ASSESSMENT SYSTEM FOR ASSESSING KNOWLEDGE SHARING AMONG SUBJECT EXPERTS IN SECONDARY SCHOOL

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ASSESSMENT SYSTEM FOR ASSESSING KNOWLEDGE SHARING AMONG SUBJECT EXPERTS IN SECONDARY SCHOOL

A project submitted to Dean of Research and Postgraduate Studies Office in partial

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By

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ABSTRACT

During the epoch of knowledge-based economy and knowledge management, teachers must learn in order to improve professional development. The success of knowledge management initiatives depends on knowledge sharing. The sharing of teaching-related knowledge may help teachers solve a variety of problems that they face, and the appropriate use of online knowledge-sharing activities is expected to assist teachers' knowledge sharing.

Since studies related to educational knowledge sharing are rare, knowledge sharing behavior may be different between organization types In order to promote knowledge sharing among subject experts within educational groups in secondary school; this study was implemented electronic assessment system to evaluate a knowledge sharing among teachers, which is helpful school organization's to develop knowledge and cultures.

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CHAPTER ONE

INTRODUCTION

1.1 BACKGROUND

Knowledge is a critical managerial resource that provides a sustainable competitive advantage in a dynamic economy and competitive (Foss & Pedersen, 2002). It is necessary to gain a competitive advantage but insufficient for organizations to rely on staffing and training systems that focus on selecting employees who have specific knowledge, abilities, skills, or competencies or helping employees acquire them (Brown & Duguid, 1991). Organizations are also considering how to transfer knowledge and expertise from specialists who have it to novices who need to know (Hinds, Patterson & Pfeffer, 2001). Organizations need to more effectively exploit knowledge and emphasize based resources that already exist within the organization (Damodaran & Olphert, 2000).

Knowledge sharing is a process whereby a resource is given by one part and received by another and for sharing to occur; there must be exchange, it is the basically means through which employees can supply to knowledge application, innovation, and ultimately the competitive

advantage of the organization (Jackson, Chuang, Harden, Jiang, & Joseph, 2006).

Studies has illustrate that knowledge sharing and combination is positively related to reductions in production costs, firm innovation capabilities, team performance, faster completion of new product development projects, and firm performance including sales growth and revenue from new products and services (Collins & Smith, 2006; Mesmer-Magnus & DeChurch, 2009). On other word, knowledge sharing between employees and within and across teams allows organizations to exploit and capitalize on knowledge-based resources (Cabrera & Cabrera, 2005).

The fast flows of knowledge and explosion brought by information technologies and advent of knowledge economy have great impact on teachers. Teachers need to learn and discover new knowledge, alter adopt teaching method, and engage in teaching by the model of student-centered learning rather than teaching with knowledge learned in the past. As a result, under the condition that knowledge is spread quickly and increased, teaching focus should be shifted to learning focus; the role of teachers should be more diversified, undertaking more obligations and responsibilities.

Requirements of teachers are more complex and demanding. Growth and update of knowledge, facing quick accumulation, and teachers should learn efficiently. The filtration and knowledge analysis, sharing and transmission, design and application, and even discovery of new

knowledge and imparting new knowledge to students or self-assess and outcome assessment are related to the issue of knowledge management.

Many studies have shown, as technologies advance and teaching methods are updated, teachers' classroom activities have become increasingly demanding. The knowledge sharing of teaching-related may help teachers solve a variety of the troubles that they face. However, many studies have been conducted to address how to utilize communities of teaching practices and to learn how teacher interactions can be improved through designed interactive mechanisms or technological interventions (Hsu, 2004; Snow-Gerono, 2005). In other side also demonstrated the constraints of teacher interactions in content, community activities, performance and including motives (Carroll, et al., 2003). Thus, the topic of how to better utilize technologies to facilitate interactions in teachers' communities surely deserves more attempt.

Highlighting on the aforementioned, the scopes in teachers' professional development may be correlated with the lack of in-depth interactions/discussions about instructional knowledge. Newly, there have been many searches addressing the issues of knowledge-sharing, which focus on the process of knowledge interaction among community members. This contains the examination of the internalization and externalization of knowledge (Hendriks, 1999). Communities or organizations can arise with various knowledge sharing strategies in order to attain knowledge transition, innovation, and re-use among members (Davenport & Prusak, 1998).

Searches of knowledge sharing have also discussed the features that motivate members to share knowledge in organizations (Bock, et al., 2005; Hsu, et al., 2007). Majority of these searches discuss the application of knowledge sharing in commercial organizations, and the technologies proposed to assist in knowledge sharing (Li, et al., 2006; Ras, et al., 2005). As far as the importance of knowledge sharing between individuals, there is a need to understand the success of the process by conducting assessment on an ongoing basis in order to avoid chaos or problems faced by any system.

Performance assessment refers to any assessment procedure that involves either the observation of behavior in the real world or a simulation of a real life activity with raters to evaluate the performance (Bachman, 2002). Performance assessment thus differs from traditional paper-and-pencil tests in that the primary focus is to get an accurate picture of person, communicative abilities and to generalize about a person, ability beyond the learning/testing situation to real-life communication.

Away from the definitions, as with all assessments, relationship between teachers or sharing knowledge among them must start with a clear purpose of the assessment. In other words, they must state what it is that they want to find out based on the assessment scores. It could be the level of teaching-related knowledge is exchanged. Or it could be to find out who can teaches designing teaching activities together or in isolation. The purpose of the particular assessing occasion will decide the subsequent steps in Performance development.

Since searches related to educational knowledge sharing are rare, knowledge sharing behavior may be different among organization kinds (Yang, 2007). In order to promote knowledge sharing among subject experts within educational groups in secondary school; this study will explores and evaluate the knowledge sharing activities of online teacher communities, through create assessment system to do this task.

1.2 PROBLEM STATEMENT

Skill teachers form the basis of better schools, and improving teachers' skills and knowledge is one of the most important investments of the time and money, and also leaders build in education. (Resnick, 2005). Knowledge sharing is the fundamental means through which employees can contribute to knowledge application and innovation (Jackson, et al., 2006). Knowledge sharing between teachers permits schools to exploit and capitalize on knowledge-based resources to evaluating and developing the teacher performance. Performance assessment refers to any assessment procedure that involves either the observation of behavior in the real world or a simulation of a real life activity with raters to evaluate the performance (Bachman, 2002).

On the other hand, searches have illustrated that most teachers do not interact in a culture in which teaching-related knowledge is exchanged (Barab, et al, 2001); they are familiar to designing teaching activities in isolation (Tyack and Cuban, 1995). The knowledge of teaching related is frequently tacit (Carroll, et al., 2003), which, in turn, prevents knowledge externalization and sharing. Finally, teachers are often unable to

3. To assess the assessment system functionality quality of assessment system prototype.

1.5 SCOPE OF THE STUDY

This study tends to have a central focus on knowledge sharing among subject expert in secondary school. In support the development of the performance of teachers. Furthermore, this study will use assessment system to assuring knowledge quality, and to clarify the problems of knowledge sharing and improve the knowledge management between subject experts in secondary school.

1.6 SIGNIFICANCE OF THE STUDY

Knowledge sharing refers to the provision of task information and know-how to help others and to collaborate with others to solve problems (Cummings, 2004). Based on definition there are a lot of benefits for this study can be summarized as follows:

- Describes the extent of cooperation between subject experts in secondary schools.
- Provide accurate information about enhance professional development of teachers by using knowledge sharing.
- Facilitate and accelerate the process of assessment through the use of information technology

1.7 ORGANIZATION OF THE PROJECT

This organization of the project is divided into five chapters. The first chapter gives a brief background of the study whereby the problem of the

research is put into light. Moreover, the research scope and significance are also pointed out.

Chapter Two (2) provides a review of literature related to the design and development of an assessment system for assessing knowledge sharing among teachers in secondary school.

Chapter Three (3) emphasizes on the research methodology developed by Boehm & Hansen (2001), with the elaboration of its five stages (Understand the requirements, Design the system, Build in stage, Test and evaluate and Documentation) in correspondence with the development of the assessment system for knowledge sharing among teachers in secondary school.

Chapter Four (4) presents the analysis and design of the research that comprises the system users' requirements, system design and prototype development.

Finally, chapter Five (5) provides the concluding remarks on the system, its limitations as well as suggestions and recommendations for future research.

1.8 SUMMARY

This chapter presents the background of the study. It includes the problem statement; Research objectives, the scope in the research and research significance. The objectives of this research are to develop assessment system as a prototype to assessing knowledge sharing among subject experts in secondary school.

CHAPTER TWO

LITERATURE REVIEW

In this chapter, a review of literature related to assessment system and knowledge sharing among teachers. Section 2.1 starts with overview about assessment system. Challenge of assessment system was discussed in section 2.2. In the section 2.3 was shows definition and describe about knowledge sharing. An overview of factors affecting knowledge sharing was shown in section 2.4. In the section 2.5 illustrate the online learning, social interaction and knowledge sharing. A general idea of Knowledge sharing in the learning process was shown in section 2.6. Some related works for this study are appeared in section 2.7. Finally, in section 2.8 summary of this chapter.

2.1 ASSESSMENT SYSTEM

According to Martell and Calderon (2005a), assessment is an ongoing process that involves planning, discussion, consensus building, reflection, measuring, analyzing, and improving based on the data and artifacts gathered about a learning objective. Assessment encompasses a range of activities including testing, performances, project ratings, and observations (Orlich, Harder, Trevisan & Brown, 2009).

Assessment is a procedure by which information is obtained relative to some known aim or objective (Myers, 2008). Assessment is a broad term that includes examining. An examination is a special form of assessment. Examines are assessments made under contrived circumstances especially so that they may be administered (Markopoulos & Bekker, 2003). That is mean, all examines are assessments, but not all assessments are tests.

Generally, assessment has different approaches according to its purposes. According to Bransford (2000) the two major basic kinds of these approaches are summative assessment and formative. The first approach is performed at the end of specific learning activity; and used to judge the students progression and also to discriminate between them. Where, the second approach is part of the learning process; this assessment is used to give feedback to both students and teachers in order to guide their efforts toward achieving the goals of the learning process. According to Bennett (2002) technology is an essential component of modern learning system. Finally, to be authentic, technology is increasingly needed for the assessment process.

Bennett (2002), shown the use of IT and e-learning approaches can provide an efficient and effective means of evaluating teaching and learning effectiveness by alternative assessment protocols, authentic, and supporting traditional. Technology presents new measures for evaluating learning that will yield rich sources of data and expand the ways, and teaching effectiveness (Vendlinski & Stevens, 2002). The use of IT and e-learning to augment the assessment process may include: pre and post

testing, diagnostic analysis, student tracking, rubric use, the support and delivery of authentic assessment through project based learning, artifact collection, and data aggregation and analysis.

E-assessment can be distinguished as Computer Based Assessment (CBA) and Computer Assisted Assessment (CAA) which are often used interchangeably and somewhat inconsistently. CBA can be understood as the interaction between the student and computer during the assessment process. In such assessment, the test delivery and feedback provision is done by the computer. Where CAA is more general, it covers the whole process of assessment involving test marking, analysis and reporting (Charman & Elmes, 1998). The assessment lifecycle includes the following tasks: planning, discussion, consensus building, reflection, measuring, analyzing, and improving based on the data and artifacts gathered about a learning objective (Martell & Calderon, 2005a).

Reimann & Zumbach (2003) defined Electronic-Assessment as software applicable for groups not only used for individuals; It is also referred to collaborative assessment, is used to evaluates the contribution of individuals in group work and their behavior of how they collaborate with each other to solve problems

According to Haken (2006) clarified that assessment is an integral piece to evaluating that an educational institution manages its learning aims, as well as a crucial means of providing the essential evidence necessary for seeking and maintaining accreditation. In the assessment community the majority of individuals' believe that the assessment process begins with

the identification of learning aims and measurable objectives (Martell & Calderon, 2005b).

In addition, the uses of specific traits that help define the objectives being measured. These traits are frequently correlated with the developmental concepts articulated in Bloom's Taxonomy of Educational Objectives which provides a recognized set of hierarchical behaviors that can be measured as part of an assessment plan (Harich, Fraser, & Norby, 2005). There are six levels of Bloom's Taxonomy that relate to cognitive growth: knowledge, comprehension, application, analysis, synthesis, and evaluation. The three upper levels of Bloom's Taxonomy analysis, synthesis, and evaluation are linked to critical thinking. Figure 2.1 illustrates the taxonomy in its hierarchical structure.

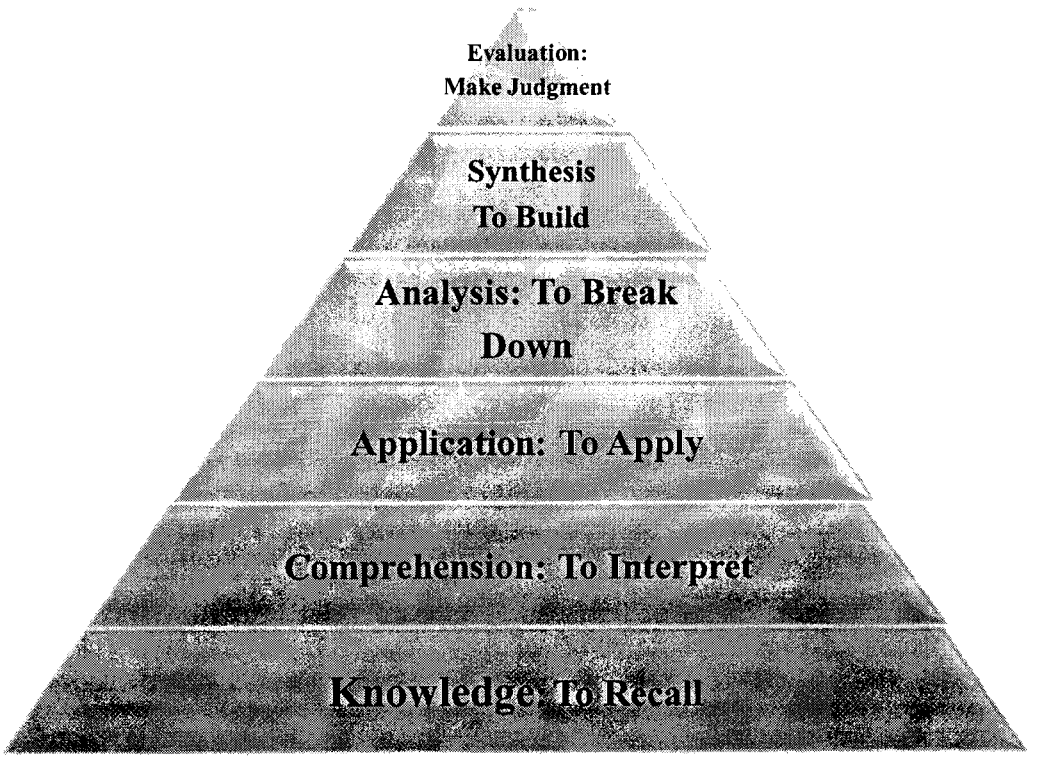


Figure 2. 1 Bloom's Taxonomy of Educational Objectives (Buzzetto-More & Alade, 2006)

Life cycle for a successful assessment is that involves the identification of outcomes, suggesting improvements, the gathering and analyzing of data, discussion, implementing changes, and reflection as shown in figure 2.2. Martell and Calderon (2005b) defined the assessment process as ongoing process that uses assessment data to improve student outcomes. In other words, is a continuous cyclical process or, rather, a loop, "Closing the loop" is a popular term in the assessment movement.

Dependent on Dhir (2005) the assessment process is the collection of high-quality data that provides a basis to evaluate all of a program's learning objectives; finally, effective data not all data is useful data. Consequently, effective data management is crucial to the assessment loop, where the data collected needs to be made available to faculty and administrators in a timely manner so that fact-based decisions can be made (Martell & Calderon, 2005b). Dhir (2005) illustrates that when data is readily available, a dialogue can occur that focuses on the serious issues at stake.

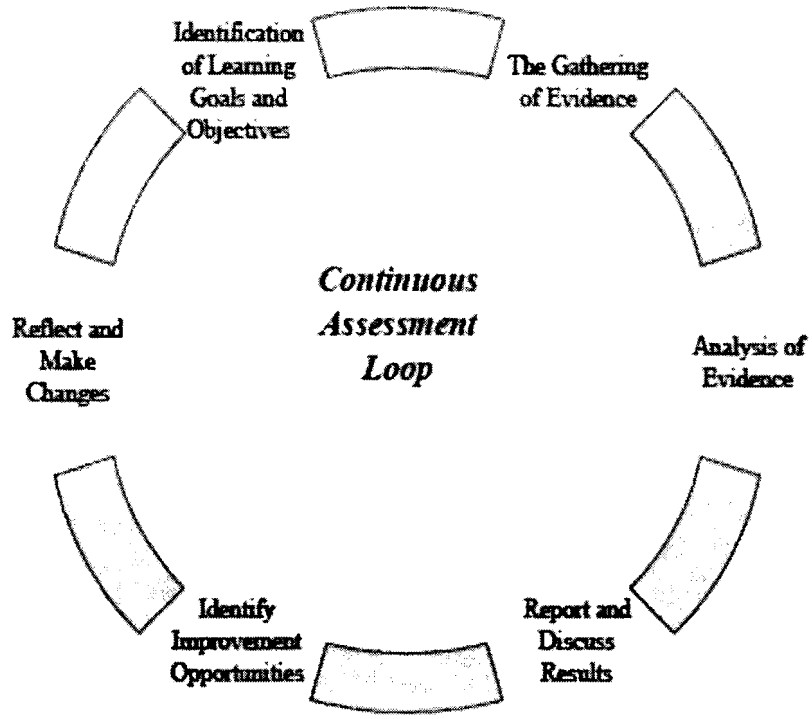


Figure 2. 2 The Assessment Process (Martell & Calderon, 2005b)

Dietel, Herman & Knuth (1991), refer that suitable evaluation information provides an accurate measure of student performance to allow teachers, students, administrators and other key stake holders to make effective decisions. Therefore, any Computer Assisted Assessment (CAA) Computer Based and Assessment (CBA) system should satisfy the quality dimensions outlined above.

2.2 E-ASSESSMENT CHALLENGES

2.2.1 Mentality Change & Culture evolution

The increasingly use of technology and the rapid change in our society culture in our modern life activities influences directly our educational process. Students today are considered to be multi-tasked; they developed with technology around them all over their lives, they use technology anytime, anywhere. Prensky (2001) named them as Digital

assessment tool, information such as questions/exercises and answers, users' information, list of enrolled students, courses information and learning objectives must be shared with other systems and tools. Several standards such as IMS-QTI (IMS Question and Test Interoperability), PAPI (Public and Private Information for Learner - IEEE) (Farance, 2000), GESTALT (Getting Educational Systems Talking Across Leading-edge Technologies) and IMS LIP (IMS Learner Information Package) (AL-Smadi & Gütl, 2008) have been proposed for such purposes. Therefore, e-assessment systems should be designed to be flexible and deal with most of these standards. Consequently, it will able to communicate and interact with other systems in an open way .

2.2.5 E-assessment Automation & Assessment Types

As mentioned earlier, the assessment process begins by identifying the learning goals and objectives (Martell & Calderon, 2005a). As a result, a variety of assessment types (such as limited choice exercises, open ended questions and essays) are used to achieve these objectives. Most of the developed e-assessment tools are related to specific part(s) of the assessment cycle or limited to some type(s) of assessment. Unlike those tools we believe that e-assessment tools should support the whole cycle of assessment and to be designed based on the learning goals. Despite the difficulties of automatic questions generation, automatic marking and grading or even automatic feedback provision, we advocate that e-assessment tools should support the entire lifecycle of assessment by (semi-)automatic methods. A comprehensive literature survey and a first

approach towards an automatic assessment tool can be found in (Gütl, 2007).

2.3 KNOWLEDGE SHARING

Knowledge sharing is an important part of building knowledge-based competitive advantage. According to Cummings (2004) it is refers to the provision of task information and know-how to help others and to collaborate with others to solve problems, develop new ideas, or implement policies or procedures Knowledge sharing can occur via written correspondence or face-to-face communications through networking with other experts, or documenting, organizing and capturing knowledge for others. Even though the term knowledge sharing is usually used more often than information sharing, researchers be inclined to use the term "information sharing" referring to sharing with others that occurs in experimental studies in which participants are known lists of information, manuals, or programs.

Because knowledge is considered as a type of strategic capital and a resource of organization competition, the more the knowledge is expanded in an organization, the more the capacity of competition is (Szulanski, Cappetta, & Jensen, 2004). Even though knowledge exchange has been used interchangeably with knowledge sharing (Cabrera, Collins & Salgado, 2006), knowledge exchange includes both knowledge sharing and knowledge seeking.

2.4 FACTORS AFFECTING KNOWLEDGE SHARING

Eriksson & Dickson (2000) concluded four preliminary elements for knowledge sharing: (1) shared knowledge discovery process: the process of discovering and distributing knowledge; (2) IT (information technology) infrastructure: the system and tools that support information dissemination; (3) catalysts: media that facilitate and promote knowledge sharing; (4) values, standard and procedure: social and cultural values that influence personal mind set. Please refer to Figure 2.3.

Eriksson & Dickson (2000) further pointed out even if the basic infrastructure of information technology serves as the key factor of knowledge creation and sharing, the behavior of sharing actually lies in social and cultural interaction. That is to say, although technical aspects are important, the adoption of refined knowledge management platform or system does not necessarily reinforce knowledge sharing to an effective extent, or stimulate incentive for knowledge sharing (Cross & Baird 2000; McDermott, 1999), for social factors is one of the major elements reassuring its success (Ruppel & Harrington 2001).

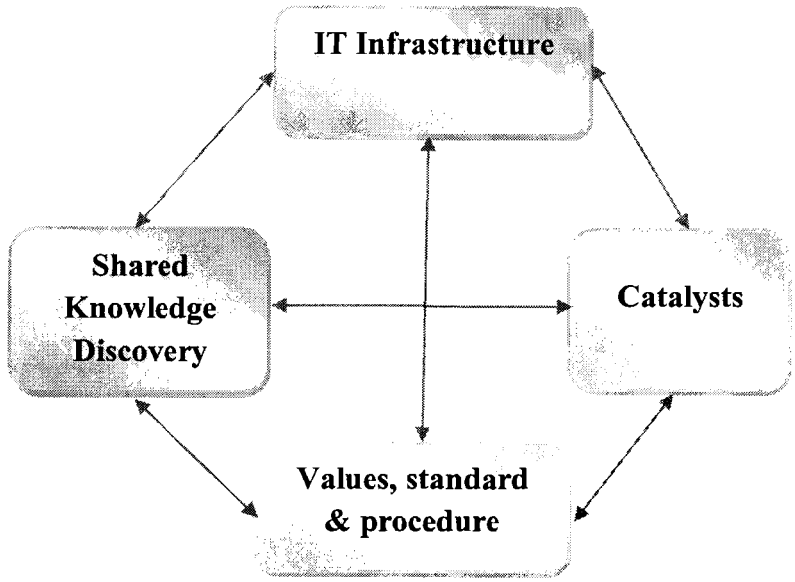


Figure 2.3 Elements for Knowledge Sharing (Erikssom & Dickson, 2000)

(Kankanhalli, et al. ,2005) adopted social exchange theory to verify factors affecting people's use of electronic knowledge databases, and their research showed that knowledge self-efficacy and enjoyment in helping others have comprehensible impact on knowledge contributors' use of electronic knowledge databases; in addition, their research results also indicated that the effect of external motivating factors such as reciprocity and organizational rewards on knowledge sharing is constrained by contexts; while internal motivating factors like knowledge self-efficacy and enjoyment in helping others are not limited by contexts.

Self-efficacy refers to people's perception of their own ability and skills (Bandura, 1986). When individuals share with other members their professional knowledge that's beneficial to their organization, their confidence level is then lifted, and they have more faith in what they are

able to achieve, benefiting from enhanced self efficacy (Constant, et al., 1994). Such beliefs drive knowledge contributors to supply more information into knowledge management system (Bock & Kim 2002). When individuals believe in their intrinsic knowledge for solving work-related problems, and they take initial to provide such knowledge, they are said to have knowledge self-efficacy. The notion of self-efficacy is endorsed for knowledge management. Research carried out by Hsu. et al. (2007) proved that one's knowledge self-efficacy has a positive influence on knowledge sharing behaviors.

In terms of satisfaction in helping others, past study indicated that knowledge contributors gain satisfaction through altruism (Wasko & Faraj, 2000), and such enjoyment evolves from helping others (Ba, 2001; Constant, et al., 1994). Knowledge owners who feel the enjoyment in helping others are keen to contribute to knowledge sharing or management. Additionally, and very importantly, the influence of enjoyment in helping others is not confined to contexts.

Another factor affecting the behaviors and motivation of knowledge sharing is individual outcome expectations, which is claimed to have a positive impact. An outcome expectation is one of the constructs identified by established cognitive-based theories, such as social cognitive theory. It refers to the expected benefits and costs of performing a behavior (Bandura, 1997; Compeau & Higgins, 1995; Lave, 1991). There are three forms of outcome expectations: (1) physical outcome expectations, such as the feelings of pleasantness, pain or un-comfortableness; (2) social outcome expectations, such as social

recognition, financial rewards, power, praise and so on; (3) self-evaluative outcome expectations, including self satisfaction, self devaluation and the like (Bandura, 1997). Whatever forms that one may experience, positive outcome expectations serve as great incentive for human behaviors, and then exert a constructive influence on knowledge sharing.

In addition, through identification-based trust, it is also possible to predict the behaviors of knowledge sharing (Hsu, et al., 2007). Identification-based trust happens when both parties fully understand, agree with, and identify with each other's needs. Both parties believe that their interests will be guarded and protected, and no supervision is needed. In virtual communities, how organizational members perceive identification-based trust has a positive impact on knowledge sharing behaviors and motivation. Therefore, trust is apparently one of the keys to knowledge sharing among members (Hsu, et al., 2007). Nelson & Cooprider (1996) investigated the potential effects of knowledge sharing on information technology worker groups, and they found that knowledge sharing is achieved through the mutual trust and influence among organizational members; while the evaluation of mutual trust, i.e. members' commitment to their organization, is linked with affection factors that help to build identification-based trust.

