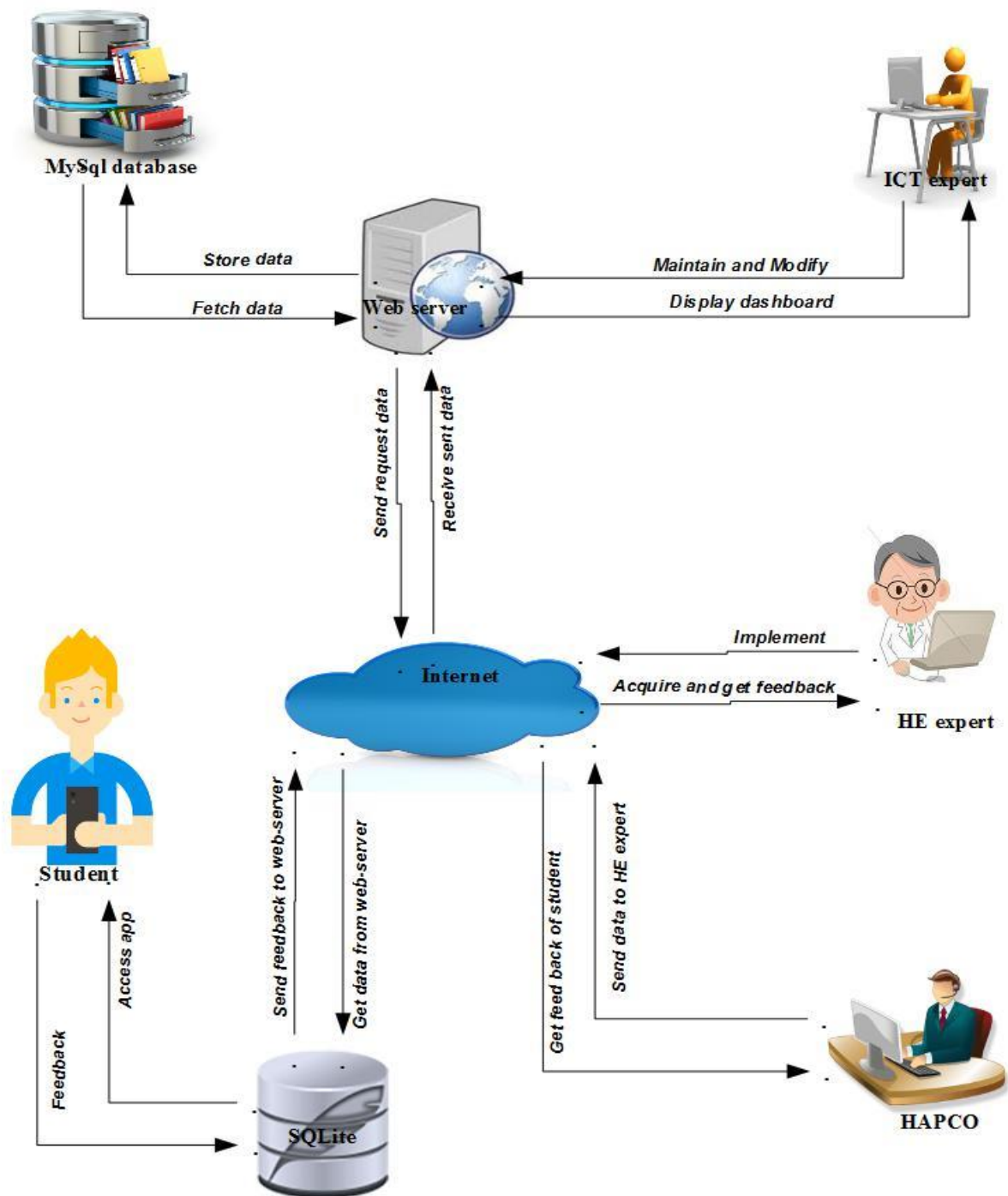


Figure 5.1 Prototype design of Knowledge transfer to enhance prevention and control of HIV/AIDS for Hawassa University students

Health Education (HE) Expert

Health education experts are people who acquire different HIV/AIDS related resource from Gender and HAPCO directorate to prepare their knowledge on the area of HIV/AIDS. They convert acquired resource into relevant format that easily understand by students. Finally implement by sending prepared knowledge to web server to disseminate to all students.

