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SCHOOL OF GRADUATE STUDIES

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Organizational Learning Assessment:
The case of World Learning Ethiopia

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Organizational Learning Assessment: The case of World Learning Ethiopia

A Thesis Submitted to the School of Graduate Studies of Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Science in Information Science

By

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_____	**Examiner**	_____	_____

DEDICATION

***To my mother Aster Hilawe who thought me how to trust the Lord*.**

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.

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Abbreviation

GSM	Grants Solicitations and Management
WL	World Learning
WLE	World Learning Ethiopia
SCOPSO	School Community Partnership Serving Orphans and Vulnerable Children
PC3	Positive Change: Children, Communities, and Care Program
CSPP	Communities and Schools Partnership Program
USAID	United States Agency for International Development
HIV	Human immunodeficiency virus
AIDS	acquired immunodeficiency syndrome
PEPFAR	President's Emergency Plan for AIDS Relief
CASCAID	Communities and Schools for Children Affected by HIV/AIDS
CGPP	Community-Government Partnership Program
CSAP	Community-School Activities Project
HPLSC	HIV Prevention in Large-scale Construction Sites
CIDA	Canadian International Development Agency
SNA	Social Network Analysis

Abstract

World Learning Ethiopia (WLE) is a country office of World learning an international NGO based in USA. WLE has been implementing development projects throughout Ethiopia since 1996 funded dominantly by USAID. Projects under development use and produce knowledge; and interaction between staff members cause organizational learning.

The overall objective of the study is to assess the nature of organizational learning in WLE and suggest appropriate organizational model that would fit the settings.

In assessing the organizational learning behavior of WLE, both quantitative and qualitative approaches are followed. A purposive sampling is used to select professional employees of WLE that are believed to have more impact in organizational learning. A questionnaire consisting of two parts was distributed using the organizations e-mail system and 91% of expected respondents filled the questionnaire and replied. For data analysis, SPSS 20 is used for organizational learning status analysis. A social network analysis approach is also applied with Gepih 0.8.2 to come up with more assessment results. Observation check list is employed to reflect on the study from researcher's point of view.

As a result of data analysis and observation, it is found that employees of the organizations are highly motivated to share knowledge and the organization play a good role of sharing best practices. However, it is also found that the organization lacks flexibility and openness to new ideas and creativity. Interactions between employees are based on belongingness in a project or department without the involvement of Information Technology. Willingness to share knowledge among staff members is positive but there is no specialized system to facilitate learning.

It is concluded that employees are motivated and active in organizational learning. It is also concluded that the organization has not been providing specialized systems that facilitate organizational learning.

It is recommended that the organization take initiative the organization take initiative to put Knowledge Management mechanism in place that facilitates multilevel organizational learning. Further studies are also recommended to investigate more facts that facilitate organizational learning.

Chapter one

Introduction

1.1 Background

World Learning Ethiopia (WLE) is the country office of World Learning in Ethiopia co-headquartered in Washington DC and Brattleboro. Established in 1996, WLE implements education and other development projects throughout the country. Currently it is managing three projects.

The HGSM (Health Grants Solicitation and Management) project assists the president's Emergency plan for Aids Relief through USAID in administering grants to Ethiopian and international nongovernmental organizations focused on HIV/AIDS. The project strengthens of international and local nongovernmental organizations that offer HIV prevention, Care and Support Programs. It also builds vital skills, provide technical support, and build institutional capacity of partner organizations so that they can provide quality service.

SCOPSO, School Community Partnership Serving Orphans and Vulnerable Children, is one of the projects launched by World Learning Inc. in 2009. Funded by USAID, this project aims to expand care and support for 40,000 orphans and vulnerable children in 400 primary schools throughout the country. Among key strategies of SCOPSO, include support school enrollment, attendance, and academic achievement of orphans and vulnerable children. Engage teachers, caregivers, and other young people with psychological support, and provide supplementary nutrition and critical health services.

MULU Worksite HIV Prevention is a five years project supported by the President's Emergency Plan for AIDS Relief (PEPFAR) through USAID. The project aimed at contributing to the government objective of reducing new HIV infection by 50% by the year 2014. The project will be implemented in 100 large-scale public and private sector worksites representing the construction, agriculture, textile, leather, cement and railways sectors. The worksites will be in nine regions, emphasizing those with the highest prevalence rates. Its HIV combination prevention approach includes three integrated components: The first one Reduce high-risk behavior and improve health-seeking behavior among key target groups through an evidence-based behavior change strategy. The second one is expand the supply of condoms, STI treatment and RH services in and around workplaces, and build demand for these services. The third is Mentor the development of an effective, gender-sensitive Workplace HIV/AIDS Policy by large-scale employers, and build their capacity to carry it out.

Since 1996, WLE has implemented multiple projects that affected lives of hundreds of thousands directly. These projects left the organization. These projects are HIV Prevention in Large-scale Construction Sites in Ethiopia (HPLSC), Positive Change: Children, Communities, and Care Program (PC3), Communities and Schools for Children Affected by HIV/AIDS (CASCAID), USAID BESO II Community-Government Partnership Project (CGPP), and USAID BESO I Community-School Activities Project (CSAP).

There are two operations support departments in WLE. *Human Resources and Administration* is organized as department under Operations Director who oversees Administrative tasks, procurement, Logistics, human resources, and Information Technology. The other department is *Finance* under Finance Director who oversees seven different professional staff members.

This research particularly addresses organizational learning in WLE and assessment of its staff members, technology, process, and organizational structure in order to add value through sharing and innovation. Subsequent sections describe the problem under investigation, purpose and methodology employed to address the research objectives.

1.2 Statement of the Problem

Saeidipour, Akbari, and Fashi (2012) described organizational Learning as a dynamic process that enables organizations adopt quickly with changes. In today's business environment, both inside and outside of the organization, dynamism is highly coupled with organizational knowledge management. Knowledge Management technology is being used to support Organizational Learning (Morecroft and Sterman, 1994). Furthermore, as Nazem (2008) stated that the presence of Organizational Learning facilitates the learning process at individual, team/work group or organizational level to increase organizational performance.

Advantage of having Organizational Learning includes maintaining corporate memory that makes organizational decision making more effective and efficient and assist the organization reach its objective (Dalkir, 2005, p. 339). Corporate memory refers to the repository in which knowledge is stored for future use. Corporate memory holds valuable lessons learned and best practices obtained through creating, sharing and applying knowledge (Dalkir, 2005, p. 3). It is fortunate for an organization to be able to maintain corporate memory and benefit from aforementioned advantages.

Staff turnover, both inwards and outwards, caused by departmental restructuring, coupled with the high workload and voluminous knowledge flows, highlighted the need for a more strategic approach to knowledge management (Christena, 2010). One of the challenges in keeping up with

undergoing activities in organizations is the fact that staff turnover exists under natural circumstances. As Experts leave an organization or a group, they are taking Knowledge and skill away that may not be replaced with the quality and time as needed.

The case with WLE is not different from what Christena (2010) has mentioned. According to the interview conducted with Human Resources Manager at WLE, staff turnover is high because all of the employees are hired based on lifetime of projects. When the staff member leaves the organization, it takes more time and effort to replace the vacant position. This has forced the organization to reinvent the knowledge that was existent at hand. It is however evident from various literatures that both tacit and explicit knowledge possessed by employees can be retained and shared to others by employing an organizational Learning.

On the other hand, preliminary interviews conducted with Chief of parties and Directors of WLE depicted the fact that the organization has a practice of keeping recorded documents of projects' activities. Whenever a project ends, documents concerning program and administrative tasks will be archived. However, there is no direct learning mechanism by which these documents are available to users. It is observed that knowledge are not shared for users except individual file access. Moreover, this is limited to the lifetime of the project about which records are kept.

We realize the need to have candid initiative for organizational learning projects. In a study conducted on 11 German and Swiss companies (Fei Gao et al, 2008) suggested that the most successful organizational Learning projects were those that were driven by strong business need, and the goals of which were to add values to the company's or business units operations. The same principle of motivation can be applied to the settings of World Learning and hence the organization will be able to assume its objectives at organizational, project/department and

individual level. With similar motivation, CIDA (Canadian International Development Agency) benefited by avoiding spending amounted $100 million a year to reinventing the knowledge that it already has. Through Organizational Learning, it was possible to organize and share over 400 best practices, lessons learned and 30 communities of practice. (Dalkir, p. 129, 2005).

With the current documentation mechanism at hand, WLE may not be able to share past and existent knowledge for organizational learning. In another terms, the current system does not maintain organizational memory that is accessible and goes beyond the lifetime of projects under implementation. Organizational memory extends and amplifies this asset (Organizational Knowledge) by capturing, organizing, disseminating, and reusing the knowledge created by its employees (Conklin, 2001). Having established organizational memory allows organizations maintain their past and current stored Knowledge. This will also enable fast and systematic access to knowledge in a desired or predefined format. Ultimately, as Modeled knowledge, it will be used to facilitate organizational Learning.

The study therefore aims to recommend suitable organizational learning model for WLE settings that will be used to capture, share, and create knowledge. As a result, WLE will be able to use Knowledge from current and phase out projects for better operations, planning and proposal writing. Organizational Learning will also retain and share experiences of individuals, teams and different projects. This is helpful in keeping up with loosing phased out projects knowledge and experience and staff turnover as one leave with their knowledge and expertise.

The following research question emanated from the problem statement stated above

- What does the learning behavior look like among employees of the organization?
- What social networks exist to facilitate organizational Learning?

- What Organizational Learning Model/Models would fit the requirements of the organization best tailored or as is?
- What are the good cultures that help support organizational Learning?

1.3 Objective

General Objective

The general objective of this study is to investigate whether organizational Learning is necessary for WLE. Moreover, if so, to determine which Organizational Learning Model works best for the organization's settings.

Specific Objectives

Specific objectives include:

- To Capture and visualize the knowledge sharing behavior among the employees of the organization
- To Map and analyze the social network existed within the organization
- To Suggest appropriate organizational Learning model
- To Point out good cultures that help support Organizational Learning

1.4 Scope and Limitation

The research is limited to address the need to have knowledge storage and sharing for organizational learning within and among projects of WLE. By doing so, an organizational Learning model will be adopted blended/tailored or as is.

1.5 Significance of the study

As organizational Learning is one that help an organization assume its strategic objective through knowledge creation and sharing, this study is planned to enable WLE harness similar

benefits. Existing and newly created knowledge will be shared and as a result learning will be facilitated.

1.6 Methodology

The approach of this study focuses in applying the theoretical constructs into the organization's settings. The primary goal of this approach is to assess the nature of organizational learning status of WLE and come up with suitable Organizational Learning model that will facilitate Knowledge sharing, creation, Learning and preserving. The methodologies described in the subsections below include Target Population, Sampling Population, Sampling Technique and Data Collection instruments.

1.6.1 **Target Population*:*** the target population is employees of WLE who are working in the development projects that are currently under implementation, projects that have been closed but have left the organization with both tacit and explicit knowledge. Moreover, those working with Knowledge of supporting operations such as Finance, administration, Information Technology, and human resources management will go under consideration for the study.

