

Enhancing Reminiscence Therapy using ICT

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Abstract : Cognitive decline which has been identified as the third area of concern in an aging population affects older people's ability to think, concentrate, formulate ideas, reason and remember. The reminiscence therapy, a process of remembering, has been proven to be an effective method in enhancing the cognitive capacities of the elderly. Conventionally, triggers or crosscuing used in reminiscence therapy was carried out with the aid of tangible prompts such as photographs, household and other familiar items from the past, music and archive sound recordings. With the advancement of technology, researchers started to explore technologies to support reminiscence therapy such as using multimedia technology that bring together suitable digital content through a web-based service. The use of new technology by the elderly population is being widely accepted for having a beneficial effect on their quality of life, also pave ways for the usage of technology to support the reminiscence therapy. Our study focuses on exploring elderly reminiscence therapy and proposed suitable technology that can support reminiscence therapy process and make the whole process more practical and manageable. From the data collected, this research discovered that reminiscence therapy consists of processes which could be supported by technologies. Thus, the development of the integrated technology-supported framework which proposed a reminiscence system consists of three main components which are (1) the storages system, (2) the recording system and (3) the analysing system could lead to a more practical and manageable reminiscence therapy. The contribution of this study towards new knowledge is through the development of an integrated technology-supported platform which was designed based on the real practice of reminiscence therapy. The prototype of the system is currently being developed and will contribute towards practice in the near future.

Keywords : Reminiscence therapy, Multimedia technology, Elderly, Cognitive Decline.

1. INTRODUCTION

The ageing population has become a global phenomenon. History showed that, since the beginning of recorded human history, young children have always outnumbered older people [1]. However, this situation is changing. For the first time in history, people aged 65 years and above over will outnumber children under five years old. This trend is not in isolation but is emerging around the world. In Malaysia scenario, the number of senior citizens in Malaysia has increased recently [2] and in the next of 10 to 15 years, Malaysia population will become an aging population when more than 15 percent of total populations are elderly. The huge increase in the proportion of older people gives an impact of social and economic changes brought by ageing population. Aging is associated with a loss of cognitive performance due to the deduction in all biological and mental functions in human [3]. Cognitive decline which has been identified as the third area of concern in an aging population affects older people's ability to think, concentrate, formulate ideas, reason and remember [4]. According to the World Population Ageing 2013 report by

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United Nations, cognitive decline that lead to memory loss is one of the major problems faced by elderly that may affect elderly in performing normal activities of daily living [5].

2. REMINISCENCE AND ELDERLY COGNITIVE DECLINE

In order to address the issues related to cognitive decline in elderly, reminiscence theory which also referred as a process of recalling or remembering, is being explored. Reminiscence refers to the process of recalling personal events or experiences from one's past that are memorable to a person [6], [7]. Reference [8] in her research stated that reminiscing is a technique employed to help patients think and talk about their lives. This technique can be implemented in a structured group, in an unstructured group, or on an individual basis. Reminiscence has been studied for various purpose among all is to determine its effect on cognitive functioning [9]–[11]. The sharing of personal reminiscence in a group can be seen as a process of turning intrapersonal reminiscence into interpersonal memory exchanges. Group members begin to explore, to gradually confront and to reconsider specific memories that over time form the thematic and interactional content of their experience together [12]. However, many reviews of reminiscence research and practice agree on the main limitations. Lack of conceptual clarity and evidence are some of the limitation pointed out by reference [7]. In addition, researchers also agreed that implementation and evaluation of this intervention has been difficult to attain and document. On the basis of these serious limitations, reference [7] outlined some future reminiscence research which was used as the basis in this research.

According to reference [13], reminiscence is an interaction which involves recalling or telling of early events or a memorable early experience which may occur, with or without specific prompts. It occurs in stages, involving the recalling of early life events and interaction between individuals across a whole adult life span. The concept of reminiscence has been studied by many researchers as a therapy especially for elderly where reviewing memories can be used to revive interest, self-esteem and improve quality of life [4]. With the increases in the elderly population, reminiscence therapy has become a popular technique for use in hospitals, day care, nursing homes and other settings [14]. Reminiscence based activities play a positive role in enhancing the quality of life for people and may become a significant predictor of an older person's ability to cope with difficulties. Reminiscence therapy when used effectively it helps individuals retain a sense of self-worth, identity and individuality [5]. Besides medication treatment, various reminiscence therapy methods also have been proven to be effective in terms of enhancing the cognitive capacities of seniors as well as improving their capabilities to participate in daily activities [15].

