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**Service Value Co-creation in Older Adult Education:
Case Studies of Chinese University for the Third Age**

by

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Abstract

The nation is rapidly graying. Such statement is mentioned in a report by American Council on Education, 2007. Aging society has becoming a global phenomenon, as the rapid growing number of older people in the world. This problem leads to various social problems such as workforce shortages, health and medical care burden and increasing demand for financial investment.

Older adult education (OAE) is a process of knowledge creation, providing older adults with ways to improve their knowledge and skills and help them to live better life in their third ages. OAE has been being increasingly adopted and deployed in many countries as an effective approach to improve the life quality of retired older adults, to keep them both physically and mentally healthy, and to help them back to workplace. In many countries, governments invest huge manpower, material resources and financial resources to found OAE organizations and provide the education as a public service. There are also numerous researches on OAE ranging from theories to practices. A challenging problem of OAE is that it lacks systematic approach to maximize the value of OAE services, i.e., curriculum that makes both the older learner and the education provider maximally satisfied and profited from the education, due to the variety of older learners' requirements and uncertainty of education providers' objectives.

Service science is a research field of studying complex service systems in which specific arrangements of people and technologies take actions that provide value for others. Maximization of service values is one of the hottest research topics in this field. Value co-creation has been proposed as an effective mean to maximize service values. It emphasizes collaboration between service providers and consumers. Many service value co-creation models are proposed and proved effectively in business services.

In this work, we study the value co-creation of OAE curriculum development from service science perspective, aiming at investigating a systematic approach to achieving the maximization of OAE service values. We first propose a structure and process model for OAE value co-creation from service science perspective. OAE as non-profit public service, its value can be achieved through value co-creation; older learners are co-creators of OAE value.

We then conduct case studies to validate the proposed research hypothesis. We choose three representative OAE universities in China as cases and investigate their mechanisms of developing OAE services and curriculum and compare analysis results with hypothesis and summarize new findings. Through case studies, we find that our hypothesis is almost

consistent to the mechanism of curriculum development in OAE universities but with some new specialties.

Finally, we make comparison of three chosen OAE universities and also compare OAE university with other modes of OAE and general school education to find more specialties of curriculum development of OAE universities. Based on case study and discussion results, we propose a new curriculum development process model for value co-creation of OAE university with high educated learners called a four-stage spiral model. The novelty of the proposed model is that it formalizes the curriculum development process in OAE university through the whole life cycles and each iteration of the four steps in the model is a waterfall process. The new novelties make the spiral model distinct from KIKI model from which the spiral model is derived.

Keywords *Older adult education, service science, service value co-creation, KIKI model, curriculum development, four-stage spiral model*

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The past four years is a long journey to me. Many things happened, and they are clearly happening in my mind whenever I look back to the life that I experienced in this period. I remember how excited I was when I was told that I succeeded got scholarship for my doctoral program; I remember how happy I was when my first research paper was accepted; and I remember birds' singing outside my window in early morning when I stayed up all night to prepare my papers. All these would be impossible without the support from my family, my supervisors, and all my friends. I would like to express my sincere gratefulness to all of them.

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Acronyms

ESLC Education Service Life Cycle.

G-D Logic Good Dominant Logic.

JAUE Jingan University for the Elderly.

LLL Lifelong Learning.

OAE Older Adult Education.

PLC Product Life Cycle.

QoL Quality of Life.

S-D Logic Service Dominant Logic.

SUE Shanghai University for the Elderly.

SURVC Shanghai University for the Retired Veteran Cadre.

Chapter 1

Introduction

1.1 Background

With the raise of aging problem in many developed and even developing countries, Older Adult Education (OAE) has been considered an effective way to deal with the problem and widely adopted and deployed. It comes naturally another problem that how to fully utilize OAE, i.e, to maximize the value of it. Unlike business services to which numerous efforts are being made to achieve their maximal value, OAE is usually provided by government as a public non-profit service, and few attention has been paid to the maximization of its value. This study proposes a concrete service value co-creation model that is specialized to OAE by studying three successful cases on OAE universities in Shanghai from service science perspective.

In this chapter, the author gives the overall introduction about the research design of the study, including research background and issues, research objectives and questions, research originality and novelty, and the organization of the dissertation.

1.1.1 Aging problem around the world

Worlds population is aging: virtually every country in the world is experiencing growth in the number and proportion of older persons in their population. (Nations et al., 2015) Such statement is mentioned in the report of World population Aging 2015 from Department of Economic and Social Affairs Population Division, United Nations. Aging society has becoming a global phenomenon, as the rapid growing number of older people in the world. Figure 1.1 shows the population aged 60-79 and aged 80 years or over by development

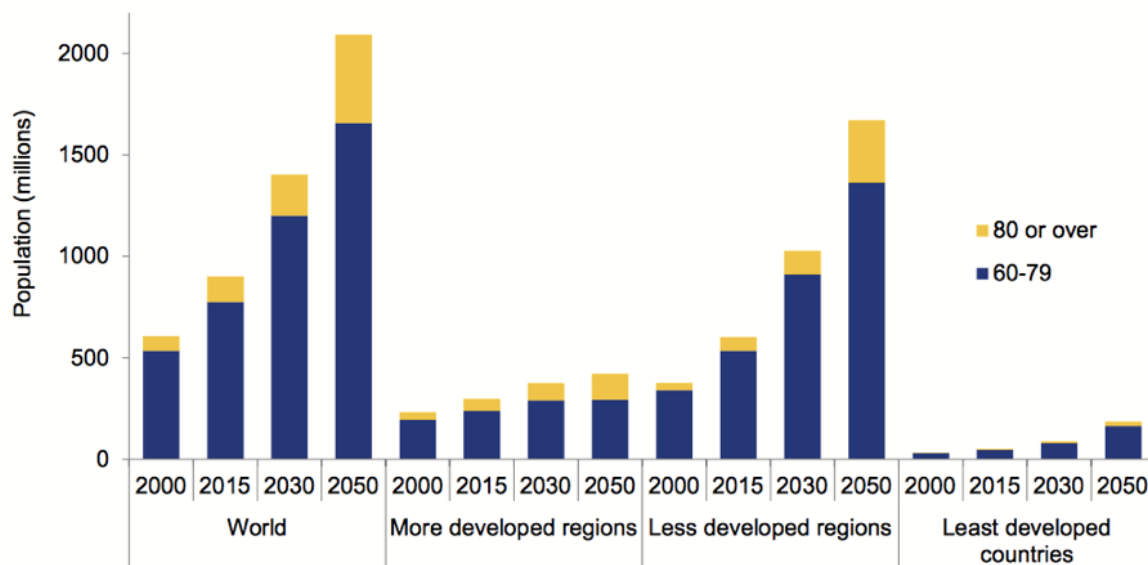
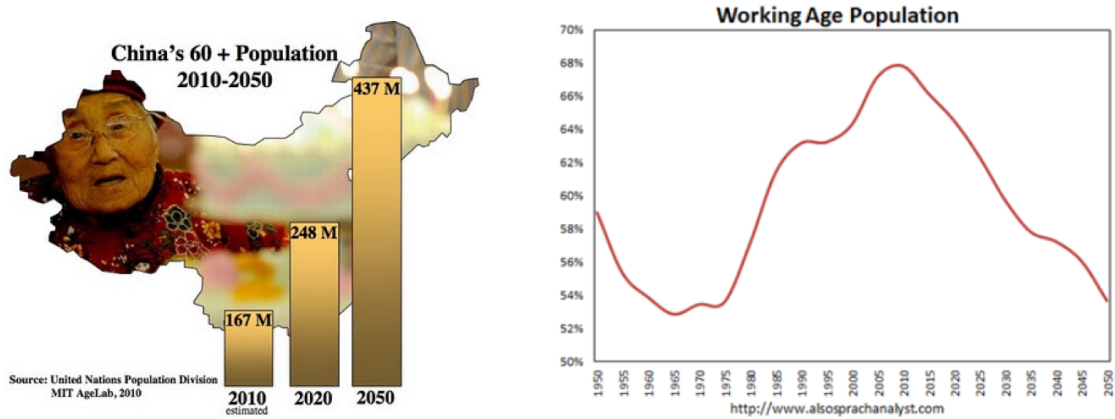


Figure 1.1: Population aged 60-79 years and aged 80 years or over by development group, 2000, 2015, 2030 and 2050; Data source: United Nations (2015). World Population Prospects: The 2015 Revision.

group, 2000, 2015, 2030 and 2050. It can be witnessed clearly that not ever in developed countries, even in developing countries are experiencing serious population aging.

The trend of population aging in China has been rather challenging as it has the largest population and has stepped into an aging society since 1999 (Wei et al., 2009). According to the national census in 2010, the 60-and above age group and 65-and above age group accounting for 13.26% and 8.87% respectively of the total population. And the percent of them will increase to 32.8% and 23.9% respectively by 2050 (Findsen and Formosa, 2016).

The aging problem brings many social issues such as the decrease of labour force population and the increasing burden for the society, such as financial burden and health care burden. Figure 1.2 shows the population aging trend in China accompanied with the decrease trend of working labour force. Population aging-the increasing share of older persons in the population is poised to become one of the most significant social transformations of the twenty-first century, with implications for nearly all sectors of society, including labour and financial markets, the demand for goods and services, such as housing, transportation and social protection, as well as family structures and inter-generational ties (Nations et al., 2015).



(a). China's 60+ population, 2010-2050 (b). Working age population trend

Figure 1.2: The population aging trend and working age population trend in China

1.1.2 OAE: an approach to aging society

In 2001, European Commission (EC) proposed the concept of Lifelong Learning (LLL) and gave the definition of it that *Lifelong learning means all learning activities undertaken throughout life with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective.* (Commission, 2001; Dehmel, 2006) The widening demographic change in the society highlights the importance of the need to include older learners into lifelong learning (Benyon et al., 2010). LLL needs to be a priority that it is the key to employment and economic success, allowing people to participate fully in society.

As the last station of LLL, Older Adult Education (OAE) is a special type of education involving older people into learning in their later life. It is a process of knowledge creation, providing the old adults with ways to improve the knowledge, skills and help them to enjoy lives (Cai and Kosaka, 2016).

OAE applies not only in terms of leisure-based learning but also in the provision of learning for older people which helps them remain in the labor market beyond the usual retirement age, and thus to engage fully in society as active citizens (Benyon et al., 2010). It was proposed to improve life quality of the older adults, and decrease the burden caused by aging society. For older learners, OAE can be used for them to add value for second careers, personal enrichment and psychological growth, to prevent or delay the onset of cognitive decline and to aid in adjustment to life beyond work.

OAE is now prevalently adopted in developed countries and also in many developing countries along with the concept of LLL which has become a central theme in education area. Figure 1.3 shows the improving percentage of older adults (65 & up) participating OAE activities from 1991 to 2005 in US. Shanghai is one of examples showing the rapid development of OAE in China. According to incomplete statistics, the number of

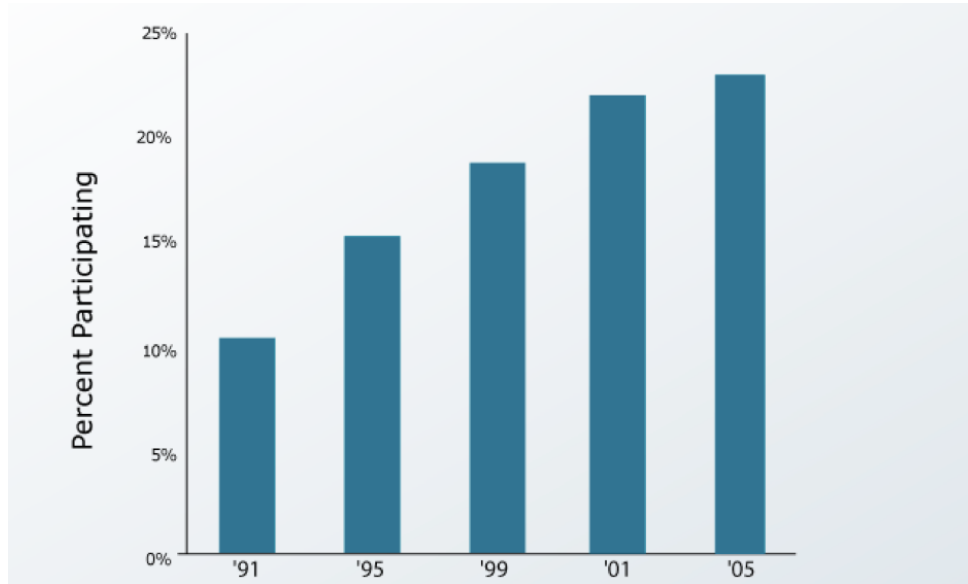


Figure 1.3: The Percentage of older adults (aged 65 & up) participating adult education activities in US, 1991-2005

universities and schools for older people in China has drastically increased to 43000 and learners have reached nearly five million until 2013 (Gu, 2013). OAE in Shanghai is at the top level among all Chinese cities. By the end of 2015, there are 4 municipal level OAE universities, 68 district level community universities or colleges, 212 OAE schools and more than 10000 teaching centers in Shanghai.