1.6.2 **Sample Population*:*** Purposive Sampling is applied to select the sample population. Professional employees of the organization involve in the study even though close to half of these professional employees are duty stationed out of Addis Ababa. This sampling technique is believed to be appropriate for the study for reason that the numbers of employees do not exceed 120 when the number of employees reaches its maximum and most of them are professional employees.

1.6.3 **Data Collection Procedure and Instruments*:*** The selected employees have at least bachelor's degree and are users of the e-mail system of the organization. Questionnaire consisting of two parts was distributed using the organization's e-mail.

The first part of the questionnaire was designed by Pune University to conduct organizational learning study for IT education and is used to capture organizational learning status of the organization from five different performance indicators namely Work Culture, Interaction, Willingness to share knowledge, Recognition, and Information Technology involvement in the organization

The second part of the questionnaire was designed by University of Canberra's New Intelligence and is used to conduct Social Network Analysis (SNA). Dalkir (2005, p.118) explains that SNA involves the use of questionnaire to gather information about the relationship between individuals and groups in the network. He described SNA as "SNA enables relationships between people to be mapped in order to identify knowledge flows: from whom do people seek information and knowledge? With whom do they share their information and knowledge?" (Dalkir 2005, p. 116).

The second part of the questionnaire is used to capture knowledge sharing behavior of the organization from five different performance indicators namely Work Culture, Interaction, Willingness to share knowledge, Recognition, and Information Technology involvement in the organization.

1.6.4 **Data Analysis**: Collected data with the first part of the questionnaire (Refer to Annex I) was analyzed with SPSS 20 to evaluate the current status of Organizational Learning in WLE.

The second part of the questionnaire was used to conduct SNA of WLE. Gephi 0.8.2 is used as network analysis tool to visualize social network graph and perform mathematical analysis based on graph and network theory..

Chapter Two

Literature Review

2.1 Knowledge

The generation and availability of new and existing knowledge presents a tremendous challenge and opportunity to organizations attempting to compete in a global arena (Brewer and Brewer, 2010). Having clearer understanding of what knowledge is in relation to technically related terms make the conceptualization and application more effective. In order to avoid ambiguity in giving meanings to knowledge in different applications Bergeron (2003) provided classification by giving clear core concepts of the following entities:

Data represents only numerical quantities or attributes that are derived from experiments, observations, calculations etc.

Information consists of data associated to particular explanations, interpretations or other textual material concerning a particular object/process.

Metadata represents additional information regarding the context in which main information is used.

Knowledge is defined as information, which is organized and synthesized in order to foster comprehension, awareness and understanding. Knowledge combines both metadata and awareness of the context suitable for applying metadata.

Instrumental understanding is the clear and complete perception of the nature and significance of an issue. It is the internal capability to gain experience by relating specific knowledge to broader themes. Other researchers refer to this concept either as sense making (Sanchez, 2005) or wisdom (Bellinger et. al., 2004).

Nonaka and Konno (1998) classified knowledge in to two major categories: Explicit Knowledge and Tacit Knowledge. Explicit knowledge refers to articulated information in a specific language (Nonaka, 1994). Therefore, Explicit knowledge can be digitized and Documenting, retrieving, and disseminating explicit knowledge is easier within organizations. Tacit knowledge is a type of knowledge that exists in mind or process of the beholder and expressed through practical actions. It is difficult to communicate and share tacit knowledge unless subjects came face to face (Nenonen, 2004). Tacit knowledge includes intuitions and unarticulated mental models (Nonaka, 1994).

2.2 Knowledge Management

Most of the time organizations are unable to utilize their knowledge at the full potential (King, 2009). This lack of ability to utilize knowledge has negative impact on organizational learning and hence organizational performance. However, many organizations have made significant efforts and considerable investments in order to manage Knowledge (Crossan and Bapuji, 2003). Managing knowledge involves managing the intangible asset of an organization with aim of improving organizational performance in achieving organizational strategic plan. According to Payne and Tony (1994) among benefit of knowledge management are to come up with efficient knowledge retrieval and effective organizational innovation. Knowledge management is aimed at improving efficiency of employees, optimized intra-organizational interaction, and improved individual competency within an organization. It is also applied primarily on improving customer service.

Knowledge management is a newly established multidisciplinary approach that has been used even before recognized as one of success factors for any organizational objective (Dalkir, 2005, p.6). Dalkir (2005, p.3) defined knowledge management as "deliberate and systematic coordination of an organization's people, technology, processes, and organizational structure in order to add value through reuse and innovation. This coordination is achieved through creating, sharing, and applying knowledge as well as through feeding the valuable lessons learned and best practices into corporate memory in order to foster continued organizational learning".

2.3 Organizational Learning

Organizational Learning came to being in academia when Argyris and Schon (1978) introduced the model of Single Loop Learning and Double Loop Learning even though the concept showed presence back in 1963 with the works of Cyert and March. However, it is Peter Senge who made it more popular with his book entitled The Fifth Discipline in 1990. Senge in his book introduced Organizational Learning with the relation to system thinking. He conceptualized an organization as a series of interconnected recursive loops rather than linear loops. Organizational members as a result are able to see the whole picture se well as the interrelationship between sub systems.

Robinson (1995) categorized definitions given to Organizational Learning into two categories; Descriptive approach and Normative approach definitions of organizational learning. Descriptive approach view organizational Learning as a common place process of changing organizational routines on the basis of feedback from internal or external environment. The normative approach view Organizational Learning as a relatively rare phenomenon that takes place only under a unique set of conditions. This approach requires an interaction to the way the organization operate to discover the best way to learn.

Different studies have given different definitions and meanings to Organizational learning. Some of the widely mentioned perspectives are listed below.

Organizational Learning is the set of actions (knowledge acquisition, information distribution, information interpretation and organizational memory) within the organization that intentionally and unintentionally influences positive organizational change. (Templeton et. al, 2002, p. 189)

Learning Organizations are organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspirations are set free and where people are continually learning how to learn together. (Senge, 1990, p.3)

Organization Learning means the process of improving actions through better knowledge and understanding. (Fiol and Lyles, 1985, p. 803)

The capacity or process within an organization to maintain or improve performance based on experience. (Nevis, 1995, p. 73)

Organizations are seen as learning by encoding inferences from history into routines that guide behavior. (Levitt and March, 1988, p. 319)

Organizational Learning is a process in which members of an organization detect errors or anomalies and correct it by restructuring organizational theory of action, embedding the results of their inquiry in organizational maps and images. (Argyris, 1977, p. 116)

A learning company is an organization that facilitates the learning of all its members and continuously transforms itself. (Pedler et al, 1991, p.12)

Organizational Learning is the process by which knowledge about action outcome relationships between the organization and the environment is developed. (Daft and Weick, 1984, p.285)

The core concepts in the citations above are the facts that Organizational Learning is existent in any organization, the ultimate goal is to improve the performance of the organization, organizational Learning makes use of people for continued transformation and it is a process of creating new knowledge. Some literatures attributed the fact as an entity and called it Learning Organization.

2.4 Learning Perspective

Organizational Learning has been presented from different perspectives that resulted in different ways to model the learning process. Three of these perspectives are described as follows

Know-how and know-why

A practical exercise to accomplish a task will give *know-how* knowledge (Sanchez, 1997). Such type of learning is accomplished while performing task with repeatable pattern of action and leads to *know-how* knowledge. Know-why knowledge is attributed to the type of learning that involves analyzing a task. This results in the comprehension of why a task is accomplished by certain actions. It is a result of more insightful investigation or inquiry into those actions or tasks (Sanchez, 2005).

Single Loop Learning and Double Loop Learning

Single Loop Learning is defined as "learning that changes strategies of actions or assumptions underlying strategies in ways that leave the values of a theory of action unchanged". (Argyris and Schon, 1978) It involves putting into effect goals, rules and plans and not trying to question them. (Kim, 1993)

Double Loop learning is learning that results in a change in the values of theory-in-use, as well as in its strategies and assumptions. (Argyris and Schon, 1996, p. 20) Double Loop Learning

includes questioning and speculation of established rules. It enables improvisation in terms of reframing a problem, which can result into radically different potential solutions. (Kim, 1993)

Individual, Group, and Organizational Learning

There are different opinions on the level of learning that takes place and the significant level to conduct a study. It is argued that learning occurs whether at Individual, Team, or Organizational level. A few argue that individual is the only entity capable of learning. Others argue that learning occurs on the two levels, Individual and group. However, Robert-Jan Simons (1995, p. 277) stated "In studying Learning in organization, one soon discovers that there are three levels of learning: Individual Learning, Team Learning, and Organizational Learning … There is no organizational Learning without individual learning and individual learning needs organizational assistance and context to be effective … It is the combination and coordination of the three kinds of learning that makes an organization a learning one."

Nonaka (1994) highlights that interaction between individuals is imperative in adding a dimension to organizational knowledge creation. Even though ideas are created in the minds of a single individual, their future evolution is highly dependent on the interaction between several individuals. Moreover, knowledge does not directly magnify into organizational level from an individual. More precisely, the relationships and shared understandings of groups get ingrained at the organizational level (Shrivastava, 1983). The gradual and ultimate impact is at the organizational level information (Hurley and Hult, 1998; Slater and Narver, 1995).

Individual Learning

Learning fundamentally occurs in the mind of individuals (Simon, 1993; Sanchez, 2005) and involves changes of skills, insights, values, attitudes and knowledge acquired by an individual. When transmitted to the rest of the organization, it has the potential to change patterns of organizational practice (Dibbon, 1999). It is widely believed that for an organization to learn, individuals must learn. (Leithwoood and Aitkens, 1996; Redding, 1995; Watkins and Marsick, 1993; Senge 1990; Argyris and Schon, 1978) As a result understanding how individuals make sense of the world is at the core of understanding organizational learning.

Dixon (1993) identified three ways that an individual can learn; Direct Experience (the receipt of sensory data as color, sound and pain), Verbal transmission of information (ideas voiced by others, books, reports, etc…), and Reorganization of what we already know into a new configuration. According to Dixon, these three ways of individual learning are not necessarily mutually exclusive in time and space. It is claimed that most individual learning involves all three simultaneously.

Dibbon (1999) states that "if we are to learn, we must become embedded in the culture in which the knowing and the learning have meaning". Learning cannot be separated from social world in which it occurs ignoring the contextual elements that gave it meaning (Dixon, 1988). The learning and knowing do not come as a result of just acquisition of knowledge but rather tend to be gained in the process of enculturation. When a learner becomes involved in the culture and activity of what is being learned, then they are more likely to be focusing on the "knowing how" than "knowing what".

According to Watkins and Marsick (1999) there are two types of learning namely intentional and non-intentional learning. Intentional Learning refers to "cognitive processes that have learning as a goal rather than an incidental outcome". Intentional learning is an achievement, not an arbitrary outcome of human experience. Individual Learning is a cyclical process whereby knowledge is created through the transformation of experience (Kolb, 1984). Intentional learning involves formal systems designed to facilitate continuous learning for improved and consistent performance. Non-intentional Learning, on the other hand, is an automatic consequence of human intelligence. Both types of learning are existent in an organization. However, an organization that is more focused on organizational learning will be opting for intentional learning with support of formal systems.