Bishop (2007) proposed the conceptual structure for the participatory situation of online community members, and it concluded the above mentioned factors affecting individual knowledge sharing behaviors. First, any action or behavior of online community members are inspired

by their personal desire, not personal needs. Second, their participatory behaviors or extent are influenced by their own goals, plans, values, beliefs and interests. Whether they act to prove their self-efficacy, or to gain enjoyment in helping others, or to fulfill individual outcome expectations, their desires take lead for their actions, which eventually produce a series of plans which live up to community members' goals, values and beliefs, and at the same time, these actions would affect their perception on community environment. Therefore, online community managers should try to change members' beliefs, even if it may not be consistent with individual member's perception.

Collective cognitive responsibility, the collective efforts made by all members for the success of a group rather than the individual responsibility concentrated in the leader, involves a cognitive dimension in modern enterprises, and this dimension along with the more tangible and practical aspects affect the operation of the community. This is even more true to organizations specialized in research or knowledge-output-related work. Collectively, members are responsible for the transfer of knowledge within their organization, with each and every one responsible for cognitive responsibility in order to understand events currently happening and to keep up with any organizational updates (Scardamalia, 2002). Educational workers also have the need for knowledge sharing, as McAndrew, et al. (2004) pointed out that school teachers like to learn about their colleagues' opinions and ideas, their methods and approaches, and hope to discuss with others through

conferences or workshops, emphasizing the importance of collective cognitive responsibility.

2.5 ONLINE LEARNING, SOCIAL INTERACTION AND KNOWLEDGE SHARING

A review of recent empirical studies identifies several streams of research into online learning that deal with knowledge sharing. The first stream considers online learning that is provided through a shared platform on which peer learners interact, often in the form of discussion forums, and in which knowledge sharing occurs through the continuous interaction of asynchronous written communication among peer learners (Mazzolini & Maddison, 2007). The second stream examines online learning in shared workplaces that allow peer learners to interact to complete a common task, in which knowledge sharing occurs through the continuous interaction of learning by doing among peer learners (Kapur & Kinzer, 2007). Yet another stream holds that online learning provides a transparent demonstration of individual outcomes, and that knowledge sharing occurs through continuous exposure to best practices and learning by observation among peer learners (Fischer & Mandl, 2005). Finally, research has also highlighted that online learning provides a centralized meeting place for community building, and that knowledge sharing occurs naturally in the presence of human resources and expertise (Zhang, et al., 2007).

All of these research streams highlight that two of the key success factors in online learning are the connecting of peer learners and their

engagement in knowledge sharing behavior. Hence, much online learning research is concerned with the development of theories and techniques that help practitioners to facilitate the meeting and sharing of knowledge among learners. In a narrower context, an important research direction is concerned with developing theories and techniques that help practitioners to understand the motivation for learners to share knowledge and to predict their knowledge sharing behavior in online learning environments.

2.6 KNOWLEDGE SHARING IN LEARNING PROCESS

The unique features and capabilities of online learning environments to support and facilitate peer learner interaction and online knowledge sharing have strong support in several theories on the learning process. A popular socio-cultural theory of learning is that of Vygotsky (Zhang, et al., 2007), who suggested a general genetic law of cultural development that explains the mechanism by which knowledge is acquired and represented through knowledge sharing and social interaction. This mechanism has two planes: the social/individual and the public/private (Ma & Yuen, 2010). Learning starts on the social plane, with learners acquiring new concepts and strategies through interactions with more knowledgeable others. Individual learners then use and extend the concepts and strategies to other contexts, and meanings and interpretations are initiated through social interactions (social to individual). Learning then emerges in the public domain, with the knowledge being used by more knowledgeable others and made available to learners. Through interactions within the public domain,

individual learners understand, adjust, and implement the knowledge that they have learned in the private domain (public to private).

In other theories of social learning, applied the reciprocal teaching process developed by Palincsar & Brown (1984) to describe how knowledge sharing takes place during learning. Wertsch & Bivens (1993) concluded that the success of learning is based on the assumptions that knowledgeable members of a culture will assist others to learn and that learners will actively engage in learning activities so that higher mental functions take place. To conclude, social interactions initiate among individual learners and naturally knowledge sharing results from these social interactions. However, none of these theories addresses the fundamental question of what drives learners to interact and hence share knowledge during learning.

2.7 RELATED WORK

2.7.1 Medical Education E-Assessment System

Medical professionals and educators recognize that Simulation Based Medical Education (SBME) can contribute considerably to improving medical care by boosting medical professionals' performance and enhancing patient safety. The basic assumption underlining SBME is that increased practice in error management and learning from mistakes in a simulated environment will reduce occurrences of errors in real life and will provide professionals with the correct attitude and skills to cope competently with those mistakes that could not be prevented. SBME functions in all forms of learning, ranging from lectures, problem

solving, in-hospital teaching to any other traditional or non-traditional form of education (Ziv, Ben-David & Ziv, 2005).

Actually, in medical education they have to take into consideration the fact that in order to achieve the best results students need special type of exercises. Virtual patient case studies allow students to take a case history from an imaginary patient, order virtual tests, and explore different diagnoses and treatments. An imaginative story line, illustrated by pictures or video clips can make these cases convincing and effective in accustoming the future doctor to the decisions he must take while dealing with a real patient (Al Shehri, 2004).

Medical education has proved that assessing by practicing skills in situations similar to those in which they will be used have boosted up the level of understanding, as well as test performance for medical schools students. Because when training with real patients, the students do not have the same power of decision, it is best to use simulators or case-based e-assessment systems (Scarlat, Stanescu, Popescu & Burdescu, 2010).

When developing an e-assessment system for students that learn Emergency Medicine, it is not needed only to follow a certain work-flow or protocol, and to offer accurate data, but also to create rich internet applications that will make him understand things better (Scarlat, et al, 2010), as well as make him try a new test after finishing one.

2.7.2 QSIA System

QSIA is acronym for Questions Sharing and Interactive Assignments; QSIA was designed to serve instructors in providing a web-based platform to share the authoring of knowledge items, the management of collections of such items and the accumulated history of the psychometric performance. The system was designed to harness the power of groups and communities to improve the process of constructing assignments and tests (Rafaeli et al., 2004). From a student and classroom perspective, QSIA enables the administration of assignments and tests under a variety of contexts.

Tests and assignments can be completed on-line or off-line, in proctored or individual settings, with or without time limits, allowing open or closed book or internet connections, etc. Creation of the database of items and assignment templates is, however, only the first tier of the system usage. A second tier allows the collection of knowledge items ratings and the provision of recommendations. Participants in the system are given tools that allow them to respond and rank the items. QSIA provides aggregation of such ranking for future sifting and selection. Actual use of the system in a learning capacity enriches the collected history and available logs. Thus, this system is designed to learn, not just teach.

For example, there are an examination of a novel way for merging assessment and knowledge sharing in the context of a hybrid on-line learning system used in a postgraduate MBA course. MBA students carried out an on-line Question-Posing Assignment (QPA) that consisted

of two components: Knowledge Development and Knowledge Contribution. The students also performed self- and peer-assessment and took an on-line examination; all administered by QSIA an on-line system for assessment and knowledge sharing (Barak & Rafaeli, 2004).

The objective was to explore student's learning and knowledge sharing while engaged in the above. Findings indicated that even controlling for the students' prior knowledge or abilities, those who were highly engaged in on-line question-posing and peer-assessment activity received higher scores on their final examination compared to their counter peers. The results provide evidence that web-based activities can serve as both learning and assessment enhancers in higher education by promoting active learning, constructive criticism and knowledge sharing (Barak & Rafaeli, 2004).

2.8 SUMMARY

After presenting this chapter, it would be clear to analysis assessment system which means computer based assessment and computer assisted assessments which are frequently used interchangeably and to some extent erratically. On other hand, knowledge sharing refers to the provision of task information and to collaborate with others to solve problems and know-how to help others, develop new ideas. Therefore, the processes of knowledge sharing between staff has to develop and organize the knowledge management within organizations, especially the education side; which leads to necessity for assess knowledge sharing among staff periodically.

CHAPTER THREE

METHODOLOGY

This section illustrates the research methodology that used in this project. Section 3.1 provides important information about spiral model that used in this study. In section 3.2 was discussed the research methodology stage. Summery placed at end of the chapter.

3.1 RESEARCH METHODOLOGY

According to Boehm & Usc (2007) the spiral model is a software development process combining which elements of both design and prototyping-in-stages, in an effort to combine advantages of top-down and bottom-up concepts. Also known as the spiral lifecycle model (or spiral development), it is a systems development method used in information technology. This model of development combines the features of the prototyping model and the waterfall model. The spiral model is intended for large, expensive and complicated projects.

Spiral model is a risk-driven approach (Boehm, 2002), which is a more general view of the process of design and development than other models and can apparently be applied to a wide range of types of project. Figure 3 shows the selected methodology, reason of selecting this methodology back to reflects the relationship of tasks with rapid prototyping (Boehm & Hansen, 2001), increased parallelism, and concurrency in design and build activities (Boehm & Usc, 2007). Meanwhile, this method is quite useful in confirming and evaluating the quality, performance, and scale of software from the early stage of development and in conveying and relaying core software of early stage to the next phase (Yamamichi, Ozeki, Yokochi & Tanaka, 2002). The spiral method should still be planned methodically, with tasks and deliverables identified for each step in the spiral.

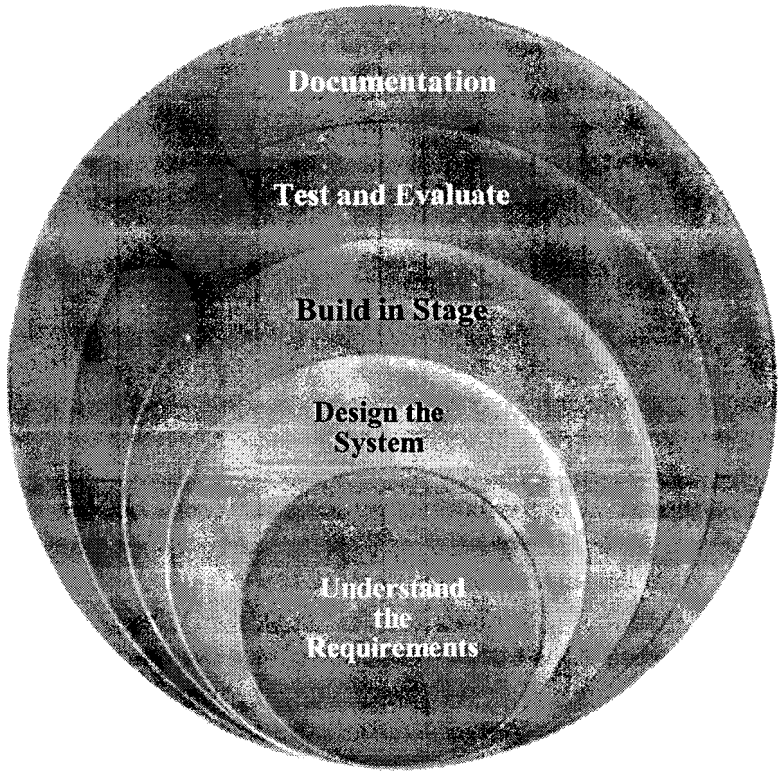


Figure 3. 1 Spiral Model steps (Boehm & Usc (2007)

According to Cioch, Brabbs & Kanter (2002), the spiral model allows the developer to integrate tool assessment into the software development process. Tool assessment is performed neither before nor after development. Rather, it is performed, along with development, during each cycle through the spiral. The spiral model impacts the tool selection process at both the macro and micro levels. The macro and micro levels of the tool selection process and how they fit into the four quadrants of the spiral model during each cycle through the spiral are given in Figure 3.2. During each cycle through the spiral, there is a separate process for each software tool being assessed.

Spiral model have several advantages features, it's more able to cope with the (nearly inevitable) changes that software development generally entails; also Work can be nested in the methodology between design and application. On other hand, the disadvantages features of spiral model are It has not been employed as much proven models (e.g. the WF model) and hence may prove difficult to 'sell' to the client; as well as demands considerable risk-assessment expertise.

3.2 RESEARCH METHODOLOGY STAGE

3.2.1 Understand the Requirements

This stage is about identifying on the target system to understand the e-assessment requirements. In the first phase must understand the functionality of the system, and how have they changed this task through its life cycle. A full understanding of the application of e-assessment in the future also requires. This should include understanding of both technical details and information relating to users and others affected by any possible changes until the final outcome of this phase are the system requirements and analysis's (Hou, Sung & Chang, 2009).

a) **Interview**

The most common of collecting information is the interview. Interviews are conducted one-on-one. Sometimes, due to time constraints, several people are interviewed at the same time (Rubin, 2004). There are five basic steps to the interview process:

Selecting interviewees

This step presents the way to select the interviewees of assessment system about knowledge sharing among subjects expert for requirement gathering, furthermore, the selecting of interviewees was based on staff of Yemen school in Sintok.

Designing interview questions

This step presents the final design for the interviewee's questions about their opinions on assessment system for knowledge sharing among subjects expert.

Preparing for the interview

This step presents the preparing for the interview with staff of Yemen school in Sintok through making workshop in school contain all the staff.

Conducting the interview

This phase presents the way to conducting the interview about assessment system for knowledge sharing among subjects expert, during this step researcher has obtained to identify the system requirements.

Follow- up

Finally, the system requirements for assessment system for knowledge sharing among subjects expert have been determined based on the previous steps.

These steps have been used in order for gathering user requirements. Moreover, in depth interview has been done with different teachers who are postgraduates' students in UUM and the teachers for Yemen school in Sintok. Details are in chapter four under the study requirements.

b) Formative Assessment

With the exceptions of initiatives such as learning assessment and recognition, learning is generally only formally acknowledged when occurring under the aegis of schools and universities (Siemens, & Tittenberger, 2009). ASKST is used to assess knowledge sharing among subjects expert in secondary school and skills in relation to specific criteria. The establishment of clear, measurable criteria is the key to a high-quality ASKST process.

In this study was apply a multi-prospective Instructional Design model, defined PENTHA ID Model (acronym of Personalization, Environment, Network, Tutoring, Hypermedia, Activity), which is inspired by the more universal complexity theory: it focuses on dynamic relationships and patterns among subjects ("complex agents") in the learning process, rather than the static properties of isolated objects. The approach is according to a didactical connectivism (Siemens, & Tittenberger, 2009), the main crucial elements of the Model are (Dall'Acqua, 2010):

1. considering learning as the result of a complex network with numerous typologies of nodes and connections of knowledge, competences, communication, representations, relationships, technologies and multi-paradigms, where:

- The knowledge is dynamic and emerges in a simultaneous and intertwining manner at multiple levels (not only at the individual level), based on reflection, expressive creativity and design, realization of artifacts and projects, dedicated searches, research and analysis in a personalized educational approach.
- New and unexpected knowledge is the result of participant's interactions from their different points of view: they continuously and actively re-orient their structures in order to maintain coherence in the relation to their worlds.
- The learning design is the result of a reaction between the teacher and students/ among teachers.

2. A focus on the creation of a Teachers Relationship Management (TRM), where Teachers:
   - are driven and motivated to share knowledge and experience;
   - can behave as learning stakeholders, collaborating through pro-active interactions (personalized learning effect), to overcome learning difficulties, able to achieve their own cognitive excellence;
3. An automation of several aspects of the design process, execution, assessment and tutoring, to interpret and manage the reticular nature of knowledge.

c) Evaluation criteria

The evaluation criteria serve as guidelines with a dual purpose: They serve the reader, so that he or she can make judgments about the empirical grounding of the research findings, and they serve the

researcher as a 'checklist' for the research process. Qualitative research methodologies vary considerably in their aims and epistemological assumptions and these, in turn, fundamentally shape the methods or procedures employed and evaluation criteria used (Finlay, 2006).

The primary objective of selecting the research sample is to obtain information from the community's original research, and it is not easy for the researcher that the application of his research on all the original members of the community.

Select a sample

The researcher was choice Yemen school in Sintok as a sample to test the study. School staff has varying degrees and they belong to different environments and communities, also the student. This situation allowed the possibility of implementing a search on the different communities to knowledge sharing among subjects expert, and the success of the experiment meant easily applied on the a single community.

3.2.1.1 Guiding Principles

While building balanced systems to guide educational improvement may take on a number of different looks, the process should be guided by certain building codes or principles:

1. Purposes. The purposes of assessment need to be clear and clearly articulated for, and at, each level of the system. For example, to be effective, assessment systems must be built around the reality that different users need different information in different forms and at

different times in order to fulfill their decision making responsibilities.

2. Assessment Adequacy. The types of assessments included in the system should be appropriate and valid for meeting the specified purposes of each system component and the system as a whole. Assessment tools and processes used at each level and for each purpose within the system must be of high quality and adequate for the kinds of decisions to be made. For example, if results will be used to make decisions about individual or institutional rewards or sanctions, the results must be obtained using highly reliable tools and processes that yield highly reliable results. If the assessment will be used to guide day-to-day instructional decisions, then formal documentation of technical adequacy becomes less important; rather, fair and accurate immediate feedback followed by instructional intervention is the key. In all cases, the quality of an assessment tool or process is dependent upon the clarity and appropriateness of the achievement expectations to be assessed. These achievement targets must be clearly and completely defined. Otherwise, the results of the assessment will be undependable and may lead to counterproductive instructional decisions.
3. Communication of Results. For balanced systems to serve productively, results must be communicated in a timely and understandable manner to the administration of school.

4. Supports. Adequate supports need to be provided so that the purposes of the system can be met. For example, if a purpose is to provide teachers with real time information to guide instruction and learning, adequate professional development opportunities will need to be provided.

3.2.1.2 Assessment criteria

Summative assessment refers to the assessment of the learning and summarizes the development of learners at a particular time. The purpose of summative assessment is to sum up or describe what has been learned over time. Chappuis et al. (2006) refer to summative assessments as assessments of learning. Summative assessment results are most often expressed as a number or score. The results of summative assessments are usually used for accountability purposes such as evaluating a teacher's instruction, evaluating a school's success.

The ASTKS system have two criteria, general criteria to assess any subjects and spatial criteria for assess knowledge sharing among subject experts. Accountability assessments are summative assessments used to hold individuals or groups accountable for specified outcomes. In this study was determined to use summative assessment. this assessment was depend on five levels : first level, under (25) marks equal very weakly; second level, (25-30) marks equal weakly; first level, under (30-35) marks equal good; four level, (35 - 40) marks equal very good; five level, above (40) marks equal excellent.

3.2.2 Design the System

In this stage the system designer identified the proposed e-assessment application and designs it to be the suitable solution to help school management to assess knowledge sharing among subject experts in secondary school depends on the requirement processes and the components of the system. Moreover, the design stage takes as its initial input the requirements identified in the approved requirements document. All of the information gathered, the requirements for developing the proposed e-assessment application are outlined. The design of the product based on Rational Unified Process (RUP) description by Kruchten (2004). The Rational Unified Process is designed and documented using the Unified Modeling Language (UML); RUP discerns three disciplines where UML is used: business modeling, requirements and analysis and design .as shown in figure 3.2.

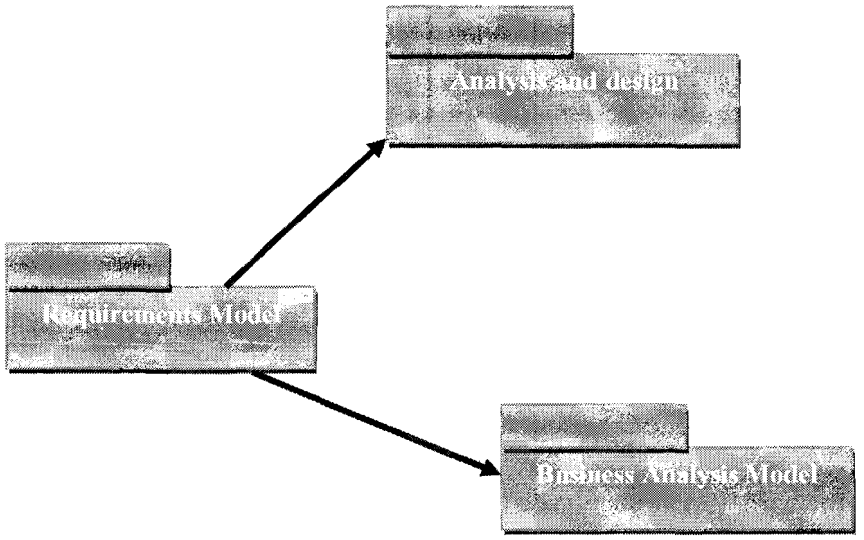


Figure 3.2 RUP Phases & Disciplines

The requirements are basically divided into functional and non-functional requirements. Based on, the collected requirements in previous stage a detailed design for the proposed system implementation. In the case of this study, object oriented approach has been implemented in the system's requirement design. During the design phase Unified Modeling Language (UML) used to involve general use cases such as (a) use case diagrams: this diagram used to show the system components and the user retaliations (b) use case specification: this diagram used to give the details about the use cases that introduced in the previous step (c) activate diagram: this diagram shows the activity and the event that causes the object to be in the particular state (d) sequence and collaboration diagram: this diagram used to show how the system work based on the use case diagram. All of these diagrams are produced by Rational Rose 2000.

3.2.3 Build in Stage

In this phase, the system designer will evaluate the current system in the same way as the previous studies and come out with appropriate application based on the requirement gathered in the first phase, and iterate the proceeding steps to arrive to the final solution and make the construction of the prototype. The prototype of this study is developed by using ASP.net with C# programming language environment; ASP.net is introduced as a unified software development platform that provides the services necessary for developers to build enterprise-class software applications.

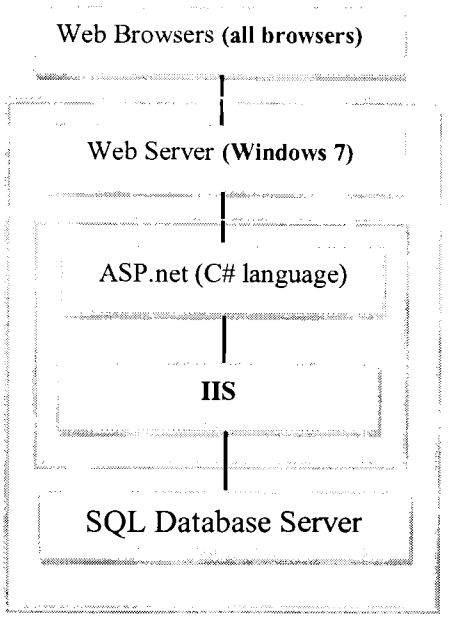


Figure 3. 3 ASTKS technology components

Microsoft Internet Information Web Server (IIS) for Windows 7 turns any Windows 7 computer into a web server and enables easy publication of personal web pages. IIS is easy to install and administer. It also simplifies sharing information on intranets or internet for all users .IIS is ideal for developing, testing and staging web application, as well as peer-to-peer publishing with its support for sharing files over HTTP. Microsoft Internet Information Server (IIS) supports all extensions and ASP.net scripts.IIS has been optimized for interactive workstation use, and does not have the System requirements of a full Web server.IIS was selected because this system will not be implement in the real web environment and only can be view in a standalone Personal Computer. Furthermore, managing IIS as there are fewer options available to those users who require web services to run on windows 7.

SQL Server (2005) has many features: (1) it is possible to post information such as forms and reports on the Web, so that people in remote locations may view the

required information. (2) Support of a variety of data formats. (3) Tables are grids that store related information.

3.2.4 Test and Evaluate

In this sage the e-assessment application has been evaluated. Moreover, user acceptance has been tested in order to measure the user satisfaction of using the proposed e-assessment application. This phase ensures that the whole set of application (system) work together. This application has been tested by prost graduate students from UUM. It is the final test before the system is taken over by the administrator. Finally, users provided their feedback over questionnaire. The evaluation is based on usability testing by using System Usability Scale (SUS) proposed by Brooke (Bangor, Kortum & Miller, 2008). Questionnaires have advantages over some other types of surveys in that they are cheap, do not require as much effort from the questioner as verbal or telephone surveys, and often have standardized answers that make it simple to compile data.

Quality control ensures the product functions as it should. During this phase, the prototype has been evaluated for its usability aspects. Questionnaire will be selected as a method to measure the satisfaction with this system. All data that gathered from questionnaire will be analyzed by using the Statistical Package for the Social Sciences (SPSS) program. Data analysis will carry out in the form of descriptive statistic.

3.2.5 Documentation

Finally, the study will be documented which includes detailed information about the system. Documentation can appear in a variety of forms, the most common one is manual. The system design and analysis will be described in document as well as the findings.

3.3 SUMMARY

Methodology is essential in every project to proper guide for achieving a study's objectives. The methodology for this study is adapted from Boehm & Usc (2007). A prototyping approach has been used in the third phase of the adapted methodology in order to design requirements model based on Rational Unified Process (RUP). The evaluation is based on usability testing by using System Usability Scale (SUS) proposed by Brooke (Bangor, Kortum & Miller, 2008). The next chapter will present the details design of the proposed requirement model using UML diagram and interface design.

CHAPTER FOUR

SYSTEM DESIGN & EVALUATION

This chapter briefly discusses to proposed e-assessment system. The result of this chapter are determined the requirements of assessment system and analysis the system using UML language to understand how the system works through models using use case diagram, class diagram, sequence and collaboration diagram. Finally, build the interface for assessment system.

4.1 SYSTEM REQUIREMENTS

4.1.1 Functional Requirements

Functional requirements capture the intended behavior of the system. This behavior may be expressed as services, tasks or functions the system is required to perform. The system consists of two users (teachers & admin). The users will interact with the system through interfaces as well as the requirements appear when it is base on the users interface. Table (4.1) summarizes the functional requirements for the system and gives a brief description of the different requirements.