3. TECHNOLOGY USE FOR REMINISCENCE THERAPY

Even though elderly have some limitation, in the rapidly aging population, the elderly are seen as a contributing consumer, thus are called upon to adapt to new technology to meet the demands of modern society. Literature shows that, the use of new technology will be widely accepted by the elderly population when the technology has a beneficial effect on their quality of life [3]. In addition, elderly are interested in using technologies, particularly mobile phones and services provided that these services are able to deliver real value for them [5]. The real value can stem from the extended possibilities to communicate with relatives and other reference groups to critical services such as emergency and health information services as well as municipal services, such as reminders of doctor's appointments and book returns to library.

Previous research shows that there are some activities and elements in reminiscence therapy and collective recall that could be supported and enhanced with the use of technology advancement. The technologies as mention by literatures are:

A. Storytelling Technology

Storytelling can be an individual or a group task depending on whether the story fragments are remembered by one or more individuals [16]. The group storytelling approach has been used in many works for different purposes. Storytelling presented an approach from the domain of face-to-face facilitation and

might translate well into online group setting where it required technologies to facilitate it [17]. There are several ways of registering a story. Among them are texts, photos, audio, video, or a combination of them. Video and audio help bring ideas to life by adding more non-text clues, including body language, graphic illustrations, and sound effects or music. However, these technologies require richer production as well as skills that people generally do not have, like the definition of a good script, a good voice, a good characterization, and high quality pictures. The idea of using a group storytelling mechanism is not simple where it depends on the existence of a knowledge management culture as well as that of a collaborative culture.

B. Multimedia Technology

Multimedia technology refers to interactive, computer-based applications that allow people to communicate and exchange information using digital and print elements. Multimedia technology applies interactive computer elements, such as graphics, text, video, sound and animation in development of various applications that serves different purposes [18], [19]. Multimedia technology allows the use of different media in computer-based applications. The use of multimedia technology could be used to enhance activities carried out in reminiscence therapy when involving trigger element to help recalling [18]. This involves discussion of past activities, events and experiences with another person or group of people, usually with the aid of tangible prompts which consist of different media elements such as photographs, household and other familiar items from the past, music and archive sound recordings.

C. Mobile Technology

The introduction of mobiles devices has improved tremendously over the years in terms of their size, weight, functions and well as their performance. Mobile devices, such as smart cell phones, personal digital assistants (PDAs), and laptop computers can free their owners of the need to remain close to a wired information system infrastructure that is provided in a stationary office environment, and provide the opportunity to perform tasks in a wide variety of use contexts. It has also offered new tools both for handling information and for advancing processes of knowledge creation and innovation [20]. Mobile technologies have the potential to enhance the lives of elderly users, especially those who experience a decline in cognitive abilities [21]. Since reminiscence plays an important role in the lives of elderly people by recalling the past events and experiences, memory prompts and mobile technology have potential to be harnessed as a tool to assist elderly in recalling their memory especially used as trigger that could happen at anytime and anywhere. Besides all those technologies, there is also an application developed to support elderly in improving their cognitive level. According to [15], there is a research findings suggest that digital games can be successful in engaging elderly into designed activities and it also has shown that gaming is a meaningful way for seniors to train their cognitive and physical capacities and it can enhance the quality of seniors' life by offering social them entertainment, socialization, relief from isolation and an improvement of self-esteem.

With the increase of elderly population that mostly characterized by cognitive decline, more people are looking for easy and efficient way to improve their memory. The technology would become useful in helping elderly to conduct reminiscence therapy independently from institution. With the improvement in their cognitive capability, elderly would be able to carry out their daily activities better. Therefore, this research explore elderly reminiscence therapy and proposed suitable technology that can support the reminiscence therapy process and make the whole process more practical and manageable.