Kolb (1984) formulated a four stage of cyclical learning model called Kolb's Experiential Learning Model.

i. *Concrete Learning* : where individuals experience the world through their senses
ii. *Reflective Observation*: where individuals consciously reflect on what has occurred
iii. *Abstract Conceptualization*: where individuals make sense of what they have experienced
iv. *Active Experimentation*: where individuals relate what they have learned to their existing experience and create new meaning.

Many other forms have presented this learning since Kolb popularized it. However, it is also criticized for not having the social dimensions. (Javis, 1984).

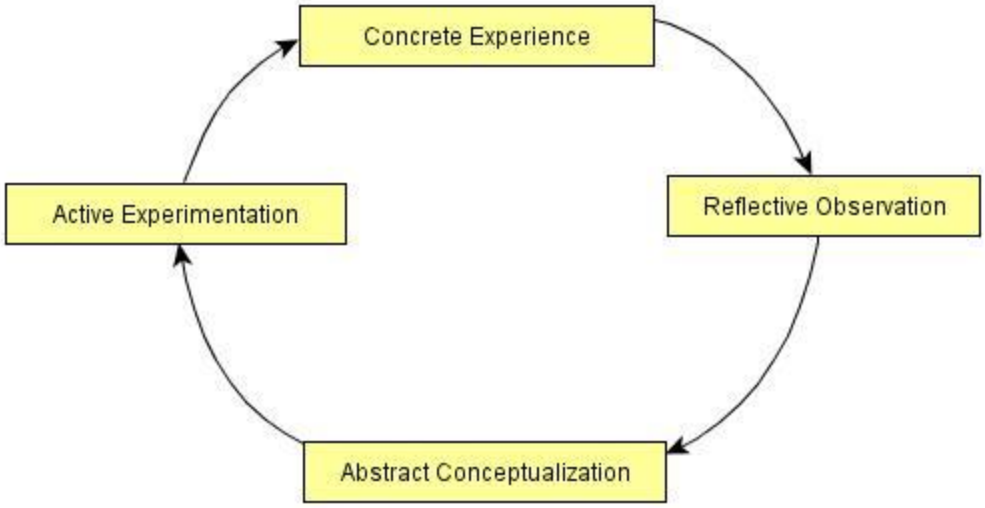


Figure 2.1 Kolb's Experiential Learning Model

Team Learning

The term "Team" and "Group" have been used interchangeably referring to people working together for a common objective. However, group is a more general term and refers to people who have some common characteristics. People in a form of group do not actually interact to each other. Team members on the other hand perform a joint action (Neck and Manz, 1994).

Team in this study refers to a group of people working in one specific department, unit or development projects with limited life span. In relation to this, a team is a collection of individuals who have come together because they need each other to explore complex issues and accomplish some common goals. They will be judged to have functioned effectively as collective learning unit when they meet the needs of their clients. When the work of a ream enhances the capacity of the members to work together independently in the future and when the group experience contributes to the growth and personal well being of team members (Heckman, 1991) and when the new learning of the team gets transferred appropriately throughout the organization.

Watkins and Warsick (1993) claim that teams represent the fundamental unit of an organization than individuals and they are more likely to represent the range of interests in an organization. Teams are capable of producing solutions that are more creative and pass decisions that are more acceptable by members and associates than individuals are. (Leithwood, 1996, p.8)

Unfortunately, Not all teams learn (Dibbon, 1999). However, team learning should occur whenever members come together for predefined objective. Team learning is interactive and involves free flow of creative ideas among members. Teams that learn have the potential to become a microcosm of learning through out the organization (Senge, 1990).

When a team learns, individual members of the team also learn (Senge, 1990). Thus, as individual team members learn and share their insights to other fellow members of the team and across the team, the newly created or adopted knowledge will spread through out the organization. And hence to other teams as well. Watkins and Marsick (1993) explain the fact that one need to understand how teams learn, not individuals learn on teams.

Senge (1990) describe the practicality of team learning as a collective discipline that involves mastering the practices of dialogue and discussion. He further explains the difference between dialogue and discussion stating that a discussion is when different views are presented and defended with persuasion to win over the other. Dialogue takes place when different views are presented and debated as a means discovering a new view with agreement among team members to suspend its basic assumptions and issues of ownership. A dialogue is a means to have open communication and must be adopted by an organizations that wishes to be the learning one.

Schon (1983) define learning as the interaction of action and reaction and developed a four interactive team learning process that revolve around collective thinking and action.

- *Framing and reframing* - framing is a groups initial perception of an issue, situation, person or object based on past understanding and present input. Reframing is the process of transforming that perception into a new understanding or frame.
- *Experimenting* - group action is taken to test hypotheses or moves, or to discover and assess impact.
- *Crossing Boundaries* – the team as a whole communicates and moves ideas, views or information between and among other people. Boundaries can be physical, mental or organizational.
- *Integrating perspectives* – group members synthesize their divergent views, such that apparent conflicts are resolved through dialectical thinking, not compromise or majority rule (Marsick, Watkins, and Kasl, 1993, p. 7).

Based on the model devised by Schon, Dechant, Marsick and Kasl (1993) identified four phases of team learning: fragmented, pooled, synergistic and continuous.

- Fragmented Phase: Beginning phase of the teams work in which individuals may learn but do not dare to reflect their experiences and understandings.
- Pooled Phase: A phase in which a partial personal experience sharing takes place within a team without attempts to reconcile opposite view points.

- Synergetic Phase: A level at which the team jointly constructs shared meaning, assumptions and language which leads to consensually developed solutions, positions, and recommendations.
- Continuous Learning: A continuation of synergetic phases in which learning becomes part of the team's nature. Learning in this phase will be able to be continuous as a result of interaction in other networks and teams.

Teams move in and out of the phases as they meet in new challenges, take new members and refine their learning skills (Dibbon, 1999).

Organizational Learning

Individual learning does not guarantee organizational learning; however, organizational learning cannot be achieved without individual learning (Dibbon, 1999). Organizational learning is a set of dynamic processes that allow movement of knowledge from individuals to organizations based on organizational information activities (Real et.al, 2006; Ruiz-Marcader et al., 2006). Organizational Learning is described to take place at various levels– individual, group and organizational (King, 2009. Moreover there is a consensus that learning takes place at all these three levels (Bappuji and Crossan, 2004).

2.5 Organizational Learning sub processes

Huber (1991) elaborated organizational learning as a process that consists of four other sub processes which still are considered as fundamental blocks. They are: knowledge acquisition, information distribution, information interpretation and organizational memory. Acquisition deals with obtaining knowledge, information distribution deals with transfer, interpretation concerns understanding information through many perspectives, while organizational memory

relates to the storage of knowledge for future use. This model served as a starting point for many detailed studies of Organizational Learning.

Knowledge Acquisition is concerned with obtaining knowledge from different sources. Both formal and informal activities in an organization involve acquiring knowledge in various ways. Formal activities, for example, acquire knowledge from different types of reports, performance review, activities analyses, and other activities in an organization. Huber (1991) listed sub process of knowledge acquisition.

- Congenital Learning : the presence of knowledge from beginning or foundation
- Experiential Learning: Intentional and systematic learning from experience
- Vicarious Learning: Acquiring second-hand experience
- Grafting: acquiring knowledge through new members of an organization who posses knowledge not previously available within the organization
- Searching and Noticing: knowledge acquisition either through scanning, focused search or performance monitoring

Information Distribution: is a transfer of information and is determinant factor for an organizational learning to occur. It is also helpful in creating new knowledge by piecing together those from different sources, i.e. combining information from different sources leads not only to new information but also to new understandings. This factor highlights the role of information distribution as a precursor to aspects of organizational learning.

Information Interpretation: Daft and Weick (1985, p.128) as "the process through which information is given meaning" and "the process of translating events and developing shared

understandings and conceptual meanings define Interpretation" (Daft and Weick, 1986, p.286). However, there is no one best way for an organization to learn and a considerable opportunity for misinterpretation of feedback resulting in incorrect adjustment of subsequent action (Daft and Weick, 1986, p.286).. As a solution to this stated potential problem. Information interpretation is proposed in the basic organizational model. Huber (1991) suggested that Information interpretation should come from different units of the organization for improved learning, as these different units tend to imply perspectives that are more diverse.

Huber (1991) suggested that the interpretation of shared information from different units can be highly influenced by the following factors:

- The uniformity of former cognitive maps possessed by the organizational units
- The uniformity of the framing of the information as it is communicated
- The richness of the media used to convey the information
- The information load on the interpreting units
- The amount of unlearning that might be necessary before an ew interpretation could be generated

Organizational Memory: Supports Organizational Learning by providing information storage and allow effective and efficient retrieval of relevant information to the appropriate personnel by the time required. Huber (1991) listed the factors influencing the ongoing effectiveness of organizational memory are:

- Membership attrition especially retaining tacit knowledge
- Information distribution and organizational interpretation of information
- The norms and methods for storing information

- The methods for locating and retrieving stored information

  And some of the factors that necessitates organizational memory for organizational learning are:

- Personnel turnover creates great loss for the human component of organizational memory
- To avoid the retrieval process in accessing information or non-anticipation of future needs information causes great amount of information not to be stored.
- Organization members with information needs frequently do not know of the existence or whereabouts of information possessed or stored by other members.

2.6 Organizational Learning frameworks

Bapuji and Crossnan (2003) have performed a review of Organizational Learning. Upon conclusion they point out learning goes beyond experiential learning and a trend of more attention shifting towards the learning process. They also point out the need attention to *accumulation, synthesis and integration* and for an increase in empirical research in Organizational Learning. Organizational Learning models are now expected to incorporate multilevel learning in which one level affecting the other with a component of strategic renewal (Crossnan et al, 1999). In addition, Organizational Learning models are expected to have a link for cognition and action in the process of learning.

Crossan et al (1999) elaborated the 4I framework which reflects learning that occurs through the sub-process of Intuiting, Interpreting, Integrating and Institutionalizing in a multilevel context i.e. individual, group and organizational.

- *Intuiting* is a preconscious recognition of a pattern or possibilities and is strongly an individual learning aspect.
- *Interpreting* occurs when an individual insight is further fortified not only through an internal conversation but also with an interpretive process with others. This is also related to individual learning.
- *Integrating* is based on two basic tenets i.e. shared understanding and coordinated actions. The interpreting process merges into the integrating process. Repeated actions of certain routines are significant of this process. This is related to group learning.
- *Institutionalizing* is an organizational level process where coordinated actions occur through a shared understanding resulting because of dialogue and joint actions. Repeated actions (Integrating) from which effective and formal rules and procedures are filtered as embedded routines.

