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ScienceDirect

Procedia - Social and Behavioral Sciences 174 (2015) 849 – 861

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**Procedia**  
Social and Behavioral Sciences

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INTE 2014

## Implementation of the lifelong learning experiences management approach – Observations on the first experiences

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### Abstract

In this study, applicability of a digital lifelog system developed for managing lifelong learning experiences has been investigated. System is designed and developed by the first author of this study and evaluated independently by the other three authors by using action research method. Because of the fact that, life logging applications produce log entries, which belong to every awake hour of the individual's daily life, they may contain private visual information, so direct observation of the application by the others may cause ethical problems. Three practitioner-researchers have implemented the system independently without being affected from one another for overcoming this limitation and they have supervised the implementation by themselves and have collected data relevant to the implementation through systematic self-observation during this period. Data gathered has thereafter been evaluated by being analyzed with a common analysis by all authors. It has been seen that the system of digital life logging used has caused the practitioners to acquire skills of planning, evaluation and controlling of lifelong learning experiences and it is a sufficient tools for implementing such skills.

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Peer-review under responsibility of the Sakarya University

*Keywords:* Life logging; lifelong learning; recording of learning experiences; management of learning experiences

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### 1. Introduction

The concept of “learning” can be handled with the help of concepts of “lifelong learning”, “life-wide learning” and “life-deep learning” in a such way that it will include all three dimensions of learning (Mutlu, 2013a). Lifelong

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learning is a process starting at birth and continuing uninterruptedly until death. Life-wide learning can be categorized as formal learning, non-formal learning and informal learning depending on where individual live its learning experiences (Clark, 2005). Life deep learning, which leads people what to believe, how to behave, how to judge himself/herself and others, embraces all the religious, spiritual, ethical and social values (Banks, et al., 2007).

Informal learning acquired by individuals leading themselves due to increased life and working time, rapid development of technology and complication of needed information and skills have started to gain more importance when compared with formal and non-formal learning provided by institutions. Informal learning can be categorized as "implicit (tacit) learning, "integrative learning", "reactive (incidental) learning" and "self-directed learning" as to the situations of pre-planning and consciousness in "expanded informal learning model" (Mutlu, 2013b).

"Learning experience" is defined as "physical, mental, emotional, spiritual, religious, social or virtual event or activity that we have participated or been exposed to by gaining, altering or strengthening new information, behavior, skill, value or preferences" by considering encyclopedic definitions of "learning" and "experience". Individual has a set of learning experience experienced in the past in any moment, learning experiences experienced at the moment and learning experiences potential to experience in the future. Approach of "management of learning experiences" sheltering the phases of planning learning experiences in the future, controlling current learning experiences and evaluating learning experiences in the past is a method developed based on recording, interpreting and signification lifelong learning experiences with a life logging system (Mutlu, 2013b). Approach of "management of learning experiences" has been initiated in 2013, February and developed within the scope of a scientific research project supported by Anadolu University and a set of tools has been designed for ensuring practical applicability of this method in the same project (Mutlu, 2014a).

Learning experiences management method consists of (a) capturing life experiences via a life logging system, (b) interpretation of experiences in the form of activities, episodes and stories, (c) creating a personal knowledge base by listing contexts accompanying experiences, (d) signification learning experiences distributed within life experiences, (e) the phases of planning, controlling and evaluating learning experiences and this method offers an integrative approach for managing lifelong learning experiences of individuals (Mutlu, 2014a).

Even if it is possible to implement approach of management of learning experiences corporately by using paper and pencil, this approach will not be preferred since it is practically tedious and time taking and unsustainable. Instead, a set of software has been developed for ensuring convenience for implementing this approach. Out of these, the first one is the system of life logging providing recording of life experiences as computer screenshot images and camera capture images within every thirty seconds (Mutlu, 2013c). Afterwards, an experience processing software has been developed (AllMyListsLE) for ensuring convenience in interpretation of images related to experiences (Mutlu, 2013d). Another study conducted for this purpose is the design of a personal knowledge base system based on life logging enabling determination of contexts created within life experiences records and creating a personal knowledge base from these contexts (Mutlu, 2013e). Additional features to AllMyListsLE software has been added for facilitating the procedures of signification and managing learning experiences that are final phases of the method (Mutlu, 2014a).

In this study, applicability of a digital life logging system developed for managing lifelong learning experiences has been investigated. As a result of the research, identifying problems and opportunities relating to implementation process has been intended.

## **2. Method**

In this study, an action research that is a qualitative method has been used. Action research used widely in social sciences as of second half of 20th century is defined as a research approach including data collection and analysis in regard to revelation of problems and understanding and solving a problem emerged available in respect with implementation process and conducted together with a researcher or directly by practitioner according to Yıldırım and Şimşek (Yıldırım & Şimşek, 2005:295).

The phases of "planning-acting-observing-reflecting" are implemented with guidelines for solution of problem handled in action research (McNiff, 2013). In most cases, due to the complex nature of the problem, research is conducted in cyclical manner of these phases and repetition by making a change in the plan in each cycle. In this

way, effect of the action realized in each cycle is elaborately observed and evaluated. A practical guide to action research has been provided below in steps (McNiff et al., 2009).

- We review our current practice,
- identify an aspect we want to improve,
- imagine a way forward,
- try it out, and
- take stock of what happens.
- We modify our plan in the light of what we have found and continue with the ‘action’,
- evaluate the modified action,
- and so on until we are satisfied with that aspect of our work.