Gender and HAPCO Directorate

Gender and HAPCO is a directorate which collect different resource from external private organization which work on HIV/AIDS and organized the AIDS resource center. In health education system Gender and HAPCO Directorate prepare AIDS resource center to be full of HIV/AIDS and related information issues in the form of newspaper, broacher, pamphlet, books and also send different resource to health education expert.

ICT Expert

A person who manage and control the whole system as administrator. The expert is allowed to see all flow of knowledge through web server and give authentication to appropriate participant like students, health education experts and Gender and HAPCO. ICT expert has permission to modify and delete the participant user account. ICT expert also has responsibility to maintain and modify the systems.

Students

Students are people who use the transferred knowledge and respond some feedback to health education expert and Gender and HAPCO Directorate. They use their smart phone to accesses the application whether offline or online to fetch data from web server. In this research paper, it is strongly believed that students should use ICT tools to get comprehensive knowledge. Mostly those tools enable the students to develop their knowledge and easily acquire comprehensive knowledge at anytime and anywhere. The students access the application through SQLite database to get data from web server and respond a feedback to health education expert and Gender and HAPCO Directorate.

5.3. Demonstration of Framework

The prototype is demonstrated with integration of a set of two sub system. These are:-

- Mobile android application and
- Web based systems

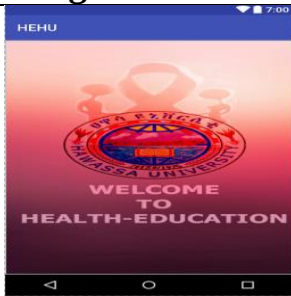
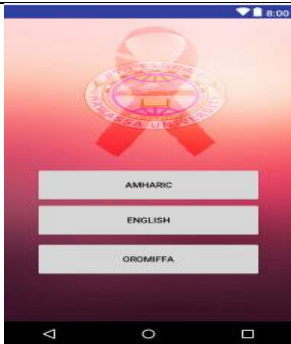
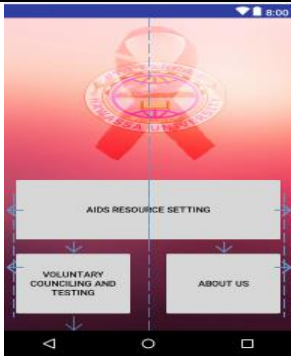
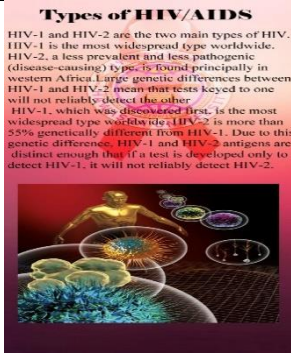
The integration of these sub systems have made the knowledge transfer process fully functional. Android application system and web based system have been integrated.

5.3.1. Mobile Android Application System

The offline android application system has been done using the SQLite database which is integrated with android application to store data. The following requirements should be arranged to deploy android application:

- Install java development kit (JDK)
- Integrate SQLite database
- Install AVD (Android Virtual Device)
- Install android SDK

SQLite has the ability to manage all forms of knowledge like text, image and audio. SQLite can be accessible as a standalone in our mobile and using android application. Students can access the system through android application system using mobile phone. This is sample demonstration of user interface android application.

No	Image Name	Image	Description
1	Splash Page		This page is the first android application page. It open when we are click the application icon.
2	Language Selection page		In this page the students can select the language. There are three language as a sample those are: Amharic, English and Oromiffa. The only English button is active for this sample demonstration.
3	Information selection page		After students select their language information page is displayed. In this page there are three buttons those are : AIDS information setting which is contain general information about HIV/AIDS, Voluntary Counseling's and testing which has disseminate information from server , and About Us.
4	General information		When student's access AIDS resource setting different item are displayed. In this page there are different items that contain general information about HIV/AIDS. This is a sample page.