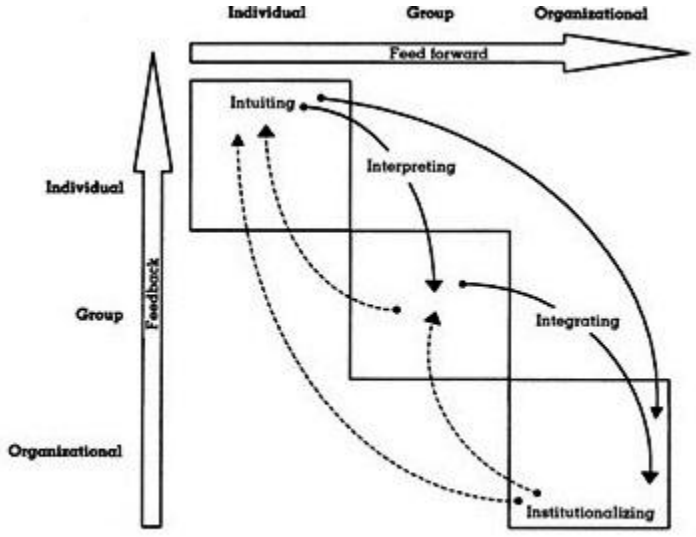


Figure 2.2 Multilevel Organizational Learning Model

2.7 Social Network Analysis

Social Network Analysis (SNA) is concerned with the study of relationship among interacting units. (Skerlavaj et al, 2010). SNA is used to visualize social network as graph and process the data input mathematically. The nodes in the graph represent employees while links/edges of the graph represent relationship or knowledge interaction among these employees (Dalkir, 2005, p.117).

Social Network graph has basic features that characterize how a network behaves and interpreted. These basic features include The Network graph, Tie strength that identify the weak and strong ties within the network, Key players that are central in the network and Cohesion which is the overall structure of the network.

Tie strength identifies the strong and weak ties in the network. Weights given to links/edges reflect the relationship strength. The strength of the tie can be the frequency of interaction (communication) or the amount of flow (exchange), reciprocity in interaction or flow, the type of interaction or flow between the two parties , other attributes of the nodes or ties (e.g., level of communication).

Key members of the network are identified by the measure of centrality.

- *Degree Centrality* measurement depicts how many people can a specific node/employee reach directly. The degree of a node is the number of edges that are adjacent to that node.[Heymann, 2012]
- *Betweenness Centrality* measures how likely is this node/employee to be the most direct route between two people in the network. It measures how often a node appears on shortest paths between nodes in the network [Brandes, 2001].
- *Closeness Centrality* measures how fast can this node/employee reach everyone in the network. It is the average distance from a given node to all other nodes in the network [Brandes, 2001].

- *The measure of Eigenvector* shows how well this node/employee connected to other well connected nodes/employees. A node is central to the extent that the node is connected to others who are central. [Heymann, 2012]

Cohesion characterizes the network's structure with the following measures

Degree of reciprocity: The ratio of the number of relations which are reciprocated (i.e. there is a link in both directions) over the total number of relations in the network. Two nodes/employees are said to be related if there is at least one link between them.

Density*:* Diameter It is the maximal distance between all pairs of nodes [Brandes, 2001]. A network's density is the ratio of the number of edges in the network over the total number of possible edges between all pairs of nodes (which is *n(n-1)/2*, where *n* is the number of nodes, for an undirected graph). It is a common measure of how well connected a network is. A perfectly connected network is called a *clique* and has density = 1. Density is useful in comparing networks against each other, or in doing the same for different regions within a single network.

Cluster*:* A node's clustering coefficient is the density of its neighborhood (i.e. the network consisting only of this node and all other nodes directly connected to it). The clustering coefficient for an entire network is the average of all coefficients for its nodes. Clustering algorithms try to maximize the number of edges that fall within the same cluster. Clustering is an indicative of the presence of different communities in a network.

2.8 Related Work

There are a number of other related works that can be taken as relevant instance for this study. In the sections below two different but related works from service and manufacturing industries are discussed separately.

2.8.1 Social Network Approach to Organizational Learning

This study is conducted by Škerlavaj and Dimovski (2006) to investigate the nature of organizational learning in software developing company. The study is based the factual

background of Network Theory that organizational learning is operating in every organization. The study organized learning activities in three components.

i. *Learning processes* – development of learning policies, development of learning programs, and execution of learning programs;
ii. *Learning structures* – content structure, organizational structure, and learning climate; and
iii. *Actors* – employees, managers etc. Learning networks take various shapes depending both on actor dynamics and work characteristics.

SNA is used to graphical visualization and mathematical analysis the complex interaction between employees of the organization. Questionnaires are used to collect data from employees and were used as input for SNA.

The SNA for the organization offered new insights to the research question how learning within the organization occurs. It is found that learning in the organization occurs in project settings and mainly involves transferring of tacit knowledge through participation. And employees that are seen as source of knowledge are those with more experience and hence more accumulated knowledge. It is also found that the more an employee is experienced in a given domain, the more probability that co-workers desire to learn from them. Physical proximity like shared office, similarity in level of expertise and complements in personal characteristics augmented the probability that co-workers will learn from each other.

2.8.2 Project-to-Project Learning in New Product Development Organization

Jarmen (2011) conducted this study in manufacturer of heavy duty transport solutions such as trucks, buses and construction equipment that is operational in 140 countries. The organization deploys multiple product development projects that have become the focus area of the study.

The study was conducted to characterize and improve project-to-project learning. This will, as a result, improve the performance of the project by optimizing the trade-off between time, cost and quality related constraints of project management. The study used the following research questions

- *How can projects share knowledge with line organizations and other projects?*
- *In the given organizations, what type of processes are present to share knowledge between projects, how are they used, what type of knowledge is shared and is it relevant for project-to-project learning?*
- *Are unwanted project outcomes repeatedly documented, why and how can they be avoided?*

The method used in the study is a qualitative research method based on secondary data from projects and semi-structured interviews to find themes and issues with project-to-project learning in the organization.

The study identifies the need to have a process to capture and disseminate lessons learned. This is used to be able to share knowledge with other projects and organization. In addition, it is suggested that lessons learned should be stored in accessible place and ensure reuse of information in subsequent projects.

Chapter Three

Data Analysis and Discussion

3.0 Introduction

This section focuses on experimentation by analyzing the collected data and discusses the results obtained. As mentioned in the previous section, this study conducted data analysis using Gephi 0.8.2 to do SNA and SPSS 20 to identify the knowledge sharing behavior of the organization.

The first part of the questionnaire is analyzed with SPSS 20. This subsection evaluates the existing Organizational Learning status of WLE through its organizational knowledge sharing behavior. The parameters used are the work culture towards knowledge sharing, the way interactions are taking place between staff members, the attitude towards willingness to share knowledge, recognition of staff members who are active in learning process and the involvement of Information Technology in Organizational Learning.

The second part of the questionnaire consists of items that are used to conduct SNA. SNA is used to show the overall social informal interaction among employees of WLE with graph separating department/projects by color of nodes. SNA is also used to identify major role players in the social network, how strong the network is and the overall structure of the network.

3.1 Learning Status

A learning network is existent in every organization (Skerlavaj and Dimovsky, 2006). However, evaluating the extent to which it is recognized, improved and cultivated makes difference in organizational performance. The subsections below present observation check list of the current WLE organizational learning status and then discuss results of analyzed data with SPSS about organizational learning status of WLE**.** The questionnaire for this part is designed by Faculty of Management, Lund University, to assess Collaborative Knowledge Sharing in IT education and is listed in Appendix A.

3.1.1 Observation Check list

Table 3.1 below shows an observation check list from researcher perspective. Facts from this check list were used in discussing the results of questionnaire. The items listed in the table are also mentioned in the questionnaire to observe and reflect on the understanding of staff members on the status of organizational learning in WLE and the tools used to support it.

Observation	Not Present	Present
Interactive Intranet for knowledge sharing	×	
Company website and E-mail		×
Online documentation System	×	
Knowledge Management unit	×	
Formal discussion sessions		×
Staff Recognition methods		×
Knowledge/Information Management Strategy	×	

Table 3.1 Observation check list

3.1.2 Work Culture

The work culture of WLE towards knowledge sharing among employees is evaluated in terms of staff members' motivation in learning and motivation to share knowledge. The evaluation also include the status of the organization in promoting creativity and how well best practices are reviewed and shared among staff members together with attitude towards knowledge sharing.

The results of analyzed data concerning work culture are shown in the table 3.1 below. And it is learnt that the work culture of WLE staff members require more effort to be at the level where knowledge sharing becomes organizational culture. Even though 80% of WLE staff members are highly motivated to learn and found the opportunity for knowledge sharing, there is ambiguity among respondents about the organization's flexibility and openness to new ideas, and promotion of creativity.

It is observed while conducting the study and reflected by respondents that best practices and lessons learned are reviewed and shared among staff members in formal discussion sessions. And negative behavior towards knowledge sharing is always discouraged in the organization.

3.1.1 Interaction

Interaction indicates whether there are interactions in the organization at various levels. Results shown in Table 3.2 depict the fact that there is very little interaction (52%) between staff members of different projects within the organization.

The absence of online discussion forums is recognized by 91.1% of respondents and 95.2% of respondents is aware of the fact that the organization does not have interactive knowledge management Intranet. However, there are meeting and workshops in the organization that take place to share knowledge among staff members.

Work Culture						
		Not at all effective	Less effective	Somewhat effective	Effective	Very Effective
No	Statement					
1	Staffs are highly motivated to learn and have the opportunity for sharing.	5.7%	6.6%	7.9%	47.5%	32.3%
2	The organization is flexible, open to new ideas and promotes creativity.	25.2%	21.4%	23.0%	16.1%	14.3%
3	Best practices in internal methods are reviewed and shared throughout the organization.	8.8%	11.4%	5.0%	36.1%	38.7%
4	Negative behavior towards Knowledge sharing is always discouraged in the organization	6.2%	7.3%	26.8%	16.1%	43.6%

Table 3.2 Work Culture

3.1.2 Willingness to share knowledge

In relation to willingness to share knowledge, 76.3% of respondents take knowledge sharing as strength. This shows there is a strong understanding among staff members towards the benefit of knowledge sharing. In addition to this fact, 70.2% of respondents found knowledge sharing as a means of improving interpersonal relationships among staff members and 76.1% of them agree that collaborative knowledge sharing enhances learning .

It is observed that there is a vague understanding about weather competition between members of different projects within an organization creates barrier for knowledge sharing.

3.1.3 Recognition

Recognition indicates whether effective Knowledge Sharing is recognized and rewarded in the organization. WLE recognizes the effort of staff members who are more interactive in knowledge

Interaction						
		Not at all effective	Less effective	Somewhat effective	Effective	Very Effective
1	There is an interaction in knowledge sharing between staff members of different projects in the organization	20.6%	52.0%	20.9%	4.8%	1.7%
2	At present, online discussion forums are receiving highest participation rate	42.0%	49.1%	6.2%	1.8%	0.9%
3	The organization has an interactive Knowledge Management Intranet site	56.8%	38.4%	1.8%	2.5%	0.5%
4	Knowledge sharing amongst the staff members takes place through regular interactions by means of review meetings and workshops in the organization	0.5%	7.1%	10.5%	28.6%	53.3%

Table 3.3 Interaction

sharing, with a record in performance appraisal. In relation to this fact, 86.6% of respondents have the understanding with different level of acceptance. Moreover, Individual members are recognized for team work and knowledge sharing but this fact is strongly understood by only 13.4% (9.8% as Effective and 3.6% as very effective) of respondents.

In relation to recognition of staff members for knowledge sharing through newsletter or website, 80% of respondents understand the fact that this methods of recognition are used. Even though feedback mechanisms are employed in WLE, 47.7% of respondents perceive them as less effective, 32.1% as somewhat effective and 12% as effective opportunity to learn.