### *2.1. Nature of problem*

Learning experiences management approach has separate phases required to be learned, got accustomed and adopted independently. For this reason, implementation process is preferred to be progressive. Thus, action research has been designed in a way in which only one change is carried out in each phase and in a way of cycles where effects created by such change are observed and evaluated (Riel, 2010).

Although learning experiences management method and software to be used in implementation of this method have been elaborately designed, it is envisaged that individual usage differences may occur in practice. Since especially AllMyListsLE that is experience processing software has been designed in a form of tree based personal knowledge base tool, it has flexibility enabling different individual usage modes while applying the method (Mutlu, 2013d). It is expected that the action research method to be applied is to revealing such individual usage differences as well as implementation problems of cycles and to identify the best practices.

The problem handled within the scope of action research is a real life problem since it has potential of gaining/enhancing participants with managing skills of lifelong learning processes. It is expected that positive effects that implementation has caused participants to gain enable both researcher and practitioner-researchers to adopt learning experiences management approach and to sustain the said implementation during lifelong learning process outside of this research scope. The research in this sense is a problem of putting an information system developed in the meantime into implementation (Henfridsson and Lindgren, 2007).

### *2.2. Participants and characteristics, included environment-context*

It is preferred that method and tools of practitioner in minimal number for revealing problems and opportunities relating to implementation process are implemented over themselves under the supervision of a researcher and to observe and evaluate themselves in detail and depth; for this purpose, it is assumed that availability of a researcher and three practitioner-researchers is sufficient. Approach of first researcher of this paper is "participating action research" (Reason and Bradbury, 2008), other three practitioner-researchers have implemented the approach of "self-study action research" under the supervision of first researcher.

Four researchers are currently working in Anadolu University, Open Education Faculty, Learning Technologies R&D Center. The activities offering design, development, presentation and support services of e-learning content intended for students studying as open education and distance education. While first researcher (Mehmet) is developing the tools used in implementation of method and the method of "learning experiences management", he has implemented it over himself for a period of 16 months. First practitioner-researcher (Ilker) is using computer intensively as doctorate student and software developer. Second practitioner-researcher (Buket) is using computer at home and in the office as doctorate student and instructional designer. Third practitioner-researcher (Ayşe) is working in the same institution and is maintaining its master education with distance education method over internet. Practitioner-researchers have implemented the method and tools within the scope of action research for the first time.

### 2.3. Action research process

The phases recommended by Riel (2010) have been used for approach of cyclic action research used in this study: (a) Identify research question. (b) Report cycles of research; for each action cycle: (b1) describe of cycle action, (b2) identify the question of action cycle, (b3) describe what happened in action, (b4) collect evidence for evaluating action, (b5) evaluate results of action, (b6) reflection. (c) Final reflection.

Since implementations of life logging perform captures images regarding all times of individuals are awake, they incorporate visual data in specific nature and thus, feature of implementation to be directly observed by others may cause ethical problems. First researcher and other three practitioner-researchers have implemented learning experiences management approach independently without being affected from one another for overcoming this limitation. They have implemented by adding each phase related to approach in each cycle and they have supervised implementation by themselves and have gathered data pertaining to implementation through a systematic self-observation during this period. Data gathered as the end of cycle has been analyzed and evaluated. One more phase pertaining to approach in following cycle has been implemented and added and put into implementation in this way. Once all cycles of independent researchers end, data gathered and interim evaluations have been analyzed and evaluated with a common study by first researcher and other practitioner-researchers.

Participative action research process of first researcher: First researcher has carried out the following procedures within the scope of the research:

- Designing action research
- Planning action cycles and kick off up meetings
- For each cycle: (a) Creating explanation and question of action. (b) Creating relevant reading parts for introducing action (c) Preparing observation forms. (d) Preparing pre-tests and final tests. (e) Preparing evaluation forms. (f) Initiating action. (g) Observing practitioner-researchers for each phase for supervising research and evaluating the phase at the end of phase. (h) Trying the implementation over itself. (i) Evaluating the implementation. (j) Organizing an evaluation meeting with practitioner-researchers.
- Evaluating collectively evaluation results of practitioner-researchers

Self-study action research process of practitioner-researchers: Practitioner-researchers have carried out the following procedures within the scope of the research:

- Participating to kick off meeting: In this meeting, (a) research problem is introduced by first researcher, research question is stated; (b) action research method is introduced, tools to be used and process to be applied are introduced, (c) action cycles are introduced.
- To carried out the following procedures for each action cycle: (a) Explaining the action in a Word document prepared by first researcher and reading and understanding reading parts relating to action. (b) Understanding action cycle question. (c) Gathering data relating to existing situation and interpreting gathered data and conducting pre-test. (d) Recognizing alternative action plan and putting action into implementation. (e) Having training of approaches to be applied and software to be used. (f) Carrying out action each day for a period of one week. (g) Gathering data for supervising and evaluating implementation; observing itself and recording observation data with the help of observation form. (h) Conducting final test at the end of the phase. (i) Analyzing and evaluating observation data; completing evaluation form, comparing and interpreting test results with pre-test results. (j) Carrying out group evaluation to which other implementers and first researchers participate. (k) Reflecting phase results critically.
- Conducting collective evaluation for all phases and carrying out critical reflection.