There are three types of OAE, i.e., formal education, non-formal education and informal education. The differences of them make it difficult to provide suitable curriculum to each type of OAE to meet learners' requirements. The following we give the explanation of them one by one.

- *Formal education:* It is conducted in the formal school system and associated with regular form of learning; Students are the recipients of education at all levels of education-at elementary school, middle school, vocational schools, secondary schools, post-secondary schools, as well as at the level of higher education with different levels: Bachelor, Master and PhD level and regardless of the form of study (full-time or part-time).

The formal type of OAE refers to formal organized and regular conducted education activities for older learners to pursue some degrees by attending provided courses.

- *Non-formal education:* It refers to any organized educational activity outside the established formal system that is intended to serve identifiable learning clientele and learning objectives. It applies to all types of further education and training outside the school system in which the person participated after leaving the formal

education system, like University of the Third Age and Community College.

- *Informal education:* It is the truly lifelong process whereby every individual acquires attitudes, values, skills and knowledge from daily experience and the educative influences and resources in his or her environment from family, neighbors, workplace, library and mass media.

The three types of education are different from each other and play different roles in process of older citizens learning, and come together to promote the development of education for older adults.

1.1.3 Main issue in OAE

At present, the service value of OAE for older adults is still at a relatively low level in that older learners' requirements cannot be met and education providers' objectives cannot be achieved. There are gaps between education providers' motivations and older learners' motivations. *The main issue that leads to the situation is the lack of desired curriculum in the education.*

Motivation plays a central role in the process of older adult learning and education (Mulenga and Liang, 2008; Yin, 2011). As described in the report (Lakin et al., 2007), *at the heart of these challenges is the range of motivations and needs of the older adult population.* To maximize the service value of OAE, it is necessary to balance the motivations of older learners and OAE providers, and hence to make the objectives of both sides achieved. In this section, we survey the current situation and literature to understand the motivations of both older learners and education providers and present three reasons that make it a challenging problem to improve the value of OAE and development proper OAE curriculum.

Reason I: requirement variety of older learners

Many researches have been conducted to study the motivations of older adult learner to participate OAE. Dench and Regan point out in their work (Dench and Jo, 2000) three major motivations that 74% of older participants reported as very or fairly important to their study, which are intellectual, personal and instrumental motivations. Intellectual motivation means that learners want to learn new knowledge, to keep their mind active, and to enjoy the challenge of learning new things. By personal motivation it means that they wish to gain qualifications for personal satisfaction and to take their life in different directions. Instrumental motivation means that learners want to learn for their work, to help their family, and to help with voluntary or community work.

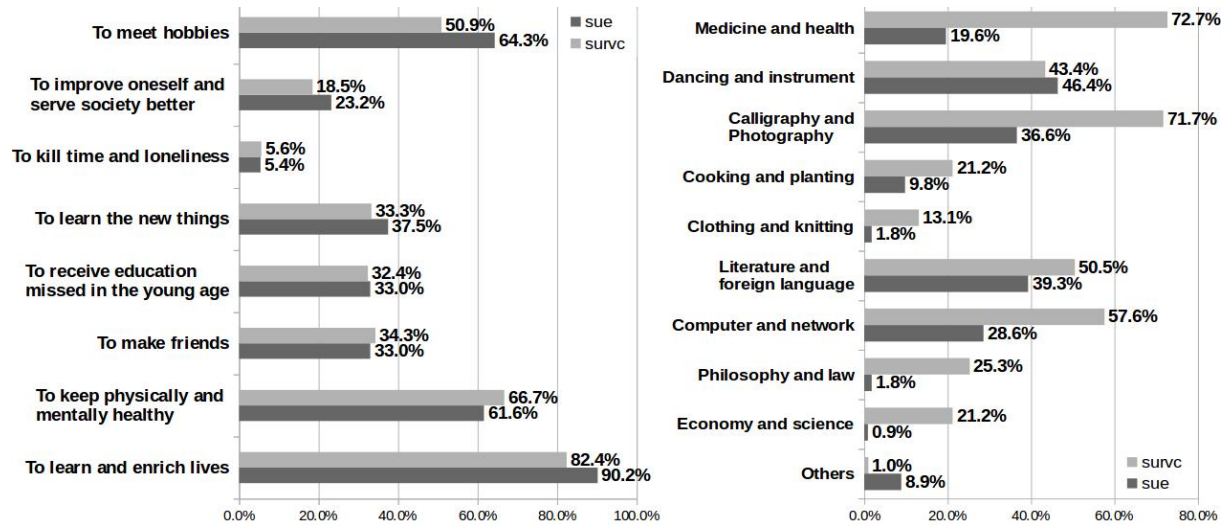


Figure 1.4: The distributions of the purposes of participating education for older learners (left) and the contents they wish to learn (right): a survey in Shanghai University for the Retired Veteran Cadre and Shanghai University for the Elderly

Yin classifies the motivations of older adult learners into the five kinds, which are close to the motivations summarized by Dench and Regan (Yin, 2011). The five kinds of motivations include:

1. *Desire for knowledge*, i.e., to improve themselves by learning new knowledge in which they are interested in;
2. *Desire for stimulation*, i.e., to have the chance to exercise their mind to keep mentally active;
3. *Desire for self-fulfillment*, i.e., to self-actualize by pursuing a diploma, or to learn to contribute society;
4. *Desire for generativity*, i.e., to take responsibility for future generations by learning and teaching;
5. *Learning as a transition*, i.e., to learn new things to transit to another life or new career.

Our survey results also reveal such reality. We investigated around 200 older adult participants randomly in two Shanghai universities for OAE (Shanghai University for the Retired Veteran Cadre (SURVC) and Shanghai University for the Elderly (SUE)) their motivations of attending the university and the contents they wish to learn in the university. In our questionnaire, we gave ten options of the purposes which are concrete instances of the motivations classified by Yin. Respondents can choose multiple purposes. Figure 1.4 shows the distributions. The left diagram shows the distributions of the purpose

of participating OAE education activities, from which it can be clearly observed that the purposes diverge and the distribution diverges of the two universities are similar. The first three purposes are *to learn and enrich lives, to keep physically and mentally healthy* and *to meet hobbies*. However, the other purposes such as *to make friends, to learn new things*, and *to receive education that is missed in the young age* are also of large portion. There is no particular one dominant purpose for which older learners go to university. The contents that older learners wish to learn are also various, ranging from literature to science, and entertainment to art, which mainly depends upon their background, hobbies, and motivations.

The variety in both purposes and contents causes big challenges to OAE university to provide appropriate education services to meet the requirements of older learners. In addition, the difference of education and working experiences also increases the difficulty in designing suitable curriculum.

Reason II: Objective multiplicity of education providers

The objectives (or aim) of providing education for older adults have been discussed in numerous literature from either theoretical or practical point of view. Theoretically, education is considered as a right that must be accessible throughout life, and therefore educational institutions become responsible for creating opportunities involving older adults themselves in activities backed up by the philosophy of lifelong learning and inter-generational education (Findsen and Formosa, 2016). To be concrete, by OAE (a) it satisfies older adults' cultural needs; (b) it answers older adults' educational demands; (c) older adults contribute to their support through their work and tax payment.

Practically, there is not certain unique motivation of founding an OAE university. Founders such as governments wish to achieve many goals by founding OAE universities. One of the main objectives of providing higher education to older adults is to alleviate or solve social problems caused by population aging. For instance, in the report (Lakin et al., 2007), it is proposed that OAE for older adult can help address workforce shortages. Older adults education experiences in Argentina emphasize the role that education has on empowering and learning new social roles or the re-signification of traditional ones (Findsen and Formosa, 2016). We take one of the most famous OAE university, i.e., The University of the Third Age (U3A) founded in France in 1972, in the world for example. The founders of the university formulated their three aims for the education of older adults (Findsen and Formosa, 2016):

1. The first rule is around learning and "intellectual stimulation" encouraging members to share their knowledge with others and learn from others;
2. The second is social and concerns providing social contacts for its membership, i.e.,

to provide continuing education, stimulation and companionship for retired people, as one committee member put out;

3. The third is an advocacy aim and asserts the ability of older adults to continue learning, i.e., to refute the idea of intellectual decline with age.

However, such aims or motivations are usually given at high level, i.e., too abstract to be put into practice directly. There remains a big gap between these motivations and practical demands from older adults. Some specific and applicable objectives should be identified. Such applicable objectives usually come from the demands of older learners.

In China, OAE universities are founded with the aim at answering various demands from the elderly. There is a well-accepted motto for OAE in China, i.e., *for older adults there should be something to live on, something to learn, and something to be happy with.* Many OAE universities are founded with this guideline. The guideline is obviously older adult-centered. However, it is a high-level guideline and lacks of concrete objectives to achieve. We interviewed some administration officers and lecturers about the motivations of their universities. We found that although both of the two universities have general guidelines and missions, there are no specific objectives to pursue and their curriculum are developed mainly on the basis of older learners' demands, as stated by one interviewed administration officer.

With the situation of objective multiplicity of education providers, it brings challenges to OAE curriculum development for creating values of service. Desired OAE curriculum should not only meet learners' needs, it also need to match the providers' objectives. When both of sides get satisfaction, then the service value of OAE is created. Therefore, how to identify learners' requirement and propose suitable education contents for learners that can also meet providers' objectives need to answer in this study.

Reason III: Education flexibility of OAE

Another characteristic in OAE is that education for older learners is more flexible than those in regular school education in both contents and forms. Such difference makes existing education guideline for regular school education not well suited to OAE.

The differences between OAE and regular school education can be coarsely viewed as the differences between non-formal education and formal education. Formal education refers to those hierarchically structured, chronologically graded education system which runs from primary school through the university including a variety of specialized programs and institutions for full-time technical and professional training. While non-formal education means any organized educational activity outside the established formal system (Siguencia et al., 2012). In the research report (Lubkina et al., 2012), a comprehensive comparison between them are made from fives aspects, i.e., teacher/student dynamic,

environment, content, teaching/learning methods, and teaching/evaluation tools. They proposed six adult learning principles which can be considered the main characteristics different from the ones of formal education. The six learning principles are:

1. Expected to be treated with respect and recognition;
2. Want practical solutions to real-life problems;
3. Can reflect on and analyze individual experiences;
4. Have different learning style;
5. Are motivated by the possibility of fulfilling personal needs and aspirations;
6. Are capable of making their own decisions and taking charge of their own learning.

Apparently, older learners play a central role in OAE, while teachers are the key figure in the regular school education. They are classified as student-centered and teacher-centered education strategies respectively, and student-centered education is regarded as an *à la carte menu* where the diners choose what they want (Blumberg, 2009). Thus, education service for OAE should be on the basis of the needs of older learners in a bottom-up manner. On the contrary, in regular school education both education providers and students have clear objectives, and the learning is generally more passive than active. Education activities for regular school education is mainly on the basis of the objectives of education providers while individual students do not have much control over what and how they learn in the school. In that sense, education principle for regular school education is basically in a top-down manner.

According to above literature review and situation survey, there are many characteristics of OAE which become barriers and main challenges for improving the service value of OAE for both older learners and education providers and developing curriculum for older learners. Little attention has been paid to minimize the gaps of motivations between education providers and older learners and build a systematical curriculum development process model that take consideration of specificities of OAE service. In this work, OAE services mean education providers providing curriculum to older learner in OAE universities. Some new solutions should be identified to maximize the service value of OAE and develop a systematical curriculum development model to design needed courses for meeting older learners' requirements, achieving education providers' objectives and suiting to OAE characteristics.

1.1.4 The importance of service science and service value co-creation

Service science is an emerging field of the studying service system and the co-creation of value within complex configurations of resources (Vargo et al., 2008). In Service Science, a service system is composed of customers, service providers and service co-creation activities, and service is thought of a kind of activity of supporting human beings and organizations to enable them to achieve their objectives (Kameoka et al., 2007). It is the application of competences (knowledge and skills) by one entity for the benefit of another (Vargo and Lusch, 2004). This definition implies that value is created through collaboration in interactive configurations of mutual exchange (Vargo et al., 2008).

Value creation is the core purpose and central process of economic exchange (Vargo et al., 2008). The objective of a service system is to maximize the service value to assure the satisfaction of both customers and service providers. Maximization of service values is one of the hottest research topics in this field. More and more researches on service innovation and service value creation have been carried out. Value co-creation has been proposed as an effective means to maximize service values. It emphasizes collaboration between service providers and consumers. A number of value co-creation models have been proposed in different logic such as Service Dominant Logic, Goods Dominant Logic, Experience based Service Value Co-creation, and Experience based Economy.