Willingness to share Knowledge						
		Not at all effective	Less effective	Somewhat effective	Effective	Very Effective
1	Knowledge Sharing can be seen as strength.	0.9%	7.1%	15.7%	28.6%	47.7%
2	Knowledge sharing improves the interpersonal relationships amongst the staff members.	4.5%	12.3%	13.0%	22.3%	47.9%
3	Inter Organizational/projects competition creates a barrier for knowledge sharing	20.3%	24.3%	22.3%	22.3%	17.9%
4	Collaborative Knowledge sharing enhances learning.	5.4%	4.5%	14.1%	25.9%	50.2%

Table 3.4 Willingness to share Knowledge

3.1.4 Information Technology

The items listed under this category, Information Technology, are planned to see whether WLE employs Information Technology tools to facilitate Organizational Learning and if employees understand the existing tools and utilize them. In this regard it is noted in the observation check list that the existence of Information Technology for organizational learning in the form of Organization website and e-mail system. In line with fact, 32.1% of respondents found the involvement of Information Technology somewhat effective, 36.6% found it effective and 15.2% as very effective. An aggregate of 83.9% of respondents have a positive understanding on the involvement of Information Technology in organizational learning.

There is an organized documentation center with proper catalogue database in WLE. However, it is only 3.6% of respondents recognized it as effective and 1.8% as very effective resource center. Other 21.4 % respondents found it to be somewhat effective. The rest majority found it to be either less effective or not at all effective,

Recognition						
		Not at all effective	Less effective	Somewhat effective	Effective	Very Effective
1	Knowledge Sharing is monitored and recorded positively in Performance appraisal of the staff.	5.7%	7.7%	25.7%	30.0%	30.9%
2	Individual staff members are recognized for team work and Knowledge Sharing.	17.9%	39.2%	29.5%	9.8%	3.6%
3	The organization symbolically recognizes (through newsletter or website) those who support and put their efforts towards Collaborative Knowledge sharing.	0.0%	5.9%	14.1%	35.9%	44.1%
4	Feedback mechanism is in place and seen as an opportunity to learn	5.4%	47.7%	32.1%	12.1%	2.7%

Table 3.5 Recognition

With respect to communication among staff members in the organization, Information Technology is found to be very effective tool for 48.8 % of respondents and effective for 34.8%. However there are no online documentation systems that support lessons learned and best practices except the summary report available on the organization website and distributed with e-mail and this fact is sensed by 44.8% of respondents rating it as less effective.

3.2 Social Network Analysis

As discussed in the literature review, Social Network Analysis (SNA) is used to visualize the interaction between staff members of WLE in exchanging knowledge and hence learning. Mathematical models are then used to analyze the role of individuals and groups in the organizational learning. The result of the analysis was used to assess the current status of the existing social network and come up with recommendations to improve organizational learning.

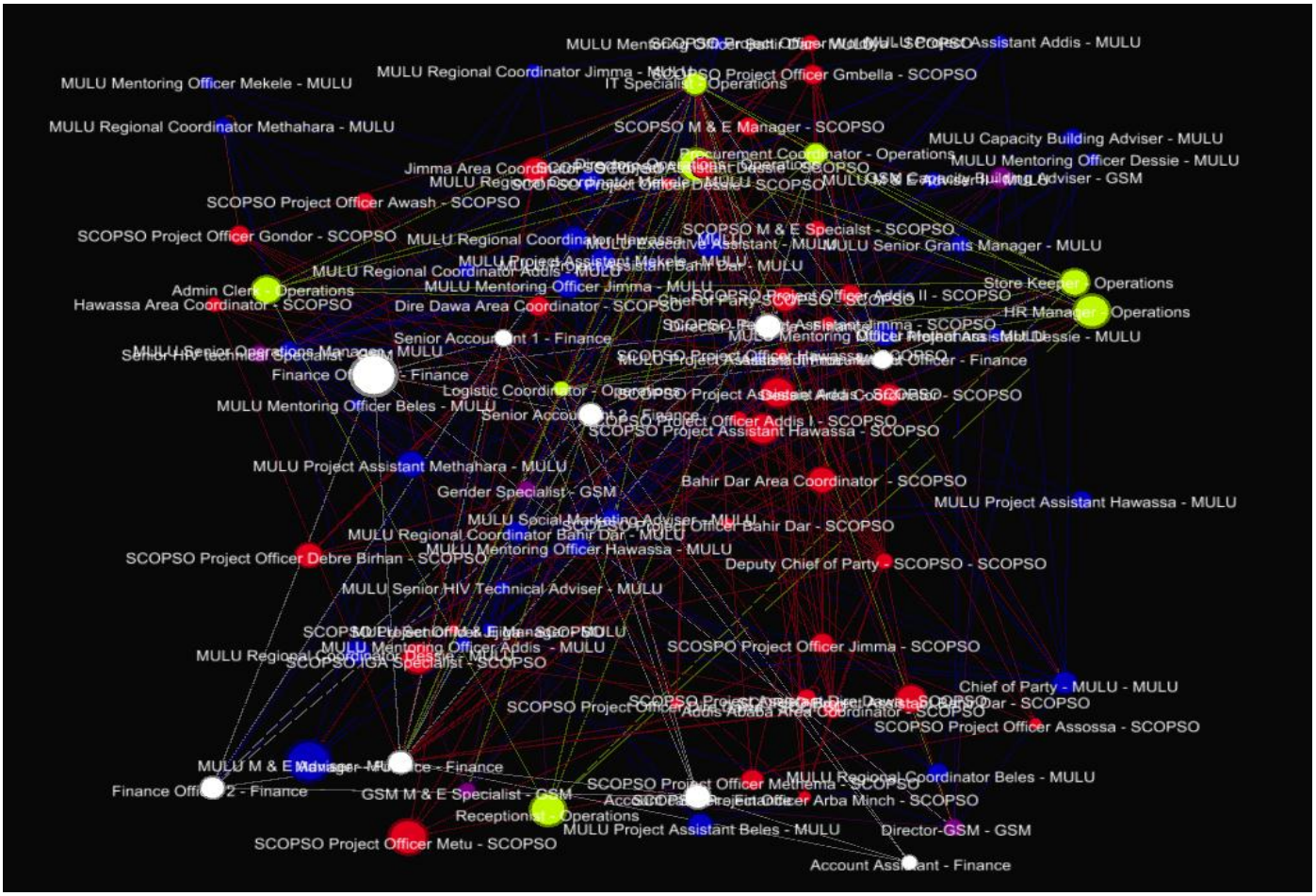
SNA is the second part of the experimentation. In this section the results of SNA are analyzed and presented with network graph. As mentioned in the methodology used, Gephi 0.8.2 version is used to create and visualize and analyze the social network of WLE.

Information Technology						
		Not at all effective	Less effective	Somewhat effective	Effective	Very Effective
1	Information Technology facilitates Collaborative Knowledge Sharing through various tools in the organization	4.5%	11.6%	32.1%	36.6%	15.2%
2	Effective cataloguing and archiving procedures are in place for document management in the organization	16.1%	57.1%	21.4%	3.6%	1.8%
3	IT supports effective communication among the staff members in the organization	2.7%	2.1%	11.6%	34.8%	48.8%
4	Online documentation systems support Lessons Learned and best practices accessible	13.4%	44.8%	24.1%	15.0%	2.7%

Table 3.7 Information Technology

3.2.1 Social Network Graph

Among the 90 respondents, the projects *SCOPSO* and *MULU* contributed 37.78% each, Finance department contributed 9.99%, Operations department contributed 8.89% and *GSM* project contributed 5.56%. Staff members of the five major department/projects are represented as nodes with five different colors that belong to their department. As a result, there are 90 nodes, 485 edges (different types of relationships between nodes of the same and different groups) out of which 100 are iterations. The social network graph is a directed one.



SCOPSO 37.78% MULU 37.78% FINANCE 9.99% OPERATIONS 8.89% GSM 5.56%

Figure 3.1 Network graph for WLE Knowledge Sharing

3.2.2 Network Tie Strength

The collected data are used to measure tie strength of the network with weights on relationships (edges). Purpose of communication is one of the weights on the relationships of the network graph that determine the reason for interaction between staff members. Level of communication identifies the initiation of interaction within organizational hierarchy. Value of information is a measure of knowledge obtained as a result of interaction. Contact frequency rates individual interaction frequency.

i. Purpose of communication: The majority 62.89% of communications are with the intention of Problem-solving interactions that actively challenge person's thinking on problems or

opportunities in my work. And 13.4% of communications aimed at Information that helps solve problems or capitalize on opportunities. 12.99% of communications are for support that allows the person to move their plans ahead. 10.72% of communications are for access to decision makers that allows the person move plans ahead.

ii. Level of Communication: It is observed that 45.98% of communications are initiated from employees that are at lower positions of WLE organizational hierarchy to higher level employee. 31.75% of communications are initiated from employees that are at higher positions of WLE organizational hierarchy than the expected respondents. 22.27% of communications are among staff members with equal level of positions.

iii. Value of Information: In related to the value of information obtained as a result of knowledge sharing among staff members, 81.86% of the respondents rated the information obtained as very Valuable while 16.08% rated it as Valuable, and 2.06% as occasionally valuable.

iv. Contact Frequency: When asked to rate the frequency of each contact an employee is having between 1 through 5, 71.75% of the respondent rate the frequency of contact to be 3. 11.34% rated as 4, 7.01% as 5, 4.95% as 2 and 4.95% as 1.

Interaction initiation to access decision makers that allows plans move ahead are made from lower level positions 100% of the time. Almost half on interaction (44.6%) to get information that help solve problem or capitalize opportunity are initiated from low level, 26.2% from lower and 19.2% from low level. Problem solving interactions that actively challenges thinking on problem solving or opportunities in work are initiated from lower level position 50.5% of the

time and from higher level of position 41% and 8.5% of the time from same level of position. Table 3.8 below presents summary of the stated facts.

Relationship label	Level		
	Higher	**Low**	**Same**
Access to decision makers that allows me to move plans ahead	100.0%	0.0%	0.0%
Information that helps me solve problems or capitalize on opportunities	26.2%	44.6%	29.2%
Problem solving interactions that actively challenge my thinking on problems or opportunities in my work	50.5%	41.0%	8.5%
Support that allows me to move my plans ahead	0.0%	0.0%	100.0%

Table 3.7 Relationship label verses position level tabulation

In relation to value of information as a result of interaction among staff members, 80.8% of respondents found interaction to access decision makers that allow plans move ahead Very Valuable and 17.3% found it Valuable. The rest 1.9% found it Occasionally Valuable. Interactions to solve problems or capitalize on opportunities are found to be Very Valuable to 75.4%, Valuable to 24.6% of respondents. The majority 85.2% of respondents found problem solving interactions that actively challenge thinking on problems or opportunities in work Very Valuable, 13.1% Valuable and the rest 1.6% found it Occasionally Valuable. Interactions to find support that allow move plans ahead are Very Valuable to 85.2%, Valuable to 20.6% and Occasionally Valuable to 6.3%. It is observed from the facts stated above that interactions for mentioned purpose of relationship are Very Valuable for the significantly majority of staff members and that shows the level of importance of knowledge sharing among staff members of WLE. The stated facts above are summarized in table 3.9 below.