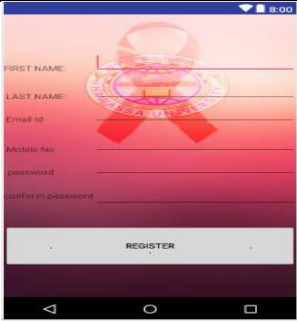
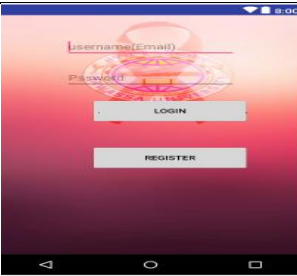
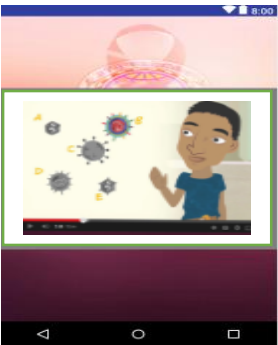
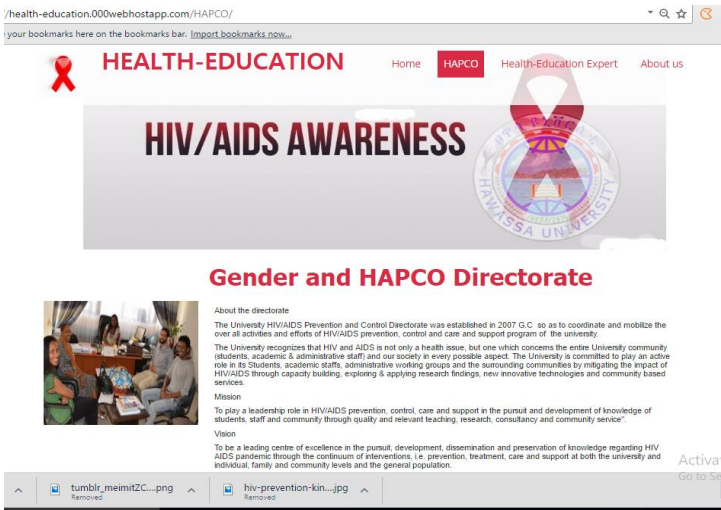
5	Registration page		In this page the students register to become the member of the system. In order to access the disseminated information the student should be registered using this page.
6	Login page		This page is used to login the students using their username and password. If the students. Pass this page, they can access all disseminated knowledge.
7	Feedback page		After students get the knowledge about HIV/AIDS they can comment or display their feeling on this page.
8	Sample video page		This is a sample page how the student get video form information from the application.
9	Sample image page		This is a sample page how the student get image form information from the application.

Figure 5.2 Sample prototype of mobile application

5.3.2. Web Based System

Web based system developed using PHP, 000webhost, and WAMPP MYSQL server to store data. PHP are used as programming language and MySQL database has been used for store and fetch different data from and/or to it. In web based system there are two pages. These are Gender and HAPCO page used to http request to upload different data to health education expert also http response to receive feedback from students. The other one is Health education expert page to acquire data from Gender and HAPCO and http request to implement and transfer data to student through web server and also http respond from web server to receive feedback from students.

Name	Image	Description
Gender and HAPCO page		This page is Gender and HAPCO directorate page. It has general information about organization and link to upload page
Health Education Expert Page		In this page the health education expert can acquire different sent data and link to disseminate page.

Gender and HAPCO Send page		On this page the Gender and HAPCO directorate enable to send data to Health education experts.
Health Education Expert send data Page		This page is Health Education expert page.it used to Implement to disseminate the data to all of students.

Figure 5.3 Web-based page for Gender and HAPCO Directorate and Health education expert

5.4. Evaluation and Communication of the System

The study framework is evaluated to assure its objectives are fulfilled through developed prototype system. The system is evaluated by expertise from area of health education expert, Gender and HAPCO directorate and students at the early stage of the design to check its functionality and usefulness for knowledge transfer on prevention and control of HIV/AIDS and related issues to students. It also evaluated based on its availability and security. In terms of availability, the system accessed anywhere and anytime using android smart phone whether online or offline. The system is also secured because security should be the major focus point, and it assure that by authenticating any users through different credentials and it also checked well.

The system evaluation test performs through component testing, usability testing and integration testing.

5.4.1. Component Testing

The system MySQL database has been tested in perspective of knowledge acquisition based on web entrance site. The transfer of data between health education expert and Gender and HAPCO side is tasted on database. Therefore web server effectively transfer and manage document with their database.

The android application also tested whether it can send and receive data from (to) web server database. In addition to this the offline access also tested. That is the students can access the application without connection.

Knowledge transfer is made through android application and web portal in collaboration with students, health education experts and Gender and HAPCO Directorate. First health education experts acquire different resource from Directorate web portal and converted it by adding their tacit knowledge. And then they implement by sending to web server. Finally disseminate knowledge to all students through android application which is available on their smart phone. Each tasks are tested independently based on the following test item.