4. QUALITATIVE STUDY

This research follows the interpretivist paradigm and employs the qualitative research approach for a deeper understanding on the process flow of reminiscence therapy. The qualitative approach is flexible and provides the interaction between researchers and interviewee. The strategy of inquiry is the multiple case-

studies where three case sites conducting the reminiscence therapy were chosen. Three types of institutions have been selected in order to provide wide spectrum of knowledge in the reminiscence therapy process. These institutions are a public funded Old Folk's Home (Case Site 1), a Non-Governmental Organization (NGO) (Case Site 2) and a Government Medical Institution (Case Site 3). Observations and interview were used as the main data collection method.

Observation offers a first-hand account of the situation under study and when combines with interviewing, it allows a holistic interpretation of this study. The main objective of the observation is to understand the process of reminiscence therapy conducted at the case sites. In order to achieve this, a theoretical lens by reference [22] used. There are six elements observed which are the physical setting, the participants, the activities and interactions, the conversation, the subtle factors and the researcher's own behaviour. Apart from that, interviews were conducted with the occupational therapist and nurses who are responsible in conducting the reminiscence therapy. The objective of the interview is to get a deeper understanding and clarification on the reminiscence therapy process observed. All interviewees are certified practitioners with more than five years experience. The interviews were semi structured in nature which allows the respondents to articulate as much detail about the process of reminiscence therapy and the other related issues and experience. As overall, the interview session ranges from 20-30 minutes in length.

5. RESULTS AND DISCUSSIONS

A. The Reminiscence Therapy Process

Findings from this research show that the reminiscence therapy process is different for each case site. For Case Site 1 and Case Site 2, the overall process basically is more simple, using informal approach and unstructured compared to Case Site 3 where it follows all reminiscence therapy process, using more formal approach and very structured. Table 1 below shows the analysis for the all case sites. It is discovered that two main factors influenced the reminiscence therapy process conducted. First, the participants' cognitive decline level is the most important factor that determined and shaped the whole process of reminiscence therapy. This is because the higher level of participants' cognitive decline (Alzheimer level), the more unstructured the setting environment would be and more simple process involved. The unstructured and informal approach was used in this type of environment because it gives less stress to the participants as their cognitive decline level is high. In Case Site 1, there is a variation of cognitive level among the participants as compared to Case Site 2 where all the participants are at the Alzheimer stage. Thus, the setting environment for conducting this reminiscence therapy become unstructured and the process is simpler and uncompleted compared to Case Site 3 where the participants involved were diagnosed only with mild cognitive impairment. Therefore the setting environment is more structured and the process used is in a complete and full cycle.

Table 1
Analysis of Reminiscence Therapy Process

<i>Elements & Process</i>	<i>Case Site 1</i>	<i>Case Site 2</i>	<i>Case Site 3</i>
The Participants (Cognitive level)	Mild Cognitive Impairment & Alzheimer	Alzheimer	Mild Cognitive Impairment
Setting Environment	Unstructured	Unstructured	Structured
Activities and Interactions	Normal Activity Informal	Daily Activity Informal	Treatment/ therapy Formal
Conversation	Minimal	Minimal	Optimum
Process	4 Steps (Simple)	3 Steps (Simple)	6 Steps (Complete)

Secondly, the provider or organisation who conducts the reminiscence therapy is another factor that shapes the process of reminiscence therapy. The approach chosen is either a normal/daily activity or is a treatment/therapy will determine how the reminiscence therapy will be conducted. This can be seen at Case Site 1 and Case Site 2 where the provider used an approach of normal/daily activity in conducting the reminiscence therapy for their participants. The normal/daily activity approach will make the therapy session more informal and conversation between the instructor and the participant is less or minimal. Thus, the overall session turn out to be unstructured and less process involved. However at Case Site 3, the provider used an approach of treatment/therapy in conducting the reminiscence therapy session. Thus we can see that activity that has been done is more formal and the conversation between the instructor and participants is optimal. Generally, the whole session become more structured with complete process involved.