It is observed that 84.8% of knowledge sharing communication initiated from lower level of position, 79.9% initiated from higher level of position and 78.7% of communications at the same level of positions take the knowledge obtained the communication to be very valuable. In addition to these facts, 98.1% of employees who term their purpose of communication as to "Access to decision makers that allows me to move plans ahead", 100% of those who term their purpose of communication as to "Information that helps me solve problems or capitalize on opportunities", and 98.6% of those who term their purpose of communication as to "support that allows me to move my plans ahead" reported the knowledge found to be very valuable or valuable.

Relationship label	**Value of Information**		
	Occasionally Valuable	**Valuable**	**Very Valuable**
Access to decision makers that allows me to move plans ahead	1.9%	17.3%	80.8%
Information that helps me solve problems or capitalize on opportunities	0.0%	24.6%	75.4%
Problem solving interactions that actively challenge my thinking on problems or opportunities in my work	1.6%	13.1%	85.2%
support that allows me to move my plans ahead	6.3%	20.6%	73.0%

Table 3.8 Relationship label verses Value of Information

Findings in table 3.9 depict the fact that most communications are very valuable despite the frequency of interaction. This fact is further strengthened with 75% of respondents found the minimum rate communication frequency (1) as very valuable.

Value	Communication Frequency Rate (1-5)				
	1	2	3	4	5
Occasionally Valuable	0.0%	0.0%	2.3%	3.6%	0.0%
Valuable	25.0%	20.8%	15.2%	16.4%	14.7%
Very Valuable	75.0%	79.2%	82.5%	80.0%	85.3%

Table 3.9 Value of Communication Frequency Rate

3.2.3 Network Key Players:

Identifying key players in the network is one of the main purposes of conducting SNA. The following sections show the findings of WLE social network in terms of the measures of Centrality such as Degree Centrality, Betweenness Centrality, and Closeness Centrality.

i. Weighted Degree Centrality – The average weighted degree of WLE social network is 5.38. The tables below show out-degree and in-degree results that are obtained from directed network graph of WLE. Out-degree refers to the number of employees (targets) that the employee (source) looks for communication in directed network graph. Table 3.x shows the top three nodes along with their project/department and the number of nodes they are connected to. This implies that these employees are the most initiators of knowledge interactions and the social network is dependent on their participation.

Rank	Position Title	Project/Department	Nodes
1	Senior Operations Manager	MULU	10
1	Social Marketing Adviser	MULU	10
2	IT Specialist	Operations	9
2	Chief of Party	SCOPSO	9
2	Deputy Chief of Party	SCOPSO	9
3	Operations Director	Operations	9
3	Finance Director	Finance	8
3	Area Coordinator (Addis Ababa)	SCOPSO	8
3	Area Coordinator (Jimma)	SCOPSO	8
3	Project Assistant (Addis Ababa)	SCOPSO	8
3	Project Officer (Bahir Dar)	SCOPSO	8

Table3.10 Top three out-degree outcome of WLE SNA

The In-degree measure of the network on the other hand refers to the number of employees (sources) that look for the employee (target) for communication in directed network graph. Table 3.11 below shows top five most searched for employees in WLE social network. These employees are believed to have important knowledge for the existence of the network.

Rank	Position Title	Project/Department	Nodes
1	Senior Operations Manager	MULU	10
1	Social Marketing Adviser	MULU	10
2	IT Specialist	Operations	9
2	Chief of Party	SCOPSO	9
2	Deputy Chief of Party	SCOPSO	9
3	Operations Director	Operations	9
3	Finance Director	Finance	8
3	Area Coordinator (Addis Ababa)	SCOPSO	8
3	Area Coordinator (Jimma)	SCOPSO	8
3	Project Assistant (Addis Ababa)	SCOPSO	8
3	Project Officer (Bahir Dar)	SCOPSO	8

Table3.11 Top five in-degree outcome of WLE SNA

The average weighted degree measure of WLE social network is 5.38.

ii. Betweenness Centrality indicates how often a node is found on a shortest path between two nodes in the network. Betweenness Centrality is calculated as the number of shortest paths that pass through a node divided by all shortest paths in the network. The graph below shows the overall Betweenness centrality distribution of the network. And table that follows the graph shows the rank list of staff members of WLE without normalized value.

Rank	Label
2811.5222892694123	Deputy Chief of Party - SCOPSO
2773.240218176728	Chief of Party-SCOPSO
2553.636648727089	MULU Senior Operations Manager
2104.8250809860792	IT Specialist
1317.830735930736	SCOPSO M & E Manager
667.9783496483625	Dessie Area Coordinator
604.1490660483307	Chief of Party - MULU

Table 3.12 Betweenness Centrality top six rank list without normalized value

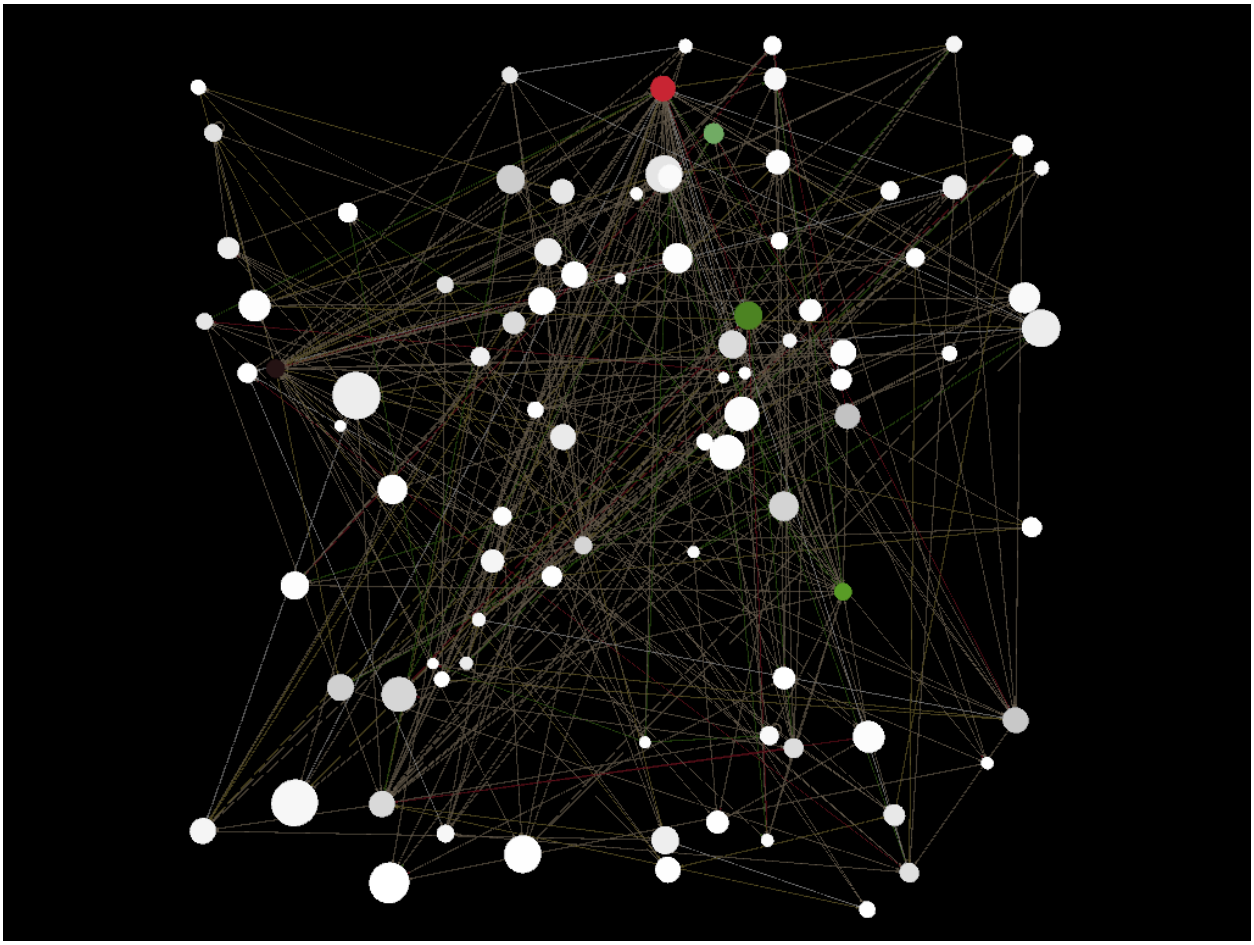


Figure 3.2 *Betweenness Centrality graph*

The staff members on the list are more likely to be in communication paths between other staff members in knowledge sharing and interaction. These are also determining point of contacts where the network would break out without.

iii. Closeness Centrality indicates how long it will take for information from a node to reach other nodes in the network. Closeness Centrality is measured as the mean length of all shortest paths from a node to all other nodes in the network. The network graph of Closeness Centrality is shown in figure below with the rank list that shows staff members as nodes in the network graph.

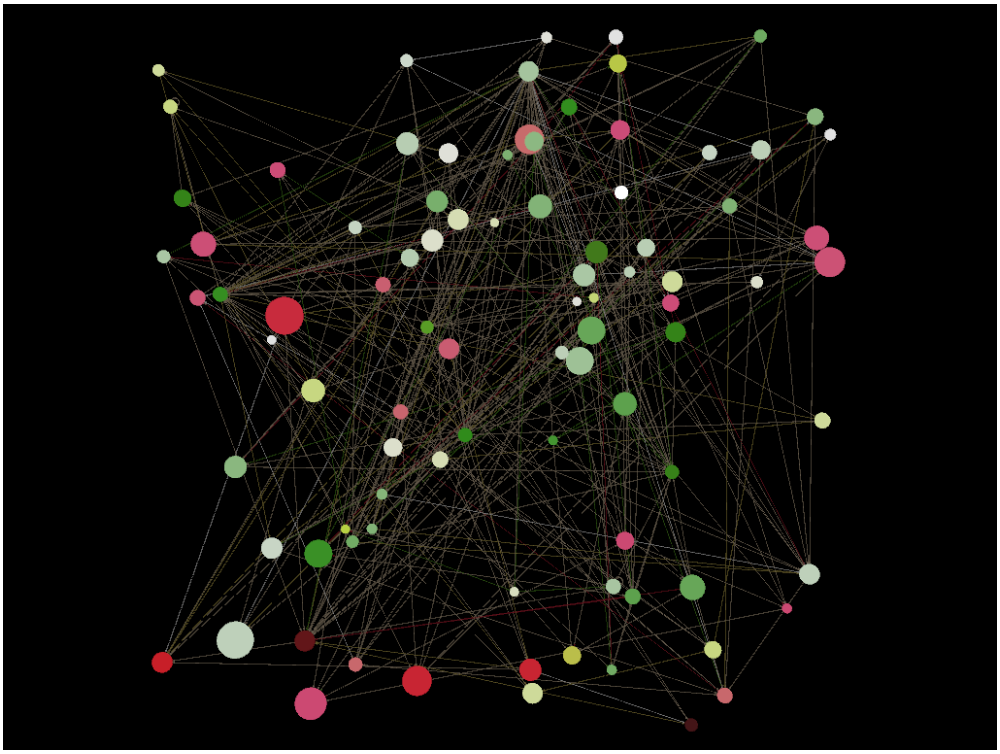


Figure 3.3 Network graph of Closeness Centrality of WLE

As shown in the network graph above and rank list table below, closeness centrality measure tends to base on projects/departments of WLE with a few staff members deviating from this fact. There is also a merge (with similar coloring due to relatively close values) of SCOPSO project and Operations department as far as closeness centrality measure is considered. However, individual staff members are observed closer to other staff members of the same project than other. For example, SCOPSO Project Officer Awash is far away from Admin clerk who is under operations department despite the color similarity.

iv. Eigenvector Centrality measures how well a staff member is connected to other well connected staff member. An employee's eigenvector centrality is proportional to the sum of the eigenvector centralities of all other employees directly connected to it (Butts, 2008). With this

measure, well connected staff members with other well connected staff members are identified. The table and figure below show the results depicted for WLE social network.