First of all, research question has been identified according to the format recommended by Riel (2010) and afterwards, question of action research has been provided. Research question is an overall question stating integrity of the research. Each of action cycles in the following part is sub-questions asked for finding response to the question of this action research.

**Research question (Overall question):** Can I manage lifelong learning experiences by implementing learning experiences management method?

Firstly, action is explained for creating question of action research and then output to be obtained is explained. Accordingly, question of action research has been determined as follows (Riel, 2010):

**Question of Action Research:** If I record learning experiences via life logging system and implement the phases of learning experiences management approach, what will its effect on my management skills of learning experiences?

#### 2.4. Cycles of action research

Each of five fundamental phases of the method for investigating applicability of the method of "learning experiences management" has been handled as the action to be applied in cycle of an action research: (1) Recording life experiences (shortly "recording") (2) Interpreting life experiences (shortly "interpreting") (3) Creating context lists (shortly "listing contexts") (4) Signification learning experiences (shortly "signification") (5) Creating management lists of learning experiences (shortly "managing").

Each phase has been envisaged to be implemented for a period of one week together with previous phases. Accordingly, practitioners will experience uninterrupted keeping life log experience for a period of five weeks, experience of interpreting life experiences for a period of four weeks as of second week, experience of listing contexts for a period of three weeks as of third week, experience of signification learning experiences for a period of two weeks as of fourth week and experience of managing learning experiences in fifth week. In this way, practitioners will start from the simplest phases and gradually put more complicated phases into implementation and they will strive to observe the change created by each phase over them. Table 1 includes explanation, action question, action plan and final test pertaining to each action cycle.

Table 1. Details of action cycles

Explanation of Action Cycle	Action Question	Pre-Test	Action Plan	Final Test
<i>In first cycle</i> , researcher records life experiences by using life experience recorder software developed for capture screenshots and camera images. Revises life experience records recorded during the week.	"What is the effect of recording life experiences over remembering and realizing experiences?"	Researcher is requested to note down all events, actions and procedures fully by trying to remember realized in regard to one and two days before from implementation start.	Alternative action is identified as "recording experiences with life log recorder tools". Participants are provided with training for using software.	Researcher is requested to create the list of operations, actions or activities realized during last two days by making use of the images captured. Compares and evaluates remembering and realizing performances of life experiences in pre-test and Final Test processes.
<i>In second cycle</i> , researcher interprets life experiences recorded in previous week and to be recorded in this week with the help of "experience processing" software.	"Does interpreting life experiences enable me to remember the experiences for longer time"	Researcher is requested to browse and define recorded images pertaining to one day.	Alternative action is identified as "interpreting experiences in the form of activities, episodes and stories by using experience processing software. Participants have been provided with training for using relevant software.	Researcher is requested to compare performance of identification procedure determined by itself in pre-test with interpretation process implemented in action cycle.
<i>In third cycle</i> , researcher creates the lists related to contexts accompanying life experiences recorded and interpreted.	"Does defining contexts such as persons, places, events etc. out of life experiences reveal implicit experiences?"	Researcher is requested to browse images pertaining to one day and to capture association experienced at that moment or in different times but having not realized.	Alternative action is identified as "creating personal knowledge base and semantic network by preparing context list" (associates with experiences, establishing associations among experiences with contexts). Participants are provided	Researcher is requested to compare performance of capturing association procedure determined by itself in pre-test with creation of context list process implemented in action cycle.

			with software training for preparing context lists.	
<i>In fourth cycle</i> , researcher starts to acquire learning experiences from life experiences that it has been recording, interpreting and identifying context and to signification such experiences.	"Do learning experience signification action enable me to realize learning experiences experienced without planning or without being conscious as well as experiences with planning or being conscious"	Researcher is requested to browse the images pertaining to one day and to identify its learning experiences experienced.	Alternative actions is identified as "to identify experiences whether they are formal, non-formal, informal-implicit (tacit), integrative, reactive (incidental), self-directed- in systematic manner.	Researcher is requested to compare performance of explanation procedure determined by itself in pre-test with explanation process implemented in action cycle.
<i>In fifth cycle</i> , while researcher continues to record, interpret life experiences and identify its contexts and signification learning experiences, it starts to plan learning experiences in the future, to control current learning experiences and evaluate learning experiences in the past.	"Does preparing lists regarding future, present and past in relation to learning experiences enable me to manage learning experiences?"	Researcher is requested to implement an approach for managing their learning experiences.	Alternative action is identified as "Preparing lists regarding future, present and past in relation to learning experiences and to use such lists" Training of preparing and using management list in regard to planning, supervising and evaluating will be provided.	Researcher is requested to compare performance of learning experience management procedure determined by itself in pre-test with approach implemented in action cycle.

*Gathering data for supervising and evaluating implementation:* Researchers systematically record context information, observation notes, remarks, episodes and stories pertaining to implementation each day during implementation period in respect to each action cycle. For this purpose, observation forms are used. Within this period, practitioners record the responses given to the questions of what has changed together with action in this process, how has been reacted to this change, what is direct and indirect proof for what it is. In a similar process, first researcher systematically observes implementation of three practitioner-researchers as passive observer and takes down notes by using a similar form each day. Entire context relating to implementation is recorded. Quality of this process is of high importance in terms of ensuring criteria set out in Credibility of Researcher and Transferability recommended by Guba (1981) for validity of action researcher.