Table 5.1 Component Testing

Test item	Target of test	Requirement	Estimated outcome
1	Health education expert Acquire different data from Gender and HAPCO Directorate web portal in different format.	Gender and HAPCO Directorate select appropriate data and upload in server	Health education expert Acquire data on their web portal
2	Implement by uploading Acquired knowledge with some modification also some created knowledge by themselves that is suitable to students.	Prepare the knowledge in mobile format and web portal format then disseminate by uploading on web server	There is successfully uploading message is displayed
3	Students can get through smart mobile	Students open the application then make active internet connection click on display new data	Display new data on students smartphone
4	Students sent feedback message to health education expert and Gender and HAPCO Directorate	Click on feedback button then writing some text and send	The student's feedback message displayed on health education expert and Gender and HAPCO web portal.

5.4.2. Integration Testing

This system are mainly implemented on the base of android application and web based technology. So, the integration of these two components are done to make the system functional. Android application used as a student's side sub system to access the system and web based technology (web server) common as a central database.

Table 5.2 Integration Testing

Test No	Objective	Requirement	Estimated outcome
1	Check the interface link from web portal to web-server	Enter user name and password and click on login	To be display web page in web portal
2	Check the interface link from android interface to web-server	Enter user name and password and click on login	To be display android application interface
3	Check the link between health education expert and Gender and HAPCO and health education expert to students	choose appropriate file and click on upload	Display sent data on student android application interface and display on Health education expert web portal.

5.4.3. Usability Testing

The proposed system should be developed for students in the form of android application format. Usability test is done on the perspectives of students. This test is performed on how all students use the proposed system and attractiveness of the interface to use.

The proposed system is examined by the health education expert and Gender and HAPCO Directorate. They recommend to be applied the transfer of HIV/AIDS and related issues. Students who are member of Anti-HIV/AIDS club also participated in the test process and they liked it. But they requested that the system need to include chatting system which enables to communicate the students with each other's and sharing individual knowledge.

Table 5.3 Usability Testing

No	Test item	Internal process
1	Registration and login to systems	Easy to use
2	Transfer knowledge by uploading	Easy to use
3	Fetch and download transferred knowledge	Easy to use

CHAPTER SIX

6. CONCLUSION AND RECOMMENDATION

6.1. Conclusion

Although extensive study has been conducted in the area of knowledge transfer, the literature on the knowledge transfer in the health domain is still scant. Furthermore, most of the studies in the literature focus only on the knowledge transfer as one activity, with very few studies focusing on the actual transfer process which might consist of several essential processes that need to occur during the process of transferring knowledge. And also some studies focus on only on the factors of knowledge transfer like individual, organizational and technological factors by ignoring the process of knowledge transfer.

This study proposed a new approach in terms of identifying the essence of knowledge transfer process which have been identified as acquisition, conversion, implementation and dissemination (ACID) which need to be executed in each transfer activity and also identify factors like health education expert, Gender and HAPCO and ICT-Technology as individual, organizational and technological factors respectively. Therefore the result of this study can accurately transfer knowledge which will enhance the knowledge on prevention and control of HIV/AIDS disease and encourage interoperability among students and health education expert. The framework of knowledge transfer on prevention and control of HIV/AIDS disease is expected to benefit in different perspectives. It can benefit the students by changing their behavior in keeping them self from STI and HIV/AIDS. Financially it can reduce high investment budget for this activity. And also in perspective of health education expert it can save their time and labor. Finally this process is tested by the designed prototype and developed demonstration using mobile android application and web service.

6.2. Research Contribution

This study has two contribution, that consider as theoretical contribution as a framework for body of knowledge and practical contribution for practitioners. The first are the proposed framework that contributed to health sectors to transfer knowledge for prevention and control service at public university. The second one is practical contribution that the developed mobile phone base

application for different society such as students, health education expert, Gender and HAPCO Directorate and Government. In the perspectives of students, they can get comprehensive knowledge from health education expert that prepare students to focus on HIV/AIDS knowledge everywhere and every time. In the health education expert perspective can transfer HIV/AIDS knowledge easily by using technology. Gender and HAPCO Directorate also benefit on this study by achieving their goal. And Government also can achieve the millennium development goal by highly reducing the prevalence of HIV/AIDS with in five year strategic plan (2016-2020G.C). Finally the researcher also benefits on this study as starting point to work furthermore on this area.

6.3. Recommendation

This research is encompassed only specific area and HIV/AIDS disease. As future work the researcher will try to expand the scope of the research to see other disease and by considering other university too. In addition to this the researcher will see additional area which is located out of higher education institutions. Regarding prototype design the researcher will test the framework by using different technology that is suitable with research area. And also adding intelligent system to replace knowledge convert process in automated way to teach the system what the students should be known and how the knowledge should be prepared.