Rank	Label
6.932584269662922	Logistic Coordinator
6.123595505617978	Account Assistant
5.955056179775281	Manager - Finance
5.314606741573034	Finance Officer 2
5.202247191011236	Account cashier
5.191011235955056	Receptionist
5.067415730337078	Finance Officer 1
4.449438202247191	SCOPSO Project Officer Assossa
4.449438202247191	SCOSPO Project Officer Jimma
4.449438202247191	SCOPSO Project Officer Metu
4.393258426966292	SCOPSO Project Officer Awash
4.382022471910112	Procurement Coordinator
4.382022471910112	Assistant Procurement Officer
4.370786516853933	Admin Clerk
4.370786516853933	Store Keeper
4.359550561797753	HR Manager
4.348314606741573	Senior HIV technical Specialist
4.325842696629214	Senior Accountant 2
4.314606741573034	Senior Accountant 1
4.292134831460674	Gender Specialist
4.280898876404494	Director-GSM
4.280898876404494	GSM M & E Specialist
4.269662921348314	Director - Operations
3.966292134831461	SCOPSO Project Officer Methema
3.932584269662921	SCOPSO Project Officer Gmbella
3.898876404494382	SCOPSO Project Officer Jijiga

Table 3.13 Closeness Centrality measure rank list

Eigenvectors of adjacency matrices are useful as measures of centrality or of status (Liyod, 2001). Table 3. show the top ten well connected staff members with IT Sepcialist having the first rank with normalized value of 1. This shows that the staff member is the most connected person with other staff members having higher eigenvector centrality measure. Staff members listted in the rank are those staff members that have high influence in the performance of organizational learning of WLE. Figure 3. depicts the same fact that colored (key to colors can be taken from table 3.12) nodes (staff members) with their relationship to other nodes in the network. Nodes with white color are ordinary nodes (the majority staff members) whose interactions are under influnce of the one with higher Eigenvector Centrality measure.

Rank	Label
1.0	IT Specialist
0.6766460372132421	Director - Operations
0.605351686614246	Manager - Finance
0.4216795955268518	Director-GSM
0.3953914423474653	Chief of Party - MULU
0.3915188160144835	Chief of Party-SCOPSO
0.3818521119424028	MULU Senior Operations Manager
0.375843535825997	HR Manager
0.37358264383901324	Director - Finance
0.3334777542024656	Deputy Chief of Party - SCOPSO
0.32968370833927363	Logistic Coordinator
0.32671959822222785	Store Keeper
0.29359800692973137	Procurement Coordinator
0.27855330822838975	GSM M & E Specialist

Table 3.14: Eigenvector Centrality measure normalized rank list

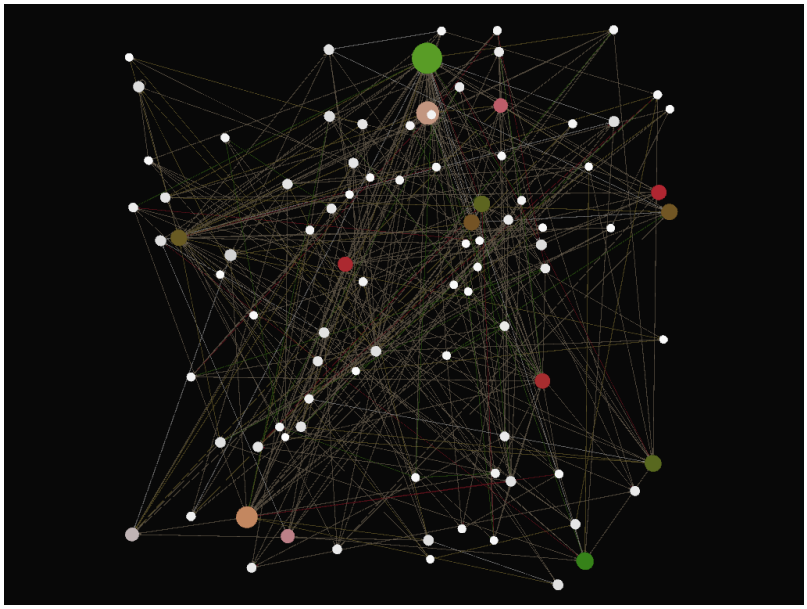


Figure 3.4 Eigenvector Centrality measure diagram

3.2.4 Cohesion: Network Structure

Cohesion is an important factor that facilitates coordinated learning without which performance is negatively affected (Chanier, 2006). In order to identify and study the social network structure (cohesion) of WLE, density of the network and different clustering algorithms have been applied and the following results are obtained.

i. Density: A network's density is the ratio of the number of edges in the network over the total number of possible edges between all pairs of nodes. And the density of the network taking the graph as directed one as parameter is 0.061. This implies that the network is loosely connected as the network connection gets denser as the value of the measure of density gets close to one. A perfectly connected network will assume a density of one.

ii. Clusters: clusters are groups with similar characteristics that differentiate them from other clusters or groups. Clustering algorithms try to maximize the number of edges that fall within the same cluster (Cheliotis, 2010). For this study, Force Atlas, Frunchterman, Label Adjust, and Yifa Huberproportional clustering algorithms are applied using Gephi and the following output of clusters are found.