"Depict context you are included objectively.", "What are the procedures or actions you perform on that day within the scope of the research?", "Jot down observation notes, thoughts and comments regarding these?" and "What changed together with this action and how did you react against this change and what is direct and indirect proof regarding this?" in a way that shall contain the questions needed to be investigated emphasized in the phases recommended by Riel (2010) in observation form. Since the phases of action cycle are implemented for a period of one week, observation form above in each phase is completed separately for seven days. Once research is completed, total 35 observation forms are acquired for each practitioner. Practitioners perform the activities called "pre-test" on the first day of each phase and "final test" on seven days of the phase. Activities in pre-tests are in a way that are performed with an approach determined by an individual without method and tools recommended by the implementation in that phase for each phase and activities in final tests are performed with method and tools recommended by the same implementation. Observation forms are prepared as a Word document containing a separate observation form pertaining to within seven days of the phase for each action cycle. This document includes the information regarding research question for being a guide for the researcher, explanation of action cycle, question of action cycle, action plan, reading parts relating to action, introduction of relevant software and user information, gathering data for supervising and evaluating implementation, data analysis and evaluation, collective evaluation and reflection processes.

*Data analysis and evaluation:* Researchers firstly evaluate action results in each action cycle by themselves. For this purpose, each researcher completes a self-evaluation form at the end of each phase. Researchers are requested to state their thoughts in the following issues in their self-evaluation process: Deficient points of the system applied, inadequacies, problems, surplus points, competencies, gains, possible effects, potential different usage possibilities, aspects open for development, hardware, software, practicability and technological comments relating to interface,



individual and external factors affecting use of model or tool developed. Researcher may add the features not included here for making comment. A Final Test is also conducted at evaluation phase. Experiences of Pre-Test and Final Test are compared and comments are written in evaluation form. This procedure is completed on last day of the phase and observation and evaluation forms are communicated via first researcher.

Self-evaluation form for each phase is included the last part of Word document bearing guidance information together with observation forms within it and prepared separately for each phase. In this way, researchers are able to perform information acquisition relating to action cycle, saving observation data and evaluation performance procedures on the same document.

*Start of action cycle and evaluation meetings:* Researchers have observed themselves each day for gathering data during action cycles and have evaluated data obtained as a result of observations individually and then have come together with other researchers and have performed collective evaluations. Common evaluation meetings held at the end of each action cycle have been organized in a way of sharing self-evaluation results of each practitioner-researcher with other practitioner-researchers and first researcher. Unstructured user stories in collective evaluations are compiled and significance of experiences undergone for individuals, contribution to individuals and expectations of individuals from this method are determined. Interrogative techniques are utilized in this phase. Evaluation meetings have been recorded to video for analyzing them later time. Once evaluation meeting of first phase is completed, kick off meeting of action cycle of the following phase is organized.

*Reflection:* Reflection pertaining to action cycle according to Riel (2010) are looked into by turning back to action. "If you could repeat the process, what would you change and what happened as you expected and what were the surprises?" the questions above are asked. Predictions relating to future cycle are noted in this phase. Investigation techniques are made use of in this phase and first researcher compiles these views in the negotiation held with other researchers and writes them down after the meeting.

*Collective evaluation of all phases:* Collective evaluation in regard to all phases is organized following fifth evaluation cycle. In this way, the problems and opportunities experienced in use of learning experiences management method and related tools are made come together. In this phase, final state of the report is made with corrections and critics made by other three practitioner-researchers over result report written on the text by first researcher.

Quality of data collection, evaluation and reflection phases is of high importance in terms of ensuring the criteria of Dependability and Confirmability recommended by Guba (1981) for validity of action researches.

### 2.5. Privacy

Record of screenshots and camera capture images has been made in desktop computers, laptop computers and tablets of participants during research process. In order for participants to avoid being unaware of images of other persons in the environment, participants have an announcement in visible size with the text of "*Screenshots and camera capture images saved in every 30 seconds within the scope of Scientific Research Project - 1301E014 in this Computer*" on their desks. Researchers have not shared the images recorded with other researchers and they have shared their views in that moment with only observation and evaluation forms in the evaluation meetings.

### 2.6. Reliability of research

Generalizability and repeatability in quantitative sense contradict with nature of action research. The reason for this is that data collection is in question depending on features of a specific context. Reliability in action researches is established in a way that data is significant for those conducting research and consistency within itself and reading research report (Uzuner, 2005).

## 3. Findings

Findings relating to implementation and usage obtained in the research are handled in two groups as findings related to each of five action findings.

### 3.1. Findings relating to implementation and usage

It is envisaged that implementation starts on 2 April 2014 Wednesday and last for five weeks and is completed on 7 May 2014 Wednesday. All of action cycles in the implementation have been started in envisaged dates. However, planned start dates have not been adhered to due to work loads of practitioners in execution of evaluation meetings and delivery of observation and evaluation forms related to action cycles. First researcher has observed practitioner-researchers during five weeks and following four weeks during research process on a daily basis. Practitioner-researchers have been able to deliver observation and self-evaluation forms regarding actions cycles within first weeks of June. Collective evaluation of research was conducted on 4 June 2014 Wednesday. The situation of extension of 5 the research of 5 weeks to 9 weeks held on this date has been investigated and no effect disrupting nature of research has been seen apart from increase in implementation periods of action cycles. It has been concluded that the phases of increase in implementation periods have enabled more proper evaluation.