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Appendix-1 – Interview Question

Theoretical Framework	Subjects:	Number of question:
	Health Education Experts related question	6
	HIV/AIDS Prevention and Control Activity	4
	Knowledge Transfer Process	5
	Overall Questions	4
	Total Interview Question	19

- **Knowledge of Health Education Experts**

- When do you heard for the first time about health education? Can you tell me about your background? (Employment; years of Service; education level).
- How do you define health education and types of health education?
- What do you think most uniquely contribution of health education as a whole?
- Do you use technological applications current in your work place? If any?
- How do think about if you use the technological application contribution in your day-to-day job? Which technology do you think appropriate for your work?
- Is there any polices or rule that may enforce you in your workplace to use those procedures to the health education?

- **HIV/AIDS Prevention and Control Activity**

- What is the role of Gender and HAPCO Directorate?
- How do you perform your work with health education expert together?
- Are there any strategy, plan, and policy within the university to guide during at your work place?
- How do you support health education experts for effective knowledge transfer?

- **Questions Related to Knowledge Transfer**

- How do you adjust your knowledge transfer style to the less-motivated or under-prepared student?
- How do you support students and other user to teach about HIV/AIDs?
- What is your comment about the effectiveness and functionality of your knowledge transfer (teaching system) processes in general?
- How do you consider if ICT will be used as a tools or means for the knowledge transfer for teaching and learning about HIV/AIDS? Do you think it is difficult or helpful?
- Thinking of the current contribution of your knowledge transfer process to students in your university?

- **Overall Questions**

- What do you suggest as the main knowledge transfer component's that have support for successful knowledge transfer in the university to prevent and control HIV/AIDS disease?
- Have you ever had a great idea that have been told us, but could not implement on your university?
- How do you feel in general the current use of methodology of your knowledge transfer process can change the student on prevention and control of disease?
- Do you have any additional information that you would like to share?

Department: - _____

Year: - _____

Sex:-_____

Student Health Education Application Evaluation

No	Criteria	Yes	No	Other
1	Is it has attractive interface?			
2	Is registration page work properly?			
3	Is login page work properly?			
4	Is the buttons work properly?			
5	Is the images and other resource see clearly?			