Table 4. 1 List of Functional Requirements

	ASTKS _01		
1.	**Homepage**	All users can enter the hyperlink in address to open home page.	M
2.	ASTKS _02	**Login**	
	ASTKS _02_01	Authenticate users (admin and staff) the user must enter validate his/her user name and password.	D
	ASTKS _02_02	Inform invalid password and user name.	D
	ASTKS _03	**Manage Assessment Criteria**	
3.	ASTKS _03_01	General Assessment Criteria	M
	ASTKS _03_01_01	Display personal information.	M
	ASTKS _03_01_02	Display computer skills, subjects studied.	D
4	ASTKS _03_02	Special Assessment Criteria	M
	ASTKS _03_02_01	Displays assessment criteria for knowledge self-efficacy.	M
	ASTKS _03_02_02	Displays assessment criteria for enjoyment in helping others.	M
	ASTKS _03_02_03	Displays assessment criteria for individual outcome expectations.	M
5	ASTKS _03_03	Administrator will be designed the questions, adoption of the needed for school in the development of management and staff.	M
6	ASTKS _03_04	Teacher view the question to make assess for knowledge sharing among subject experts in secondary school.	M

7	ASTKS _03_05	Teacher select the mark for each to answer (degree of assessment are 1= strongly disagree, 2 = disagree, 3 = natural, 4 = agree and 5 = strong agree).	M
8	ASTKS _03_06	Teacher click 'Submit' button after answer the entire question.	M
9	ASTKS _03_07	System will collect scores of questions for each teacher then shows the mean (CGP) to identify the effectiveness of the teacher with knowledge sharing.	M
10	ASTKS _03_08	System will collect the CGP for each teacher then shows the mean for all (CGPA) to help school management to assess knowledge sharing among subject experts in secondary school.	M
	ASTKS _04	Display Result	
11	ASTKS _04_01	Admin can view the result of the assessment report for knowledge sharing among subject experts in secondary school.	M
12	ASTKS _04_02	Admin can check if all the teachers make assess about knowledge sharing among subject experts or not.	M
	ASTKS _05	Print Result	
13	ASTKS _05_01	Admin can modify the design of diagram result for assessment about knowledge sharing among subject experts in secondary school.	M
14	ASTKS _05_02	Admin can make print out for assessment report about knowledge sharing among subject experts in secondary school.	M
	ASTKS _06		
15	**Logout**	The user (teacher & admin) make logout of the system.	M

4.1.2 Non Functional Requirements

The non-functional requirements will capture properties of the system that has to do with performance, quality or features that are not fundamental for the system to work. They are however very important because they are often properties that highly desired by the user and can help the system gain competitive advantage over other systems. Table (4.2) summarizes the non-functional requirements for the system.

Table 4. 2 List of Non-Functional Requirements

S/N	Requirement ID	Requirement Description	Priority
	ASTKS _7	**Usability issues**	
16.	ASTKS _7_01	The interface should be most being easy navigation.	M
17.	ASTKS _7_02	The system must be easy to deal with.	M
18.	ASTKS _7_03	The admin should be able to view assessment result in 4 second after click	M
19.	ASTKS _7_04	The system should be easy to understand	D
20.	ASTKS _7_05	The teacher will wait few mounts to process confinement teacher's assessment.	M
	ASTKS _8	**Operational requirements**	
21.	ASTKS _8_01	The system will have server for the database and connection to the main database.	M
22.	ASTKS _8_02	The system work under the web environment with all web browsers.	M
23.	ASTKS _8_03	The system must be current with evolving web standard.	M

	ASTKS _9	**Performance requirement**	
24.	ASTKS _9_01	The system database must be updated in real time.	M
25.	ASTKS _9_02	The system must have reasonable speed according to technology use to access many of users at the same time.	M
26.	ASTKS _9_03	The system should be available 24x7.	M
	ASTKS _10	**Security requirements**	
27.	ASTKS _10_01	Only who has user name and password can access the system.	M
28.	ASTKS _10_02	Unauthorized person should not use the system, just view the main page.	M
29.	ASTKS _10_03	No one can change the password without login to the system.	M
	ASTKS _11	**Maintainability requirements**	
30.	ASTKS _1_01	In case of change or addition demand, the maintainability shall be easily done by integrating new modules and offering new software solutions.	D
	ASTKS _12	**Availability requirements**	
31.	ASTKS _12_01	The availability of this system is up to the internet connection of the client (teacher & admin).	M

4.2 USE CASE

A use case defines a goal-oriented set of interactions between external actors and the system under consideration. Actors are parties outside the system that interact with the system (Egeberg, 2006). An actor may be a class of users, roles users can play, or other systems. Cockburn (1997) distinguishes between primary and secondary actors. A primary actor is

one having a goal requiring the assistance of the system. A secondary actor is one from which the system needs assistance.

A use case is initiated by a user with a particular goal in mind, and completes successfully when that goal is satisfied. It describes the sequence of interactions between actors and the system necessary to deliver the service that satisfies the goal. It also includes possible variants of this sequence, e.g., alternative sequences that may also satisfy the goal, as well as sequences that may lead to failure to complete the service because of exceptional behavior, error handling, etc.

Generally, use case steps are written in an easy-to-understand structured narrative using the vocabulary of the domain. This is engaging for users who can easily follow and validate the use cases, and the accessibility encourages users to be actively involved in defining the requirements.

4.2.1 Scenarios

A scenario is an instance of a use case, and represents a single path through the use case. Thus, one may construct a scenario for the main flow through the use case, and other scenarios for each possible variation of flow through the use case (e.g., triggered by options, error conditions, security breaches, etc.) (Egeberg, 2006). The following scenarios describe how school stuff (administrator and teachers) would use (ASKST). This should been help to gain insight in the problem domain and elicit requirements the system has to meet.

4.2.2 Use Case Diagram

The use cases are more formal methodology means to show how the functionality the system offers meet some need of the user. They are not

meant to indicate how the communication between participants of the system, but rather a tool to identify the functionality the different actors have to offer (Egeberg, 2006). A use case and measurable value of actor to provide something that describes a series of actions can be made as a horizontal ellipse (Ambler, 2004). Using use cases to determine the best way to run a project. Common to two or more use cases should be applied only once and then can be reused.

UML (1999) provides three relationships that can be used to structure use cases. These are generalization, include and extends. An include relationship between two use cases means that the sequence of behavior described in the included (or sub) use case is included in the sequence of the base (including) use case. Including a use case is thus analogous to the notion of calling a subroutine (Coleman, 1998).

The extend relationship provides a way of capturing a variant to a use case. Extensions are not true use cases but changes to steps in an existing use case. Typically extensions are used to specify the changes in steps that occur in order to accommodate an assumption that is false (Coleman, 1998). The extends relationship includes the condition that must be satisfied if the extension is to take place, and references to the extension points which define the locations in the base (extended) use case where the additions are to be made.

A generalization relationship between use cases "implies that the child use case contains all the attributes, sequences of behavior, and extension points defined in the parent use case, and participates in all relationships of the parent use case." The child use case may define new behavior

sequences, as well as add behavior into and specialized existing behavior of the parent (Alhir, 2003).

According to the use case diagram the system has two main components (actor/use case). In this study actor represent by teacher and admin. The teacher has to login to the system using his/her user name and password. The teacher can make assessment for knowledge sharing among subject experts. The admin can view the result of assessment and he/she can print out the report of result. The use case it represented in the following Figure (4.1):

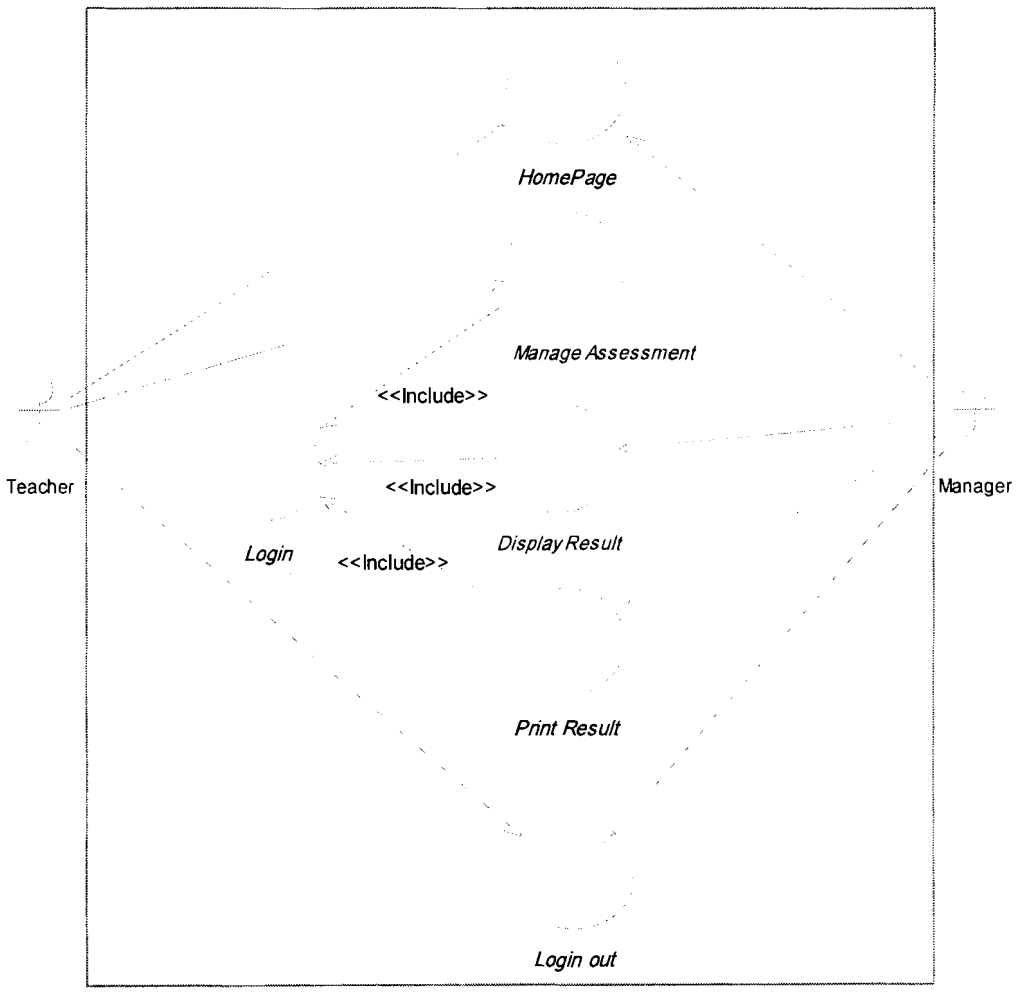


Figure 4.1 ASKST Use Case Diagram

4.3 USE CASE SPECIFICATION

Every detail has been placed in the appendix B

4.4 Activity Diagram

Activity diagrams represent the business and operational workflows of a system. An Activity diagram is a dynamic diagram that shows the activity and the event that causes the object to be in the particular state. Figure 4.2 descriptions the activity diagram for admin.

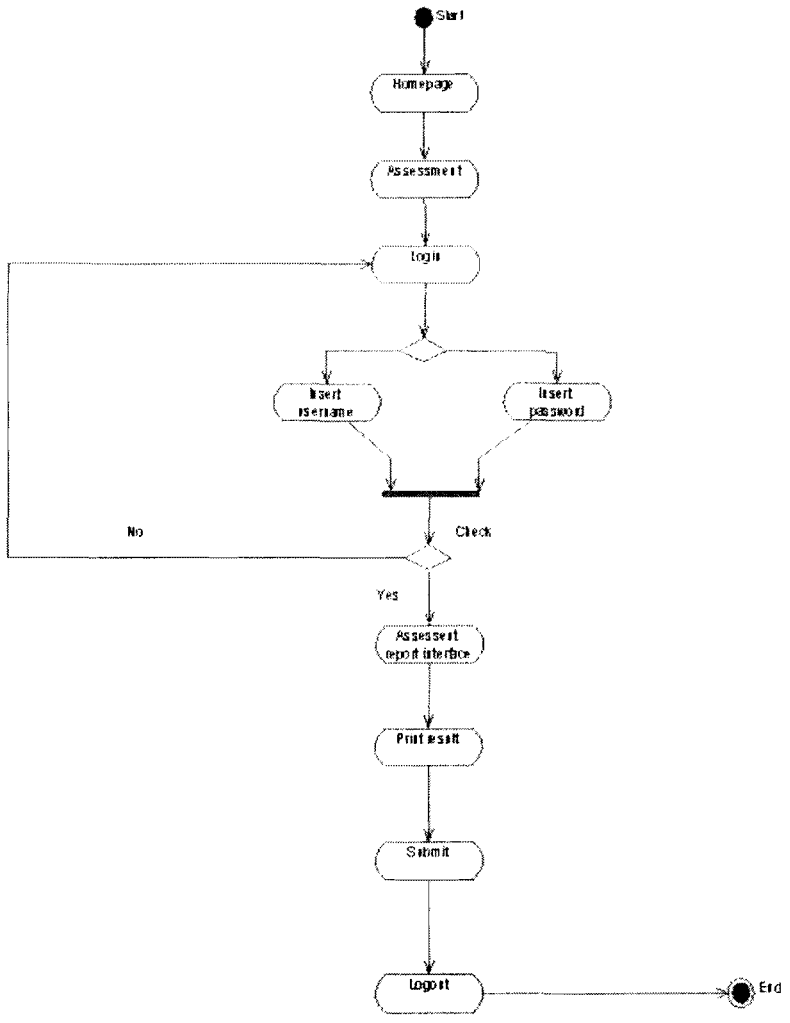


Figure 4. 2 Descriptions the Activity Diagram For Admin

The teacher activity diagram was illustrated in figure 4.3.

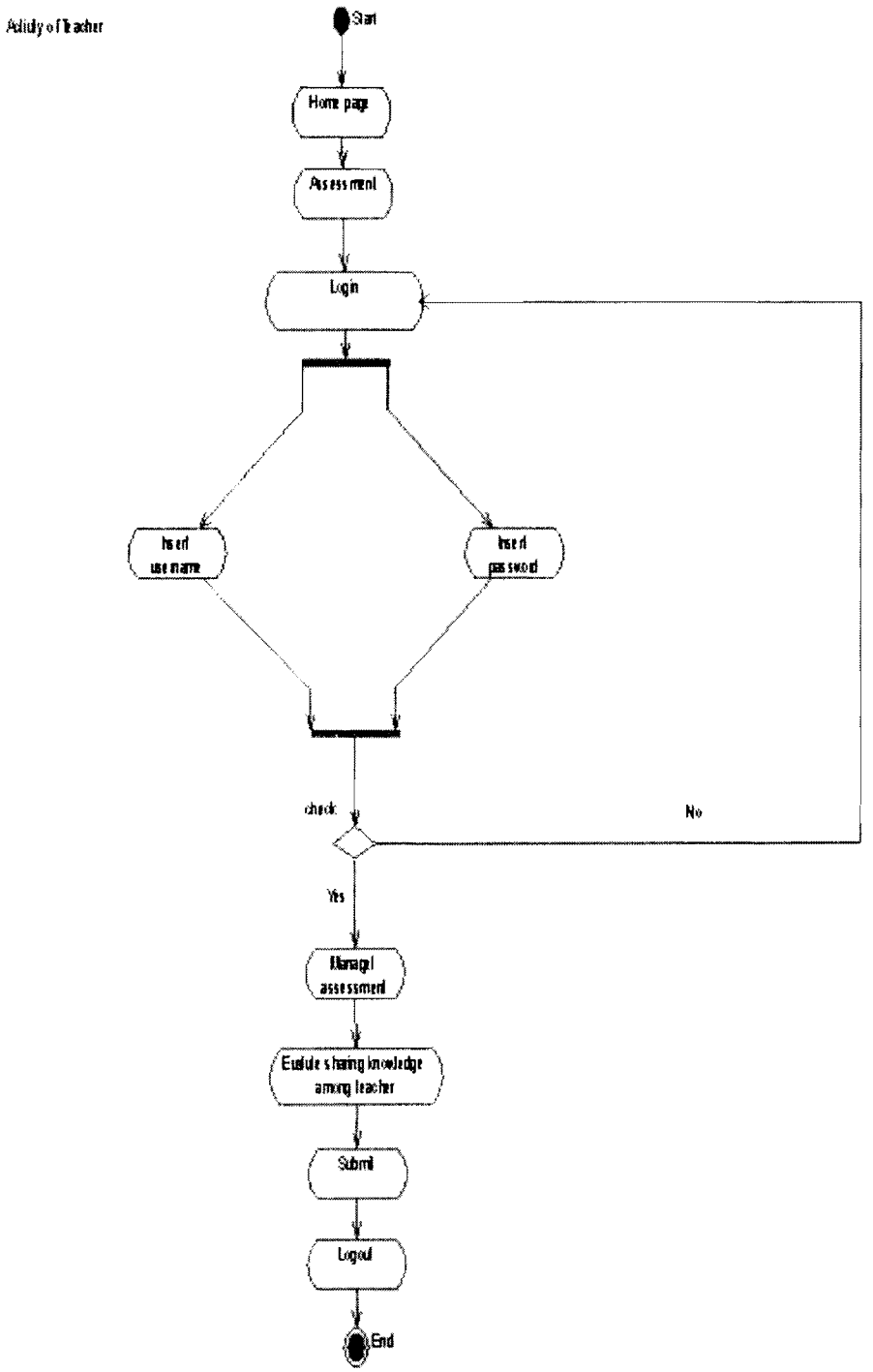


Figure 4. 3 Descriptions the Activity Diagram For Teacher

4.5 SEQUENCE AND COLLABORATION DIAGRAM

The sequence diagram is a unified modeling langue (UML) diagrams that shows the processes that are executed in sequence (Bennett, et al., 2007), the sequence of message which are exchanged among roles that implement the behavior of the system, arranged in time. There are three kinds of objects:

a) Boundary: it is the boundary the user and it actors (interface).

b) Entity: it's the information a system uses (date).

c) Control: it's the control logic of the system (who does what).

Home Page

In this sequence diagram as in Figure 4.4, the Users (Teacher & Admin) can access his/her page by put link in address.

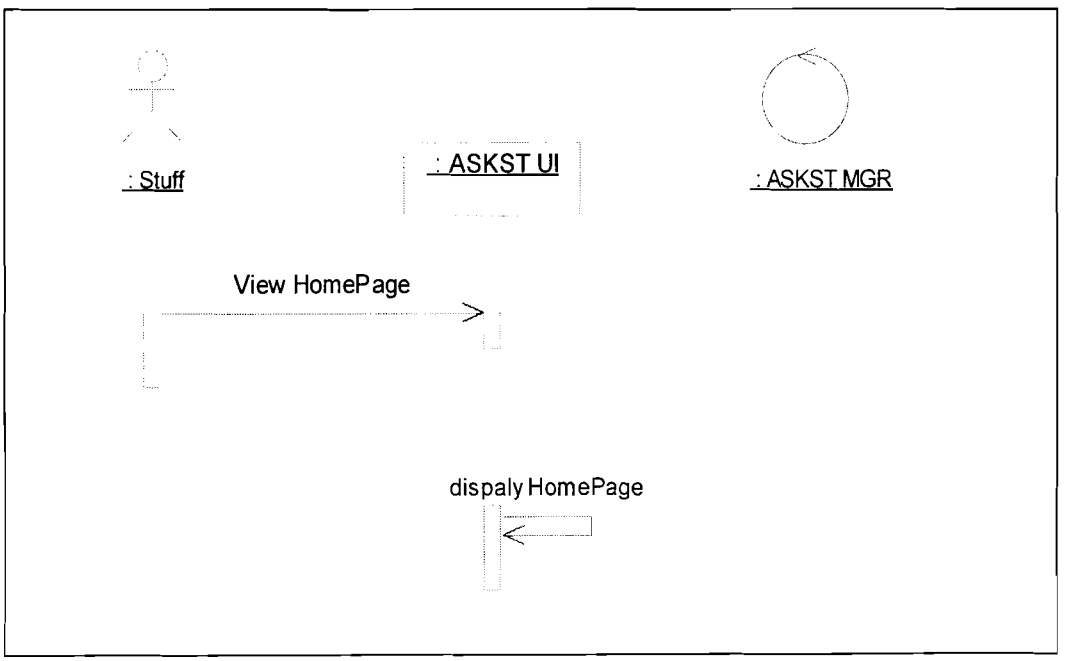


Figure 4. 4 Home page Sequence Diagram

Login

As showing in figure 4.5 it's describe the sequence diagram for system login. Users (Teacher & Admin) can access to system by login his/her account through the username and the password.

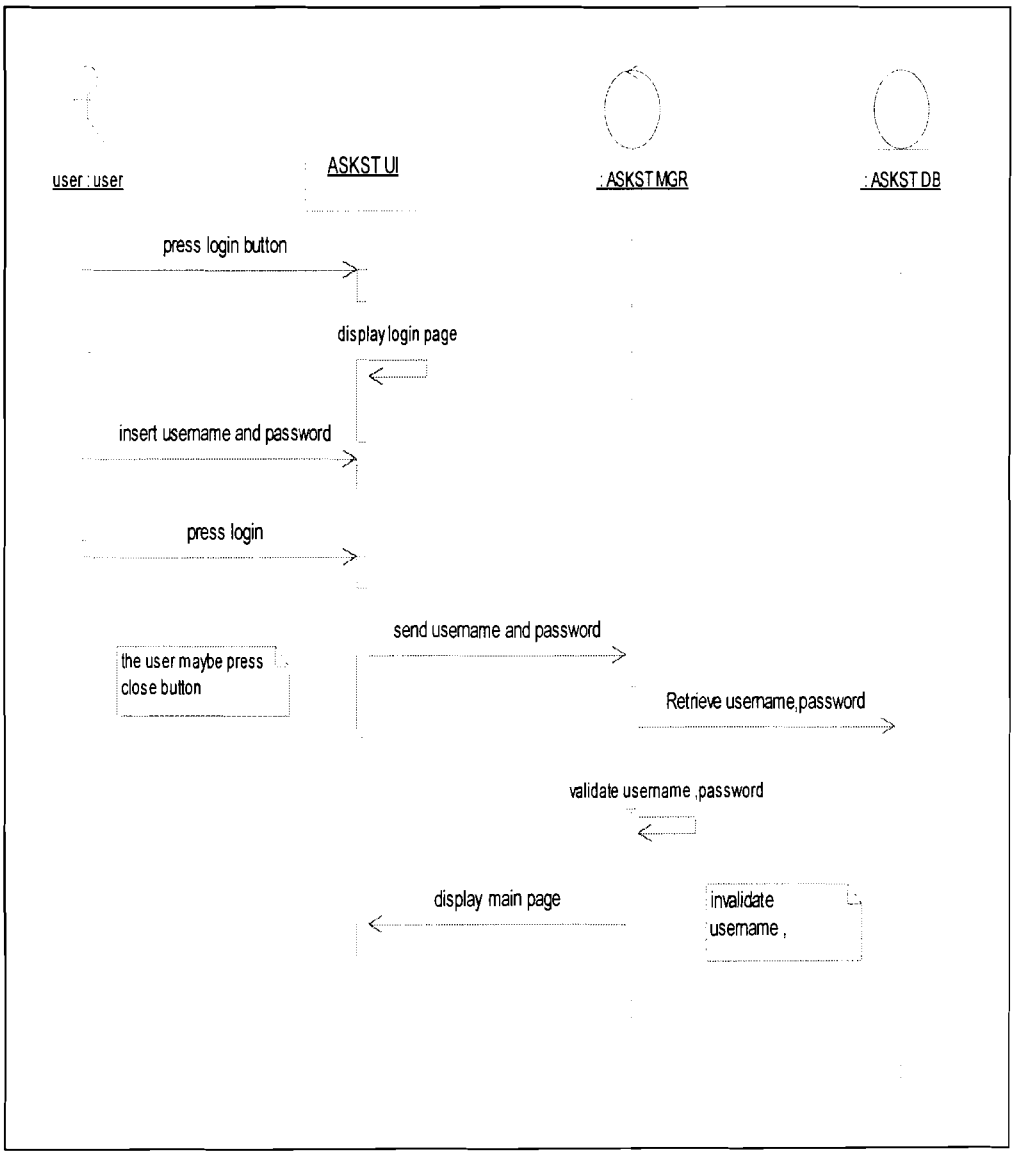


Figure 4.5 Login Sequence Diagram

Manage assessment

An evaluation process carried out by teachers to demonstrate the knowledge sharing among subject expert is illustrated in Figure 4.6. when the teacher access to the system he/she can make assess by answer all the question then make submit.