Since all researchers are assigned in the same department, no problem has been detected in observation of other researchers of first researcher each day upon organization of kick off meetings of action cycles. Implementation is not limited to working hours and specific location and but it can be performed in each environment where practitioners can use computer and in all hours where they are awake. As a result of this, kick off meetings relating to the first three phases have been organized in the workplace and kick off meeting relating to 4th phase has been organized in a hotel lobby commuted for participating to a conference and kick off meeting relating to 5th phase has been organized in an home environment.

Differences of researchers in their frequency of daily computer use and their usage purpose of computer affect observation and evaluation processes in research. It is envisaged that it will not be possible to establish homogeneity in terms of time and interest spent by the persons in research to be selected randomly in the research of this type to be performed with more participants.

It has been seen that images are saved from early hours of morning to late hours of evening since researchers use computers intensively in both workplaces and in other places rather than their workplaces. It has been observed that life logs are related with the work in day time and are related with education and social media in the evenings and at the weekends.

### 3.2. Summaries of observation and evaluation reports concerning the phases

Individual observations and evaluations concerning implementation can be categorized into two groups as problems and opportunities. Evaluations of participants in the phases are briefly included in Table 2 and Table 3.

Table 2. Problems identified in action cycles

Phase	Participant	Problems
Recording	Ayşe	<ul style="list-style-type: none"> <li>• The procedure of capturing image ends when computer turns into sleep mode.</li> <li>• Windows messages locking screen ends the procedure of recording screen image.</li> <li>• Computer cameras captures image with narrow angle.</li> <li>• Screen image captured in displays with small resolution can be cropped.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>• I have experienced a period of adaptation since I have been using Windows for the first time.</li> <li>• I do not take image from camera embedded to computer in Windows working over MAC Pro.</li> <li>• I have had a feeling of being watched for a short period when screen images start to be recorded.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>• Recording current moment leads more controlled performance of movements of individuals. Naturalness gets lost.</li> <li>• Recording other persons in the meetings causes the persons to be anxious.</li> <li>• When sleep mode is activated, capturing image is stopped. When sleep mode is deactivated, capture image does not continue.</li> <li>• Browsing and analyzing the images recorded each day take time.</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>• When image is captured from external USB camera, if camera is removed, software does not detect this case and it continues recording last image.</li> <li>• Windows Store applications installed from development environment stops working when developer license ends.</li> <li>• While Windows 8 tablet is full charge, it can perform recording for maximum 3,5-4 hours.</li> <li>• Overloading of recycling box can causes problem in OneDrive (SkyDrive) synchronization. Regular</li> </ul>



		clean-up is needed.
Interpretation	Ayşe	<ul style="list-style-type: none"> <li>Files in the nature of "Online-Only" cannot be transferred from SkyDrive (OneDrive). File attribute should be made as "Available offline".</li> <li>Once entered activity is selected, to come forward of images relating to that activity gets better.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>I only run software in Windows 8 system installed in Mac Pro. Screen resolution of Mac Pro is sufficient for displaying all time slices on display screen.</li> <li>Connection between images and comments should be tighter. When an image is selected, inputs relating to this and images relating to this input when an input is selected should appear more properly.</li> <li>Options of displaying images should be increased.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>Commenting procedure is time taking.</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>After a detail is processed in comment entry, data processed when another input is not clicked gets lost.</li> <li>Default image mode on the screen when images are listed should be "FullDayView". This will provide convenience.</li> <li>Browsing and commenting one week generally takes one hour. I have processed stories relating to 2014 year, episodes relating to January, February, March and April months and activities relating to the days between 1-5 April in a half day. For this purpose, I have created more than 50 records.</li> <li>While daily comments are processed, it is necessary to have a look at calendar tool of computer for determining which day of the week the day selected from node will be. What day of the week the selected day should be should be displayed within software.</li> </ul>
Listing Contexts	Ayşe	<ul style="list-style-type: none"> <li>If tree regarding context lists and images is displayed on the screen, it will be better.</li> <li>Relationship between experiences and contexts and contexts and experiences should be seen in a more useful manner.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>I have had a difficulty in creating behaviour and feeling lists.</li> <li>The system should be used for a longer period for developing context lists.</li> <li>Browsing experiences and obtaining contexts is fun but it is time taking.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>Each activity relating to the project for listing contexts of a project should be defined.</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>Context data in abundant number cannot be obtained sufficiently within research period because of lacking of period. Context data related to previous periods should be processed and lists should be enriched.</li> </ul>
Signification	Ayşe	<ul style="list-style-type: none"> <li>Required time is not sufficient for improving the project when the numbers of the phases get higher.</li> <li>More time is required in each phase for internalizing the phases more.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>I think that browsing and detecting the images of implicit learning experiences is difficult.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>Detecting integrative learning experiences is difficult.</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>Learning types are with their old names in experience processing software. I have made an update in software for enabling accurate selection of learning experiences of inputs from "Type" field.</li> </ul>
Management	Ayşe	<ul style="list-style-type: none"> <li>When the project proceeds, this becomes more significant for practitioners but it becomes difficult to explain this to others.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>I have had a difficulty in preparing the lists concerning past.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>How the persons having practice of planning activities can implement the recommended methods in this approach by avoiding repetition?</li> <li>How can mind mapping be added to this system?</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>Images of planning, controlling and evaluation lists cannot be processed onto experience processing screen and this is an important issue.</li> </ul>