Sample system evaluation question form

Appendex-2 – Images of Organization

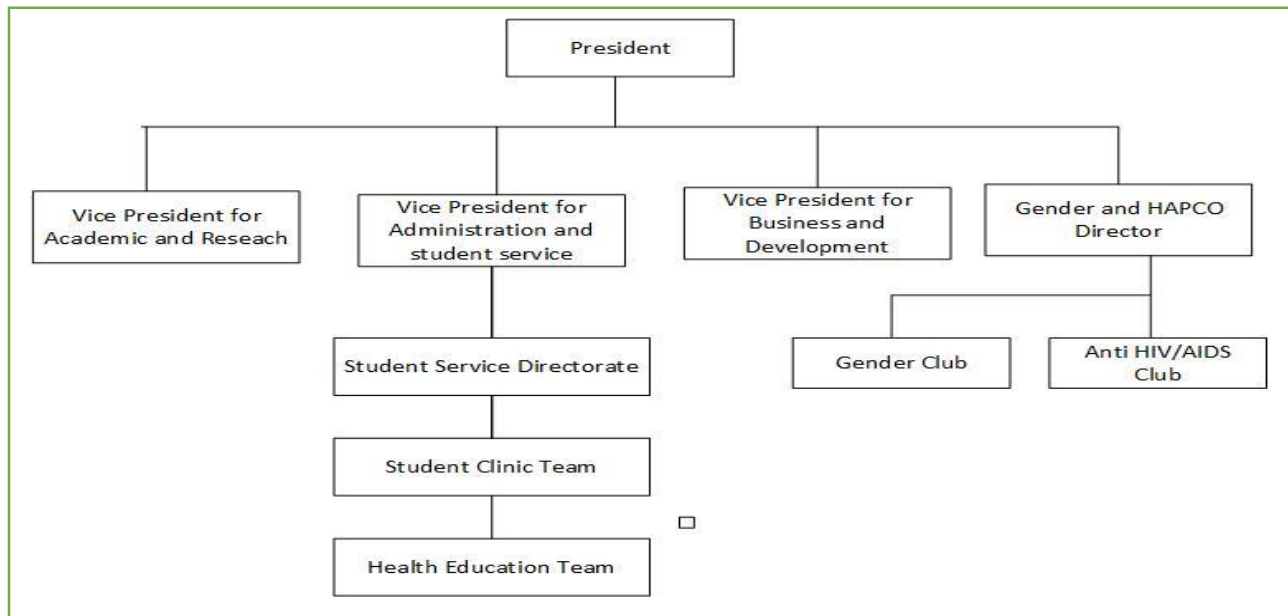


Figure 1 Overall Structure of Hawassa University



Figure 2 Student Test HIV/AIDS



Figure 3 Student in Tea and Coffee room



Figure 4 HIV AIDS day in Hawassa University

Appendex-3 -Androids sample Code

```
import android.content.ContentValues;

import android.content.Context;

import android.database.Cursor;

import android.database.sqlite.SQLiteDatabase;

import android.database.sqlite.SQLiteOpenHelper;

public class DatabaseHandler extends SQLiteOpenHelper{

    public DatabaseHandler(Context context, String name, SQLiteDatabase.CursorFactory factory, int version) {

        super(context, "Mydatabase", null, 1); }

    String password;

    private static final int DATABASE_VERSION = 1;

    private static final String DATABASE_NAME = "Mydatabase.db";

    private static final String TABLE_REGISTER= "register";

    public static final String KEY_ID = "id";

    public static final String KEY_FIRST_NAME = " first_name";

    public static final String KEY_IAST_NAME = "last_name";

    public static final String KEY_EMAIL_ID="email_id";

    public static final String KEY_MOB_NO = "mobile_number";

    public static final String KEY_PASSWORD = "password";

    public static final String CREATE_TABLE="CREATE TABLE " + TABLE_REGISTER + "(" + KEY_ID + " INTEGER PRIMARY KEY," +
    KEY_FIRST_NAME + " TEXT,"+KEY_IAST_NAME + " TEXT,"+KEY_EMAIL_ID+ " TEXT," + KEY_MOB_NO + " TEXT," + KEY_PASSWORD + "
    TEXT " + ")";

    private static final String TABLE_FEEDBACK ="Feedback";

    public static final String KEY_MESSAGE = "message";

    public static final String CREAT_TABLE = "CREATE TABLE"+ TABLE_FEEDBACK +"(" +KEY_MESSAGE +"TEXT"+")";

    @Override

    public void onCreate(SQLiteDatabase db) {

        db.execSQL(CREATE_TABLE); db.execSQL(CREAT_TABLE); }

    @Override

    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {

        db.execSQL("DROP TABLE IF EXISTS " + TABLE_REGISTER); db.execSQL("DROP TABLE IF EXISTS" + TABLE_FEEDBACK);

        onCreate(db); }
```

```

void addregister(RegisterData registerdata) {

    SQLiteDatabase db = this.getWritableDatabase(); ContentValues values = new ContentValues();

    values.put(KEY_FIRST_NAME, registerdata.getFirstname()); // register first Name
    values.put(KEY_LAST_NAME, registerdata.getLastname()); // register last name
    values.put(KEY_EMAIL_ID, registerdata.getEmailId()); //register email id
    values.put(KEY_MOB_NO, registerdata.getMobNo()); //register mobile no
    values.put(KEY_PASSWORD, registerdata.getPassword());

    db.insert(TABLE_REGISTER, null, values);

    //db.close(); // Closing database connection

    values.put(KEY_MESSAGE, registerdata.getMessage());

    db.insert(TABLE_FEEDBACK, null, values);

    db.close(); }

String getregister(String username){

    SQLiteDatabase db = this.getReadableDatabase();

    Cursor cursor=db.query(TABLE_REGISTER,null, "email_id=?",new String[]{username},null, null, null, null);

    Cursor curso=db.query(TABLE_FEEDBACK,null, "message=?",new String[]{username},null, null, null, null);

    if(cursor.getCount()<1){

        cursor.close();

        return "Not Exist"; }

    else if(cursor.getCount()>=1 && cursor.moveToFirst()){

        password = cursor.getString(cursor.getColumnIndex(KEY_PASSWORD));

        cursor.close(); }

    return password; }

public String getDatabaseName() {

    return DATABASE_NAME; }

public static String getKeyId() {

    return KEY_ID; }

public static String getTableContacts() {

    return TABLE_REGISTER; }

public static int getDatabaseVersion() {

    return DATABASE_VERSION;

```