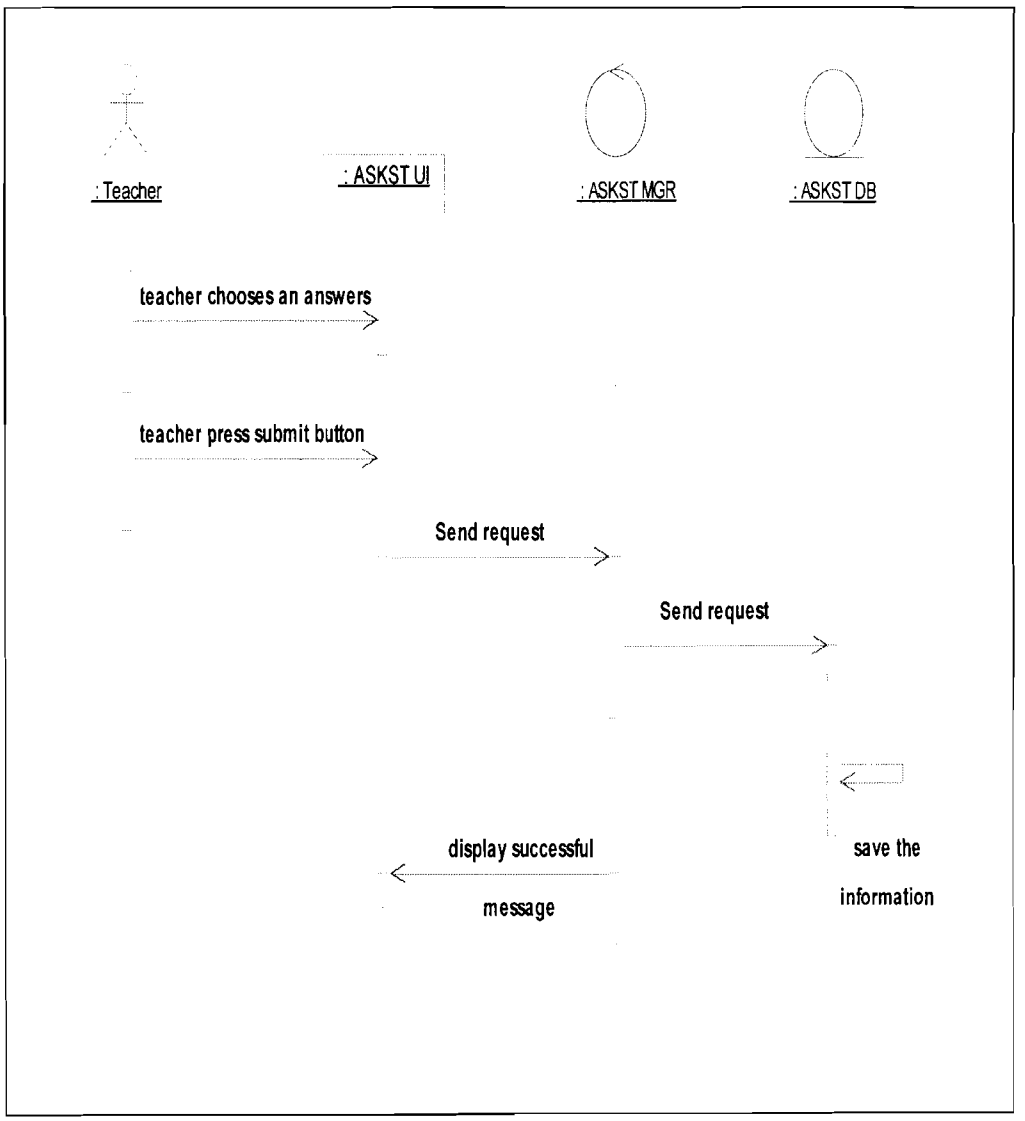


Figure 4. 6 Manage Assessment Sequence Diagram

Display Result

The admin after enter the system he/she can view all the assessment result. The system will display the assessment report for the admin as shown in figure 4.7.

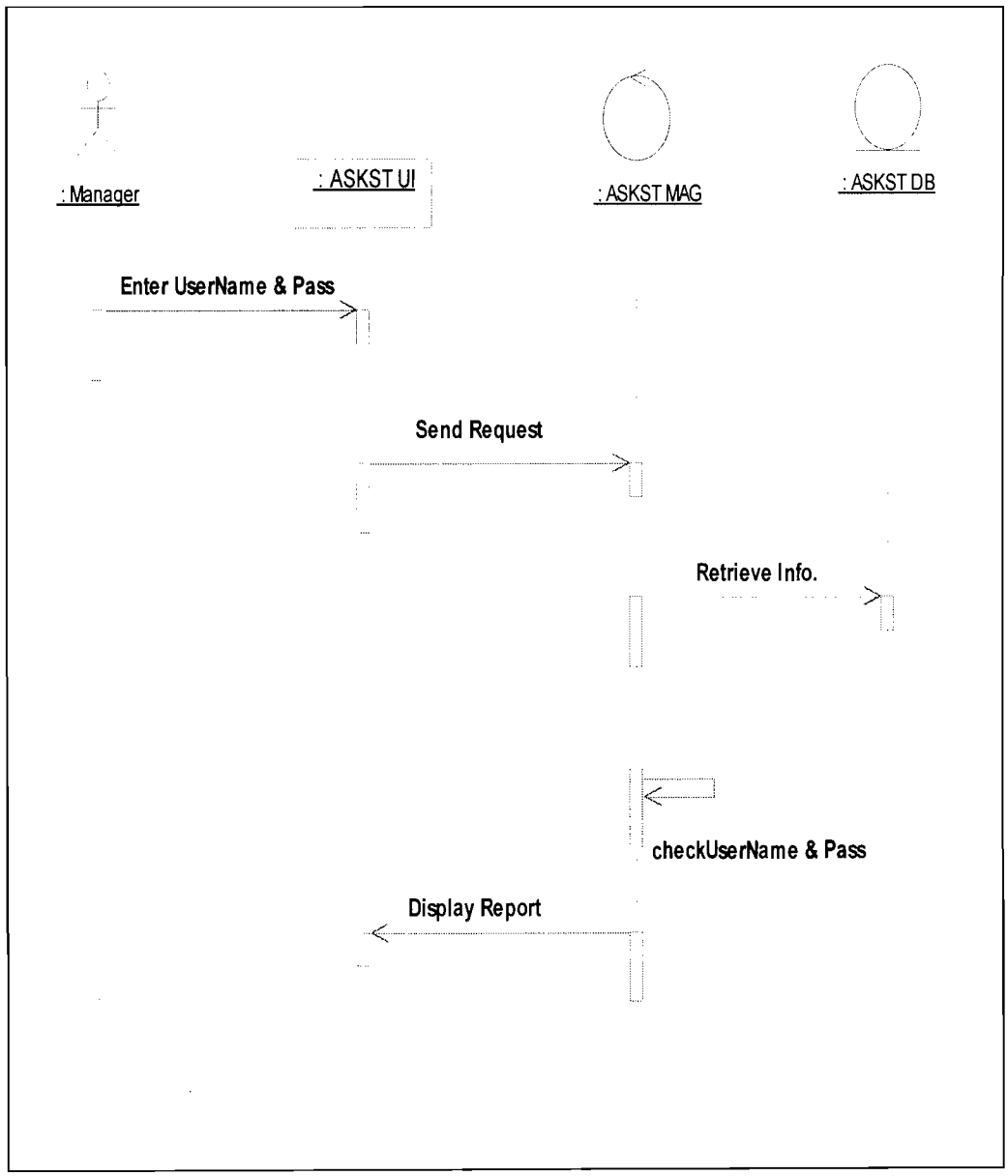


Figure 4.7 Display Result Sequence Diagram

Print Result

The admin after view the assessment result he/she can print out report of assessment result. The system will display successful massage to confirm the process as shown in figure 4.8.

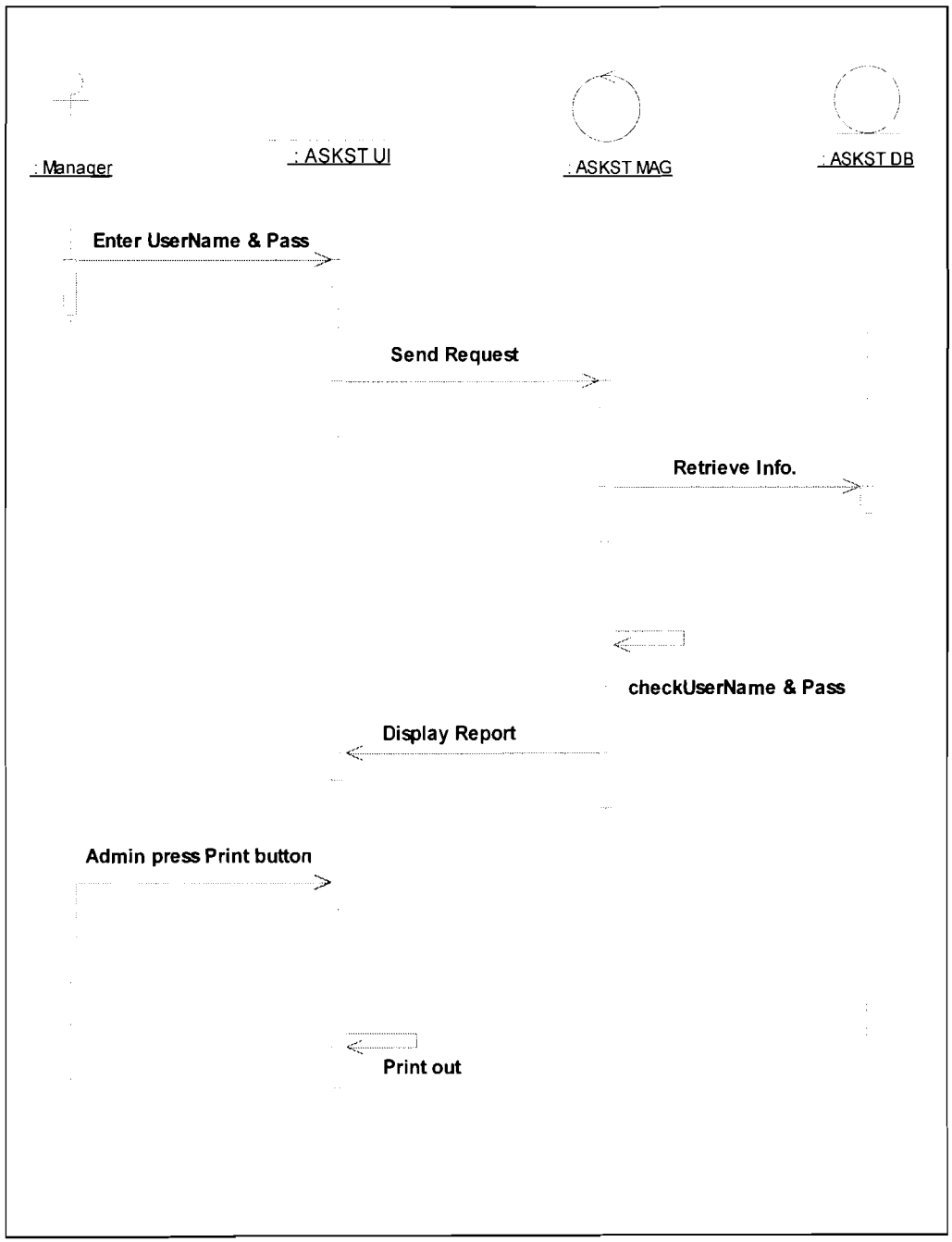


Figure 4. 8 Print Result Sequence Diagram

4.6 COLLABORATION DIAGRAMS

According Khriss, Elkoutbi & Keller (2004), A collaboration diagram is a graphical representation of a collaboration. The objects in a collaboration diagram are instances of classes in a class diagram. It's illustrated the relationship and interaction between software objects. They require use cases, system operation contracts, and domain model to already exist. The collaboration diagram illustrates messages being sent between classes and objects.

Login

In figure 4.10 there is login collaboration for the system; its will explain all the details of movement for system in use case login.

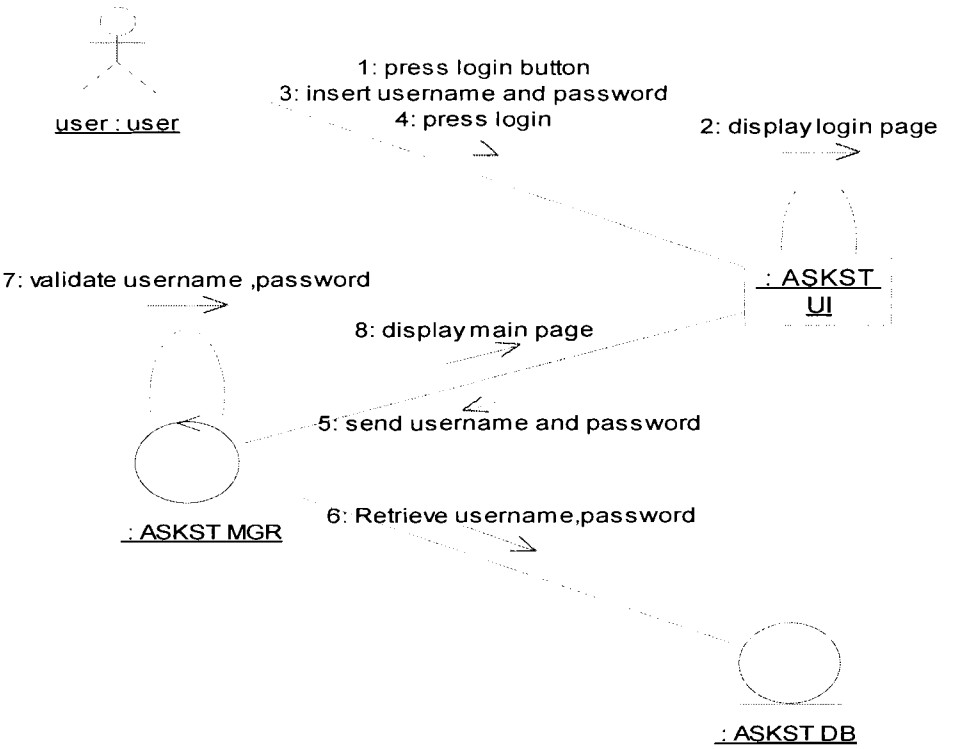


Figure 4.10 Login Collaboration Diagram

Display result

In figure 4.12 there is view assessment result collaboration for the system; it will explain all the details of movement for system in use case view assessment result.

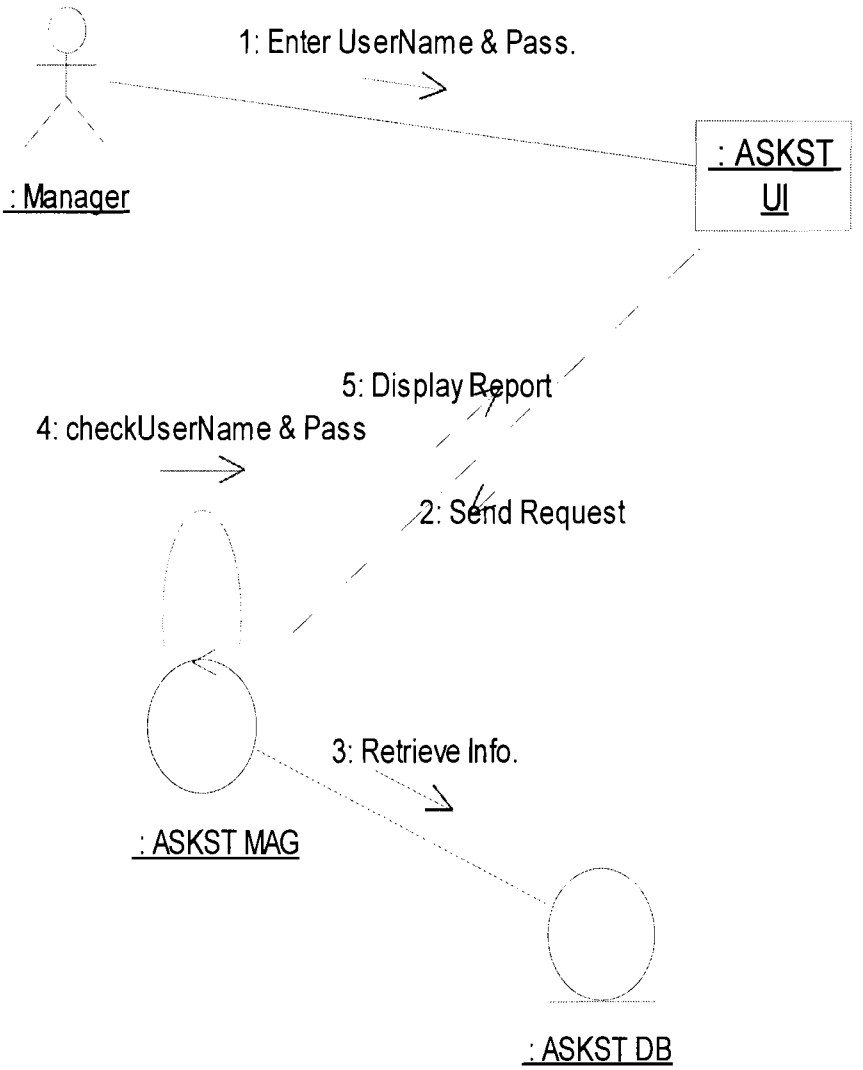


Figure 4. 12 Display Result Collaboration Diagram

Print Result

In figure 4.13 there is print out assessment result collaboration for the system; its will explain all the details of movement for system in use case print out assessment result.

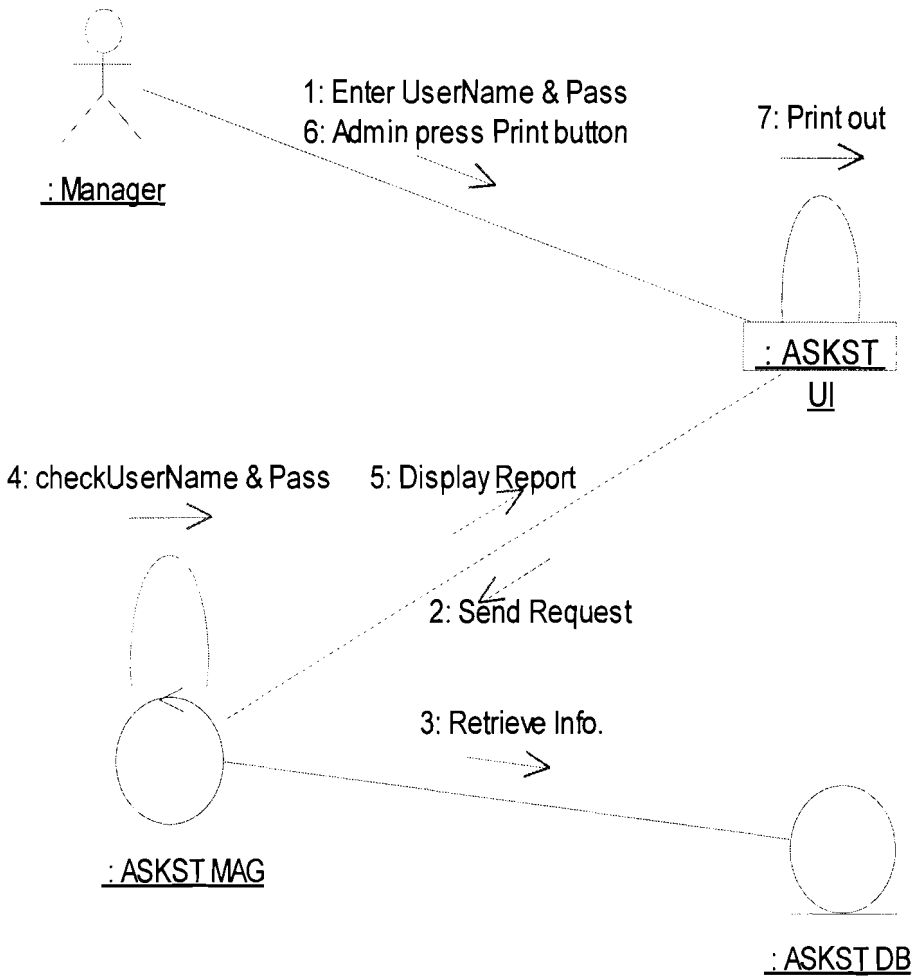


Figure 4. 13 Print Result Collaboration Diagram

Login out

In figure 4.14 there is login out collaboration for the system; its will explain all the details of movement for system in use case login out.

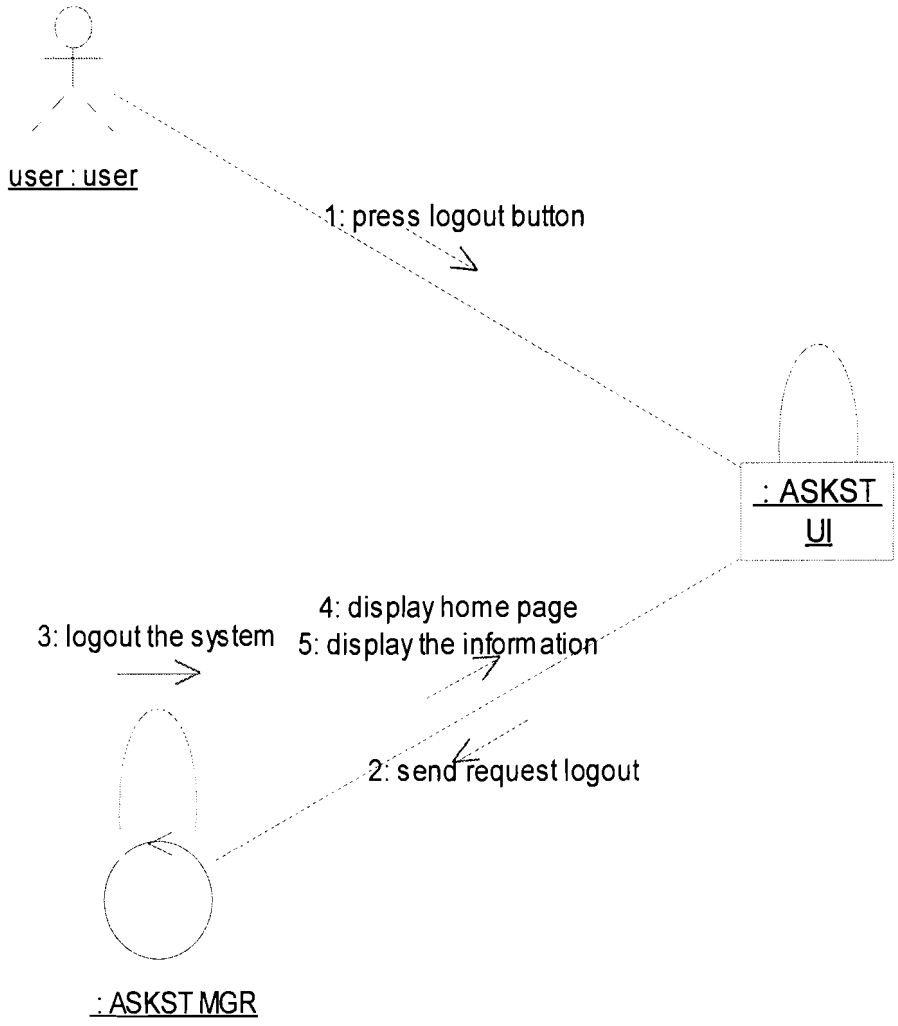


Figure 4. 14 Login out Collaboration Diagram

4.7 CLASS DIAGRAM

According Martin (2003) class diagrams are the basis for object-oriented analysis and design. The purpose of a class diagrams to represent the classes within a model. In an object-oriented application, classes have attributes (member variables), operations (member functions) and relationships with other classes. The UML class diagram can illustrate all these things fairly easily. Moreover Class diagrams show the classes of the system, their relationships (including inheritance, aggregation and association), and the operations and attributes of classes. So Class diagrams are used for a wide range of uses, including conceptual / domain modeling and detailed design modeling.

The class diagram of the system will illustrate in figure 4.13. The class diagram content six classes that represented are teacher and admin; and two entities for account information and data base to save assessment result and give reports.

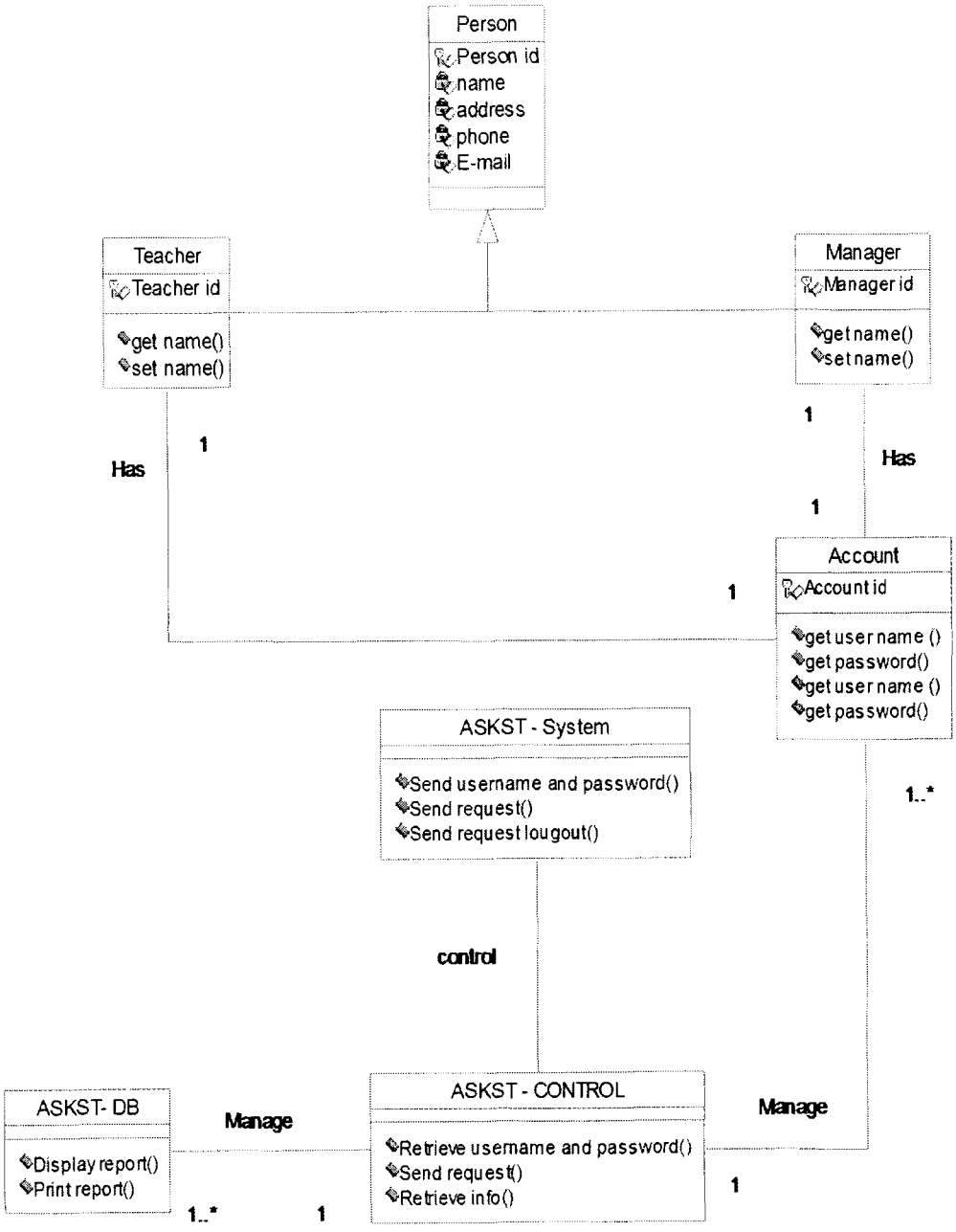


Figure 4.15 Class Diagram for ASKST

4.8 SYSTEM COMPONENTS

4.8.1 Microsoft Internet Information Server (IIS)

Microsoft Internet Information Web Server (IIS) for Windows 7 turns any Windows 7 computer into a web server and enables easy publication of personal web pages. IIS is easy to install and administer. It also simplifies sharing information on intranets or internet for all users .IIS is ideal for developing, testing and staging web application, as well as peer-to-peer publishing with its support for sharing files over HTTP. Microsoft Internet Information Server (IIS) supports all extensions and ASP.net scripts.IIS has been optimized for interactive workstation use, and does not have the System requirements of a full Web server.IIS was selected because this system will not be implement in the real web environment and only can be view in a standalone Personal Computer. Furthermore, managing IIS as there are fewer options available to those users who require web services to run on windows 7.