Table 3. Opportunities identified in action cycles

Phase	Participant	Opportunities
Recording	Ayşe	<ul style="list-style-type: none"> <li>As far as what we have remembered by utilizing from our memory, those remembered by looking at images are more than average and in what time slice they are realized are more accurately remembered.</li> <li>When images are browsing at the end of day, the procedures envisaged to be performed but forgotten to be performed are easily remembered.</li> <li>When it is needed to have a look at an important document examined in a computer within a day again in another location, images contained in cloud can be browsed and image of that document can be accessed.</li> <li>Recording of screen and camera image during a day can be accepted in a time and this is not noticed.</li> <li>When computer is left open at night or when there is no one at home, this can be used as a type of security system since it continues to capture image.</li> <li>When a procedure performed in a computer is needed to be performed in another time or computer, recorded images can be leading.</li> <li>Activities performed in a computer by browsing daily activities can be detected where they get</li> </ul>

		<p>intensive. (Work, communication, social media, education, shopping etc.)</p> <ul style="list-style-type: none"> <li>• With whom computer is shared can be remembered from camera images.</li> <li>• I realize a lot of message which I have ignored while listening to the lesson in a virtual class environment by recording and browsing learning activities that I have performed over Internet while continuing with distance master education.</li> <li>• While image is recorded while using computer, experiences relating to other times or places cannot be recorded. This issue can be solved with a portable camera.</li> <li>• Recording images as well as recording sound and video will be useful in terms of revising experiences undergone afterwards.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>• When it is utilized from memory, details relating to a few days ago can be obscure. I start to make predictions instead of remembering clearly the procedures rather than daily routines. Even if more time is elapsed, I have remembered when and for what period I have done it with image record.</li> <li>• I have realized that I have spent a lot of time in shopping web sites in my first browsing. I need to make a time management.</li> <li>• It is accustomed to recording period within three days and it is started not realize it.</li> <li>• Browsing images of days gives opportunity of evaluating the day.</li> <li>• When I make a daily plan and review them at the end of the day, I can see to what extent I adhere to the plan.</li> <li>• Camera image capturing software has been updated in a way that will take image more than one camera and I have started to capture image by plugging external camera to my computer.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>• I have gained a different perspective about myself by revising in detail all my activities up today for the first time.</li> <li>• I can sense how much time I spend which job.</li> <li>• Following completion of research, I am contemplating to continue recording my experiences.</li> <li>• The procedure of recording image transforms into a routine procedure within a time.</li> <li>• I have realized that I have spent more time than I have thought in social networks in browsing performed in the first days.</li> <li>• Life logs contribute performing self-evaluation.</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>• When I watch a film on TV over HDMI cable by accessing Internet, archive of watched film is created since I continue capturing screen image.</li> <li>• I can take regular records in the computer in my workplace. I should strive to use Windows 8 tablet for recording the moments I have spent in especially social media in the evenings and at the weekends. I have started to capture environment image with Windows 8 tablet in the moments when I do not spend time in my computer environment.</li> <li>• I have purchased a telephone holder for recording image experimentally with Windows 8 smart phone while driving by my car and I have started to try it. After shooting inside of my car for a while, I have started to shoot outside from windscreen of my car.</li> <li>• When I record with the camera in presentation environments, slides in curtains can be recorded completely and an archive can be created.</li> </ul>
Interpretation	Ayşe	<ul style="list-style-type: none"> <li>• When images relating to experiences are interpreted, even if longer time is elapsed, it becomes easier to remember it.</li> <li>• For example, visual evidence is created in my hand belonging to all courses I have joined in virtual class.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>• While interpreting the images, I have had a chance to have a look at the woks I have done within a day.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>• Interpretation becomes more active by using image recognition technologies.</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>• I can make more integrative interpretation in classifications in the form of stories “continuing from previous year”, “stories started in previous years and to be completed in this year”, “stories starting in this year/predicted to be started in this year and to continue in the next year”, “stories started in this year/predicted to be started in this year”, “stories to be completed in this year”, “stories predicted to start in the next years” and “stories completed in previous years”. In addition to this, defining some portion of life routines as continuous stories (stories with no starting and ending) facilitates the episode.</li> <li>• I have taken notes of stories and episodes relating to past and future years by opening nodes not containing images regarding past years (2011,2012, 2013) and future years (2015,2016, 2017).</li> <li>• Software which will enable accessing interpretation inputs and recording records at the same time will enable to take down notes simultaneously (as in meeting environments).</li> </ul>
Listing Contexts	Ayşe	<ul style="list-style-type: none"> <li>• I have create a special information set for myself by determining contexts.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>• Context lists seems like a reflection of our lives.</li> <li>• Creating a context list and adding explanation is a fun.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>• Listing contexts enables me to realize relationship between contexts accompanying experiences.</li> <li>• Focusing on a context enables navigation between details.</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>• Starting from the closest contexts and accessing them accurately to remote ones will facilitate the</li> </ul>