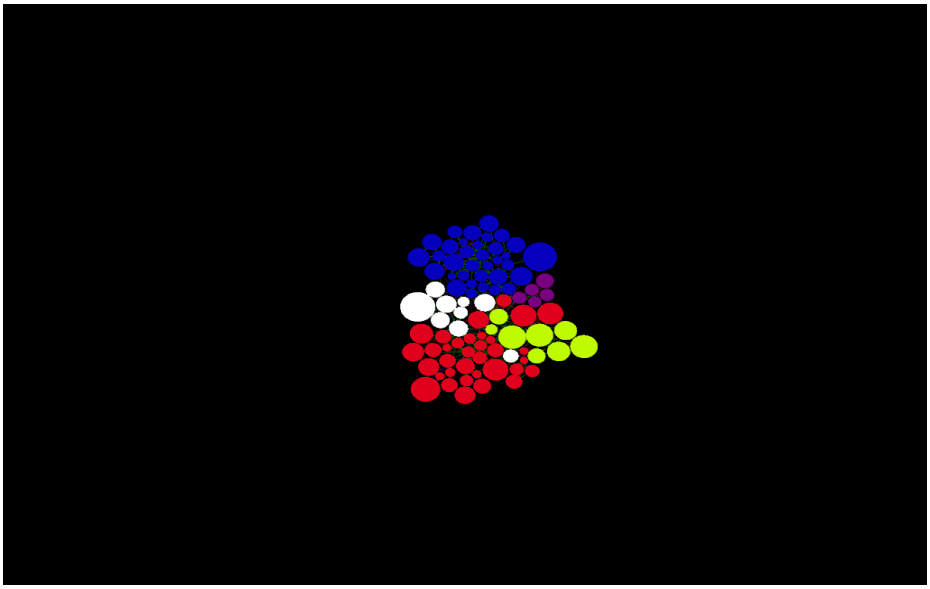


Figure 3.5 Force Atlas Algorithm Layouts

SCOPSO 37.78% MULU 37.78% FINANCE 9.99% OPERATIONS 8.89% GSM 5.56%

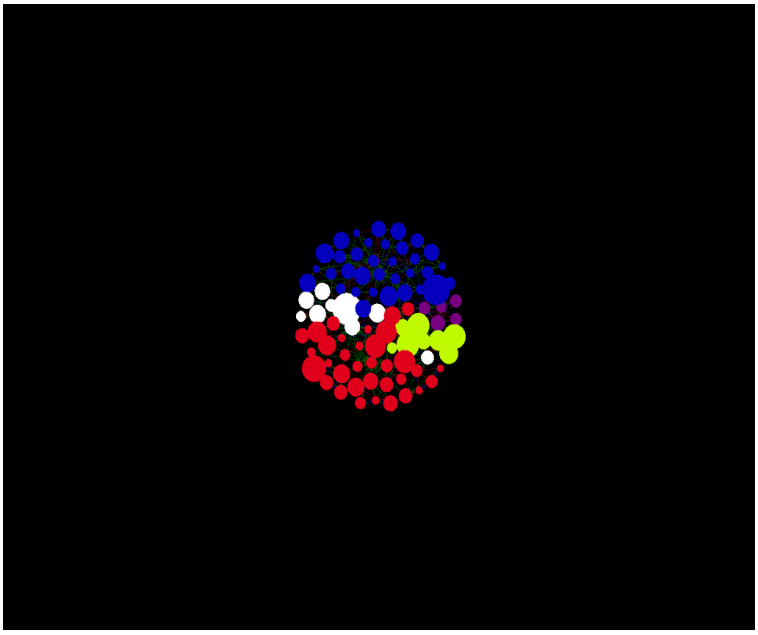


Figure 3.6 Fruchterman Reingold Algorithm layouts

SCOPSO 37.78% MULU 37.78% FINANCE 9.99% OPERATIONS 8.89% GSM 5.56%

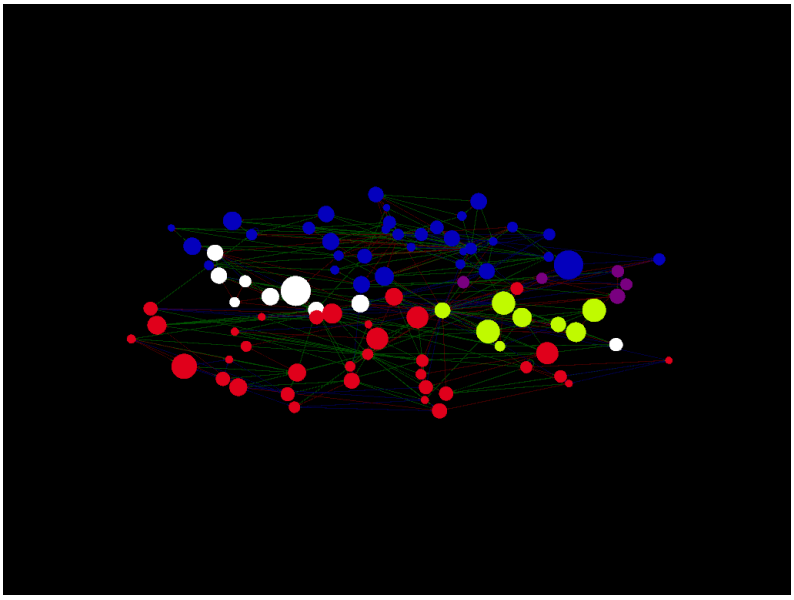


Figure 3.7 Label Adjust Clustering algorithm layouts

SCOPSO 37.78% MULU 37.78% FINANCE 9.99% OPERATIONS 8.89% GSM 5.56%

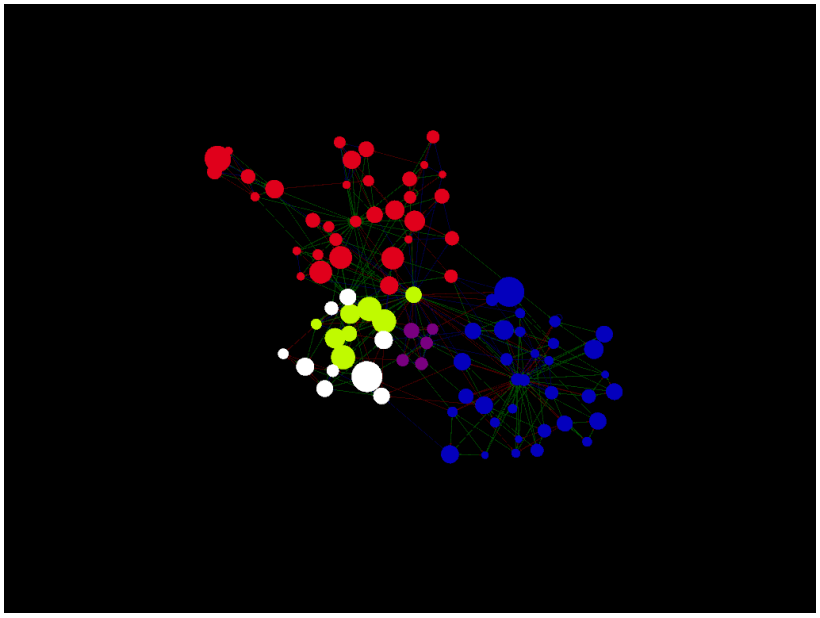


Figure 3.8 *Yifa Huproportional algorithm layout*

SCOPSO 37.78% MULU 37.78% FINANCE 9.99% OPERATIONS 8.89% GSM 5.56%

Clusters are indicatives of the presence of different sub-communities in a network. In the case of WLE figures 3.5 to 3.8 above depict that modularity is dominantly on projects/departments with few nodes intermingling for inter-unit communication. This is done with different types of layout algorithms that cluster staff members with similar attributes on nodes and relationships.

Chapter Four

Conclusions and Recommendations

This chapter gives a concluding points and recommendations based on the analysis conducted and discussions made on the previous chapter.

4.1 Conclusion

The conclusion made in this subsection are based on the analysis of collected data from WLE employees and from observation check list maintained. The bullet points below are current status of the organizational learning from findings of data analysis.

- Employees of WLE are found to be highly motivated for learning from each other. And the organization has created a formal learning sessions to review and share knowledge by discouraging negative behavior towards it. However, the organization is not at the level where employees are satisfied with its flexibility, openness to new ideas and promotion of creativity.
- Apart from the learning sessions organized by the organization, there is no way to have interaction between staff members of different projects and departments.
- The organization recognizes outstanding learning behavior of project and departments through different publications. However, it does not recognize individual staff members.
- The organization do not have specialized system for purpose of learning that is supported by Information Technology. Information Technology is used only for purpose of communication between employees.
- The existing social network within the organization is strongly tied with collaborative work with learning from one another despite level of organizational positions.

- Key players in the social network are found to be members from different projects and departments of the organization. This shows that these staff members are bridging interaction between different projects and departments.
- The social network of the organization is not dense compared to the number of employees. A perfect social network has a density of 1. However, WLE social network has a density of 0.061.
- The social network of the organization is clustered based on the organizational division, i.e. between project and departments with slight mixture on individual staff members who are key players in the network.

4.2 Recommendations

The following recommendations are based on the finding of the study. Following the recommendation put the organization in a position where cultivation of better organizational performance through enhanced organizational learning. It is assumed that the need to have such type of study to be conducted time to time so that a continuous assessment of organizational learning keeps on improving performance in competitive world.

- It is recommended that the organization put a multilevel organizational learning framework that enable learning at individual, project/departmental and organizational level.
- Even though there is strong belief in the benefit of knowledge sharing, vague understanding is observed towards whether competition between different projects members creates a barrier for knowledge sharing or not. It is recommended that further study should be made to investigate the relationship between these two factors.

- It is observed that the social network is not dense as compared to the number of members in the network. It is recommended that the organization put effort towards social network development by involving the use of Information Technology into consideration.
- Social networks are interactions among human and other entities. Clusters that are dominantly based on departments and projects will limit inter-units interaction and hence will limit organizational learning. The organization can improve organizational learning by facilitating more inter-units interaction sessions.
- Since half of the organization is located in different geographical location, further study is recommended on the best way to facilitate fast and real time learning by the advent of the web technology.

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ANNEX I Research Questionnaire

Dear respondent

This study is being conducted as partial fulfillment of Masters of Science in Information Science. It aims to investigate the status of organizational Learning mechanism in World Learning Ethiopia and suggest improvements for better use in the future. World Learning can use its knowledge capital with improved and efficient organizational learning mechanism that will benefit employees, projects and the organization as whole.

This questionnaire is self-administered with the objective of collecting data that will be used to grasp the real picture of the existing situation and requirements for improved organizational learning. You are kindly requested to fill the questionnaire carefully.

The first part helps investigate status of the current system and level of functionality. The second part of the questionnaire is for Social Network Analysis (SNA), which captures the communication network, and hence knowledge sharing pattern. If you have question in the process of filling the questionnaire, please forward the questions with the signed e-mail address and mobile number.

Thank you in advance

Samuel Mohammed

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Part I. The table below consists of items that are used to evaluate the performance of the existing knowledge sharing behavior and good cultures for improved organizational Learning. Please indicate your answer by inserting X in the corresponding number with meaning on top.

Performance Indicator 1 : Work Culture						
		Not at all effective	Less effective	Somewhat effective	Effective	Very Effective
No	Statement	1	2	3	4	5
1	Staffs are highly motivated to learn and have the opportunity for sharing.					
2	The organization is flexible, open to new ideas and promotes creativity.					
3	Best practices in internal methods are reviewed and shared throughout the organization.					
4	Negative behavior towards Knowledge sharing is always discouraged in the organization					
Performance Indicator 2 : Interaction						
5	There is an interaction in knowledge sharing between staff members of different projects in the organization					
6	At present, online discussion forums are receiving highest participation rate					
7	The academic organization has an interactive Knowledge Management Intranet site					
8	Knowledge sharing amongst the staff members takes place through regular interactions by means of review meetings and					

	workshops in the organization					
Performance Indicator 3 : Willingness to share Knowledge						
9	Knowledge Sharing can be seen as strength.					
10	Knowledge sharing improves the interpersonal relationships amongst the staff members.					
11	Inter Organizational/projects competition creates a barrier for knowledge sharing					
12	Collaborative Knowledge sharing enhances learning.					
Performance Indicator 4 : Recognition						
13	Knowledge Sharing is monitored and recorded positively in Performance appraisal of the staff.					
14	Individual staff members are recognized for team work and Knowledge Sharing.					
15	The organization symbolically recognizes (through newsletter or website) those who support and put their efforts towards Collaborative Knowledge sharing.					
16	Feedback mechanism is in place and seen as an opportunity to learn					
Performance Indicator 5 : Information Technology						
17	Information Technology facilitates Collaborative Knowledge Sharing through various tools in the organization					

18	Effective cataloguing and archiving procedures are in place for document management in the organization					
19	IT supports effective communication among the staff members and in the organization					
20	Online documentation systems support Lessons Learned and best practices accessible					

Part I. Social Network Analysis

Thank you for agreeing to complete this survey. I value the time and responses. There are 8 questions in this part. The answers to the questions in will allow me to map and visualize the knowledge sharing and communication network in the organization.

1. What is your position?

   _____

2. Where is your duty station?

   _____

3. Please identify up to 10 positions in World Learning that are important to the professional network. Please enter at least four positions and duty stations. These can be position holders who provide you with information to do the work, help you think about complex problems posed by the work, or provide developmental advice or personal support helpful in the day-to-day working life. These may or may not be position you communicate with on a regular basis and must come from within World Learning.

Position 1 _____

Duty Station 1 _____

Position 2 _____

Duty Station 2 _____

Position 3 _____

Duty Station 3 _____

Position 4 _____

Duty Station 4 _____

Position 5 _____

Duty Station 5 _____

Position 6 _____

Duty Station 6 _____

Position 7 _____

Duty Station 7 _____

Position 8 _____

Duty Station 8 _____

Position 9 _____

Duty Station 9 _____

Position 10 _____

Duty Station 10 _____

4. For each person identified above please indicate in his or her hierarchical level relative to the own.

	Higher	**Same**	**Lower**	**Other**
Position 1				
Position 2				
Position 3				
Position 4				
Position 5				
Position 6				
Position 7				
Position 8				
Position 9				
Position 10				

5. For each person you have identified please indicate the primary benefit that you currently receive from them.

	Information that helps me solve problems or capitalize on opportunities	Access to decision makers that allows me to move plans ahead	Political support that allows me to move my plans ahead	Problem solving interactions that actively challenge my thinking on problems or opportunities in my work	Career advice or other developmental feedback that helps me be more effective in my work	Personal support and ability to vent or discuss a tough problems in my work in ways that help me to get back on track	Purpose or a sense that what I do at work has a positive impact and matters
Position 1							
Position 2							
Position 3							
Position 4							
Position 5							
Position 6							
Position 7							
Position 8							
Position 9							
Position 10							

6. For each person you have identified please assign a score based on the amount of contact you have with them? Please indicate the answer giving values from 1 to 5 with 1 being the lowest grade and 5 the highest.

Position 1 _____

Position 2 _____

Position 3 _____

Position 4 _____

Position 5 _____

Position 6 _____

Position 7 _____

Position 8 _____

Position 9 _____

Position 10 _____

7. For each person you have identified please indicate the value of information they provide you that helps you to do the work.

	Very valuable	**Valuable**	**Occasionally Valuable**
Position 1			
Position 2			
Position 3			
Position 4			
Position 5			
Position 6			
Position 7			
Position 8			
Position 9			
Position 10			

8. For each person you have identified please indicate the project they belong to.

	Very valuable	**Valuable**	**Occasionally Valuable**
Position 1			
Position 2			
Position 3			
Position 4			
Position 5			
Position 6			
Position 7			
Position 8			
Position 9			
Position 10			

ANNEX II: Observation Check list

	Very valuable	Valuable	Occasionally Valuable
Position 1			
Position 2			
Position 3			
Position 4			
Position 5			
Position 6			
Position 7			
Position 8			
Position 9			
Position 10			

Declaration

I declare that the thesis is my original work and has not been presented for a degree in any other university.

_____

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

_____

Advisor