4.8.2 Microsoft Visual Studio.Net

Microsoft Visual Studio .net Active Server Page (ASP.net) is a file with a Microsoft visual Studio .net suffix that that contains a combination of HTML statement and script logic .When IIS receives on HTTP request for an ASP.net ,the final HTML response is generated dynamically will be the static ITML statements plus the insertion of any HTML generated by the scripting. The ASP .net programming coding and HTML tags can view ASP.net is actually an extension to our web server that allows server-side scripting .At the same time it also provides a compendium of objects and components ,which manage interaction between the web server and the browser.

4.9 SYSTEM INTERFACE

Homepage Interface

The assessment system will be under the school system, which means the home page for the system will be the school homepage as illustrated in figure 4.14. The users (teacher & admin) can choose assessment button to enter to the ASKST.

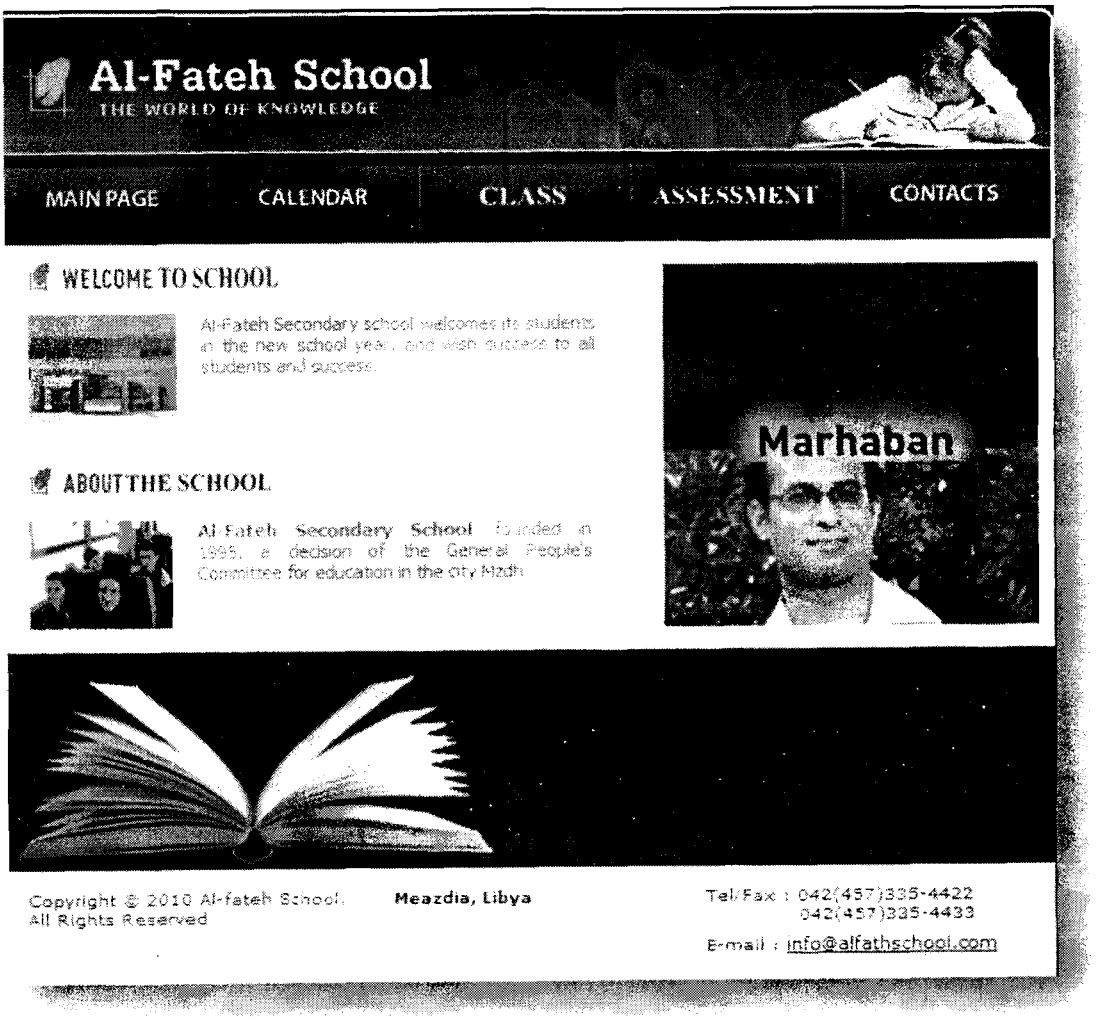
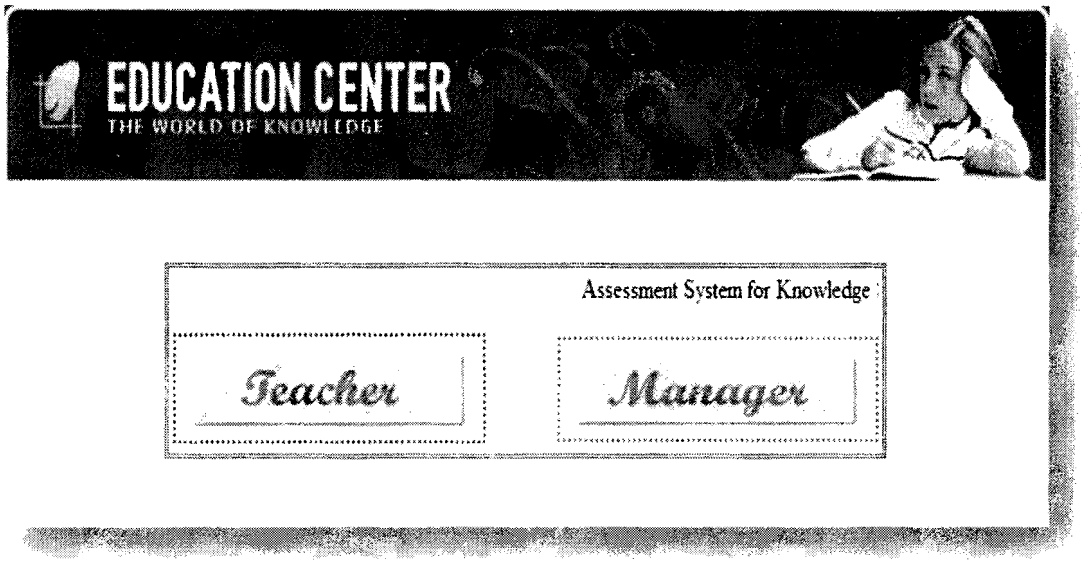


Figure 4.16 Homepage interface for ASKST

Login Interface

The users (teacher & admin) when he/she enter the login page he/she should put the username and password as shown in figure 4.15. The system will verification if the username and password is correct then the users can enter to the assessment system.



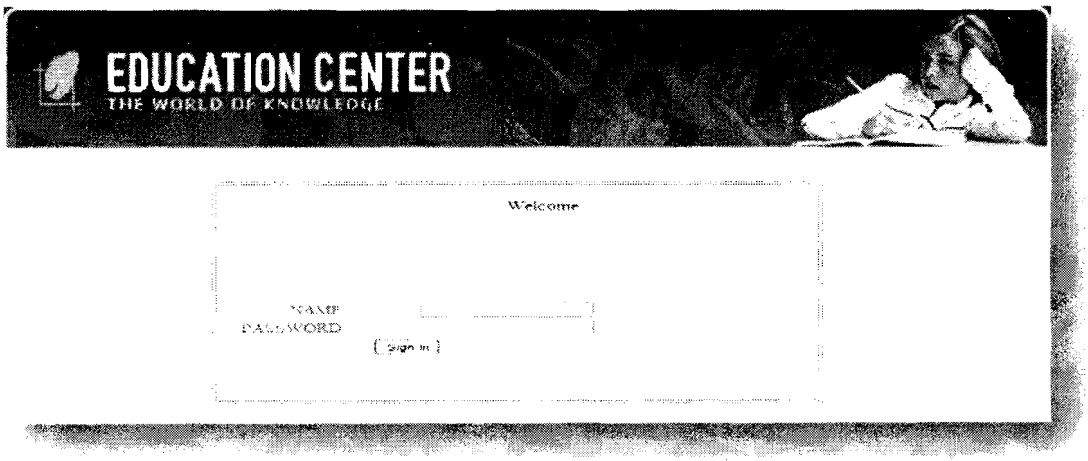


Figure 4.17 Login interface for ASKST

Assessment Interface

The teacher when he/she enter the system, the system will display assessment interface. This interface as shown in figure 4.16 content several of question and in front of each question there is score between 1-5 can teachers chose the number to answer the question.

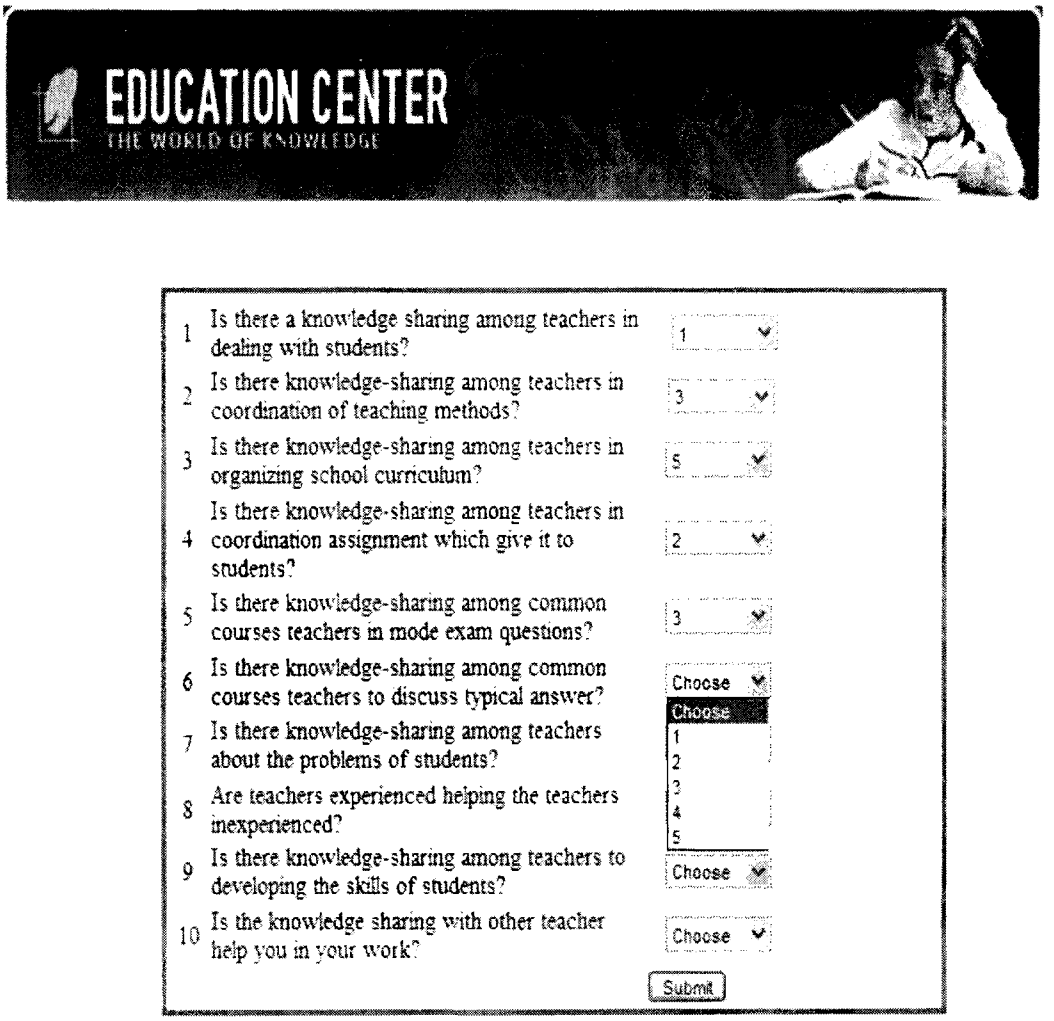


Figure 4. 18 Assessment interface for ASKST

Assessment Report Interface

The admin when he/she enter the system, the system will display assessment result interface as shown in figure 4.17. In this interface content the result and pin chart for the assessment which teacher make it before.

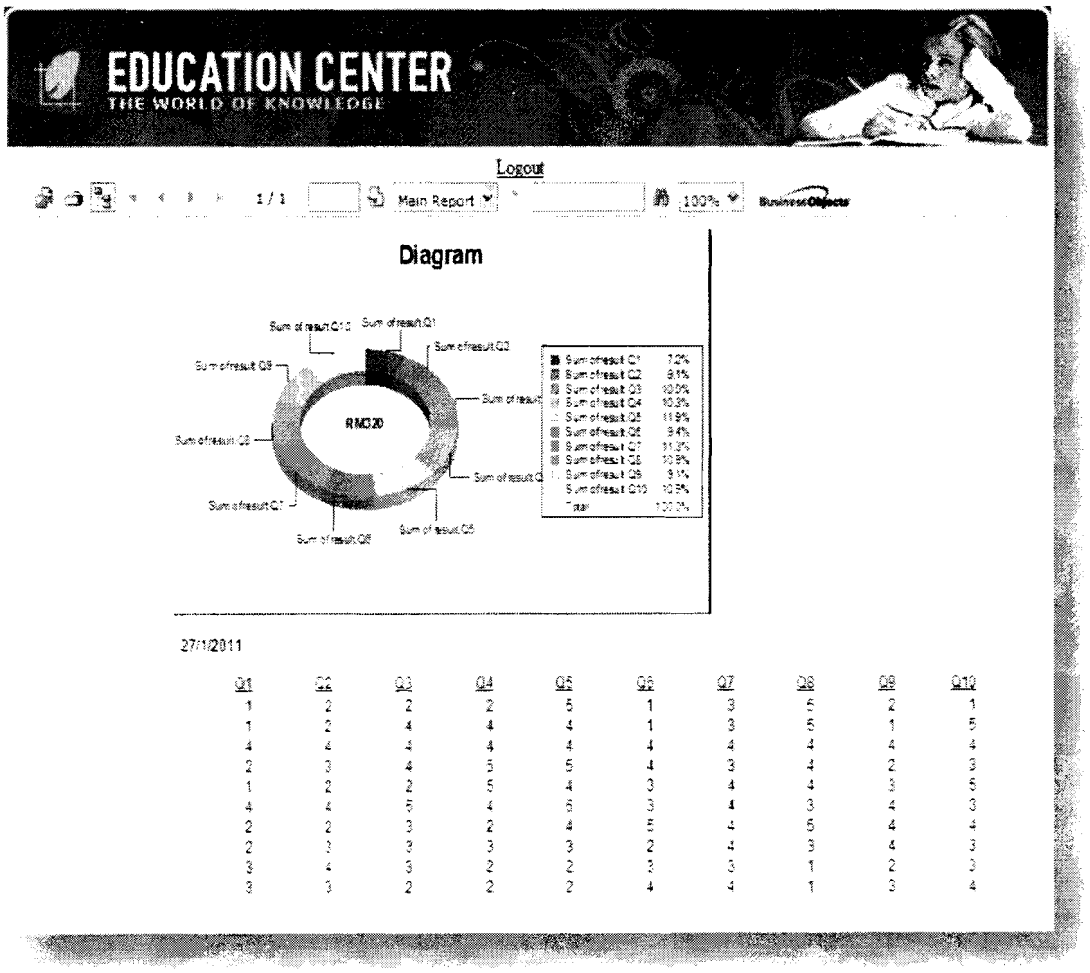


Figure 4.19 Assessment report interface for ASKST

Print Report Interface

The admin when he/she view the result for assessment in figure 4.17, he/she can make printout for the assessment result report as shown in figure 4.18.

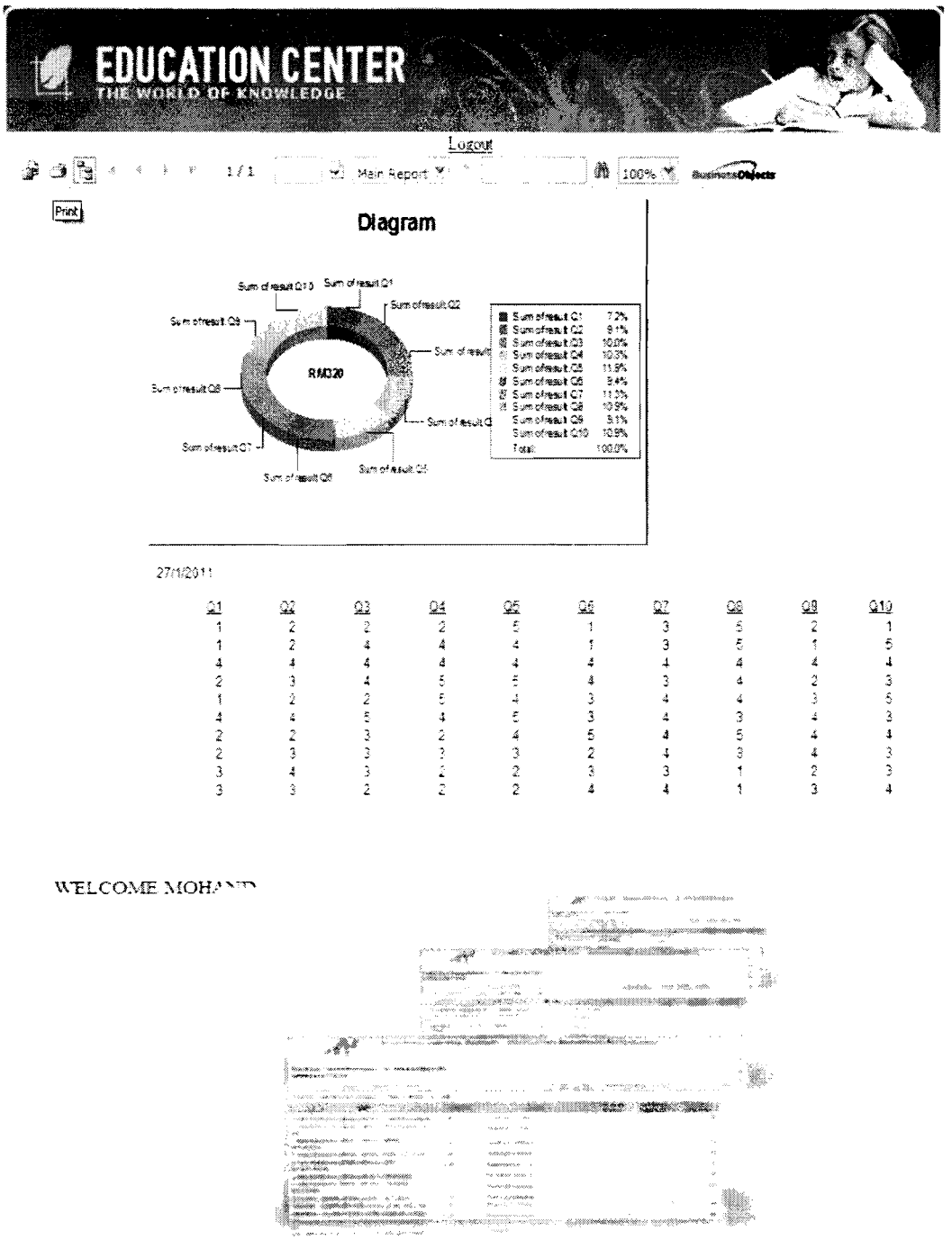


Figure 4. 20 Assessment report print interface for ASKST

4.10 ASKST SYSTEM EVALUATION

Evaluation system is important to demonstrate the viability of the system and can be used by the user. To assess the system was made using the questionnaire technique. The evaluation is based on usability testing by using System Usability Scale (SUS) proposed by Bangor, Kortum & Miller (2008). The questionnaire consists of two section, general information and evaluation of user. The Statistical Package for Social Sciences version 13 has been used to perform descriptive statistics analysis for the collected data. Also the (SPSS) used to determine the frequencies of each question; however, the histogram has been provided in this evaluation.

Table 4. 3 Summary of Demographics Data

Gender	Frequency	Percentage (%)
Male	22	73.33%
Female	8	26.66%
Education		
PhD	2	6.66%
Master	9	30%
Degree	14	46.66%
Diploma	5	16.66%
Computer Experience		
1 year	2	6.66
2 year	6	20%
3 year	5	16.66%
Above 3 year	17	56.66%

As illustrate in Table 4.3, 22 (73.33%) of the respondents were male and 8 (26.66%) were female. Most of the respondents 14 (46.66%) have degree certificate and the minority of them are PhD certificate 2 (6.66%). The remaining 9 (30%), 5 (16.66%) are Master and Diploma respectively. Finally, the majority of simple have experience more than 3 years 15 (56.66%).

4.10.1 Evaluation of User

Measure the performance of the system depends mainly on the assessment of users and as described earlier that the system is interested to assess knowledge sharing among teachers, and most of the sample surveyed have experience of more than 3 years in the field of education. Each questions in the measurement has a rate from 1 - 5 (1 mean Strongly Disagree, 2 mean Disagree, 3 mean Neutral, 4 mean Agree, and 5 mean Strongly Agree).

As describe in Table 4.4 the survey focus on two dimension the usefulness and ease of use; the result illustrates that the mean for every dimension is above than 4.00.

Table 4. 4 attributive statistics for dimensions

Perceived Usefulness	30	4.0388
Perceived Ease of Use	30	4.0586

As shown in tables 4.5 there is an indicate details about the mean for each questions. All the details for the questionnaire are existed in appendix C.

Table 4. 5 Illustrate Statistics for All Elements

PERCEIVED USEFULNESS		Mean
Q1	Using ASKST helps me to be more effective	3.9333
Q2	Using ASKST helps me to be more productive.	3.7000
Q3	Using ASKST saves my time when I use it	3.9000
Q4	Using ASKST would enhance my effectiveness	4.3000
Q5	Using ASKST would make it easier to do my tasks	4.1000
Q6	ASKST was everything I would expect it to do.	4.3000
PERCEIVED EASE OF USE		**Mean**
Q7	ASKST is simple to use.	3.8854
Q8	ASKST is very friendly to use	4.3000
Q9	It requires the fewest steps possible to accomplish what I want to do with it	3.9000
Q10	I can use it without written instructions	4.6333
Q11	I don't notice any inconsistencies as I use ASKST	3.8000
Q12	I can use ASKST successfully every time.	3.8333

Depend on the result of first dimension effectiveness and effective of the system got high satisfaction from the evaluators with mean 4.3000 and 3.9333 respectively, and also, the evaluators was asses the system is can used successfully every time with mean 3.8333. According to Q7, Q8 and Q10 the capability of the system to be understood, learned, used and liked got high satisfaction with mean 3.8854, 4.3000 and 4.6333 respectively, mean the usability of the system conform to quality specifications.

As illustrated in the result of Q 12, Q5, Q11 the system has successful of reliability with 3.8333, 4.1000 and 3.8000 respectively, to maintain its level of performance when used under specified conditions. In general, the ASKST system will provide functions which meet stated and implied needs for the project based on the result of questioner

4.11 SUMMARY

This chapter are content the analysis about the system, the requirement, use cases and the entire diagram which describe the function of ASKST system. The result of running the system illustrated that target of the study is done successfully. The output of chapter four is the developed prototype and the result of user assessment for the prototype.

CHAPTER FIVE

CONCLUSIONS AND RECOMMENDED FURTHER STUDY

Beginning the chapter with a discussion of the outcome found in chapter four and it's density with prior research works that either support or disagree with result of this research labor. It's followed by conclusions that are drawn from this research labor. Several implications for both research and practice emerged and are discussed in following section, and then recommendations for future research are made, finally, the conclusion of the study.

5.1 DISCUSSION

The purpose of this research is to identify the following:

- Can develop assessment system help school management to assess knowledge sharing among subject experts in secondary school?

Drawing on the research result, will discusses how the finding support the objective of this study.

Concluded the study that is the skill teachers form the foundation of good schools, and improving teachers' skills and knowledge is one of the most important investments of the time and money, and also leaders build in education. (Resnick, 2005). Knowledge sharing is the fundamental means

through which employees can contribute to knowledge application and innovation (Jackson et al, 2006). in return, the studies have shown that most teachers do not interact in a culture in which teaching-related knowledge is exchanged (Barab et al, 2001); they are accustomed to designing teaching activities in isolation (Tyack and Cuban, 1995). Therefore, there are need to find a assessment system for knowledge sharing among teacher professional communities to avoid defects and improved performance, which is helpful for schools' to develop knowledge and cultures (Zhao, 2010). That's what the study aims to achieve

Objective 1:

First subject of this study understands the system requirements to automate of assessment system help school management in assessing knowledge sharing among subject experts in secondary school. As a result, have been identified the following requirements.

Teacher enters the system by using login, then teacher can go to assessment page, in assessment page, he/she can answer all the question, after that, he/she will pressing submit button. On other side, the director (head of school administration) can enter the system by login, and then he/she can view the result about the assessment.

The system also automatically processing the data and gives a report on the results immediately after submits. Through these requirements consists of a simple system to deal with the user in order to be more appropriate.