		<ul style="list-style-type: none"> <li>process. It is possible to revise and deepen contexts on continuous basis.</li> <li>Obtaining contexts from experiences for longer times and adding experience information relating to these contexts enable to reveal implicit information of individual.</li> </ul>
Signification	Ayşe	<ul style="list-style-type: none"> <li>Trying to handle experiences as to their learning types enable to capture possibility of learning experiences without plan or realization.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>My awareness has increased in the issue of availability of other learning experiences as self-directed experiences within learning experiences within this phase and reactive (incidental) learning experiences as weighted terms.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>I have realized the learning processed that I was not aware with the activities I have made within the scope of this study. Lists I have created and notes I have taken, revisions I have made retroactively over these records and records I have made regularly will enable hidden data within a period to come together and to realization of new learning processes and reinforcement of learned information.</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>Revising learning experiences enable to relate different experiences with one another and especially experiences of acquiring new information can be undergone with intuition in integrative learning.</li> </ul>
Management	Ayşe	<ul style="list-style-type: none"> <li>I can plan distance learning activities, revise and supervise and evaluate the images.</li> </ul>
	Buket	<ul style="list-style-type: none"> <li>Procedures of planning future, controlling of present and evaluation of past generally consist of processes embedded with one another.</li> <li>Preparing lists regarding future (to do), present (doing) and past (did) in relation to learning experiences have enabled me to manage learning experiences.</li> </ul>
	İlker	<ul style="list-style-type: none"> <li>Supporting management process with mind map techniques will increase efficiency.</li> </ul>
	Mehmet	<ul style="list-style-type: none"> <li>In the method developed, firstly activities, then episodes and then stories emerge. However, in practice, stories and episodes can be determined in detail in advance as annual and monthly planning tools. These information can be updated at the end of month and in following periods of the year. Yearly and monthly nodes relating to future years and months should be manually opened herein. Software permits this.</li> <li>An approach which will facilitate acquiring stories from episodes can be developed.</li> <li>In this phase, I have started to create lists such as stories of year, plan of year, episodes of month, plan of month and weeks of month. These lists enable planning future, controlling present day and evaluating past to appear on the same screen with story, episode and activity comments.</li> </ul>

### 3.3. Descriptive analysis of data

When observation and evaluation reports pertaining to implementation performed for a period of nine weeks in the research are analyzed, the following findings have been accessed. Discussions in the meetings where individual observation and evaluation reports are evaluated within analysis period are mostly made use of.

- Even if system of life logging used has problems open for development, practitioners can easily get accustomed to passive daily record and can get adapted.
- Recording daily lives of individuals as computer screen and camera image is a thrilling experience and this raises awareness in regard to experiences of individuals in their daily lives.
- Since recording life experiences enable to return a desired moment and examine it, it reduces stress of remembering activities and events in individuals.
- Individuals discover new and different usage possibilities of recording procedure that they do not envisage before.
- Interpreting experiences enable individuals to get to know themselves better.
- Interpreting experiences direct individuals to contemplate over past and future experiences as current experiences.
- Listing contexts relating to experiences enable creating personal knowledge base and makes nodes of complex network and associations constituting life of individual more distinctive.
- Activities such as realizing learning experiences disperse to whole area of life experiences by trying to signification learning experiences, naming, distinguishing period and frequency of experiences and classifying the same can be performed in this way. This case reinforces dominance of individual over its learning process.
- Management process of experiences with the procedures of recording, interpreting, classifying and signification experiences has been performed implicitly to a great extent. "Management" phase that is final phase enables reporting of decisions given in this process.

- Individual's observing itself in a way that will cover a few years before and a few years after regarding the moment will enable individual to identify its personal road map properly.

#### *3.4. Findings as to user's characteristics*

Although personal characteristics are not emphasized in this study, findings show that usage habits of users vary according to learning experiences emphasized (informal learning, formal learning and formal distance learning). This case triggers necessity of longer term individual action researches and focusing mostly on type of learning experience of practitioners.

### **4. Discussion, conclusion and recommendations**

#### *4.1. Discussion*

Life logging researches become widespread as of the beginning of 2000's and approaches are developed in order for individuals to record their experiences and to examine them afterwards. Especially researches come to the fore for supporting individuals having memory problem (Hodges et al., 2011). Obtaining learning experiences from life experiences records in this study and managing these learning experiences are studies as an original issue.

It is seen that capturing life experiences as a result of findings obtained and analysis of findings is a thrilling experience and causes habit after a while. In addition to this, interpreting experiences helps individual to reveal the information possessed about itself. After this, when individual creates context lists related to experiences, it can clearly draw its own borders. When individual focuses on learning experiences during recording, interpreting and classifying process, it can explain its learning experiences and it can realize learning opportunities that it has missed as it has owned. In the same way, it realizes weak areas as strong areas via learning. In final phase, individual targets to manage learning experiences, to turn unplanned and/or unaware life learning experiences into opportunity and to obtain more value than these experiences. Other learning experiences undergone by individual will enable supporting self-directed learning experiences and this enhances effect of life experiences over development of individuals.

#### *4.2. Conclusion*

Findings obtained in the study and method of "learning experiences management" as a result of analysis of findings and software developed for facilitating implementation of this method equip practitioners with foundations relating to planning, evaluation and controlling skills of formal, non-formal and informal lifelong learning experiences and it is seen that these skills are sufficient tools on starting level for implementing these skills.

#### *4.3. Recommendations*

That individuals capture their life experiences and use skills of learning experiences management during their lives by making use of this will have influential effects over their personal developments. Having knowledge and skills required by the age, correct orientation of professional development, effectively creating and updating personal road map, realizing learning deficiencies and acting more consciously and in a planned way for remedying such deficiencies can be listed among them.