A service value co-creation model can be either static or dynamic. Kosaka et al. proposed a dynamic experienced-based service value co-creation process model called KIKI model (Kosaka et al., 2012), and one of the features of KIKI model is that a new notion of *service field* is first introduced and applied to B-to-B (Business-to-Business) collaboration. Service field is a concept that is similar to electromagnetic field in physics, where electromagnetic power is determined by both the electric charge and the electromagnetic field where it is located. The value of a service is also determined by the service itself and the field which shows the context of provided services (Kosaka, 2012). KIKI model is a four-step spiral process, aiming at designing new service that is suited to service field, and hence creating maximal service value. During the iteration of the process, the service field changes based on the change of the customer's experience in each step. Correct identification of service fields determines the design of new service, and hence is the crucial step in the model.

Besides service field, another feature of KIKI model is that collaboration between service providers and customers is emphasized for service value co-creation. Customers actively participate into knowledge sharing and implementation of new service idea. By collaboration, service providers learn better the preferences of potential customers, and draw correct service fields, which help service provider design new services to create maximal values in the identified service field (Zhang et al., 2013). KIKI model has been applied to concrete business fields such as branding of university research-laboratories

(Nguyen et al., 2016), human resource management (Doan et al., 2014) and language education (Dong et al., 2013). Details about KIKI model can be find in Section 2.3.3 of Chapter 2.

1.2 Research objectives and questions

In this section, we first show the research objectives and then give the main research question and subsidiary research questions which need to be answered in this study.

1.2.1 Research objectives

In this research, we focus on non-formal education for older learners with the consideration that non-formal education plays a dominant role in OAE, compared with other two types of educations. For non-formal OAE education, OAE universities and institutions are more comprehensive organized than other organizations such as learning centers and social organizations. The education systems in OAE universities and institutions are more complete, representative and stable.

With the consideration of the problems and characteristics of OAE as aforementioned, *the main objective of this study is to investigate from service science systematic approaches to OAE curriculum development, by which older learners' objective and education providers' objective can be achieved with maximized satisfaction from the education, aiming at improving the current situation by maximizing the service value of OAE.*

To be more concrete, the main objectives consists of three subsidiary objectives as follows:

1. To identify the most challenging point of identifying older learner' requirements for education contents;
2. To get the overall understanding about roles of older learners and education providers and their relationship in the process of curriculum development.
3. To propose a specific curriculum development model tailored for the value co-creation of OAE service.

1.2.2 Research questions

To achieve the aforementioned main objective of this study, the central question needing to answer is that *can we apply existing service value co-creation models to OAE and how to achieve the innovation of OAE and improve service value of it to get the maximized*

satisfaction of older learners.. We take above three characteristics of OAE into consideration, and answer main research question and three subsidiary research questions. From the answers to this question, we would be able to find solutions to existing problems of OAE and hence achieve the objective of the study.

Main research question (MRQ)

How to create service value of OAE and develop curriculum to get the maximized satisfaction of older learners.

Subsidiary research questions (SRQ)

To answer the main research question, we consider the following three subsidiary research questions:

SQR 1: How to identify the requirements of older learners for education contents?

SQR 2: What are roles of older learners and education providers in the OAE curriculum development.

SQR 3: What is the process of OAE curriculum development.

1.3 Research originality and novelty

Currently, the researches on OAE are usually limited to the theories in education science and social science. It makes the impact of research results quite limited. For instance, from the sociological point of view, one may consider how to make the elderlies lives colorful, but neglect their desire to re-establish themselves. While from the educational point of view, researchers may emphasize the results of the education, but neglect the process, which is in some sense more important than the results. Thus, it requires a broader view to discover new solutions to release or even solve existing problems in OAE, instead of treating them just as social or educational problems. There are some earlier researches in the other countries related to the proposed one. Lusch et al. have proposed to study higher education reform from the service science perspective (Lusch and Wu, 2012). They applied the service productivity theory to higher education reform. They claimed that the product of education is a co-created learning service, such as instruction, credentialing, career support, rather than credit hours or degrees. Comparing their research with our study, there are several differences.

The first is research subject. OAE is essentially different from higher education. For instance, the main purpose of OAE is to meet the various and spiritual demand of the

elder, while the latter is to develop the youngers talent and skills. Therefore, their results are not suited to OAE.

The second difference is underlying theories. we study the innovation of OAE by service value co-creation models, while their underlying theory is service productivity. Compared with service productivity theory, service value co-creation models emphasize the knowledge sharing between service provider and customers, and the identification of service field, which are more suited to study the OAE.

The most distinctive point of our study from empirical works of OAE is to achieve the innovation of OAE from the service science perspective, especially from the service value co-creation conception. That is to investigate a model of applying service science point of view to OAE for maximization of service value. As far as we know no such researches have been conducted to solve the problems in OAE by service science. From the perspective of service science, we treat OAE as services, education providers provide services to the elderly for their satisfaction. The provided education services are designed on the basis of the motivations of education providers and older learners. Then the maximal value of OAE can be gradually achieved through knowledge sharing and collaboration of education provider and older learner. Such conjecture seems feasible, but needs more work to prove. Therefore, this research brings us a new research topic, i.e., to invent a model based on the theory of service science for OAE in order to improve the quality of it.

Precisely, in the research, we are going to achieve the innovation of OAE by using service value co-creation model, e.g., KIKI model (Knowledge sharing related to service system, Identification of service fields, Knowledge creation for new service idea, and Implementation of service idea). KIKI model is new service value co-creation model based on experience and has been successfully applied in various B-to-B (Business to Business) collaborations such as energy saving service business. Are the applications of KIKI model only limited to B-to-B collaborations? Can the model be used in other fields such as OAE and how can it be? They are the questions we want to answer by conducting this research. Another new point of this research is to demonstrate the validity of KIKI model in OAE, and hence to show the generality of the model for service value co-creation.

Concisely, there are three main innovative points in the study that have not been researched before. They are listed as follows:

Innovative Point I: This is the first work studying OAE from Service Science perspective

OAE is different from general school education in many aspects, such as education forms and education objectives. The older learners have some common characteristics with customers, it makes possible to think OAE from service science perspective. With these facts, OAE can be viewed as a type of service, and it should be conducted according to SDL,

in which older learners are active participants of the service. The value of OAE can be achieved through service value co-creation. The model of service value co-creation structure can be used to analyze relationship between older learners and education providers, and the model of service value co-creation process (KIKI model) can be used to identify the service field of OAE, provide new services to older learners, and maximize their satisfaction and improve the value of education providers. Based on above inferences, we propose the structure and process model of service value co-creation model for OAE based on KIKI model.

Innovative Point II: A practical waterfall process is summarized from case studies for OAE curriculum development

we summarize the collected data from older learners and education providers, and three examples of curriculum development and conclude a waterfall process for OAE curriculum development. The process of six steps are from the successful education practice in three cases.

Innovative point III: A collaboration-based four-stage spiral model is proposed for OAE curriculum development by extending an existing model

We compare the research hypothesis with the concluded analysis results and find the consistency of them and also some specialties of OAE service. Then we extend the research hypothesis and propose a collaboration-based four-stage spiral model. The new model is proposed for curriculum development of OAE universities which have high educated older learners. It has four steps with four stages and each step is essential a waterfall process with rollback. In each stage of curriculum development, it needs many spiral process of four steps. The new extended spiral model have some common points with the hypothesis, but it has the characteristic of education service life cycle and roles of education providers and older learners.

1.4 Organization of the dissertation

In this section, an overall introduction to the organization of the study is given. There are totally 7 chapters in the study. The contents of each chapter is described as follows:

- **Chapter 1:** This chapter gives a general introduction of the research, such as research background, issues, research objective and questions and also research novelty and originality.

- **Chapter 2:** This chapter introduces the literature reviews with wide range of contents about OAE and service science. Firstly, a systematic present on research of OAE is given, and also the research limitations is summarized. We then conclude the research of service science, the find there are some common points of these two area of research.
- **Chapter 3:** After the literature view, especially the research of service science, we propose research hypothesis in Chapter 3 based on the perspective of service value co-creation. Three foundations are firstly introduced as the basis of proposing research hypothesis. Then we propose structure and process model for OAE curriculum development. After that, we give an introduction to research methodology used to verify hypothesis, such as the investigation target, data collection and analysis strategy, hypothesis validation strategy and proposal of curriculum development model.
- **Chapter 4, 5 and 6:** We verify proposed research hypothesis by using case studies. We choose three famous OAE universities from Shanghai as cases to explore their education mechanisms. In each case, we give an overview of case, data collection and analysis, and then verify hypothesis by comparing analysis results with hypothesis and summarize some new findings in each case.
- **Chapter 7:** In this chapter, we first do discussion about differences between three cases, differences between OAE universities and other modes of OAE and differences between formal education, non-formal education and informal education. Based on the discussion and verification results of each case, we propose a collaboration-based four-stage spiral model for OAE curriculum development which is an extended model from research hypothesis with some new characteristics.
- **Chapter 8:** This chapter finally conclude the study. Firstly, the answers to research questions is given, then the theoretical and practical implication of the study is clarifies. In the end of the research, the limitations and possible suggestions for future research are introduced.

Chapter 2

Literature Review

2.1 Introduction

In this chapter, we do literature reviews with wide range of contents about OAE and service science. Firstly, a systematic present on research of OAE is given. The definition of OAE and its development history are presented for understanding the terminology of OAE; then the research situation of OAE from theoretical and practical aspects are concluded, and also the research limitations are summarized.

Secondly, we conclude the research of service science. The main items such as service, service science and service system are introduced and also the development history of service science. Then the major researches of service science are presented, such as Service Dominant Logic, value-in-use, service value co-creation, service field concept, and KIKI model.

Finally, we summarize the empirical work of OAE and service science, and find there are some common points of these two area of research. Such common points inspire us to solve research questions from service science perspective.

2.2 Literature review on OAE

The study of OAE belongs to the domain of lifelong learning (LLL), which is evolved from the term *lifelong learners* and used in the mission statement of Temple City Unified School District in 1993. Lifelong learning recognizes that learning is not confined to childhood or the classroom but takes place throughout life and in a range of situations (Field, 2000). It is defined as all learning activities undertaken throughout life, with the aim of improving

knowledge, skills and competences within a personal, civic, social and/or employment-related perspective (Commission, 2001). Lifelong learning is the *ongoing, voluntary, and self-motivated* pursuit of knowledge for either personal or professional reasons (Clyth et al., 2000).

With the concept of LLL and learning society becoming more and more popular, OAE is gradually conducted all around the world as an important part of lifelong learning. At the same time, attentions are also paid to the education of older learners. OAE has become a hot research topic with the emerge of aging problem in many countries. The research contents mainly include types and principles of education for the elderly, educational models, evaluation toolkit for OAE institutions, the original aims of OAE, the specificity and complexity of senior learning and so on. International organizations and institutions such as American Council on Education (ACE), Europe Commission carry out projects to investigate it from the perspectives of both theories and practices.

2.2.1 The meaning and development history of OAE

According to our literature survey, there is no uniform definition for older adult education. In some literature, older adult education is also referred as *the education of older learners* in the work (Peterson, 1990), *education in the later years* in the work (Lowy and O'Connor, 1986), *education for older adults* in the work (Weiland, 1995), etc. Recently in 2016, Findsen and Marvin published a proceeding entitled *International Perspectives on Older Adult Education Research, Policies and Practice* (Findsen and Formosa, 2016). In this study, we follow Findsen and Marvin's terminology.

The concept of OAE

In a broad sense, older adult education means any activities that provide older adults learning opportunities. Older adult is a term referred to old people in social sciences (Association et al., 1994). Similar terms in different cultures include *seniors* in American usage, *senior citizens* in British and American usage, the elderly and elders in many cultures. To be self-consistent, we use the term older adult throughout this study.

The definition of older adult may be different in different countries. It is well-accepted in most developed countries that the chronological age of 65 years is the beginning age of older adults, while the United Nations has agreed that 60+ years may be usually denoted as old age (Organization et al., 2013). There is no universally defined age at which old age begins because it differs according to the context. We give our survey result on the definition of older adults in different cultures. In the report (Lakin et al., 2007), older adults are referred as the people aged 55 to 79 in the United States. In China, although there is no official definition of older adults, in OAE universities male

older adults are usually referred as those aged 60 to 80, and female older adults 55 to 80. Another standard for older adults is those from the legal retirement age to around 80. In Africa, the chronological age of 60 years has been accepted by many countries as the official age of retirement (Findsen and Formosa, 2016, Chapter 13).

In this study, we adopts the following working definition of older adults: *people, whatever their chronological age, who are post-work and post-family, in the sense that they are less or no longer involved in an occupational career or with the major responsibilities for raising a family*(Findsen and Formosa, 2011).

In the dictionary (Hornby and Wehmeier, 1995), education is defined as *a process of teaching, training and learning, especially in schools or colleges, to improve knowledge and develop skills*. In a broader sense, education is the process of facilitating learning, or the acquisition of knowledge, skills, values, beliefs, and habits, as described on Wikipedia (Wikipedia, 2017).