Objective 2:

Skill teachers form the foundation of good schools, This skill need to constantly refine, and develop the skill you need to know the strengths

and weaknesses, knowledge sharing could be a major point in achieving these goals., It cannot be understand the success of knowledge sharing among teachers only through an evaluation of this process.

The system was implemented using ASP.net environment with C# language, and the database designed by using SQL. However, the system is compatible with all operating system.

Objective 3:

Knowledge is a critical organizational resource that provides a sustainable competitive advantage in a competitive and dynamic economy (Foss & Pedersen, 2002). Implementation of this system helps school administration to understand and develop of the regulatory status in the school. As will as, gives a vision to understand how to transfer expertise and knowledge from experts who have it to novices who need to know.

All above depend on the evaluating of the system. System was assessed through a group of teachers, especially teachers for Yemen school in Sintok and the teachers who are postgraduates' students in UUM; and the results have been positive.

5.2 LIMITATION

For this research, the researcher was focused on construction of prototype e-assessment system help school administration to develop teacher's skills and improve knowledge management organization. As well as ensure the proper management of the knowledge sharing among

subjects expert. Furthermore, show the results, to evaluate the knowledge situation for the teachers specially and the school in general.

5.3 CONTRIBUTION

This study obtained the following contributions in the knowledge management field:

a) Use of the facilities in the area of information and communication technologies to development of knowledge system in the school and re-installed in line with healthy society.

b) Give a picture of possible solutions for the transfer expertise and knowledge from experts who have it to novices who need to know, through the use of e-assessment system to evaluate the knowledge sharing among teachers in secondary school.

c) Provide full analysis for relationship between teachers in secondary school and understand the possibility of cooperation among them.

5.4 FUTURE WORK

The spread of the Internet and the growth of the number of users quickly, putting information technology in the areas of new research and development vehicle. Accompanied by the continuous development and facility earned this area the flexibility to cope with all the sciences. Through this research was to shed light on an important aspect in the relationship and knowledge sharing among teachers in secondary school. It is recommended that, the future research in this field covers the followings:

a. It can be development of the system and make it absorb more of the areas of assessment of knowledge management within secondary schools.

b. Through the system can extend the notion of evaluation to include all schools within a certain range, so that the exchange of experiences among teachers in different schools for the advancement of education in generally.

5.5 CONCLUSION

Assessment system is an ongoing process that involves planning, discussion, consensus building, reflection, measuring, analyzing, and improving based on the data and artifacts gathered about a learning objective. On other hand, knowledge sharing as a concept is very attractive and provides huge learn opportunities that should not be missed. It's provision of task information and know-how to help others and to collaborate with others to solve problems. In this study was used electronic assessment system to evaluate a knowledge sharing among teachers, which is helpful for schools' organizations to develop knowledge and cultures.

REFERENCES

Al Shehri, M. (2004). Current issues in medical education. *West African Journal of Medicine, 22*(4), 329.

AL-Smadi, M., & Gütl, C. (2008). Past, Present and Future of e-Assessment-Towards a Flexible e-Assessment System. *Proceeding of ICL2008, Villach, Austria.*

Bangor, A., Kortum, P. T., & Miller, J. T. (2008). An empirical evaluation of the system usability scale. *International Journal of Human-Computer Interaction, 24*(6), 574-594.

Barab, S., MaKinster, J., Moore, J., & Cunningham, D. (2001). Designing and building an on-line community: The struggle to support sociability in the inquiry learning forum. *Educational Technology Research and Development, 49*(4), 71-96.

Barak, M., & Rafaeli, S. (2004). On-line question-posing and peer-assessment as means for web-based knowledge sharing in learning. *International Journal of Human-Computer Studies, 61*(1), 84-103.

Barker, T., & Lee, S. (2007). *The verification of identity in online assessment: A comparison of methods.* Paper presented at the Proceedings of 11th Computer Aided Assessment Conference, Loughborough.

Bennett, R. (2002). Inexorable and inevitable: The continuing story of technology and assessment. *Journal of Technology, Learning, and Assessment, 1*(1), 3-23.

Bock, G., Zmud, R., Kim, Y., & Lee, J. (2005). Behavioral intention formation in knowledge sharing: Examining the roles of extrinsic motivators, social-psychological forces, and organizational climate. *Mis Quarterly, 29*(1), 87-111.

Boehm, B. (2002). Get ready for agile methods, with care. *COMPUTER*, 64-69.

Boehm, B., & Hansen, W. (2001). The spiral model as a tool for evolutionary acquisition. *CrossTalk, 14*(5), 4–11.

Boehm, B., & Usc, B. (2007). Anchoring the software process. *Software engineering: Barry W. Boehm's lifetime contributions to software development, management, and research, 13*(4), 367.

Boehm, B., Egyed, A., Kwan, J., Port, D., Shah, A., & Madachy, R. (2002). Using the winwin spiral model: A case study. *Computer, 31*(7), 33-44.

Bransford, J. (2000). *How people learn: Brain, mind, experience, and school*: National Academies Press.

Brown, J., & Duguid, P. (1991). Organizational learning and communities-of-practice: Toward a unified view of working, learning, and innovation. *Organization science, 2*(1), 40-57.

Bull, J., & McKenna, C. (2004). *Blueprint for computer-assisted assessment*: Routledge.

Buzzetto-More, N., & Alade, A. (2006). Best practices in e-assessment. *Journal of Information Technology Education, 5*(1), 251-269.

Cabrera, A., Collins, W., & Salgado, J. (2006). Determinants of individual engagement in knowledge sharing. *The International Journal of Human Resource Management, 17*(2), 245-264.

Cabrera, E., & Cabrera, A. (2005). Fostering knowledge sharing through people management practices. *The International Journal of Human Resource Management, 16*(5), 720-735.

Carroll, J., Choo, C., Dunlap, D., Isenhour, P., Kerr, S., MacLean, A., et al. (2003). Knowledge management support for teachers. *Educational Technology Research and Development, 51*(4), 42-64.

Charman, D., & Elmes, A. (1998). Computer Based Assessment: A guide to good practice. *Volume I, University of Playmouth.*

Cioch, F., Brabbs, J., & Kanter, S. (2002). Using the spiral model to assess, select and integrate software development tools *Assessment of Quality Software Development Tools,* (pp. 14-28).

Cross, R., & Baird, L. (2000). Technology is not enough: improving performance by building organizational memory. *IEEE Engineering Management Review, 28*(4), 8-16.

Cummings, J. (2004). Work groups, structural diversity, and knowledge sharing in a global organization. *Management Science, 50*(3), 352-364.

Dall'Acqua, L. (2010). *Cognitive Tutoring based on Intelligent Decision Support in the PENTHA Instructional Design Model.* Paper presented at the AIP Conference Proceedings Special Edition of the World Congress on Engineering and Computer Science-2009, San Francisco, California. (pp.261-275).

Damodaran, L., & Olphert, W. (2000). Barriers and facilitators to the use of knowledge management systems. *Behaviour & Information Technology, 19*(6), 405-413.

Davenport, T., & Prusak, L. (2000). *Working knowledge: How organizations manage what they know*: Harvard Business Press.

Dhir, K. (2005). Content access, and the use of data for student learning: The case of Berry College. *K. Martell & T. Calderon, Assessment of student learning in business schools: Best practices each step of the way, 1*(2), 167-183.

Dietel, R., Herman, J., & Knuth, R. (1991). What does research say about assessment. *North Central Regional Educational Laboratory, Oak Brook.*

Dochy, F., & McDowell, L. (1997). Introduction: Assessment as a Tool for Learning. *Studies in Educational Evaluation, 23*(4), 279-298.

Elliot, B. (2008). Assessment 2.0: Modernising assessment in the age of web 2.0. *Scottish Qualifications Authority, Retrieved on, 28.*

Eriksson, I. V., & Dickson, G. W. (2000). *Knowledge sharing in high technology companies.* Paper presented at the Americas Conference on Information Systems (AMCIS). Relative December 25, 2010 from: http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1706&context=amcis2000

Farance, F. (2000). Draft standard for learning technology. Public and private information (PAPI) for learners (PAPI Learner): Version 6.0. Tech. Rep. Institute of Electrical and Electronics Engineers, Inc.

Finlay, L. (2006). Mapping methodology. *Qualitative research for allied health professionals: Challenging choices. Chichester, Sussex: John Wiley.*

Fischer, F., & Mandl, H. (2005). Knowledge convergence in computer-supported collaborative learning: The role of external representation tools. *Journal of the Learning Sciences, 14*(3), 405-441.

Foss, N., & Pedersen, T. (2002). Transferring knowledge in MNCs:: The role of sources of subsidiary knowledge and organizational context. *Journal of International Management, 8*(1), 49-67.

Gütl, C. (2007). Moving towards a Fully-Automatic Knowledge Assessment Tool. *iJET International Journal of Emerging Technologies in Learning, to be published.* Relative December 18, 2010 from: http://info.iicm.edu/home/cguetl/publications/2008/Guetl%202008%20-%20IJET.pdf.

Haken, M. (2006). *Closing the loop-learning from assessment.* Paper presented at the Presentation made at the University of Maryland Eastern Shore Assessment Workshop, Princess Anne: MD.

Harich, K., Fraser, L., & Norby, J. (2005). Taking the time to do it right. *K. Martell & T. Calderon, Assessment of student learning in business schools: Best practices each step of the way, 1*(2), 119-137.

Hendriks, P. (1999). Why share knowledge? The influence of ICT on the motivation for knowledge sharing. *Knowledge and process management, 6*(2), 91-100.

Hinds, P., Patterson, M., & Pfeffer, J. (2001). Bothered by abstraction: The effect of expertise on knowledge transfer and subsequent novice performance. *Journal of Applied Psychology, 86*(6), 1232-1243.

Hou, H., Sung, Y., & Chang, K. (2009). Exploring the behavioral patterns of an online knowledge-sharing discussion activity among teachers with problem-solving strategy. *Teaching and Teacher Education, 25*(1), 101-108.

Hsu, M., Ju, T., Yen, C., & Chang, C. (2007). Knowledge sharing behavior in virtual communities: The relationship between trust, self-efficacy, and outcome expectations. *International Journal of Human-Computer Studies, 65*(2), 153-169.

Hsu, S. (2004). Using case discussion on the web to develop student teacher problem solving skills. *Teaching and Teacher Education, 20*(7), 681-692.

Jackson, S., Chuang, C., Harden, E., & Jiang, Y. (2006). Toward developing human resource management systems for knowledge-intensive teamwork. *Research in Personnel and Human Resources Management, 25*, 27-70.

Khriss, I., Elkoutbi, M., & Keller, R. K. (2004). Automating the synthesis of UML statechart diagrams from multiple collaboration diagrams. *The Unified Modeling Language.«UML»'98: Beyond the Notation*, 514-514.

Klassen, J. (2001). *Pedagogical Support for the use of Information technology in teaching.* Paper presented at the Conference Proceedings for Informing Science, Krakow, Poland.

Kruchten, P. (2004). *The rational unified process: an introduction.* Canada: Addison-Wesley Professional.

Li, X., Montazemi, A., & Yuan, Y. (2006). Agent-based buddy-finding methodology for knowledge sharing. *Information & Management, 43*(3), 283-296.

Ma, W., & Yuen, A. (2010). Understanding online knowledge sharing: An interpersonal relationship perspective. *Computers & Education, 56*(1), 210-219.

Markopoulos, P., & Bekker, M. (2003). On the assessment of usability testing methods for children. *Interacting with Computers, 15*(2), 227-243.

Martell, K., & Calderon, T. (2005a). Assessment in business schools: What it is, where we are, and where we need to go now. *Assessment of student learning in business schools: Best practices each step of the way, 1*(1), 1-26.

Martell, K., & Calderon, T. (2005b). Assessment of student learning in business schools: What it is, where we are, and where we need to go next. *K. Martell & T. Calderon, Assessment of student learning in business schools: Best practices each step of the way, 1*(1), 1-22.

Mazzolini, M., & Maddison, S. (2007). When to jump in: The role of the instructor in online discussion forums. *Computers & Education, 49*(2), 193-213.

Mesmer-Magnus, J., & DeChurch, L. (2009). Information sharing and team performance: A meta-analysis. *Journal of Applied Psychology, 94*(2), 535-546.

Myers, G. (2008). *The art of software testing*: Wiley-India.

Orlich, D., Harder, R., Callahan, R., Trevisan, M., & Brown, A. (2009). *Teaching strategies: A guide to effective instruction*: Wadsworth Pub Co.

Palinscar, A., & Brown, A. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and instruction, 1*(2), 117-175.

Prensky, M. (2001). Digital natives, digital immigrants Part 1. *On the horizon, 9*(5), 1-6.

Rafaeli, S., Barak, M., Dan-Gur, Y., & Toch, E. (2004). QSIA-a Web-based environment for learning, assessing and knowledge sharing in communities. *Computers & Education, 43*(3), 273-289.

Ras, E., Avram, G., Waterson, P., & Weibelzahl, S. (2005). Using weblogs for knowledge sharing and learning in information spaces. *Journal of Universal Computer Science, 11*(3), 394-409.

Reimann, P., & Zumbach, J. (2003). Supporting virtual learning teams with dynamic feedback. *The "Second Wave" of ICT in Education: from Facilitating Teaching and Learning to Engendering Education Reform*, 424-430.

Ruppel, C. P., & Harrington, S. J. (2001). Sharing knowledge through intranets: a study of organizational culture and intranet implementation. *IEEE Transactions on Professional Communication, 44*(1), 37-52.

Scarlat, R., Stanescu, L., Popescu, E., & Burdescu, D. (2010). *Case-Based Medical E-assessment System.* Paper presented at the Advanced Learning Technologies (ICALT), 2010 IEEE 10th International Conference. Sousse. pp. 158-162.

Siemens, G., & Tittenberger, P. (2009). *Handbook of emerging technologies for learning*. Manitoba, CA: University of Manitoba.

Snow-Gerono, J. (2005). Professional development in a culture of inquiry: PDS teachers identify the benefits of professional learning communities. *Teaching and Teacher Education, 21*(3), 241-256.

Szulanski, G., Cappetta, R., & Jensen, R. (2004). When and how trustworthiness matters: knowledge transfer and the moderating effect of casual ambiguity. *Organization science*, 600-613.

Tyack, D., & Cuban, L. (1995). *Tinkering toward utopia: A century of public school reform*: Harvard Univ Pr.

Vendlinski, T., & Stevens, R. (2002). Assessing student problem-solving skills with complex computer-based tasks. *Journal of Technology, Learning, and Assessment, 1*(3).

Wertsch, J., & Bivens, J. (1993). The social origins of individual mental functioning: Alternatives and perspectives. *The development and meaning of psychological distance*, 203-218.

Yamamichi, N., Ozeki, T., Yokochi, K., & Tanaka, T. (2002). *The evaluation of new software developing process based on a spiral modeling.* Paper presented at the Global Telecommunications Conference, London. *3*, 2007-2012.

Yang, C., & Chen, L. (2007). Can organizational knowledge capabilities affect knowledge sharing behavior? *Journal of Information Science, 33*(1), 95.

Zhao, J. (2010). School knowledge management framework and strategies: The new perspective on teacher professional development. *Computers in Human Behavior, 26*(2), 168-175.

Ziv, A., Ben-David, S., & Ziv, M. (2005). Simulation based medical education: an opportunity to learn from errors. *Medical teacher, 27*(3), 193-199.

APPENDIX A

Homepage

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html xmlns:v="urn:schemas-microsoft-com:vml" xmlns:o="urn:schemas-microsoft-
com:office:office">
<head>
<title>Home</title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
<link rel="stylesheet" type="text/css" href="style.css" />
<style type="text/css">
.style1 {
        color: #2C61A9;
}
.style2 {
        text-align: justify;
}
.style3 {
        margin-top: 0px;
}
</style>
</head>

<body>
        <div class="style3">
                <img src="images/title.jpg" alt="" width="636" height="87" /><br />
                <ul class="menu">
                        <li><a href="index.html"><img src="images/but1.jpg" alt=""
width="126" height="40" /></a></li>
                        <li><a href="#"><img src="images/but2.jpg" alt="" width="127"
height="40" /></a></li>
                        <li><a href="AdminLogin.html"><img src="images/but3.jpg" alt=""
width="127" height="40" /></a></li>
                        <li><a href="index.aspx"><img src="images/but4.jpg" alt=""
width="127" height="40" /></a></li>
                        <li><a href="#"><img src="images/but5.jpg" alt="" width="125"
height="40" /></a></li>
                </ul>
        </div>
        <div id="content"><div class="inner_copy"><a
href="http://www.freetemplatesonline.com/">Free Web Templates</a> <a
href="http://www.websitetemplates.org/">Website Templates</a> <a
href="http://www.webdesign.org/">Web Design</a></div>
                <div class="column" style="width: 341px">
                        <img src="images/title1.JPG" alt="" width="183" height="17"
class="title" /><br />
                        <div class="info border">
                                <img src="images/btnqn.jpg" alt="" width="89" height="68"
/>
                                <p class="style2">
                                        <a href="#">A<span class="style1">l-Fateh
Secondary</span></a>
                                        <span class="style1">school </span>welcomes its
students in
                                        the new school year, and wish success to all students
and success.<br />
                                         </p>
```

```
                    </div>
                    <img src="images/title2.JPG" alt="" width="182" height="18"
class="title" /><br />
                    <div class="info">
                        <img src="images/16191314.jpg" alt="" width="86"
height="67" />
                        <p class="style2">
                            <strong>Al-Fateh</strong><span title=""
closure_uid_gq8u6t="293" sc="&#1578;&#1571;&#1587;&#1587;&#1578;
&#1605;&#1583;&#1585;&#1587;&#1577;
&#1575;&#1604;&#1578;&#1575;&#1578;&#1581;
&#1575;&#1604;&#1579;&#1575;&#1606;&#1608;&#1610;&#1577; &#1601;&#1610;
&#1587;&#1606;&#1577; &#1633;&#1641;&#1641;&#1637; &#1548;
&#1576;&#1602;&#1585;&#1575;&#1585; &#1605;&#1606;
&#1575;&#1604;&#1604;&#1580;&#1606;&#1577;
&#1575;&#1604;&#1588;&#1593;&#1576;&#1610;&#1577;
&#1575;&#1604;&#1593;&#1575;&#1605;&#1577;
&#1604;&#1604;&#1578;&#1593;&#1604;&#1610;&#1605; &#1601;&#1610;
&#1605;&#1583;&#1610;&#1606;&#1577; &#1605;&#1586;&#1583;&#1607;" te="Altath
Secondary School, founded in 1995, a decision of the General People's Committee for education
in the city Mzdh" id="result_box"><strong>
                            Secondary School</strong>, founded in 1995, a
decision of
                            the General People's Committee for education in the
city
                            Mzdh</span><br />
                        </p>
                        <p>
                            <br />
                        </p>
                    </div>
                </div>
                <div class="column2">
                    <br />
                    <img alt="" src="libya.gif" width="225" height="226"></div>
            </div>
            <div id="learning">
                <img src="images/book.jpg" alt="" width="316" height="128" /> 
            </div>
            <div id="footer">
                <div>
                    Copyright &copy; 2010 Al-fateh School. All Rights Reserved<br />
                </div>
                <div class="centeral-block">
                    <strong>Meazdia, Libya</strong></div>
                <div>
                    Tel/Fax : 042(457)335-4422<br />
                                  042(457)335-
4433<br />
                    E-mail : <a href="#" id="mail">info@alfathschool.com</a>
                </div>
            </div>
</body>
</html>
```

Login

```
<%@ Page Language="C#" AutoEventWireup="true" CodeFile="index.aspx.cs"
Inherits="index" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml" >
<head runat="server">
   <title>Untitled Page</title>
<script language="javascript" type="text/javascript">
// <!CDATA[

function IMG1_onclick() {

}

// ]]>
</script>
</head>
<body>
   <form id="form1" runat="server">
   <div>
      <a href="loginManager.aspx">
      </a>
      <table style="z-index: 103; left: 339px; position: absolute; top: 226px; border-left-color:
#ff00ff; border-bottom-color: #ff00ff; border-top-style: double; border-top-color: #ff00ff; border-
right-style: double; border-left-style: double; border-right-color: #ff00ff; border-bottom-style:
double;">
         <tr>
            <td colspan="4"><marquee behavior="scroll" direction="left" style="height: 22px;
text-align: center" scrollamount="1" >Assessment System for Knowledge Sharing</marquee>
            </td>
         </tr>
         <tr>
            <td style="width: 161px">
            </td>
            <td style="width: 30px">
            </td>
            <td style="width: 11px">
            </td>
            <td style="width: 100px">
            </td>
         </tr>
         <tr>
            <td style="width: 161px">
            </td>
            <td style="width: 30px">
            </td>
            <td style="width: 11px">
            </td>
            <td style="width: 100px">
            </td>
         </tr>
         <tr>
            <td style="width: 161px; height: 71px">
               <a href="loginteacher.aspx">
         <img src="img/teacher.bmp" style="border-left-color: #cc0000;
```

```
            border-bottom-color: #cc0000; width: 228px; border-top-style: dotted; border-top-
color: #cc0000;
            border-right-style: dotted; border-left-style: dotted;
            height: 62px; border-right-color: #cc0000; border-bottom-style: dotted" /></a></td>
            <td style="width: 30px; height: 71px">
            </td>
            <td style="width: 11px; height: 71px">
            </td>
            <td style="width: 100px; height: 71px">
              <a href="loginManager.aspx">
          <img id="IMG1" src="img/manager.bmp" style="border-left-color: #ff3300; border-
bottom-color: #ff3300; width: 234px; border-top-style: dotted;
            border-top-color: #ff3300; border-right-style: dotted; border-left-style: dotted; height:
59px; border-right-color: #ff3300; border-bottom-style: dotted" onclick="return IMG1_onclick()"
/></a></td>
          </tr>
        </table>
        <img src="images/title3.jpg" style="z-index: 104; left: 219px; position: absolute;
          top: 72px; height: 106px" />

    </div>
    </form>
</body>
</html>
```

Login Teacher

```
<%@ Page Language="C#" AutoEventWireup="true" CodeFile="loginManager.aspx.cs"
Inherits="loginManager" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml" >
<head id="Head1" runat="server">
    <title>Untitled Page</title>
<script language="javascript" type="text/javascript">
// <!CDATA[

function TABLE1_onclick() {

}

// ]]>
</script>
</head>
<body>
    <form id="form1" runat="server">
    <div>
      <table style="border-right: #ff9900 thick double; border-top: #ff9900 thick double;
        z-index: 101; left: 429px; border-left: #ff9900 thick double; border-bottom: #ff9900 thick
double;
        position: absolute; top: 243px" id="TABLE1" onclick="return TABLE1_onclick()">
        <tr>
          <td style="width: 100px">
          </td>
          <td style="width: 100px">
```

```
            </td>
            <td style="width: 100px">
            </td>
          </tr>
          <tr>
            <td style="width: 100px; text-align: center">
              <span style="color: #009999">NAME</span></td>
            <td style="width: 100px">
              <asp:TextBox ID="TextBox1" runat="server" Style="border-left-color: #00cc99;
border-bottom-color: #00cc99;
                  border-top-style: dotted; border-top-color: #00cc99; border-right-style: dotted;
                  border-left-style: dotted; border-right-color: #00cc99; border-bottom-style:
dotted"></asp:TextBox></td>
            <td style="width: 100px">
              <asp:RequiredFieldValidator ID="RequiredFieldValidator1" runat="server"
ControlToValidate="TextBox1"
                  ErrorMessage="*"></asp:RequiredFieldValidator></td>
          </tr>
          <tr>
            <td style="width: 100px; text-align: center">
              <span style="color: #009999">PASSWORD</span></td>
            <td style="width: 100px">
              <asp:TextBox ID="TextBox2" runat="server" Style="border-left-color: #00cc99;
border-bottom-color: #00cc99;
                  border-top-style: dotted; border-top-color: #00cc99; border-right-style: dotted;
                  border-left-style: dotted; border-right-color: #00cc99; border-bottom-style: dotted"
TextMode="Password"></asp:TextBox></td>
            <td style="width: 100px">
              <asp:RequiredFieldValidator ID="RequiredFieldValidator2" runat="server"
ControlToValidate="TextBox2"
                  ErrorMessage="*"></asp:RequiredFieldValidator></td>
          </tr>
          <tr>
            <td style="width: 100px">
            </td>
            <td style="width: 100px">
              <asp:Button ID="Button1" runat="server" Text="Sgin In"
OnClick="Button1_Click" /></td>
            <td style="width: 100px">
              <asp:Label ID="Label1" runat="server" ForeColor="Red" Text="Try Again"
Visible="False"></asp:Label></td>
          </tr>
        </table>
        <asp:SqlDataSource ID="SqlDataSource1" runat="server" ConnectionString="<%$
ConnectionStrings:ConnectionString %>"
          SelectCommand="SELECT * FROM [teacher]"></asp:SqlDataSource>

    </div>
    </form>
</body>
</html>
```

Login Admin

```
<%@ Page Language="C#" AutoEventWireup="true" CodeFile="loginteacher.aspx.cs"
Inherits="loginteacher" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml" >
<head runat="server">
  <title>Untitled Page</title>
</head>
<body>
  <form id="form1" runat="server">
  <div>
    <table style="border-right: #ff9900 thick double; border-top: #ff9900 thick double;
      z-index: 101; left: 429px; border-left: #ff9900 thick double; border-bottom: #ff9900 thick
double;
      position: absolute; top: 243px">
      <tr>
        <td style="width: 100px">
        </td>
        <td style="width: 100px">
        </td>
        <td style="width: 100px">
        </td>
      </tr>
      <tr>
        <td style="width: 100px; text-align: center">
          <span style="color: #009999">NAME</span></td>
        <td style="width: 100px">
          <asp:TextBox ID="TextBox1" runat="server" Style="border-left-color: #00cc99;
border-bottom-color: #00cc99;
            border-top-style: dotted; border-top-color: #00cc99; border-right-style: dotted;
            border-left-style: dotted; border-right-color: #00cc99; border-bottom-style:
dotted"></asp:TextBox></td>
        <td style="width: 100px">
          <asp:RequiredFieldValidator ID="RequiredFieldValidator1" runat="server"
ControlToValidate="TextBox1"
            ErrorMessage="*"></asp:RequiredFieldValidator></td>
      </tr>
      <tr>
        <td style="width: 100px; text-align: center">
          <span style="color: #009999">PASSWORD</span></td>
        <td style="width: 100px">
          <asp:TextBox ID="TextBox2" runat="server" Style="border-left-color: #00cc99;
border-bottom-color: #00cc99;
            border-top-style: dotted; border-top-color: #00cc99; border-right-style: dotted;
            border-left-style: dotted; border-right-color: #00cc99; border-bottom-style: dotted"
TextMode="Password"></asp:TextBox></td>
        <td style="width: 100px">
          <asp:RequiredFieldValidator ID="RequiredFieldValidator2" runat="server"
ControlToValidate="TextBox2"
            ErrorMessage="*"></asp:RequiredFieldValidator></td>
      </tr>
      <tr>
        <td style="width: 100px">
        </td>
        <td style="width: 100px">
```