In this study, applicability of learning experiences management method has been focused on. Especially formal learning, non-formal learning and informal learning types have been independently emphasized for examining in detail effectiveness of developed method and tools and more comprehensive and longer term researches should be conducted. Moreover, it may be targeted to determine different usage modes of method with the studies based on observation of several users and to measure contributions made to individuals having different qualifications. More different sensors such as sound and video in addition to camera and screenshot image for capturing life experiences should be used and research and development studies are needed for observing effects of these. Development should

be made in order for "experience processing" software used for management and processing of captured data to be more user friendly.

Modular nature of learning experiences management method enables this approach to be used for different purposes. For example, if health experiences are emphasized instead of learning experiences in fourth phase following the first three phases and planning, controlling and evaluating health experiences are conducted in fifth phase over this, approach of "lifelong health experiences management" can be obtained. This adaptation procedure method can be tried out for very different areas to be focused on in fourth phase.

## Acknowledgements

This study was supported by Anadolu University Scientific Research Projects Commission under the grant no: 1301E014.

## References

- Banks, J., Au, K., Ball, A., Bell, P., Gordon, E., Gutierrez, K., et al. (2007). *Learning in and out of school in diverse environments: Life-long, life-wide, life-deep*. The LIFE Center (The Learning in Informal and Formal Environments Center), Seattle, University of Washington, Stanford University, and SRI International, Retrieved from [http://life-slc.org/docs/Banks\\_etal-LIFE-Diversity-Report.pdf](http://life-slc.org/docs/Banks_etal-LIFE-Diversity-Report.pdf).
- Clark, T. (2005). Lifelong, life-wide or life sentence? *Australian Journal of Adult Learning*, 45(1), 47-62.
- Henfridsson, O., & Lindgren, R. (2007). Action research in new product development. In *Information Systems Action Research* (pp. 193-216). Springer US.
- Hodges, S., Berry, E., Wood, K. (2011). SenseCam: A Wearable Camera That Stimulates and Rehabilitates Autobiographical Memory, *Memory*, 19(7), 685-696.
- Hodges, S., Williams, L., Berry, E., Izadi, S., Srinivasan, J., Butler, A., ... , Wood, K. (2006). SenseCam: A Retrospective Memory Aid, In *UbiComp 2006: Ubiquitous Computing*, Springer Berlin Heidelberg, 177-193.
- Guba, E. G. (1981). Criteria for assessing the trustworthiness of naturalistic inquiries. *ECTJ*, 29(2), 75-91.
- McNiff, J. (2013). *Action research: Principles and practice*. Routledge.
- McNiff, J., & Whitehead, J. (2009). *You and your action research project*. Routledge.
- Mutlu, M.E. (2013a). Creating Three Dimension Learning Model and Learning Experiences, 22 *Ulusal Eğitim Bilimleri Kurultayı*, Eskişehir Osmangazi Üniversitesi, 5-7 September 2013. (In Turkish)
- Mutlu, M.E. (2013b). Genişletilmiş İnförmel Öğrenme Modeli ve Öğrenme Deneyimlerinin Yönetimi için Bir Yöntem, 22. *Ulusal Eğitim Bilimleri Kurultayı*, Eskişehir Osmangazi Üniversitesi, 5-7 September 2013. (In Turkish)
- Mutlu, M.E. (2013c). Öğrenme Deneyimlerinin Kaydedilmesi İçin Çoklu Cihaz Tabanlı Bir Yaşam Günlüğü Sisteminin Geliştirilmesi, *Eğitim ve Öğretim Araştırmaları Dergisi (JRET)*, Cilt 2, Sayı 4, Makale No:28, 256-269 pp., November 2013. (In Turkish)
- Mutlu, M.E. (2013d). Yaşam Deneyimlerinin Yönetimi İçin Bir Sistem Önerisi, 30. *Ulusal Bilişim Kurultayı*, 28-29 November 2013, Ankara. (In Turkish)
- Mutlu, M.E. (2013e). Yaşam Günlüğüne Dayalı Bir Kişisel Bilgi Tabanı Sistemi Tasarımı, *İnet-Tr 2013 – XVIII. Türkiye’de İnternet Konferansı*, İstanbul Üniversitesi, 9-11 December, 2013. (In Turkish)
- Mutlu, M.E. (2014a). Design and Development of a Digital Life Logging System for Management of Lifelong Learning Experiences, *Int-e 2014 International Conference on New Horizons in Education*, June 25-27, 2014, Paris. (Accepted)
- Reason, P. and Bradbury, H. (2008). Introduction, in P. Reason and H. Bradbury (eds) *The Sage Handbook of Action Research: Participative Inquiry and Practice*. Sage, CA, pp. 5–10.
- Riel, M. (2010). *Understanding Action Research*, Center For Collaborative Action Research, Pepperdine University (Last revision Sep, 2013). Retrieved from <http://cadres.pepperdine.edu/ccar/define.html>.
- Uzuner, Y. (2005). Özel Eğitimden Örneklerle Eylem Araştırmaları, *Ankara Üniversitesi Eğitim Bilimleri Fakültesi, Özel Eğitim Dergisi*, 2005, 6 (2), 1-12. (In Turkish)
- Yıldırım, A., Şimşek, H. (2003). *Sosyal bilimlerde araştırma yöntemleri*. Ankara:Seçkin (In Turkish)