Development history of OAE

As long as the existence of educational programs, older people have participated into instructional activities (Peterson, 1990). The history of studying education for adults can be dated back to 1928 when Thorndike et al. published the first empirical study of adult learning. However, until the 1970s awareness to older adult education was gradually arising with an historic number of people around the world reaching retirement age. Before that only some individuals with available time and interest participated into educational programs. Unlike previous generations before the 1970s, these people were relatively healthy, financially solvent and interested in pursuing activities involving learning (Ginsberg, 2001). In the early 1970s older adults were considered as a segment of the life span when Howard McClusky established the first graduate program in educational gerontology at the University of Michigan. In 1976, the journal *Educational Gerontology* devoted to the topic of educational gerontology was launched, which can be considered as a marker in the development of OAE. In 1978, Peterson et al. identified older adult learners as a separate area of research and practice in their work (Peterson et al., 1978).

The 21st century is the age of lifelong learning (Chang and Lin, 2011). When the average life expectancy of a society is continually rising, lifelong learning is no longer just a slogan but also a way of life. Towards this phenomenon, more and more countries have attempted to recruit older adults and to design educational activities that are exclusively for people reached old aging. The education of older adults has been considered the fastest growing branch of adult education in post-industrial countries and one of the most crucial challenges facing current adult European education. Propelled by these factors, the older adult population has become an important focus of adult education programming and research (Chen et al., 2008).

Table 2.1: The theoretical basis of development task achievement and training organization is built up on behaviorist, constructivist, cognitivist and connectivist cognitions. (Source: the analysis research of EduSenior project, 2011)

	Behaviorism	Cognitivism	Constructivisms	Connectivism
Description	May be applicable to adult learning objectives as in the case of psychomotor skills development. Behavioral approach can effectively facilitate mastery of the content (knowing what) or when learning environment is time limited.	Learning is a dynamic process of individuals creative communication that occurs by observing the activities of others, but the obtained experience and information influence persons sphere of activity.	In the result of experience and during the whole life a person forms his/her own individual world perception model (construct). There is importance of adaptation (new impressions supplement the existing structures, the new becomes a part of the old) and accommodation (inclusion of new information into existing cognitive schemes, its adaptation). It is important to allow learners the choice and autonomy to develop learning in their own way by giving them space to follow their own individual interests and understandings, and by recognizing that this process will be different for each learner.	A learning theory for the digital age. Learning is a process of connecting specialized nodes or information sources. Ability to see connections between fields, ideas, and concepts is a core skill. Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities. Decision-making is itself a learning process.
How learning occurs	Train responses using behavioral techniques Break complex behaviors into simple chains Reward performance	Build on learners existing knowledge Ensure the learners understand what they have learned	Allow choice and autonomy to develop own style Allow learner follow own interests Combine new and old information Adapted for each learner	Distributed within a network, social, technologically enhanced, recognizing and interpreting patterns Ability to see connections between fields, ideas, and concepts is a core skill. Setting not based in the classroom or in proximity to the person, but a distance Informal learning is a key element to providing the flow of information in connected societies
Influencing factors	Nature of reward, punishment, stimuli	Existing schema, previous experiences	Engagement, participation, social, cultural	Diversity of network, strength of ties

2.2.2 Current research on OAE

In this section, we review the researches on OAE from the perspectives of values and purposes, theoretical background, objectives, types and educational forms, respectively.

Theoretical background of OAE

There are mainly four major paradigms that andragogy learning theory and practice: behaviorism, cognitivism, constructivism and connectivism. For any educational institution interested to implement an educational program to senior citizens must be aware of some concepts that are related to this specific social group.

The first is behaviorism which is a world view saw learning as a straightforward process of response to incentives. Behaviorists assert that direct observation and feedback are determinant factors for modeling of learning process (Gredler, 2005; Kearsley, 1994; Spillane et al., 2002). However, this theory tends to diminish the possibilities in human learning. In some circumstances, even though this method of learning is necessary. The cognitivists are concerned with how learners "how information is received, organized, stored, and retrieved by the mind" (Ertmer and Newby, 1993). The constructivist maintains that learning is a process of constructing meaning and it is how people make sense of their experience (Merriam et al., 2012). Connectivism is the integration of principles explored by chaos, network, and complexity and self-organization theories. In this view of learning, networks (neural, social, and technological) represent a distributed view of knowledge (Siemens, 2014).

The difference of these four paradigms can be found in Table 2.1. None of the various pedagogical models stemming from different theories or paradigms is the most appropriate under all the circumstances and situations, but each enlarges our understanding of the learning process. Therefore, the educators have to know and understand the strengths and limitations of each learning theory to optimize their use in appropriate situations.

The project supported by Europe Commission have specified the special development tasks of seniors. There are:

1. self-acceptance, awareness of own peculiarities and reorientation of the value system;
2. evaluation of life, search of new socially significant activities;
3. physical and mental activity appropriate to age, adaptation to health problems;
4. personal communication with other people;
5. acquisition of new types of recreation and hobbies;
6. participation in various voluntary organization activities (Liegeniece, 2002, Fa1es, 1996, Knowles, 1980).

With consideration of theoretical research and unique development tasks of old citizens, the researchers stated that in OAE training the forms, methods and means are selected according to the sphere of development and related tasks, as depicted in Figure 2.1. Cognitive sphere refers mainly to information processing and knowledge acquisition

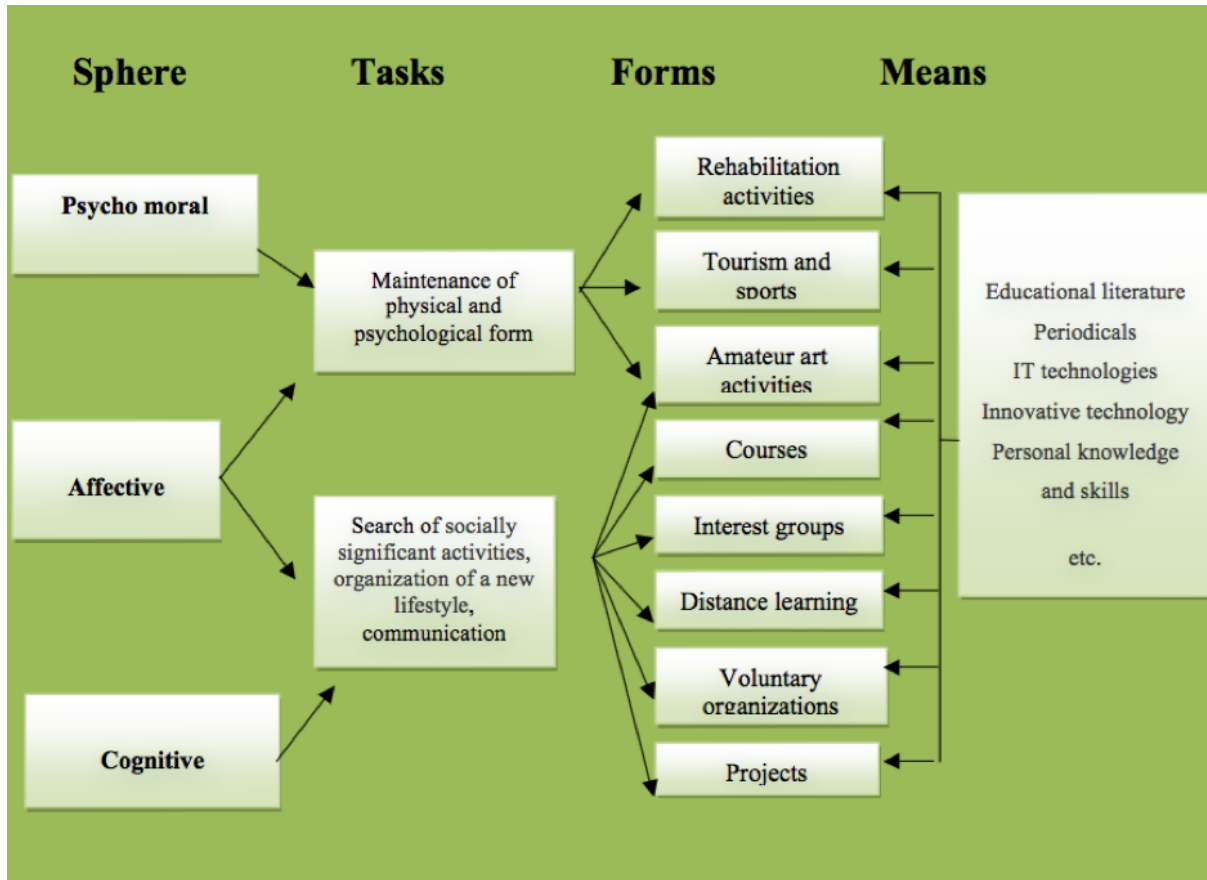


Figure 2.1: The sphere of development and related tasks for OAE training (Source: the analysis research of EduSenior project, 2011)

process. Learning in the cognitive sphere means to acquire knowledge. Such kind of learning is based on the use of intellect. Psycho moral sphere is the development of muscles and motor skills. Learning in psycho moral sphere means to get persons desired physical abilities. Affective sphere is characterized by emotions, attitudes, value orientation and others related to changes in human behavior and formation of confidence.

Objectives of OAE

There are some researches emphasize the different aims of OAE institutions . They define institutions that teach seniors (65+ years old or retired) need to address courses to a target group that is not aiming to get degree or to improve their career opportunities. They must therefore apply different methodologies and also create specially designed courses, activities and materials. They proposed now concept quality of life (QoL), the main aim is to increase senior learners well-being and quality of life. In this context, teaching becomes a socio-educational educational activity where more formal, non-formal and informal activities are blended. The knowledge students acquire is important, but

other skills, attitudes and aims should not be forgotten such as socialization, integration, adapting to society, active citizenship, etc.

Existing research defines QoL in terms of both objective and subjective perceptions. Some parameters are available for evaluating QoL and, therefore, to take action to improve an individuals QoL. Levels of QoL may fall as a result of several kinds of risks (e.g. loneliness, isolation) and may rise due to other activities that promote integration or communication. Education can be used to minimize the risks and maximize QoL. The promotion and enhancement of QoL in senior citizens is highly positive as it not only leads to happier seniors, but also to more active, productive, participative, healthy older people who require fewer social services and whose value in society is increased. (Please refer to original source to find more information

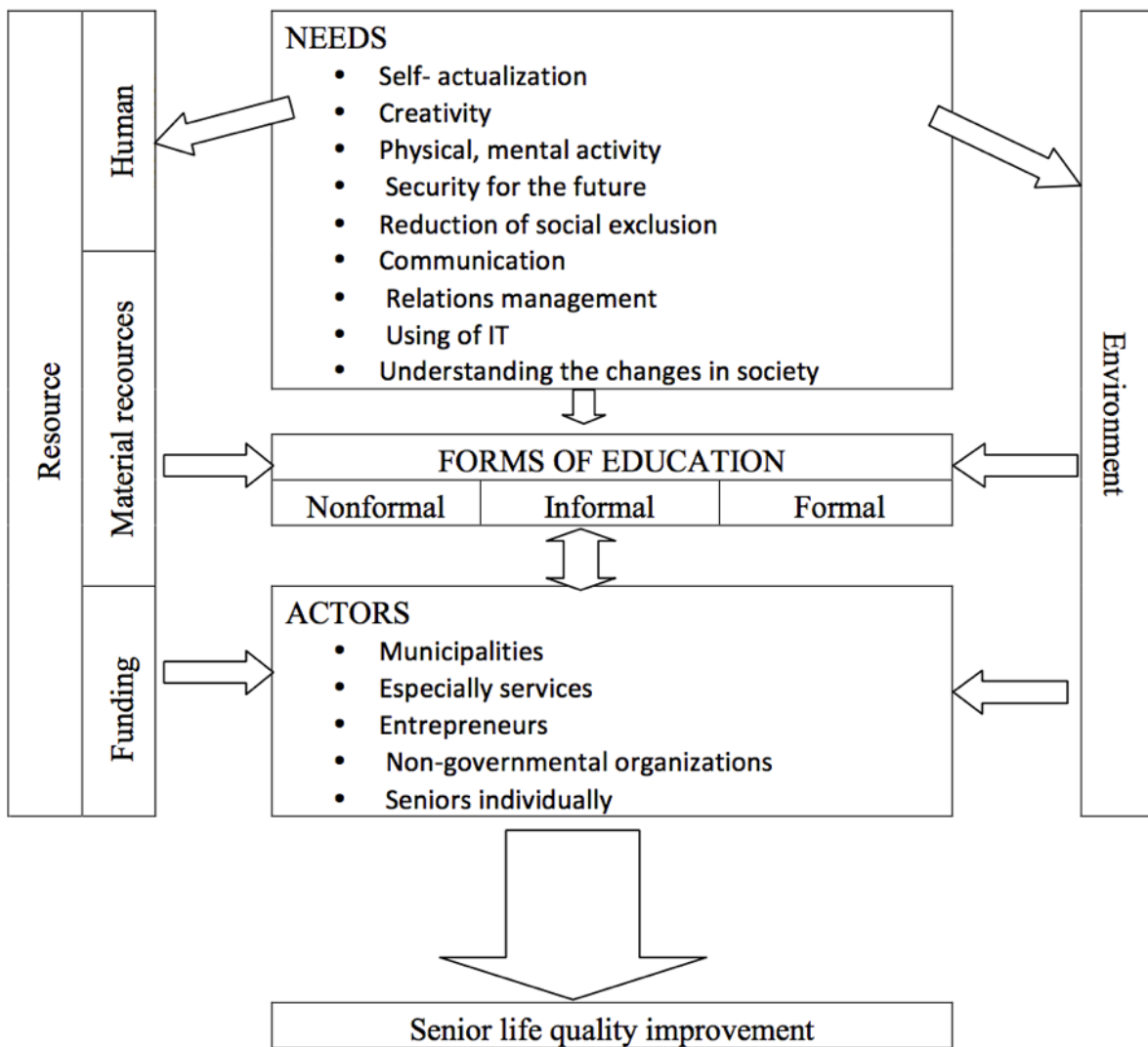


Figure 2.2: Educational model of OAE (Source: the analysis research of EduSenior project, 2011)

Types of OAE

With the socio-economic changes in the last few decades, traditional formal education system had adapted too slowly to the development of the world, and that planners and economists began to make a distinction between informal, non-formal and formal education. OAE is also conducted formally, informally and non-formally. Formal education means general academic studies, and a variety of specialized programs and institutions for full time technical and professional training, like University of the Third Age. Informal education is the truly lifelong process whereby every individual acquires attitudes, values, skills and knowledge from daily experience and educative influences and resources in his or her environments-from family and neighbors, from work and play, from market place, the library and the mass media. Non-formal education refers to any organized educational activity outside the established formal system that is intended to serve identifiable learning clientele and learning objectives, like Community College. These three types of education play different roles in old citizens learning, and they come together to promote the development of OAE. More detailed information about the three types of education is shown in Table 7.2.