```
            <asp:Button ID="Button1" runat="server" Text="Sgin In"
OnClick="Button1_Click" /></td>
            <td style="width: 100px">
              <asp:Label ID="Label1" runat="server" ForeColor="Red" Text="Try Again"
Visible="False"></asp:Label></td>
          </tr>
        </table>
        <asp:SqlDataSource ID="SqlDataSource1" runat="server" ConnectionString="<%$
ConnectionStrings:ConnectionString %>"
          SelectCommand="SELECT * FROM [teacher]"></asp:SqlDataSource>

    </div>
    </form>
</body>
</html>
```

Assessment Manage

```
<%@ Page Language="C#" AutoEventWireup="true" CodeFile="Teacher.aspx.cs"
Inherits="Teacher" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml" >
<head runat="server">
    <title>Untitled Page</title>
</head>
<body>
    <form id="form1" runat="server">
    <div>
        <table style="z-index: 100; border-left-color: #ff3300; left: 392px; border-bottom-color:
#ff3300;
            border-top-style: solid; border-top-color: #ff3300; border-right-style: solid;
            border-left-style: solid; position: absolute; top: 183px; border-right-color: #ff3300;
            border-bottom-style: solid">
            <tr>
                <td style="width: 25px">
                </td>
                <td style="width: 303px">
                </td>
                <td style="width: 100px">
                </td>
                <td style="width: 100px">
                </td>
            </tr>
            <tr>
                <td style="width: 25px; text-align: center">
                    1</td>
                <td style="width: 303px">
                    Is there a knowledge sharing among teachers in dealing with students?</td>
                <td style="width: 100px">
                       
                    <asp:DropDownList ID="DropDownList1" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                        border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                        border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                        border-bottom-style: dotted">
                        <asp:ListItem Selected="True">Choose</asp:ListItem>
```

```
                    <asp:ListItem>1</asp:ListItem>
                    <asp:ListItem>2</asp:ListItem>
                    <asp:ListItem>3</asp:ListItem>
                    <asp:ListItem>4</asp:ListItem>
                    <asp:ListItem>5</asp:ListItem>
                  </asp:DropDownList></td>
                <td style="width: 100px">
                </td>
              </tr>
              <tr>
                <td style="width: 25px; height: 21px; text-align: center">
                  2</td>
                <td style="width: 303px; height: 21px">
                  Is there knowledge-sharing among teachers in coordination of teaching
methods?</td>
                <td style="width: 100px; height: 21px; text-align: center">
                   <asp:DropDownList ID="DropDownList2" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                    border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                    border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                    border-bottom-style: dotted">
                    <asp:ListItem Selected="True">Choose</asp:ListItem>
                    <asp:ListItem>1</asp:ListItem>
                    <asp:ListItem>2</asp:ListItem>
                    <asp:ListItem>3</asp:ListItem>
                    <asp:ListItem>4</asp:ListItem>
                    <asp:ListItem>5</asp:ListItem>
                  </asp:DropDownList></td>
                <td style="width: 100px; height: 21px">
                </td>
              </tr>
              <tr>
                <td style="width: 25px; text-align: center">
                  3</td>
                <td style="width: 303px">
                  Is there knowledge-sharing among teachers in organizing school curriculum?</td>
                <td style="width: 100px; text-align: center">
                  <asp:DropDownList ID="DropDownList3" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                    border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                    border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                    border-bottom-style: dotted">
                    <asp:ListItem Selected="True">Choose</asp:ListItem>
                    <asp:ListItem>1</asp:ListItem>
                    <asp:ListItem>2</asp:ListItem>
                    <asp:ListItem>3</asp:ListItem>
                    <asp:ListItem>4</asp:ListItem>
                    <asp:ListItem>5</asp:ListItem>
                  </asp:DropDownList></td>
                <td style="width: 100px">
                </td>
              </tr>
              <tr>
                <td style="width: 25px; text-align: center">
                  4</td>
                <td style="width: 303px">
                  Is there knowledge-sharing among teachers in coordination assignment which give
                  it to students?</td>
                <td style="width: 100px; text-align: center">
```

```
            <asp:DropDownList ID="DropDownList4" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                border-bottom-style: dotted">
                <asp:ListItem Selected="True">Choose</asp:ListItem>
                <asp:ListItem>1</asp:ListItem>
                <asp:ListItem>2</asp:ListItem>
                <asp:ListItem>3</asp:ListItem>
                <asp:ListItem>4</asp:ListItem>
                <asp:ListItem>5</asp:ListItem>
              </asp:DropDownList></td>
            <td style="width: 100px">
            </td>
          </tr>
          <tr>
            <td style="width: 25px; height: 21px; text-align: center">
              5</td>
            <td style="width: 303px; height: 21px">
              Is there knowledge-sharing among common courses teachers in mode exam
questions?</td>
            <td style="width: 100px; height: 21px; text-align: center">
              <asp:DropDownList ID="DropDownList5" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                border-bottom-style: dotted">
                <asp:ListItem Selected="True">Choose</asp:ListItem>
                <asp:ListItem>1</asp:ListItem>
                <asp:ListItem>2</asp:ListItem>
                <asp:ListItem>3</asp:ListItem>
                <asp:ListItem>4</asp:ListItem>
                <asp:ListItem>5</asp:ListItem>
              </asp:DropDownList></td>
            <td style="width: 100px; height: 21px">
            </td>
          </tr>
          <tr>
            <td style="width: 25px; text-align: center">
              6</td>
            <td style="width: 303px">
              Is there knowledge-sharing among common courses teachers to discuss typical
answer?</td>
            <td style="width: 100px; text-align: center">
              <asp:DropDownList ID="DropDownList6" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                border-bottom-style: dotted">
                <asp:ListItem Selected="True">Choose</asp:ListItem>
                <asp:ListItem>1</asp:ListItem>
                <asp:ListItem>2</asp:ListItem>
                <asp:ListItem>3</asp:ListItem>
                <asp:ListItem>4</asp:ListItem>
                <asp:ListItem>5</asp:ListItem>
              </asp:DropDownList></td>
            <td style="width: 100px">
            </td>
          </tr>
          <tr>
```

```
            <td style="width: 25px; height: 21px; text-align: center">
              7</td>
            <td style="width: 303px; height: 21px">
              Is there knowledge-sharing among teachers about the problems of students?</td>
            <td style="width: 100px; height: 21px; text-align: center">
              <asp:DropDownList ID="DropDownList7" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                  border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                  border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                  border-bottom-style: dotted">
                  <asp:ListItem Selected="True">Choose</asp:ListItem>
                  <asp:ListItem>1</asp:ListItem>
                  <asp:ListItem>2</asp:ListItem>
                  <asp:ListItem>3</asp:ListItem>
                  <asp:ListItem>4</asp:ListItem>
                  <asp:ListItem>5</asp:ListItem>
                </asp:DropDownList></td>
            <td style="width: 100px; height: 21px">
            </td>
          </tr>
          <tr>
            <td style="width: 25px; text-align: center">
              8</td>
            <td style="width: 303px">
              Are teachers experienced helping the teachers inexperienced?</td>
            <td style="width: 100px; text-align: center">
              <asp:DropDownList ID="DropDownList8" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                  border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                  border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                  border-bottom-style: dotted">
                  <asp:ListItem Selected="True">Choose</asp:ListItem>
                  <asp:ListItem>1</asp:ListItem>
                  <asp:ListItem>2</asp:ListItem>
                  <asp:ListItem>3</asp:ListItem>
                  <asp:ListItem>4</asp:ListItem>
                  <asp:ListItem>5</asp:ListItem>
                </asp:DropDownList></td>
            <td style="width: 100px">
            </td>
          </tr>
          <tr>
            <td style="width: 25px; text-align: center">
              9</td>
            <td style="width: 303px">
              Is there knowledge-sharing among teachers to developing the skills of students?</td>
            <td style="width: 100px; text-align: center">
              <asp:DropDownList ID="DropDownList9" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                  border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                  border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                  border-bottom-style: dotted">
                  <asp:ListItem Selected="True">Choose</asp:ListItem>
                  <asp:ListItem>1</asp:ListItem>
                  <asp:ListItem>2</asp:ListItem>
                  <asp:ListItem>3</asp:ListItem>
                  <asp:ListItem>4</asp:ListItem>
                  <asp:ListItem>5</asp:ListItem>
                </asp:DropDownList></td>
            <td style="width: 100px">
```

```
            </td>
        </tr>
        <tr>
            <td style="width: 25px; text-align: center">
                10</td>
            <td style="width: 303px">
                Is the knowledge sharing with other teacher help you in your work?</td>
            <td style="width: 100px; text-align: center">
                <asp:DropDownList ID="DropDownList10" runat="server" Height="22px"
Style="border-left-color: #ff0033;
                    border-bottom-color: #ff0033; border-top-style: dotted; border-top-color: #ff0033;
                    border-right-style: dotted; border-left-style: dotted; border-right-color: #ff0033;
                    border-bottom-style: dotted">
                    <asp:ListItem Selected="True">Choose</asp:ListItem>
                    <asp:ListItem>1</asp:ListItem>
                    <asp:ListItem>2</asp:ListItem>
                    <asp:ListItem>3</asp:ListItem>
                    <asp:ListItem>4</asp:ListItem>
                    <asp:ListItem>5</asp:ListItem>
                </asp:DropDownList></td>
            <td style="width: 100px">
            </td>
        </tr>
        <tr>
            <td style="width: 25px">
            </td>
            <td style="width: 303px">
            </td>
            <td style="width: 100px">
                <asp:Button ID="Button1" runat="server" OnClick="Button1_Click" Text="Submit"
/></td>
            <td style="width: 100px">
            </td>
        </tr>
    </table>
    <img src="images/title3.jpg" style="z-index: 101; left: 280px; width: 731px; position:
absolute;
        top: 8px; height: 123px" />

  </div>
  </form>
</body>
</html>
```

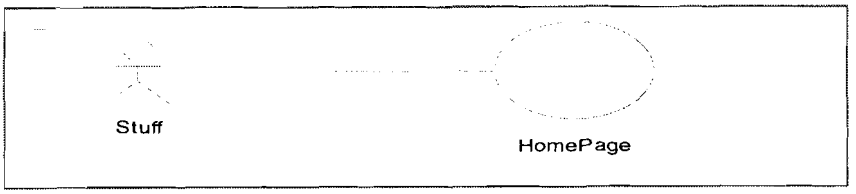
Admin Assessment Report

```
<%@ Page Language="C#" AutoEventWireup="true" CodeFile="finaldiag.aspx.cs"
Inherits="finaldiag" %>

<%@ Register Assembly="CrystalDecisions.Web, Version=10.2.3600.0, Culture=neutral,
PublicKeyToken=692fbea5521e1304"
   Namespace="CrystalDecisions.Web" TagPrefix="CR" %>

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml" >
<head runat="server">
   <title>Untitled Page</title>
   <link
href="/aspnet_client/System_Web/2_0_50727/CrystalReportWebFormViewer3/css/default.css"
      rel="stylesheet" type="text/css" />
   <link
href="/aspnet_client/System_Web/2_0_50727/CrystalReportWebFormViewer3/css/default.css"
      rel="stylesheet" type="text/css" />
</head>
<body style="text-align: center">
   <form id="form1" runat="server">
   <div>
      <asp:HyperLink ID="HyperLink1" runat="server"
NavigateUrl="~/index.html">Logout</asp:HyperLink>
      <CR:CrystalReportSource ID="CrystalReportSource1" runat="server">
         <Report FileName="CrystalReport9.rpt">
         </Report>
      </CR:CrystalReportSource>