B. The Reminiscence Therapy Process and Activities

Table 2
Reminiscence Therapy Process and Activities

<i>Reminiscence Therapy Process</i>	<i>Activity</i>
1. Set a Session & Define the objective	<ul style="list-style-type: none"> The instructor/coordinator will set the theme session and define the objective according to the theme session. The session is normally based on key stages in life which most people will have experiences. E.g. of session: Introduction, childhood and family life, schooldays etc.
2. Preparation Trigger	<ul style="list-style-type: none"> The instructor will do a preparation in term of material collection for trigger items and other supporting equipment in order to do conduct the session. Trigger is to help and encourage person to recall information and knowledge. Items that be used in triggering memories especially through sensory stimuli are such as: objects, photos, smells, tastes, textures & touch, sounds, music, dancing, words & saying, writing, poetry, selective use of radio & television, computer programs, visits and inter-generational work.
3. Introduction	<ul style="list-style-type: none"> The instructor will start the session with an introduction. Greeting each person as they arrive and do a welcoming speech for each session to welcome the participant.
4. Warm-up	<ul style="list-style-type: none"> The instructor will do some warm-up session such as a physical exercise. Make all participants feel good and do warming-up according to session theme.
5. Main Activities	<ul style="list-style-type: none"> The instructor will start the main activity according to the theme session. Then the instructor starts showing the trigger items and begins to interact and communicate with all participants. The other participants or group members will converse and help to contribute to the topic. Each session plan sometimes will include more activities that can be fitted into a single session
6. Closing	<ul style="list-style-type: none"> The instructor close the session by summarizing the whole activities that have been done during the session and asked participant to take a deep breath. The instructor also will explain the plan for the following week if necessary.

The observations carried out in this research have provide deeper insights on the reminiscence therapy process, where this research were able to explore the detailed activities involved in the therapy process. The discovery of activities in the reminiscence therapy was structured based on the guidelines suggested by [23] who have developed a programme of 12 weekly sessions based around themes such as Introduction, Childhood and family Life and Schooldays and a few others. They also suggested useful resources that could trigger memories such as objects such as leather football, skipping rope, photographs, smells

associated with childhood, early life experience and hobbies such as herbs, soap, camphorated oil and perfumes, tastes such as old fashioned toffee tins, china cups and old recipe books, textures and books such as old fabrics, crochet, shawls, sounds and music like church bells, nursery rhymes and films or music relating to dancing. Table 2 listed all the activities related to the reminiscence therapy.

C. Mapping of Technology with Reminiscence Therapy Process

Based on the most completed process of reminiscence therapy conducted on the case sites, the appropriate and suitable technologies are identified. Technology proposed act as an enabler in improving and making the process becomes more practical and manageable. Earlier studies by [17]–[21], [24] have highlighted the use of technology in the reminiscence therapy. Therefore in mapping the technology with each phase of reminiscence therapy, earlier studies mentioned above are used as the references. The list of proposed technology based on the process involved in the reminiscence therapy is shown in Table 3. The proposed technology is chosen based on the process and activity. Although it appears as if the technologies are used in silos, this study proposes an integrated technology-supported platform to support the reminiscence therapy. The integration of technologies would be able to make the reminiscence therapy process more efficient and manageable.

Table 3
Proposed Technology to Support Reminiscence Therapy Process

<i>Reminiscence Therapy Process</i>	<i>Proposed Technology</i>
1. Set a Session & Define the objective	<ul style="list-style-type: none"> • Database system as a repository to store: <ul style="list-style-type: none"> – List of theme session and the objective according to theme session – Personal information of the participants
2. Preparation Trigger	<ul style="list-style-type: none"> • Multimedia technology as a computer based applications can be used as a tool to develop various applications related to trigger items. • All trigger items developed can be stored into the database repository.
3. Introduction	<ul style="list-style-type: none"> • Multimedia technology for interactive opening and introduction.
4. Warm-up	<ul style="list-style-type: none"> • Multimedia technology. E.g. show an exercise video or some animation video for participant to follow.
5. Main Activities	<ul style="list-style-type: none"> • Multimedia technology as the trigger items in graphics, text, video or sound. • Storytelling technology that help group members to create story collectively and synchronously. • Collaboration technology such as video conferencing
6. Closing	<ul style="list-style-type: none"> • Multimedia technology. E.g. – Show the summary of today’s activity and have a short preview for the next session plan if necessary. • All information will be stored in the database system.