Research on education models of seniors

The old adults are different from other groups; they have their own requirements for the education. Many reports show investigation results of demands of the elderly for OAE, which are totally different from other forms of education. According to the survey of Personality Socialization research institution of Rezeknes Augstskola, it shows that old citizens have their own characteristics as depicted in Section 1.1.3 as one of challenges of OAE development.

In the survey, researchers also design educational model of seniors. It can be found in the Figure 2.2. The improvement of senior life quality needs participation of all resources, human beings and environment creation based on the various needs of seniors. And the forms of education are important ways for integrate these resource and effective ways to help to improve the QoL of older adults.

2.2.3 Existing problems in the study of OAE

Currently, there are a lot of research work have been done including theoretical research and practical research, most of them were conducted from education science perspective or social science perspective.

However, problems are still existing there as what we have explained in Chapter 1. It makes the impact of research results quite limited. For instance, from the sociological

point of view, one may consider how to make the elders lives colorful, but neglect the elders desire to re-establish themselves. While from the educational point of view, researchers may emphasize the results of the education, but neglect the process, which is in some sense more important than the results.

OAE as a new type of education, no such research has been done on the value creation of OAE and on proposing systematical methodology on OAE curriculum development. The existing research work cannot give answers to research questions and achieve research objectives. Thus, it requires a broader view to discover new solutions to release or even solve existing problems in OAE, instead of treating them just as social or educational problems.

2.3 Literature review on service science

The purpose of this part is to present the established research findings of service science and to make premises for this study. On the empirical work on service science, we mainly present it in fours aspect: (1) the introduction of basic items, such as service, service science and service system; (2) the comparison of Service Dominant Logic with Good Dominant Logic; (3) the conception present of service value co-creation, such as service field concept and value co-creation model.

2.3.1 Service, service science and service system

Research development of service science

Before tracing the research track of service science, we first take a glimpse at the item of service. From the viewpoint of standard economic theory, the economy is divided into three major industry sectors: extractive (primary); manufacturing (secondary); and services (tertiary) (Wolfe, 1955). The third sector, services, although often thought of as an intangible output, is essentially, for national accounting purposes, viewed as a residual of the other two industry sectors in essence, what is not extractive or manufacturing is services (Lusch and Wu, 2012). It exists in many public and private organizations across many industries such as transportation, health care, entertainment, finance, insurance, education, wholesaling, retailing and professional services like legal and architecture.

Due to the rise in ascendance of the services sector, there has been an increased interest by industry, government, and academia on understanding the determinants of productivity in service industries as well as service innovation (Lusch and Wu, 2012). In the period of agricultural and industrial revolutions, economists focused their efforts

mainly on these sectors and ignore the research of services.

However, the situation began to change since 1985, when a center was set up in Arizona State University to first focus on research of services, known as Arizona State University W.P. Carey School of Business Center for Services¹. Later in 1998, David Bruce Smith from the University of Maryland launched the Journal of Service Research² which is undoubtedly the leading scholarly journal around the world in research of service science. In 2004, Paul Maglio and Jim Spohrer from the IBM Almaden Research Center³ led up an effort to advance the research and teaching of service, which was identified as service science, management, and engineering, or SSME (Lusch and Wu, 2012). The IBM introduced the SSME to illustrate the item of service science as “*an interdisciplinary approach to the study, design, and implementation of service systems*”. Precisely, “*SSME has been defined as the application of science, management, and engineering disciplines to tasks that one organization beneficially performs for and with another*” (Spohrer et al., 2007).

In 2007, the University of California, Berkeley followed IBMs lead and developed a formal service science, management, and engineering program around information and service design⁴. Next year, a special issue of the IBM Systems Journal was released with 14 articles from thought leaders across various disciplines that intersect with service science, management, and engineering. In March 2009, 104 participants from 31 countries, gathered in Helsinki, Finland, for a program focused on the development of SSME (Lusch and Wu, 2012). This seminal event resulted in the publication of “Making Service Mainstream: A White Paper Based on the 2009 Service Science Summit⁵.” Today universities and countries around the world are accelerating their efforts to understand service and service systems.

The concept of service

With the research development of service science, the view of service is broadened and abstracted. It is not limited to be thought as a residual to the extractive and manufacturing industries any more, it is being viewed as the act of helping others and the process of doing something for another person (or entity) that is beneficial (Lusch and Wu, 2012).

On the definition of service, different scientist has different view. Fitzsimmons and

¹“W.P. Carey School of Business Center for Services Leadership” <http://wpcarey.asu.edu/cs1>.

²<http://journals.sagepub.com/home/jsr>.

³“University Relations Worldwide Community,” <https://www.ibm.com/developerworks/mydeveloperworks/blogs/d433e517-1ebc-410d-bdc3-cc2b4c1952fc/resource/univcomm.html?lang=en>.

⁴“History and Scope,” <http://isd.ischool.berkeley.edu/about/history+scope>.

⁵Aalto University, IBM, and Ovum, “Making Service Science Mainstream” (2009), <http://service-science.info/wp-content/uploads/2010/03/Helsinki-Service-Science-Summit-White-Paper-v1.pdf>.

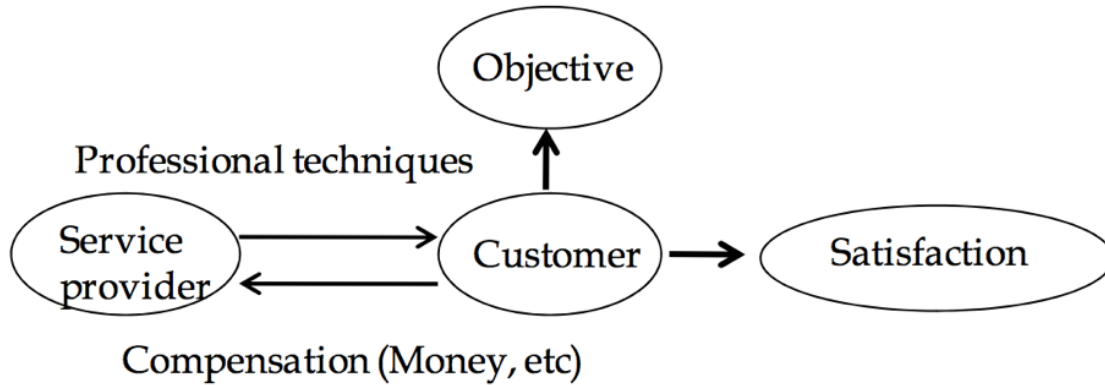


Figure 2.3: The definition of service (Source: Kosaka, 2012)

Fitzsimmons stated that “a service is a time-perishable, intangible experience performed for a customer acting in the role of a co-producer” (Fitzsimmons et al., 2006). Another definition is “services are economic activities offered by one party to another” (Lovelock and Wirtz, 2001). Vargo and Lush defined service as “the application of specialized competences (knowledge and skill) through deeds, processes and performances for the benefit of another entity” (Vargo and Lusch, 2004). They pointed out that services (plural) often refer to intangible units of output that a firm produce.

Among the above definitions, the core premise of them is that “service is to support people or organizations to achieve objectives”, which was stated by Kameoka and Sadahiko Oda (Kosaka, 2012). Kameoka pointed out that “service is the activity of supporting human beings or organizations to enable them to achieve their objectives or desires (Kameoka et al., 2007).” Sadahiko Oda, the chairman of Kagaya, thought service as an activity that provides professional techniques, satisfies the customer, and results in compensation for the service provider (Kosaka, 2012).

Kosaka concluded the aforementioned definitions of service and pointed out the three factors of service activity. He mentioned that “a service activity consist of (1) service providers who perform professional techniques; (2) customers who feel satisfaction from provided services, and (3) customers who award compensate, usually in the the form of money, the provider for its services” (Kosaka, 2012). The definition of service is shown in Figure 2.3.

According to these definitions, service is the most productive of human activities. It is defined as an activity that support organizations or human beings and enable them to achieve their objectives.

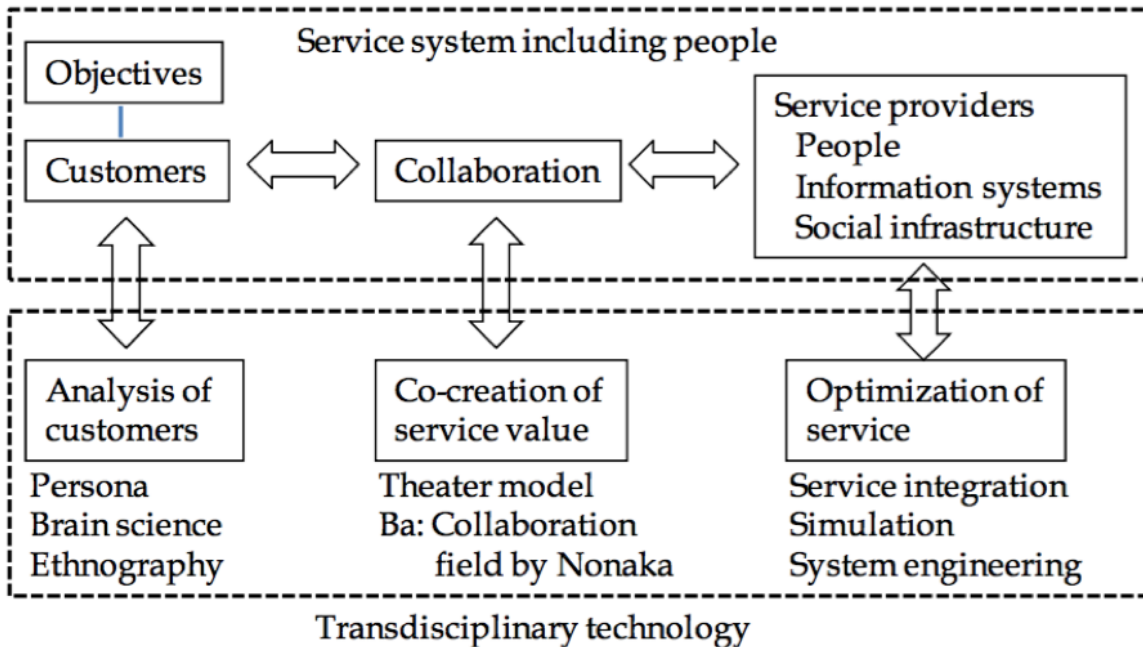


Figure 2.4: Service system (Source: Kosaka, 2012)

The concept of service science

By clarifying the definition of service, service science is an interdisciplinary academic research focused on fundamental research of models and theories, and applications of service innovation. Maglio and Spohrer stated that “*service science combines organization and human understanding with business and technological knowledge to categorize and explain many existing types of service systems or model as well as how service systems interact and get involved in co-creating value*” (Maglio and Spohrer, 2008). Vargo and Lush mentioned in their work that “*service science is the study of service system and of the co-creation of value within complex configurations of resources. It centers on the participant, processes, and resources that interact to create value in service systems. So value and value creation are at the heart of service and are critical to understanding the dynamics of service systems and to furthering service science*” (Vargo et al., 2008).

From the aforementioned statements, we learn that the collaboration of participants in service system is very essential to the innovation of service and service value creation. Among the research of service science, Service Dominant Logic is undoubtedly the pioneering research and dramatically argued over its applications in recent years. It is also one of the theoretical foundation of conducting this study.