   </div>
      <CR:CrystalReportViewer ID="CrystalReportViewer1" runat="server"
AutoDataBind="true"
         ReportSourceID="CrystalReportSource1" />
   </form>
</body>
</html>
```

APPINDIX B

USE CASE SPECIFICATION FOR ASKST

1. Use case: Home Page



BRIEF DESCRIPTION

This use case is initiated by the user. This use case will enable the user to see the home page of the web site that contains general information and instruction to users. And by which the user can select log in.

PRE-CONDITIONS

The computer is connected to internet.

CHARACTERISTIC OF ACTIVATION

Event Driven (on user's demand)

FLOW OF EVENTS

5.5.1 Basic Flow (ASKST _01_01)

- This use case begins when the user writes the URL of the site in the internet explorer address bar and presses enter to access the website.

- The system will display the main page of the site on the screen.
- The user can surf the information and the instructions and select the log in option.

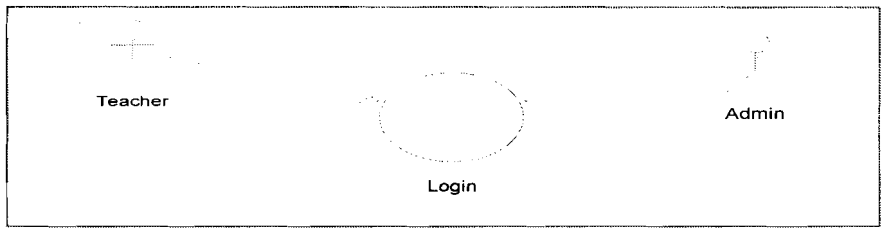
5.5.2 Exceptional Flow

Not Applicable.

POST-CONDITIONS

Not Applicable.

2. Use case: Login



BRIEF DESCRIPTION

This use case is initiated by the user (teacher & admin). This use case will enable the user to login during use name and password.

PRE-CONDITIONS

The user must be stuff.

CHARACTERISTIC OF ACTIVATION

Event Driven (on user's demand)

FLOW OF EVENTS

5.5.3 Basic Flow (ASKST _02_01)

- This use case begins when the user press Login Button.
- The system will display login page.
- The user insert username and password
- The systems will Verification from username and password and then display main page.

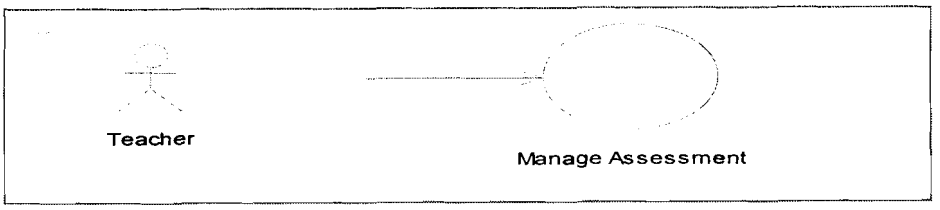
5.5.4 Exceptional Flow

E-2: the username or password in not correct.

POST-CONDITIONS

User will be able to proceed to other activities

3. Use case: Manage Assessment



BRIEF DESCRIPTION

This use case is initiated by the teacher. This use case will enable the teacher to make assessment and submit.

PRE-CONDITIONS

Already the user login into the system.

CHARACTERISTIC OF ACTIVATION

Event Driven (on user's demand)

FLOW OF EVENTS

5.5.5 Basic Flow (ASKST _02_01)

- This use case begins when the user press assessment Button.
- The system will display assessment page.
- The teacher put his / her chooses 1-5 for the question.
- The teacher press submit button when he finish
- System will display successful massage.

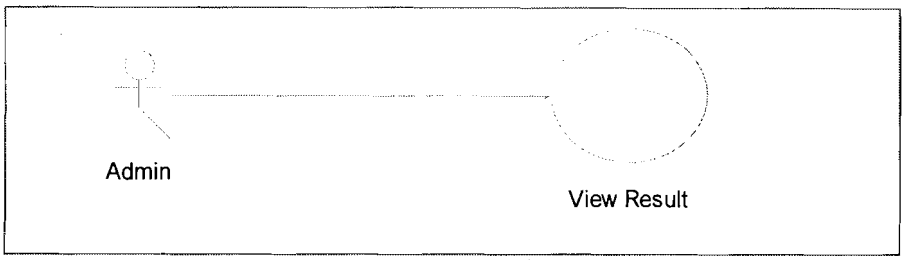
5.5.6 Exceptional Flow

E-2: the username or password in not correct.

POST-CONDITIONS

User will be able to proceed to other activities

4. **Use case: View Result**



BRIEF DESCRIPTION

This use case is initiated by the user (admin). This use case will enable the admin to view the result of assessment.

PRE-CONDITIONS

Already the user login into the system.

CHARACTERISTIC OF ACTIVATION

Event Driven (on user's demand)

FLOW OF EVENTS

5.5.7 Basic Flow (ASKST _02_01)

- This use case begins when the admin press assessment Button.
- The system will display assessment result page.
- The admin can view the result about the assessment that makes by the teachers.

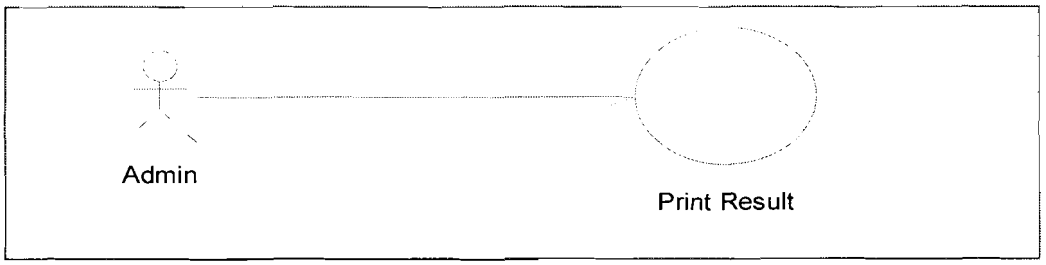
5.5.8 Exceptional Flow

E-2: the username or password in not correct.

POST-CONDITIONS

User will be able to proceed to other activities

5. Use case: Print Result



BRIEF DESCRIPTION

This use case is initiated by the user (admin). This use case will enable the admin to print out the result about the assessment.

PRE-CONDITIONS

Already the user login into the system.

CHARACTERISTIC OF ACTIVATION

Event Driven (on user's demand)

FLOW OF EVENTS

5.5.9 Basic Flow (ASKST _02_01)

- This use case begins when the user press assessment Button.
- The system will display assessment result page.
- The admin can press print to print out the assessment report.

- The systems will make print out the report for the admin.

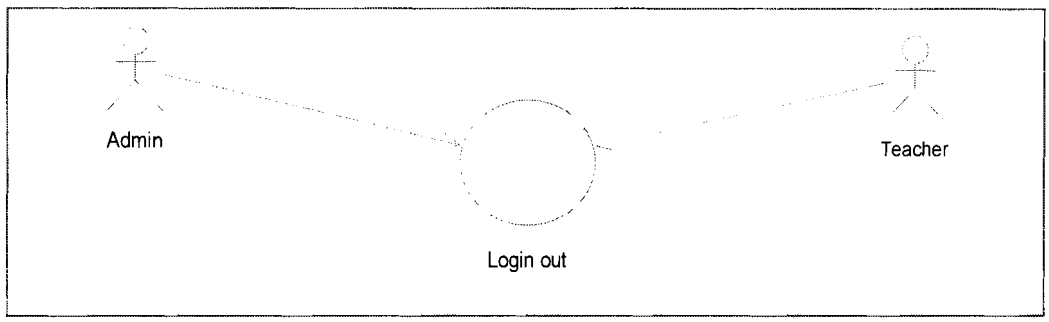
5.5.10 Exceptional Flow

E-2: the username or password in not correct.

POST-CONDITIONS

User will be able to proceed to other activities

6. Use case: Login out



BRIEF DESCRIPTION

This use case is initiated by the user (teacher & admin). This use case will enable the user to login out the system.

PRE-CONDITIONS

Already the user login into the system.

CHARACTERISTIC OF ACTIVATION

Event Driven (on user's demand)

FLOW OF EVENTS

5.5.11 Basic Flow (ASKST _02_01)

- This use case begins when the user press Login out Button.
- The system will login out the user from the system.
- The system will display home page.

5.5.12 Exceptional Flow

E-2: the username or password in not correct.

POST-CONDITIONS

Not Applicable

APPENDIX C

QUESTIONNAIRE

System to Be Evaluated:

ASSESSMENT SYSTEM FOR KNOWLEDGE SHARING AMONG TEACHER (ASKST)

Objective:

Obtain your view on the evaluation of ASKST.

Introduction:

This questionnaire consists of two sections:

- General information.
- Assessment System for Knowledge Sharing Among Teacher Prototype Evaluation.

Please answer **all** questions from each segment.

1) General Information

This segment is about your background information. Please fill up the blanks and mark [√] where appropriate.

1. Gender: [ ] Male [ ] Female

2. Age: _____ Years.

3. Education background

[ ] Diploma [ ] Degree [ ] Master [ ] Ph.D.

4. Teacher Experience

[ ] 1 year [ ] 2 years [ ] 3 years [ ] more than 3 years.

2) Assessment System for Knowledge Sharing among Teacher Prototype Evaluation

Please rate the usefulness and ease of use of Assessment System for Knowledge Sharing among Teacher (ASKST)

	PERCEIVED USEFULNESS	1	2	3	4	5
Q1	Using ASKST helps me to be more effective	O	O	O	O	O
Q2	Using ASKST helps me to be more productive.	O	O	O	O	O
Q3	Using ASKST saves my time when I use it	O	O	O	O	O
Q4	Using ASKST would enhance my effectiveness	O	O	O	O	O
Q5	Using ASKST would make it easier to do my tasks	O	O	O	O	O
Q6	ASKST was everything I would expect it to do.	O	O	O	O	O
	PERCEIVED EASE OF USE	1	2	3	4	5
Q7	ASKST is simple to use.	O	O	O	O	O
Q8	ASKST is very friendly to use	O	O	O	O	O
Q9	It requires the fewest steps possible to accomplish what I want to do with it	O	O	O	O	O
Q10	I can use it without written instructions	O	O	O	O	O
Q11	I don't notice any inconsistencies as I use ASKST	O	O	O	O	O
Q12	I can use ASKST successfully every time.	O	O	O	O	O

Questionnaire Result

	Q1	Q2	Q3	Q4	Q5	Q6
N Valid	30	30	30	30	30	30
Missing	0	0	0	0	0	0
Mean	3.9333	3.7000	3.7667	4.0000	4.1000	4.1000
Std. Error of Mean	.10649	.17387	.17075	.12685	.12082	.14661
Median	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000
Std. Deviation	.58329	.95231	.93526	.69481	.66176	.80301

	Q7	Q8	Q9	Q10	Q11	Q12
N Valid	30	30	30	30	30	30
Missing	0	0	0	0	0	0
Mean	3.4854	3.3000	3.9000	3.6333	3.8000	3.8333
Std. Error of Mean	.16667	.11890	.16153	.15524	.18194	.15962
Median	4.0000	3.0000	4.0000	3.0000	4.0000	4.0000
Std. Deviation	.91287	.65126	.88474	.85029	.99655	.87428

Evaluation of the results

A: Usefulness evaluation

Using ASKST helps me to be more effective

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	natural	6	20.0	20.0	20.0
	agree	20	66.7	66.7	86.7
	strongly agree	4	13.3	13.3	100.0
	Total	30	100.0	100.0	

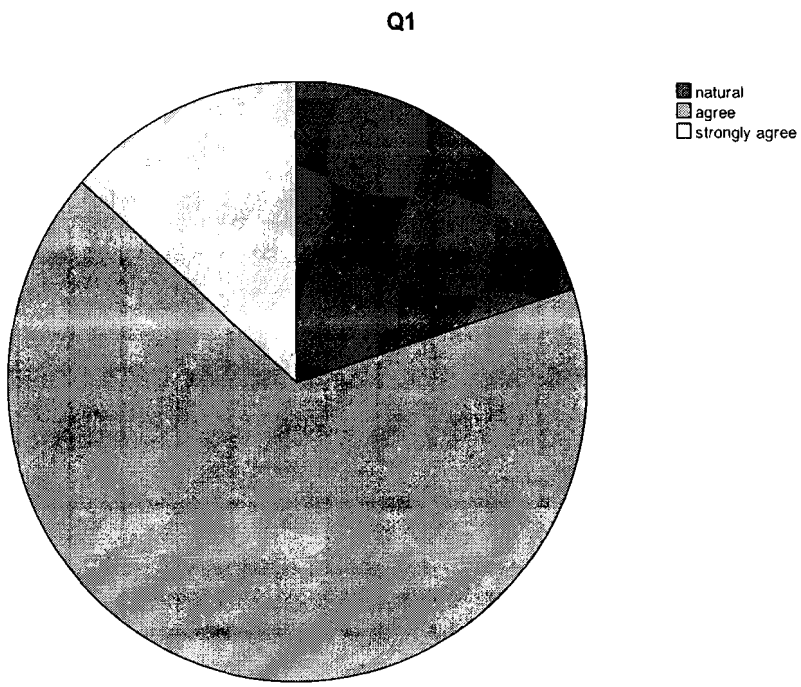


Figure A1 Pie chart

Using ASKST helps me to be more productive

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disgree	4	13.3	13.3	13.3
	natural	7	23.3	23.3	36.7
	agree	13	43.3	43.3	80.0
	strongly agree	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

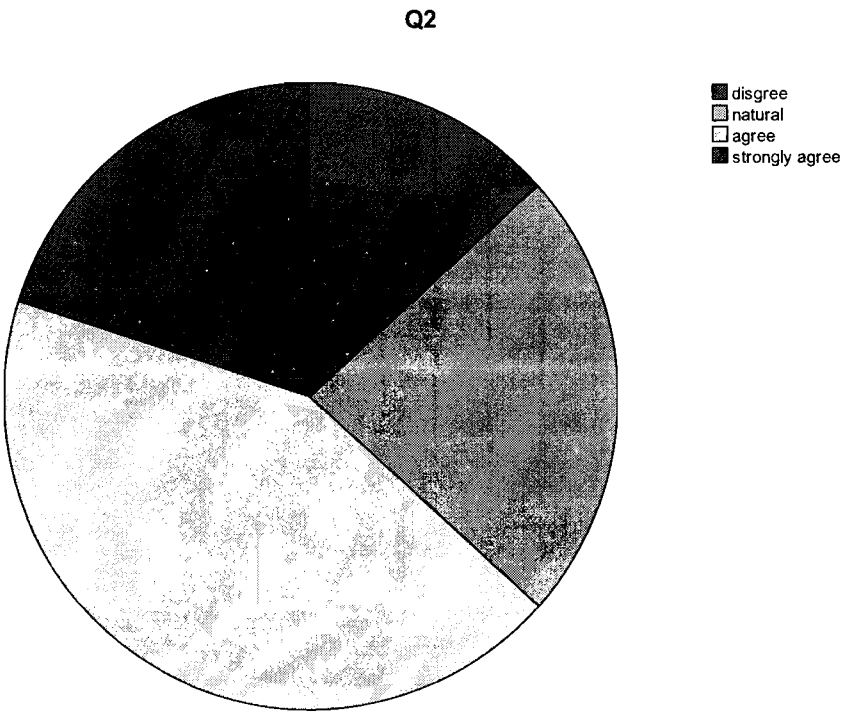


Figure A2 Pie chart

Using ASKST saves my time when I use it

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disgree	3	10.0	10.0	10.0
	natural	8	26.7	26.7	36.7
	agree	12	40.0	40.0	76.7
	strongly agree	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

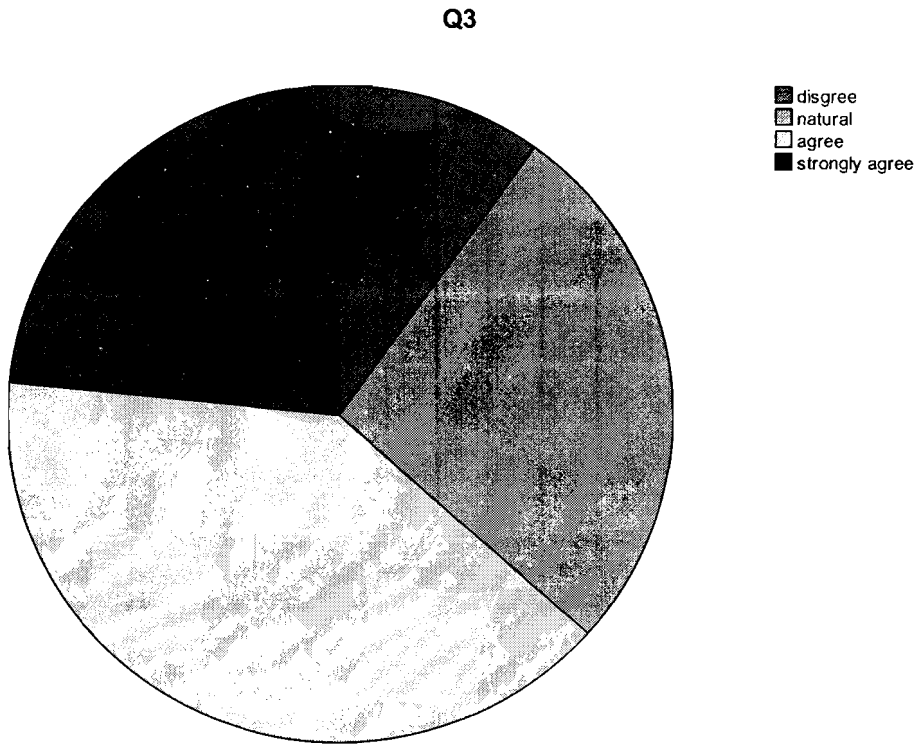


Figure A3 Pie chart

Using ASKST would enhance my effectiveness

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	natural	7	23.3	23.3	23.3
	agree	16	53.3	53.3	76.7
	strongly agree	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

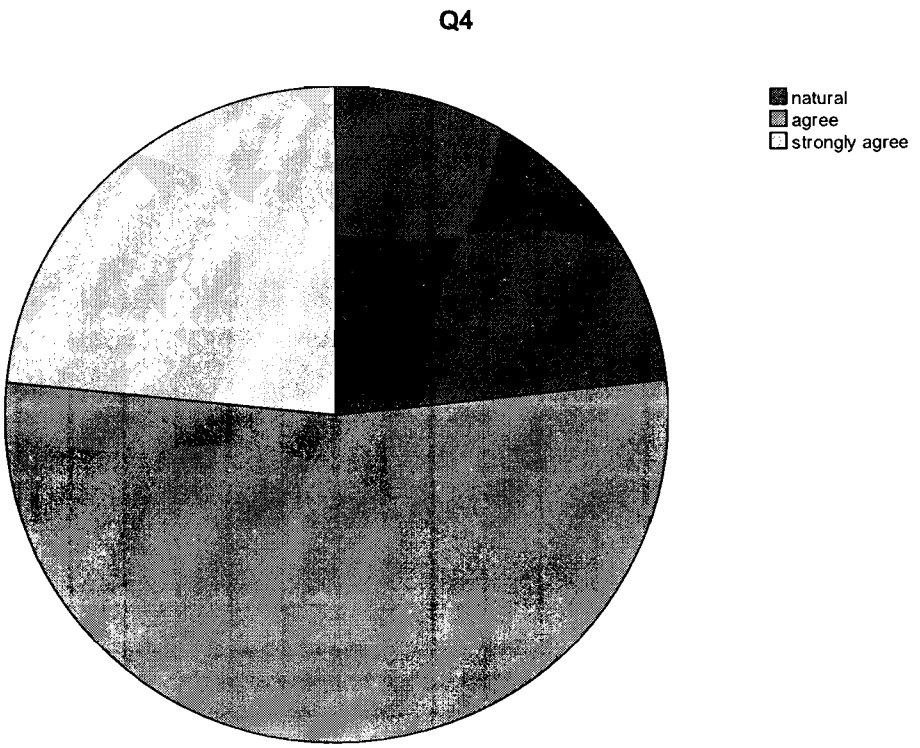


Figure A4 Pie chart

Using ASKST would make it easier to do my tasks

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	natural	5	16.7	16.7	16.7
	agree	17	56.7	56.7	73.3
	strongly agree	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

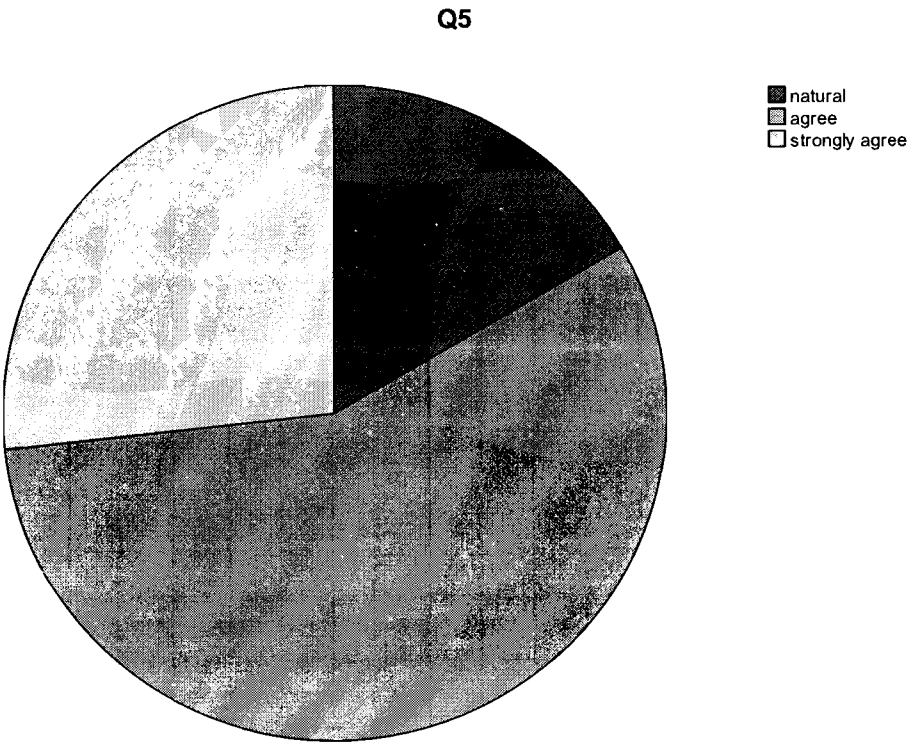


Figure A5 Pie chart

ASKST was everything I would expect it to do.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disgree	2	6.7	6.7	6.7
	natural	2	6.7	6.7	13.3
	agree	17	56.7	56.7	70.0
	strongly agree	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

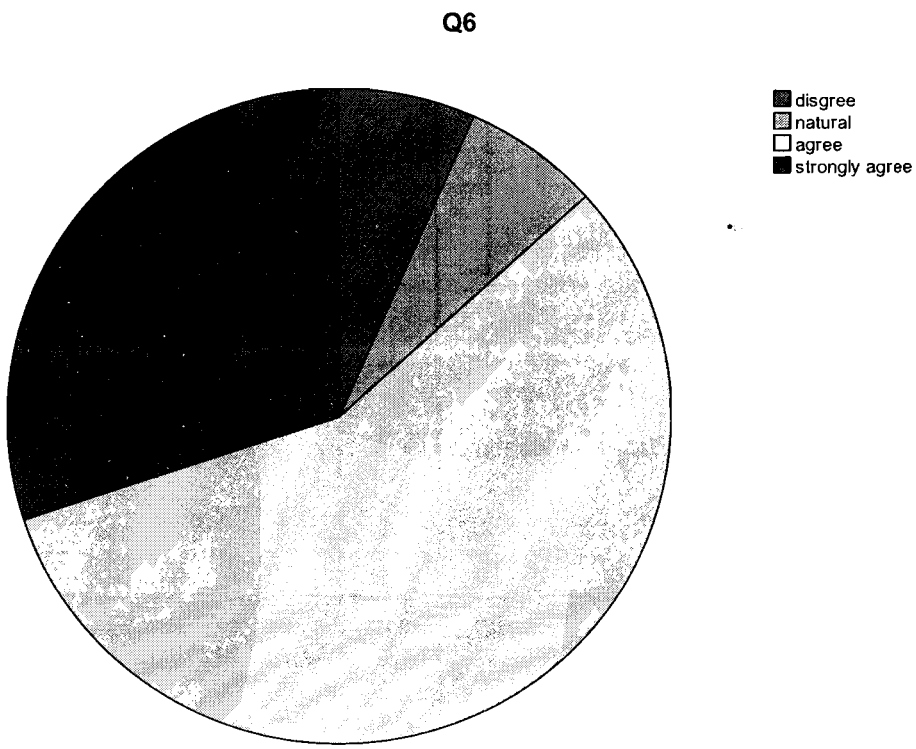


Figure A6 Pie chart

B: Ease of use evaluation

ASKST is simple to use.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disgree	2	6.7	6.7	6.7
	natural	9	30.0	30.0	36.7
	agree	11	36.7	36.7	73.3
	strongly agree	8	26.7	26.7	100.0
	Total	30	100.0	100.0	

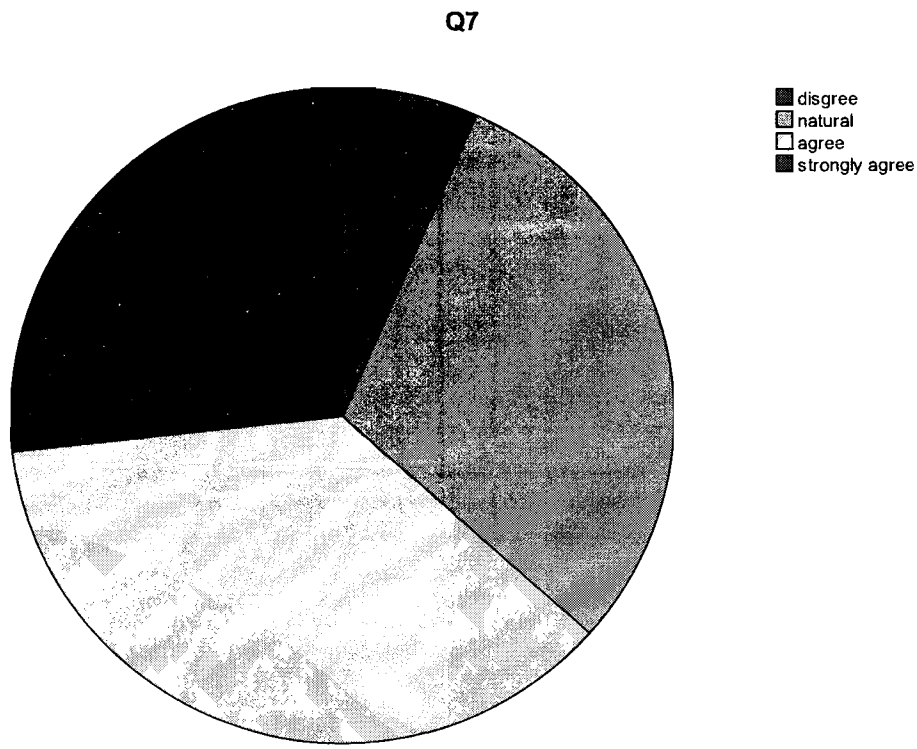


Figure B1 Pie chart

ASKST is very friendly to use

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disgree	2	6.7	6.7	6.7
	natural	18	60.0	60.0	66.7
	agree	9	30.0	30.0	96.7
	strongly agree	1	3.3	3.3	100.0
	Total	30	100.0	100.0	

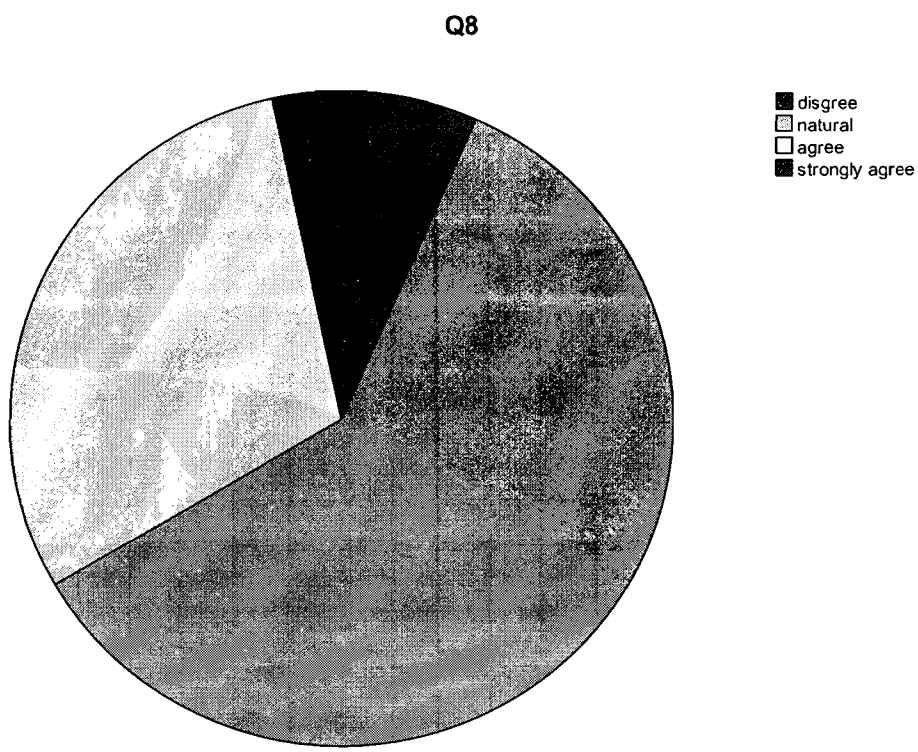


Figure B2 Pie chart

It requires the fewest steps possible to accomplish what I want to do with it

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid disgree	2	6.7	6.7	6.7
natural	7	23.3	23.3	30.0
agree	13	43.3	43.3	73.3
strongly agree	8	26.7	26.7	100.0
Total	30	100.0	100.0	

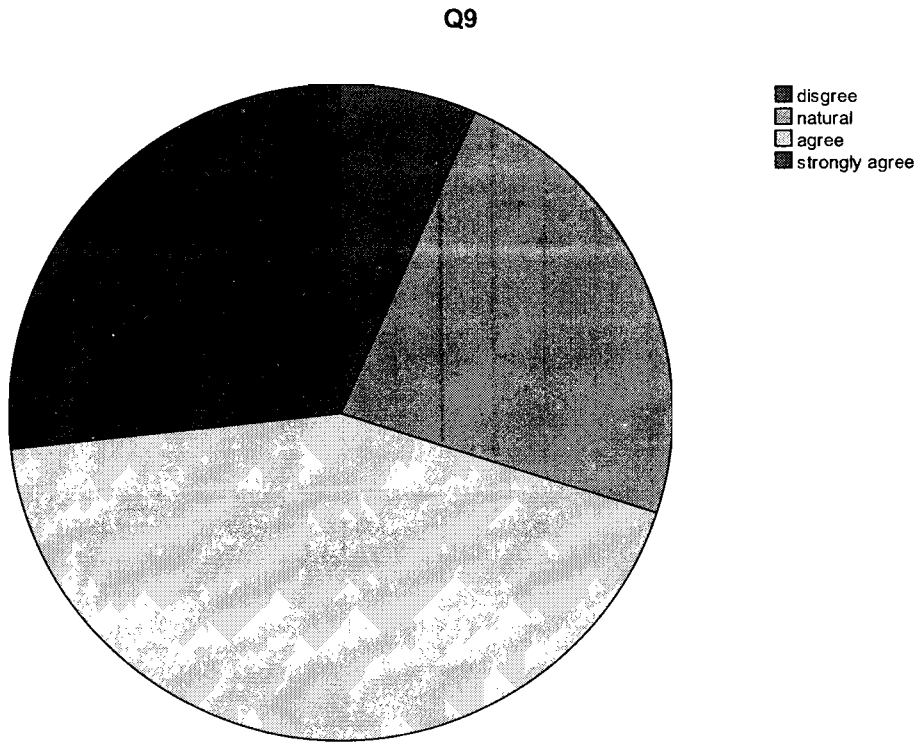


Figure B3 Pie chart

I can use it without written instructions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disgree	1	3.3	3.3	3.3
	natural	15	50.0	50.0	53.3
	agree	8	26.7	26.7	80.0
	strongly agree	6	20.0	20.0	100.0
	Total	30	100.0	100.0	

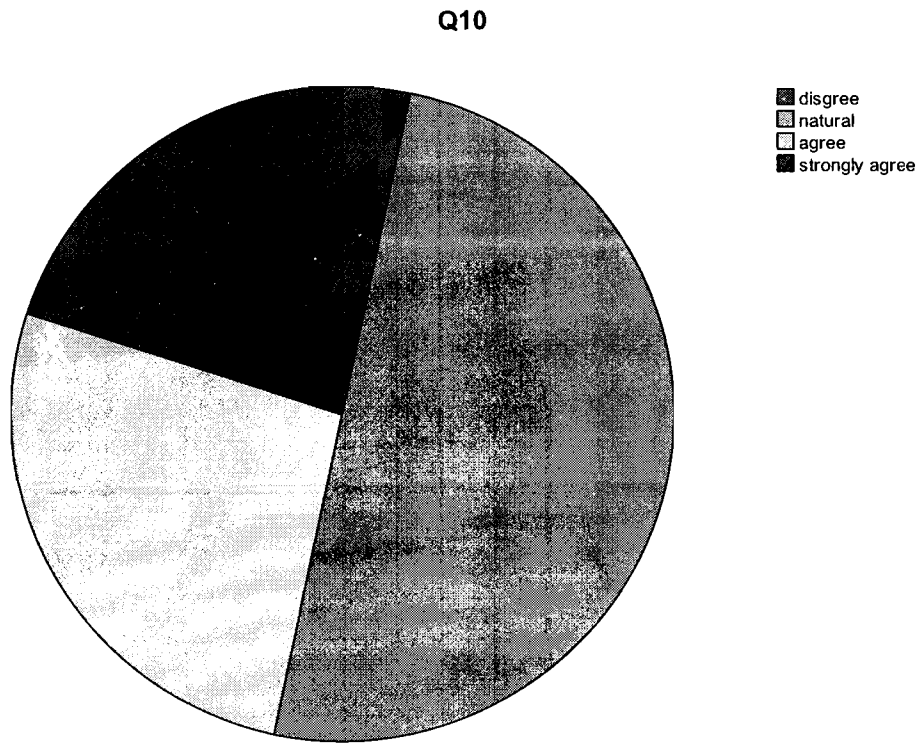


Figure B4 Pie chart

I don't notice any inconsistencies as I use ASKST

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disgree	3	10.0	10.0	10.0
	natural	9	30.0	30.0	40.0
	agree	9	30.0	30.0	70.0
	strongly agree	9	30.0	30.0	100.0
	Total	30	100.0	100.0	

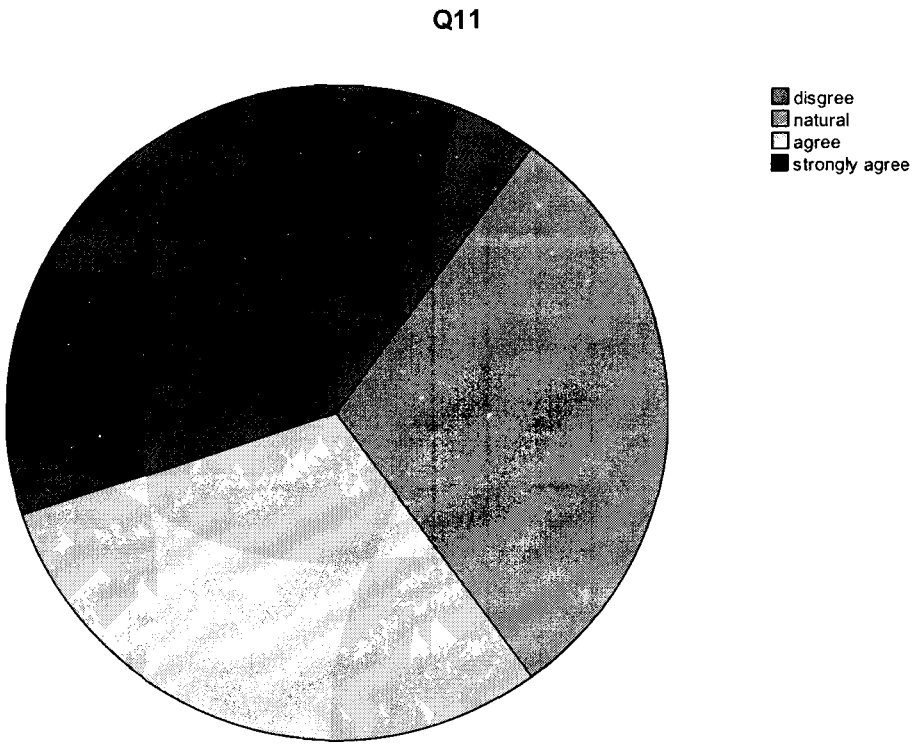


Figure B5 Pie chart

I can use ASKST successfully every time.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disgree	2	6.7	6.7	6.7
	natural	8	26.7	26.7	33.3
	agree	13	43.3	43.3	76.7
	strongly agree	7	23.3	23.3	100.0
	Total	30	100.0	100.0	

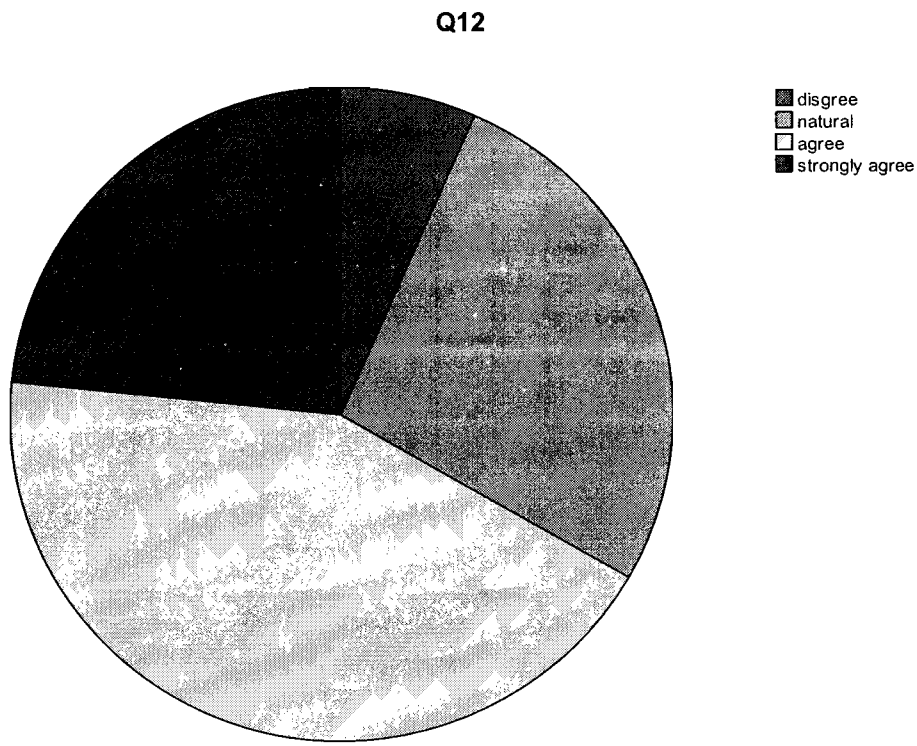


Figure B6 Pie chart