The proposed integrated technology-supported model for reminiscence therapy is illustrated in Figure 1 below. This model was adapted from a model of support system of life review activity by reference [25]. The system is designed to improve the reminiscence therapy process as well as making the process becomes more practical and manageable, which is done through the gathering and recording of the participants’ information. The system is also designed to help provider to analyse and review the success of reminiscence therapy through the capturing the reminiscence therapy activities. The model proposed a reminiscence system which consists of three main components which are *i*) the storages system, *ii*) the recording system and *iii*) the analysing system. The details of each components are described in the following sections.

D. Central Storages System

Storage system plays an important role in storing and retrieving data from storage devices for this system. There are three types of data stored in the system, which is the multimedia data, participants' personal information and session information. The multimedia data refers to multiple media elements, including text, graphics, animations, video, and sound to record knowledge. These data are used as trigger items in the reminiscence process. This research incorporate the activities used in reminiscence therapy as suggested by [26] which include discussion of past activities, events and experiences and assisted by aids such as videos, pictures and sound to help elderly recall their knowledge, with the support of multimedia technology, interactive applications having multiple media elements, including text, graphics, animations, video, and sound. Apart from that, the storage system also stores participants' personal information including their name, age, address, medical information and other related information. This information will be used by the administrator to record their participant's personal details. Lastly, the storage system also stores the information regarding the reminiscence therapy session for example the session's number, the session's theme, the session's objectives, the session's participant's names, session's status and other related information. It also stores the recording of each therapy session as recorded by the recording system. The use of central storage system allows data to be kept and maintained in an organized way. It also allows an accessible place of storage and provide ability to selectively extraction of data.