The concept of service system

Among the research of service science, one need to be pointed out is service system. It is the key point to achieve the service value. Regarding the concept of service system, Spohrer et al stated that “*service system is an arrangement of resources (including people, technology, information, etc.) connected to other systems by value propositions*” (Spohrer and Maglio, 2008; Spohrer et al., 2007). Kosaka pointed out that “*service system includes human beings (service provider, recipient), and its objective is to maximize the service value for customers as regards their objectives in order to assure their satisfaction*” (Kosaka, 2012). Figure 2.4 shows the outline of service system from the Kosaka’s points of view. Various technologies are used to maximize the level of satisfaction for both customers and service providers.

In this study, the OAE education system can be considered as a service system composed by older learners and education providers. The service value of OAE can be achieved through the participation of all resources, such as human beings and other auxiliary technologies.

2.3.2 Good dominant logic versus service dominant logic

As the rise in ascendancy of the service sector, there has been an increasing interest by industry, government, and academia on understanding the determinants of productivity in service industries as well as innovation. Generally, there are two orientations of research in service science. The first is a traditional one that take the goods (tangible products) as the determinant of value in economic exchange. It means that firm could turn goods into resources available for customers (Grönroos, 2006). The other one suggests that the essence of exchange is delivery service and firm facilitates processes that support customers’ value creation.

Good dominant logic (G-D Logic)

In the early of last century, the formal research of marketing focused on the delivery and exchange of goods and manufactured products and featured a foundation in economics (Marshall, 1927; Shaw, 1912; Smith, 1776; Vargo and Lusch, 2004). That “*Value is embedded in matter through manufacturing*” (Vargo and Lusch, 2004) and the creation of value should follow good-centered logic. This thinking originated from the Smith’s research work on economic philosophy and economic science (Smith, 1776).

From the traditional view of sense, the In some of previous researches, the goods centered logic assumes the followings tips: (Vargo and Lusch, 2004):

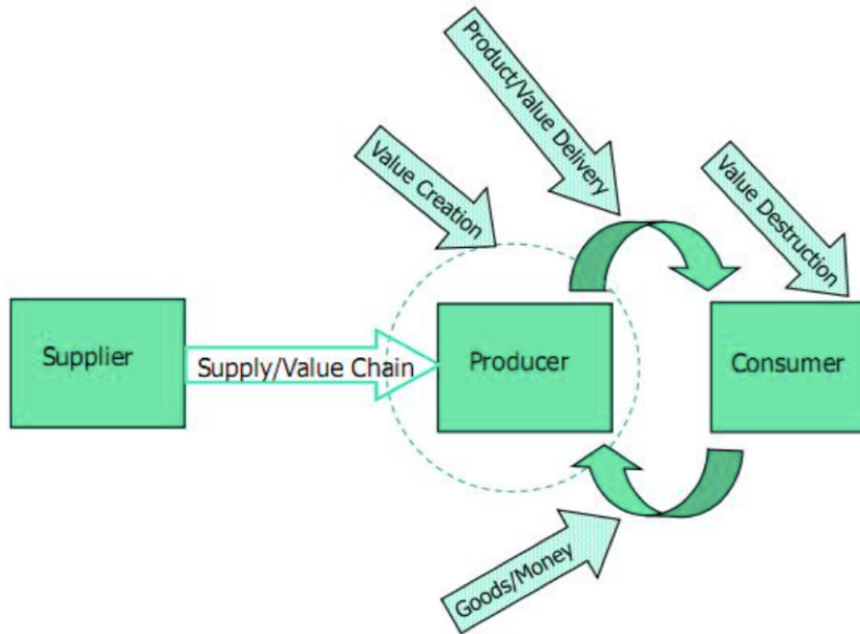


Figure 2.5: Business model based on G-D Logic (Source: Vargo, 2009)

1. The purpose of economic activity is to produce and distribute goods that can be sold.
2. To sell the produced goods, the utility and value of the goods must be embedded in the process of production and distribution.
3. The products must offer superior value to consumers compared to competitors offerings.
4. All decision variables of firms should be set at a level that enable firms to maximize the profit from the sale of products.
5. The goods should be standardized and produced away from the market for maximum efficiency and production.
6. The good can then be inventoried until it is demanded and then delivered to the consumer at a profit.

As described above, goods or commodity is the core of the economy from the view of G-D logic. Research theories of marketing, business model and value creation strategies were proposed based on this logic

Due to the traditional orientation of G-D logic, service was ignored though they existed (Lusch et al., 2008). With the rise of ascendance of the service sector, there has been an increased interest by industries, companies, governments and academia on understanding the determinant of productivity and value in service industries (Lusch and Wu, 2012)

and rethinking the traditional orientation (Vargo and Lusch, 2004). Over the years, the significance of service in the industry was realized by researchers and operators.

Service was considered as an add-on to the core product rather than object. From the view point of Lovelock, "services are the performances that bring about the desired results for the customers" (Lovelock and Wirtz, 2001). There are some characteristics of service in marketing, such as perishability, intangibility, inseparability and heterogeneity (Zeithaml et al., 1985). Besides, Lovelock gave more distinct explanation on the characteristic of services as follows Lovelock and Wirtz (2001):

1. Most service products cannot be inventoried.
2. Intangible elements usually dominate value creation.
3. Services are often difficult to visualize and understand.
4. Customers may be involved in co-production.
5. People may be part of the service experience.
6. Operational inputs and outputs tend to vary more widely.
7. Time factor often assumes great important.
8. Distribution may take place through non-physical channels.

Upon the above characteristics, Lovelock emphasized the importance of factors *process design, physical environment and people* in the research of marketing. Even it is a great progress of conventional orientation, it is still defined based on the G-D logic and there are still gaps in the real situation. Figure 2.5 shows the business model based on G-D Logic.

Service dominant logic (S-D Logic)

Along with the research of G-D Logic, Vargo clarified the problems of it that (Vargo, 2009): *(1) goods are not why we buy goods; (2) goods are not what we fundamentally own to exchange with others; (3) customer is secondary and seen as value receiver and destroyer.* In 2004, Vargo and Lush published their research work *Evolving to a New Dominant Logic for Marketing* and proposed a new service-dominant logic (Vargo and Lusch, 2004). In their opinion, the universal role of service in the economy and firm can provide a frame reference to help guide a management philosophy that is more effective and better contributes to competing in the future than a frame of reference based on tangible goods.

From the view of S-D Logic, the service is the purpose and nature of exchange of markets. As Vargo and Lush mentioned that "*the foundational proposition of SDL is that*

Table 2.2: Foundational premises of SDL, source:Vargo et al, 2008

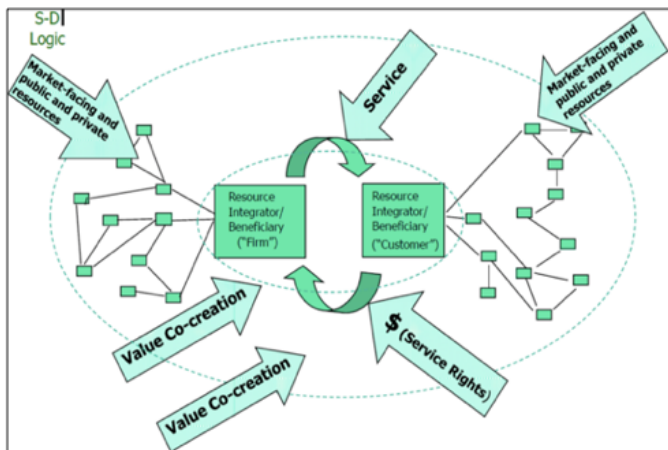
Premise number	Foundational premise
FP1	Service is the fundamental basis of exchange.
FP2	Indirect exchange masks the fundamental basis of exchange.
FP3	Goods are a distribution mechanism for service provision.
FP4	Operant resources are the fundamental source of competitive advantage.
FP5	All economies are service economies.
FP6	The customer is always a co-creator of value.
FP7	The enterprise can not deliver value, but only offer value propositions.
FP8	A service-centered view is inherently customer oriented and relational.
FP9	All social and economic actors are resource integrators.
FP10	Value is always uniquely and phenomenologically determined by the beneficiary.

organizations, markets, and society should be fundamentally concerned with the exchange of service the applications of competences (knowledge and skills) for the benefits of one party” (Vargo and Lusch, 2004). That, ”service is exchanged for service; all firms are service firms; all markets are centered on the exchange of service, and economies and societies are all service based” (Vargo and Lusch, 2004).

Many researchers in service science quickly joined in the discussion of this new orientation and appreciated for what Vargo and Lusch had done for marketing research. S-D logic provides an alternative perspective for research of economic exchange and a hit in the research field of service science. It is considered as a foundation to solve the problems of G-D logic. S-D logic is more consistent with the reality and can explain the essence of exchange which should be delivering real value (use) (applied, specialized knowledge) to customers rather than goods compared with the G-D logic.

In S-D logic, the nature of exchange is service not goods. The item service here refers to ”service” (singular) which is a process, distinct from ”services”, particular types of goods (Vargo and Lusch, 2004). The ten foundational premises (Vargo and Lusch, 2008) help to explain the emerging new dominant logic. Table 2.2 defines these premises and presents what have been implied in them.

These premises generalize the foundations which SDL implicate and justify. In this study, the key point of S-D logic is the theoretical concept of value co-creation. In the traditional G-D logic, value is created at the moment of the exchange and customers use the goods and may produce added value by their own. Whereas, in the S-D logic, value is co-created after the value exchange process. The Value for customers means that, after customers have been offered a service process, they feel better than before using it. The service process helps them to solve their issues. Customers themselves determine satisfaction, not by the service suppliers. It is said that value is co-created when customers



a. Business model based on S-D logic
(Source: Vargo, 2009)



b. Service dominant marketing model
(Source: Lush, Vargo & Brien, 2007)

Figure 2.6: Business model based on S-D Logic (Source: Vargo, 2009)

needs and requirements are fully met.

Vargo, Lush and others proposed business and marketing model based on S-D logic for firms and customers shown in Figure 2.6 (a) and (b). They provide guide for firms to create better value-in-use for customers. The models implies that firms can only make an offer on value creation through customers requirements and then, if accepted, value is co-created in concert with the customer. In the models, both firms and customers are resource integrators/beneficiaries. To achieve value, both of them must take part in the service process and co-create it. It would bring great satisfaction to customers when co-created value makes service more dynamic and innovative to fulfill customers desired outcomes. Firms should keep interactions and relationships with customers to have better cooperation, thus lead to productive and satisfactory co-created value.

S-D logic embraces the concepts of value-in-use and value co-creation rather than the value-in-exchange of G-D logic. Instead of simply delivering value to customers, firms should collaborate with customers and tighten the relationship between them to build more useful and sufficient value to customers.

Comparing G-D Logic with S-D Logic

S-D logic represents a shift in logic of exchange in markets. If G-D logic think market as good-based mindset, S-D logic suggests a service-based foundation, for understanding all economic activities. There are some different points between them. Vargo et al pointed out the difference between traditional G-D logic and S-D logic, and stated that the emerging new logic focused on the interaction of producers and the customers and other supply

and value network partners as they co-create value through collaborative processes (the difference between G-D logic and S-D logic can be referred to Table 2.3). In G-D Logic, the determination of value is products based on concept "value in exchange". Whereas, in S-D Logic, it leads to a new viewpoint of service through extension of its concept to include goods. The key point of SDL is that service value for customers is created through collaboration between service providers and customers, and the customer is a co-producer of the service and is an active participant of mutual interaction. That, value results from the beneficial application of operand resources, which are sometimes transmitted through operand resources or goods (Vargo et al., 2008). Thus, value is co-created through the combined efforts of firms, employees, customers, stockholders, government agencies, and other entities related to any given exchange, but is always determined by the beneficiary Vargo et al. (2008).

Overall, the traditional G-D logic is not a suitable logic since it views the roles of firms and customers in the process of business separately. Otherwise, S-D logic is a systematic logic and highlights the interaction and collaboration between firms and customers.

The mindset of S-D logic and value co-creation inspire us to think the value creation of OAE activities from service science perspective. That value creation of OAE is based on the satisfaction of older learners, and value is co-created by education providers and older learners.

2.3.3 Research on service value co-creation

Value-in-exchange versus value-in-use

When customer purchases a product or service, there is a uprising question "why he or she should buy this product or service no that one?". The answer should convince potential consumers that the value of the product or service would make them more satisfied than others.

The concepts of "use-value" and "exchange-value" have been discussed since ancient times. Aristotle first distinguishes the meaning of two items. The item use-value is quality related and means that different things have different values to different people. The value of a object depends on the usefulness of it to others. Whereas, exchange-value is quantity related and means a commensurable value of a object.

Smith argued that "commodities may have an exchange-value but may satisfy no use-value, such as diamonds, while a commodity with a very high use-value may have a very low exchange-value, such as water" (Smith, 1776). This statement gives us general view about the difference between value-in-use and value-in-exchange.

In the past, manufacturers as providers sold products and delivered value to customers. In this process, value is created at the moment of exchange. Customers are offered values

just as receipts and inactive in the process. In modern society, the meanings of value in exchange and value-in-use is related more to customers satisfaction. S-D logic challenges the traditional foundations of economics that maximum efficiency and maximum profit are based on the usefulness of service to customers which is value-in-use, not value-in-exchange. Customers actively join in the value creation process and actually, they are the ones who accept and make the value useful for their requirements. It is acknowledged that there is no value until an offering is used (Lusch and Vargo, 2006).

Value creation versus value co-creation

Traditionally, customers are separate part of value creation process that firms sold products and services and customers purchase goods and services. The interactions of firms and customers are not related to value creation ((Normann and Ramirez, 1998)). It began to change in this decades, that customers have more power to engage in the process with providers in each stage of product design and delivery. Also, "the supplier and the customer have the opportunity to create value through customized co-produced offerings" (Payne et al., 2008). The value co-creation is a desirable goal to help firms to learn customers requirements and enhance the customers insight to get deeper understanding about their real needs.

In the S-D logic, it emphasizes the value co-creation through collaboration of service providers and customers. When both of them are beneficiaries in the business, they co-create the value. Customers create and define the value of service. Specifically, service providers and receivers share their experience, information, background and learn from each other to get the best solutions to their objectives.

The perspective shift from goods to service leads to the view change of value creation. Prahalad argued in his research work that "consumers seem to want power without accountability. They want to choose for themselves but not be reliable for consequence of their choices" (Prahalad and Ramaswamy, 2004b). Firms should recognize the changing role of customers to new situation. They are no longer the ones who create products, operate manufacturing processes, and leads distributions without collaboration from customers.

Equipped with powerful tools and dissatisfied with available choices, customers want to interact with firms and then co-create value (Prahalad and Ramaswamy, 2004a). Customers now want to take part in and put their influence in all processes of the business exchange. The need of collaborations for co-creation shows the emerging situation for the value propositions. In this service perspective, Prahalad and Ramasw emphasized, value co-creation is the basis for value creation (Prahalad and Ramaswamy, 2004a). Significantly, value co-creation can take place only if there are interactions between service providers and the customers (Svensson and Grönroos, 2008). Hence, firms should not only

Table 2.3: G-D logic vs. S-D logic on value creation, source: Vargo et al, 2008

	G-D logic	S-D logic
Value driver	Value-in-exchange	Value-in-use or value-in-context
Creator of value	Firm, often with input from firms in a supply chain	Firm, network partners, and customers
Process of value creation	Firms embed value in goods or services, value is added by enhancing or increasing attributes	Firms propose value through market offerings, customers continue value-creation process through use
Purpose of value	Increase wealth for the firm	Increase adaptability, survivability, and system wellbeing through service (applied knowledge and skills) of others
Measurement of value	The amount of nominal value, price received in exchange	The adaptability and survivability of the beneficiary system
Resources used	Primarily operand resources	Primarily operant resources, sometimes transferred by embedding them in operand resources-goods
Role of firm	Produce and distribute value	Propose and co-create value, provide service
Role of goods	Units of output, operand resources that are embedded with value	Vehicle for operant resources, enables access to benefits of firm competences
Role of customers	To ‘use up’ or ‘destroy’ value created by the firm	Co-create value through the integration of firm- provided resources with other private and public resources

facilitate their customers needs but also take those opportunities to engage collaboration with customers to build value through interactions.

Table 2.4 shows us the concept of value co-creation. Different from referring the concept of co-creation, Vargo noted the shift from G-D logic to S-D logic as the transformation of value creation to value co-creation. This transform rules the effectiveness of what successful service provided (Vargo, 2009). Table 2.3 presents the differences of value provision through a number of perspectives. By interaction of service providers and customers to sharing problems, then the gaps between them can be narrowed.

The concept of service field

Kosaka first proposed the concept of service field in service system for creating service value dependent on the situation (Michitaka et al., 2011). He noted value-in-use concept in S-D logic greatly depends on the situation. Context-aware service should also consider the relationship between the service value and the situation. Service field contains all

Table 2.4: The concept of co-creation, source: Prahalad and Ramaswamy, 2004

WHAT CO-CREATION IS NOT	WHAT CO-CREATION IS
Customer focus Customer is king or customer is always right	Co-creation is about joint creation of value by the company and the customer. It is not the firm trying to please the customer
Delivering good customer service or pampering the customer with lavish customer service	Allowing the customer to co-construct the service experience to suit her context
Mass customization of offerings that suit the industry supply chain	Joint problem definition and problem solving
Transfer of activities from the firm to the customer as in self-service	Creating an experience environment in which consumers can have active dialogue and co-construct personalized experiences; product may be the same (e.g., Lego Mind storms) but customers can construct different experiences
Customer as product manager or co-designing products and services	Experience variety
Product variety	Experience of one
Segment of one	Experiencing the business as consumers do in real time
Meticulous Market research	Continuous dialogue
Staging experiences	Co-constructing personalized experiences
Demand-side innovation for new products and services	Innovating experience environments for new co-creation experiences

contexts related to service (backgrounds, situation, supply, demand, etc.).

He also pointed out that the concept of service field is an analogy of the electromagnetic field, where electromagnetic power is determined by the relation between the electric charge and the electromagnetic field. According to this analogy, the service value is determined based on the relation between the provided service and its situation. A Model of service field was also given as $(\text{Service value}) = (\text{Service}) * (\text{Service field})$. From this model, to maximize the service value, the service field should be first identified, then suitable services should be provided that corresponds to the customers characteristics and requirements.

Service value co-creation model based on service field concept

Value creation is the core purpose and central process of economic exchange (Vargo et al., 2008). A number of value co-creation models have been proposed in different logic such as Service Dominant Logic (Vargo et al., 2008), Experience based Service Value Co-creation (Kosaka et al., 2012), and Experience based Economy.

Kosaka et al. proposed an experienced-based service value co-creation process model called KIKI model (Kosaka et al., 2012), which has been successfully applied to many business cases such as Energy Saving Service System. The feature of KIKI model is that the concept of service field is applied to B-to-B (Business-to-Business) collaboration. Service field is a concept that is similar to electromagnetic field in physics, where electromagnetic power is determined by both the electric charge and the electromagnetic field where it is located. The value of a service is also determined by the service itself and the field which shows the context of provided service(Kosaka, 2012). In KIKI model, the process model of service value co-creation consists of four steps: *Knowledge sharing in collaboration, identification of the service field, Knowledge creation for new service idea and Implementation of new service idea*. These steps are iterated as a spiral development process. During the iteration of the process, the service field changes based on the change of the customer's experience in each step. More detailed information is presented in Chapter 3 which KIKI model is considered as one of important foundations of the study.

2.4 Summary

There are researches that putting the service science perspective into social issues. One example was conducted by Lush and Christopher Wu in 2012 (Lusch and Wu, 2012). They thought about high education as a service, and made links between service productivity theory and high education reform, and then provided a guidance for university leadership. However, it is the high education not OAE, they are different types of education. In the case of value creation of OAE should find new mechanisms.

The literature review part gives us a general knowledge about empirical research works of OAE and service science relevant to this research. It is a valuable information resource to study and acknowledge the significant of service science and S-D Logic orientation. OAE as a non-public service, its value can be achieved through value co-creation based on S-D Logic. Therefore, value co-creation and S-D logic are good foundations to start the research topic and propose hypotheses for OAE service value co-creation and curriculum development.

In this research, value co-creation is the key concept for the proposed model. The research model engaging to the co-creation is the most essential network that can help leverage customers satisfaction and solve the gaps in the business process. Moreover, concept of service field is used as the premise for this research. Therefore, understanding of co-creation in the service field is necessary.

Chapter 3

Research Hypothesis and Methodology

In this work, we attempt to study the research issues mentioned in Chapter 1 from service science perspective. Older learners share common features with customers in that older learners decide what to learn as customers decide what to buy. Moreover, as a special kind of education, OAE can be regarded as a non-profit public service, making it possible to view OAE from service science perspective.

In this chapter, we propose the research hypothesis in our study. Before explaining the hypothesis, we first give the foundations for the hypothesis from three aspects including the characteristics of OAE, the theory of S-D logic, and theory of service value co-creation. We then propose a concrete structure and process model for value co-creation of OAE service and explain the three criteria for validating the hypothesis. We also introduce the detailed information on research methodology and process in this study .

3.1 Foundations for proposing research hypothesis

The Chapter 2 give us general knowledge on OAE research and service science. It also providers us three foundations for proposing research hypothesis. The following we list them and explain them clearly.

3.1.1 Foundations from the characteristics of OAE

OAE shares common characteristics with market services such as the self-directivity of older learners (and customers), requirement-oriented education (and service) design and

implementation, learner(and customer)-centered education (and service) system. Such characteristics are the foundations of the research hypothesis which are to be proposed in Section 3.2 from the viewpoint of OAE.

One characteristic of OAE is that older learners are self-directed in the education (Roberson Jr, 2005). The self-directivity of older learners has two meanings, i.e., they are self-motivated to engage in learning intentionally, and they can decide the content that they want to learn, as reflected by the characteristics of older learners mentioned in Chapter 1. The self-directivity of older learners in the education make older learner share a common characteristic with customers in purchasing services in the market.

Another characteristic of OAE is that education providers should design and provide their education services mainly based on older learners' requirements. As a means to aging society, the main objective of OAE is not to help older learners get degrees or to improve their career opportunity, but to increase their wellbeing and quality of life (Escuder-Mollon et al., 2014). One criteria of judging the quality of an education service for older learners is whether it meets older learners' requirements. This feature makes the role of education providers similar to the role of service suppliers in that service suppliers must consider seriously the requirements of customers to design and implement their services.

In summary, OAE is student-centered and is regarded as an *à la carte menu* where the diners choose what they want (Blumberg, 2009), as service system in market is usually customer-centered. Such similarity is one of the foundations for the research hypothesis we are going to propose in Section 3.2.

3.1.2 Foundations from S-D Logic

Service is a kind of activity of supporting human beings and organizations to enable them to achieve their objectives (Kameoka et al., 2007). It is the application of competences (knowledge and skills) by one entity for the benefit of another (Vargo and Lusch, 2004). This definition implies that value is created through collaboration in interactive configurations of mutual exchange (Vargo et al., 2008).

Service science is the study of service system and of the co-creation of value within complex configurations of resources (Vargo et al., 2008). More and more researches on service innovation and service value creation have been proposed and put forward. A service consists of three objects, i.e., service providers, customers and compensation. A service system is composed of customers, service providers and service co-creation activities. The objective of a service system is to maximize the service value to assure the satisfaction of both customers and service providers.

In service science, new concepts related to service have been proposed. Vargo and Lusch proposed the S-D logic concept which is different from traditional G-D logic, that

the value is determined by customer on the basis of "value in use" (Vargo and Lusch, 2004; Vargo et al., 2008). In G-D logic, the determination of value is products based on concept "value in exchange". Whereas, in S-D Logic, it leads to a new viewpoint of service through extension of its concept to include goods. The key point of S-D logic is that service value for customers is created through collaboration between service providers and customers, and the customer is a co-producer of the service and is an active participant of mutual interaction.

3.1.3 Foundations from the theory of service value co-creation

Value creation is the core purpose and central process of economic exchange (Vargo et al., 2008). A number of value co-creation models have been proposed in different logic such as Service Dominant Logic, Goods Dominant Logic, Experience based Service Value Co-creation, and Experience based Economy. A service value co-creation model can be either static or dynamic.

Kosaka et al. proposed a dynamic experienced-based service value co-creation process model called KIKI model (Kosaka et al., 2012), and one of the features of KIKI model is that a new notion of *service field* is first introduced and applied to B-to-B (Business-to-Business) collaboration. Service field is a concept that is similar to electromagnetic field in physics, where electromagnetic power is determined by both the electric charge and the electromagnetic field where it is located. The value of a service is also determined by the service itself and the field which shows the context of provided services (Kosaka, 2012), i.e., $V = S \times F$, where V, S, F stand for service value, service and service field, respectively. KIKI model is a four-step spiral process, aiming at designing new service that is suited to service field, and hence creating maximal service value. The four steps are:

Step 1: *Knowledge sharing in collaboration*: Service providers and receivers cooperate with each other, share their objectives and experience, and understand each other;

Step 2: *Identification of the service field*: Data collection and analyses are used to extract information of the first step, and identifying service field;

Step 3: *Knowledge creation for new service idea*: New service idea is designed based on the identified service field of step 2. Through participants' collaboration in value co-creation process, new knowledge of service is created by combining various service ideas and technologies;

Step 4: *Implementation of new service idea*: The created new idea is put into practice. Collaborators in service value co-creation process evaluate the results of knowledge creation step for the required service and take them into account in the following process for enhancing service.

During the iteration of the process, the service field changes based on the change of the customer's experience in each step. Correct identification of service fields determines the design of new service, and hence is the crucial step in the model. There are basically three steps to identify service field, including to collect data related to customers behavior, thoughts and opinions, to analyze collected data using various methods and technologies, and to draw conclusion from analysis result.