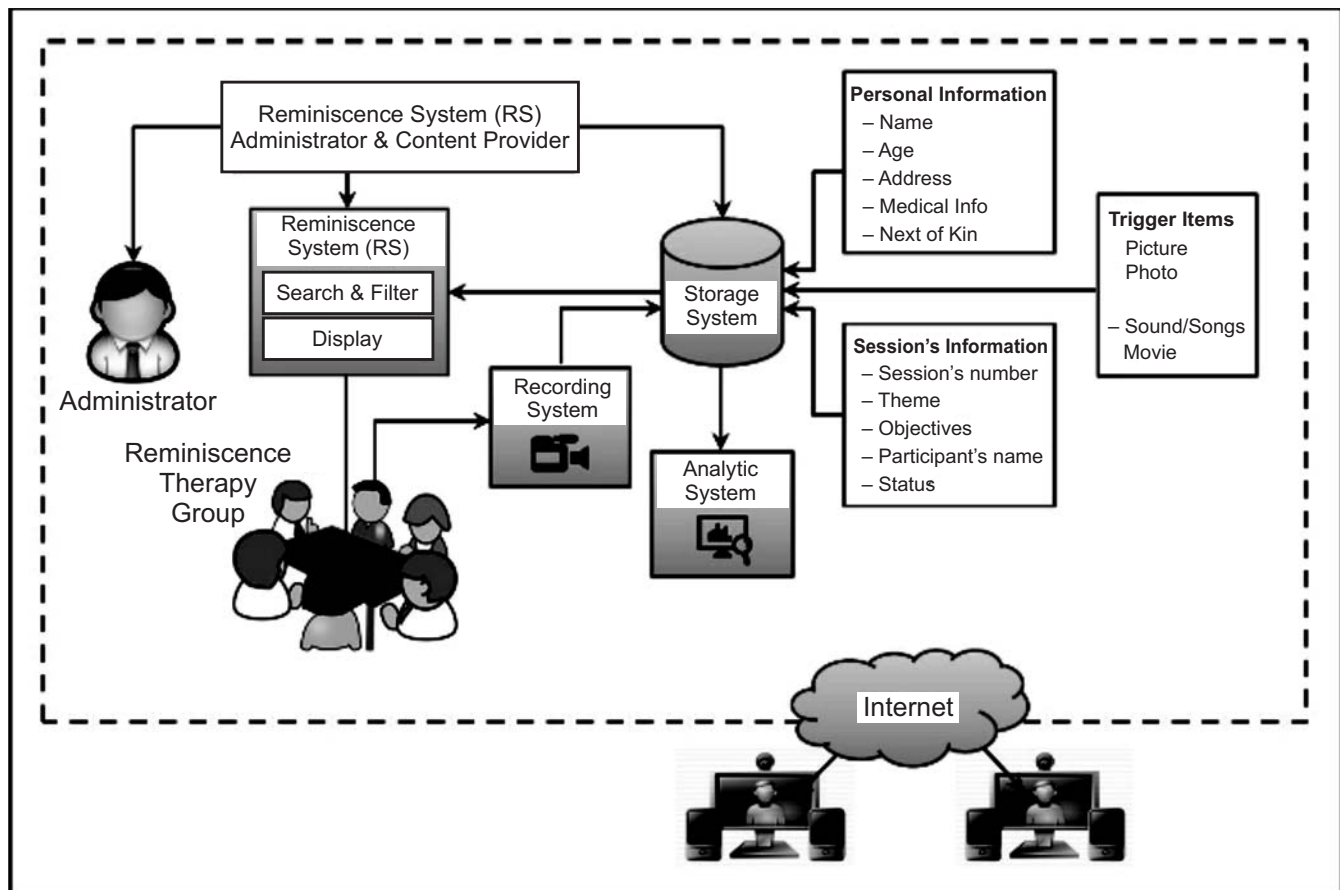


Figure 1: An Integrated Technology-supported Platform for Reminiscence Therapy

E. Recording System

The reminiscence therapy is a process that helps the elderly in reviewing their memories, which subsequently can help the elderly to revive their interest, self-esteem and improve quality of life. The reminiscence therapy is a long process which involves many therapy sessions that could take months. In order to assess the effectiveness of each session, it is important for the administrator to review the sessions after each

session activities. To enable the review of each session, the recording system records each sessions of the therapy conducted and store it in the central storage system. Recording is done using video camera. Apart from that the administrator can also type in notes based on his observation throughout the therapy sessions. The notes help to explain the session in more details or to clarify things that take place during the session. The administrator then will review the sessions which will be used to improve the sessions and help the participants improve their conditions. The recording could also be used to improve techniques on progressing the sessions and also for new therapists' training purposes.

F. Analytic System

The analytic system utilizes data stored in the central storage and interpret it to produce a meaningful pattern on reminiscence therapy for each participants or for that particular group. The system analyses the information stored and captured by the recording system and provide administrator with periodical or ad-hoc reports on the progress of the participants or therapy session after each therapy session. The system also compares the actual achievement of each session against target set earlier by the administrator to determine the success of each session.

6. CONCLUSION

Reminiscence therapy process is explored in-depth in this research in order to propose suitable technologies to support the process. The main findings discovered are that the therapy process is influenced by the cognitive level of the participants and the approach of the therapy, either as a routine activity or as a treatment for illness. Since reminiscence therapy is a process to enhance recalling among the elderly, the nature of the process is repetitive. Activities conducted also vary depending on the life experiences of individuals. Personalization of the treatment would be beneficial as it provides a more personal approach for the process. The usage of technology has been implemented in reminiscence therapy. Technology has the potential of enhancing the reminiscence therapy process. The study proposed an integrated technology-supported platform which integrates various technologies to support the complete cycle of the reminiscence therapy process. The technology-supported model has been validated by experts conducting the reminiscence therapy. In conclusion, this study contributes towards new knowledge through the development of an integrated technology-supported platform which was designed based on the real practice of reminiscence therapy. The prototype of the system is currently being developed and once finalized it can contribute towards practise where the system can be used by the practitioners.

7. ACKNOWLEDGEMENT

The authors are grateful to Universiti Teknologi MARA for their cooperation and supports towards the completion of this research.

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