Another feature of KIKI model is that collaboration between service providers and customers is emphasized for service value co-creation. Customers actively participate into knowledge sharing and implementation of new service idea. By collaboration, service providers learn better the preferences of potential customers, and draw correct service fields, which help service provider design new services to create maximal values in the identified service field (Zhang et al., 2013). KIKI model has been applied to concrete business fields such as branding of university research-laboratories (Nguyen et al., 2016), human resource management (Doan et al., 2014) and language education (Dong et al., 2013).

3.2 Research hypothesis for OAE service value co-creation

According to existing issues of OAE service and three foundations, OAE as a type of non-profit public service, its value depends on the usefulness of OAE to older learners. That is, the service value of OAE is determined by older learners. OAE should be conducted according to S-D Logic and service value co-creation in which older learners are active participants and collaborators in the process of curriculum development. We propose the structure and process model of OAE service development for value co-creation of OAE, as depicted in Figure 3.1.

The structure model of service value co-creation for OAE

Figure 3.1 (a) shows the value co-creation structure model of OAE service. In the structure, there are two groups of people, the education providers and the older learners. They are the main participants and collaborators of OAE services. The education provider designs education activities and service based on the motivation of themselves and older learners, and then provides these services to older learners for their satisfaction. The older learners give their feed back to provided education service. The objective consistency of two groups is the premise for collaboration.

In this structure model, the education providers play a role of facilitators in the development of OAE service that they lead the whole process of OAE curriculum design

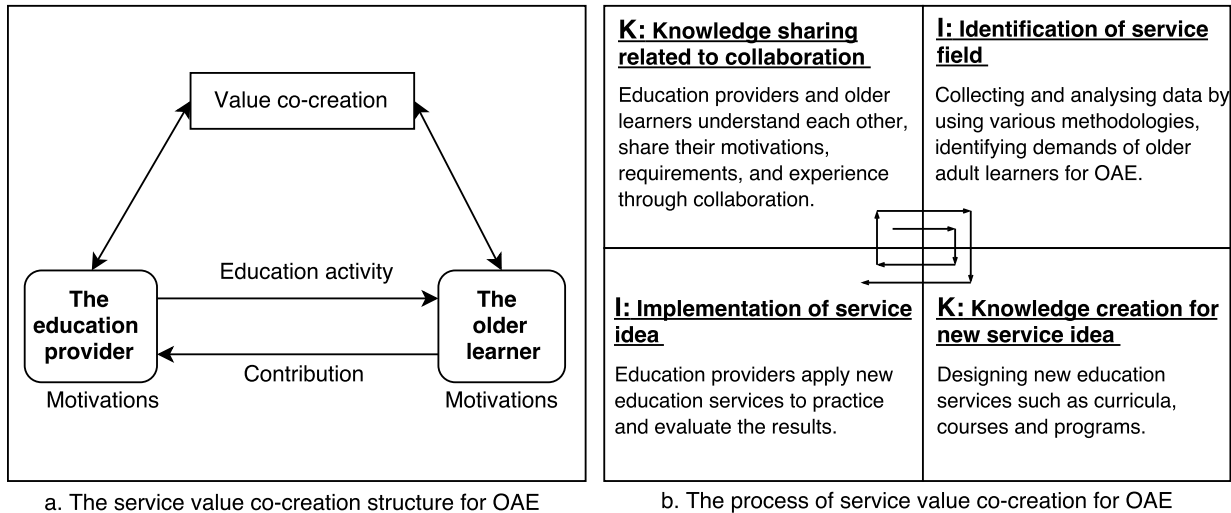


Figure 3.1: The abstract structure and process of value co-creation model for OAE from service science perspective

and development and collaborate with students. Older learner are active creators and all education contents are designed based on learners' requirements in the process and for achieving maximal satisfaction of learners. This is a co-created process that education providers and older learners co-create the OAE service value.

The process model for curriculum development of OAE

There are four steps in the process of value co-creation to develop curriculum. Figure 3.1(b) presents the process model. This model is an application of KIKI model to OAE service for curriculum development. The four steps of service value co-creation of OAE are explained as follows:

Step 1: *Knowledge sharing related to collaboration.* In this step, knowledge means the information which are closely related to education service, such as the objectives of education providers, facilities, funding, current education activities, education resources, education requirements of older learners, interest, experiences and expectations, etc. This step is achieved collaboratively by interaction between education providers and older adult learners by various means such as questionnaire, open campus, interviews, seminars, BBS, observations, etc.

Step 2: *Identification of service field.* The title of this step is inherited from KIKI model. In the step, education providers collect data from the first step and analyze them both quantitatively and qualitatively to identify service fields. There are many conventional methodologies related to the identification of service field, and they

mainly fall into the categories of field research or questionnaire analysis. Questionnaire and interview are popular in conventional educational surveys. These analyses collect respondents thoughts about a target service but sometime are affected by some subjective factors. IT technology (like data mining technology) and human science (like brain science and eye tracking equipment) as objective methods can be employed to analyze learners needs or inclinations. Ethnography can also be used for identifying older learners requirements in education services through observations of human behavior. Through field work at real sites, ethnographers obtain findings related to older learners true needs. This step is crucial because the service fields that are identified are the main references to forthcoming education design.

Step 3: *Knowledge creation for new curriculum idea.* The third step is called Knowledge Creation and Design, in which new education ideas are proposed and designed by education providers on the basis of identified service field from the previous step. The criteria of designing new curriculum are satisfaction of older learner, state of the art and current resources of institute. Curriculum ideas include curriculum objectives, syllabus, teaching contents, lecture handouts, textbook, teaching methods, learning resources, etc.

Step 4: *Implementation of new curriculum idea.* In the last step, education providers deploy new created ideas to older learners, and older learners give their feedback to providers for assessment. Several criteria should be considered to deploy and evaluate the new created ideas, like the satisfaction of older learners, achievement of education objectives. For the assessment, it needs the collaboration of education providers and older adults to share their teaching and learning experience, such as the satisfaction of learners, existing problems, possible solutions. The deployment approaches vary according to the types of education services, and the assessment methods mainly include online evaluation system, expert review, questionnaire, seminars, etc.

During the iteration of four steps, the service field changes based on the change of learners and education providers experience. Correct identification of service field determines the design of new education service, and hence is the critical step in the proposed model. Another characteristic of the model is collaboration between education providers and older learners is emphasized for service value co-creation. Older learners actively participate into knowledge sharing, implementation and assessment of new idea. By collaboration, education providers learn better the preferences of potential learners, and draw correct service field, which help education providers design new education idea to create maximal service values in the identified service field.

3.3 Criteria of validating research hypothesis

In this section, we present the criteria that is used to validate the research hypothesis that are proposed in the previous section. The criteria includes the following 3 aspects:

1. Satisfaction of OAE services
2. The value co-creation structure

In this criteria, it include 3 sub-criteria: (1) consistency of motivations and collaboration relation; (2) older learners are co-creators of service value; (3) education providers play leading roles as facilitators of OAE service.

3. The value co-creation process

In this criteria, it includes 5 sub-criteria, they are: (1)step 1: knowledge sharing related to collaboration; (2) step 2: identification of service field; (3) step 3: knowledge creation for new service idea; (4) step 4: implementation of service idea; (5) overall spiral process.

The first criteria is used to demonstrate the successful education service of selected case studies that older learners are satisfied with provided education service. The second one is the premise of service value co-creation and used to compare the structure of real OAE service design situation with the one in the hypothesis. The third one is used to analyze the similarities and differences between the development process of real education service and the one in the hypothesis.

3.3.1 Satisfaction of OAE services

To demonstrate the successful education service of selected case studies, one important criteria is that the quality of education in these case studies must be high. Satisfaction of older learners is one of the most important factors to show the successful education practice. The satisfaction degree of learners with provided education service can be shown in 8 aspects as listed below:

1. Overall degree of satisfaction with served education;
2. Reasonability of courses;
3. Appropriateness of teaching methods;
4. Dedication of teachers;
5. Scientificity of teaching contents;

6. Satisfaction with the infrastructure;
7. Helpfulness of learning activities;
8. Comparison of learned contents with expected contents.

The 8 aspects are mainly about the courses that are provided to older learners. They are also the main basis for the design of questionnaire used in case studies.

3.3.2 Value co-creation structure

For verification of structure model, there are 3 sub-criteria can be used to check the correctness of it.

Objective consistency of OAE service providers and learners

One of the premise of service value co-creation in proposed models is that education providers and receivers should have common objectives from service activity. Service providers hope to achieve education objectives by providing satisfying services to students, and students hope to receive satisfying services by attending OAE learning activities. Value co-creation depends on the objective matching between service providers and receivers.

In order to apply value co-creation model to OAE service, we need to identify if the premise of service value co-creation holds for OAE services, i.e., if both OAE service providers and learners have common objectives in education activities.

Education providers play leading roles as OAE service facilitators

In the OAE service development process, education providers play leading role that they collaborate with older learners and sharing experience with them to learn their needs. Then they analyze those data and design, deploy, evaluate and improve OAE service by interacting with older learners. During the process of service value co-creation, education providers play a dominant role in that they have the right to determine what services should be provided in terms of both content and form according to learners' requirements and feedbacks.

We need to investigate the role of OAE service providers in the process of education service and check if they also play a leading role in the process as service providers do in service value co-creation. Such similarity would demonstrate the feasibility of applying service value co-creation model to OAE services in some sense.

Older learners are collaborators and co-creators of OAE service

Service receivers also play an important role in the process of service value co-creation according to existing models. The receiver positively engage into the process and their requirements are the main basis for service providers to design and supply their services. Although the receiver does not have the right to determine the content and the form of services, they are the people who determine whether to design the service or not. This factor is important for service value co-creation because customers only want to attend OAE for those services from which they think they can get satisfied from it. Service providers have to take the requirements of customers into consideration when designing the service to make its value maximized. Moreover, in existing models it is assumed that customers have motivations to be collaborative with service providers, which is the key to service value co-creation. In that sense, we say that customers play a collaborative role in the process of service value co-creation.

In order to apply existing service value co-creation model to OAE services, we need to understand the role that older learners play in the process education and check if it is collaborative. If that is the case, it demonstrates the feasibility of achieving value co-creation of OAE services, as one does for business services.

3.3.3 Value co-creation process

Another criteria to compare business services and OAE services is their development process, besides the criteria from the structure point of view. Our proposed process model is based on the assumption that the development process of OAE services is the same as the one of business process in existing KIKI model, i.e., a spiral four-step process. There are two features of the development process. One feature is the interaction between service providers and receivers, and the other is the spiral development of services.

In the case studies, we need to understand the development process of OAE services and examine if it follows the proposed spiral four-step process. If that is the case, it would turn out that KIKI model can be faithfully applied to OAE services for value co-creation. Otherwise, it is necessary to tailor KIKI model based on the differences of the development process of OAE services to make the tailored model well suited to OAE services.

3.4 Research methodology based on case study

To verify the research hypotheses, we conduct case studies on three OAE universities. We first collect data using an integration of both quantitative and qualitative approaches, and analyze the collected data. Then, we compare between research hypothesis and

survey results to check the validity of the proposed hypothesis. Based on the comparison result, we propose a new service value co-creation process model for OAE curriculum development. More precisely, the general research process of the study is as follows:

Step 1: *Choosing research target for case studies.*

Step 2: *Collecting data by using questionnaire, interview and other complementary methods, and analyzing the education mechanisms of three cases.*

Step 3: *Comparing the investigation results from case studies with proposed hypothesis and Checking the validity of research hypothesis.*

Step 4: *Designing a service value co-creation process model for OAE curriculum development which is more generalized and specified to OAE realities.*

3.4.1 Choosing research target for the study

In this research, we mainly focus on non-formal OAE research. Among non-formal OAE, there are many modes of older learning. In case study, we choose OAE university as cases to study. Before introduction to three cases, we first introduce the basic information of Chinese OAE universities, such as its organization, management.

Introduction to Chinese OAE universities

In the case study, we choose Chinese OAE universities as cases to study. OAE has been prevalently adopted in China along with the concept of Lifelong Learning (LLL) (Williamson, 1998) and Education for All (EFA) (Goldstein*, 2004), and has gained much attention from government and universities. At present, the modes of OAE learning programmes in Mainland China could be categorised into 5 types: (1) universities/schools for the third age, (2) community learning, (3) long-distance learning, (4) degree-education at formal colleges, and (5) other types (Findsen and Formosa, 2016). Among these 5 types, the University (School) of the Third Age (U3A) are the most important and primary mode for elderly learning in China. According to incomplete statistics, the number of universities and schools for old people in China has drastically increased to 43000 and learners have reached nearly five million until 2013 (Gu, 2013).

In U3As, OAE universities are large scale and set up by central, provincial, municipal or county governments or large corporations. The majority of the universities are established and financed by the government and some are founded by private sectors, charging a very low tuition fee ranging from tens to several hundred CNY for each semester.

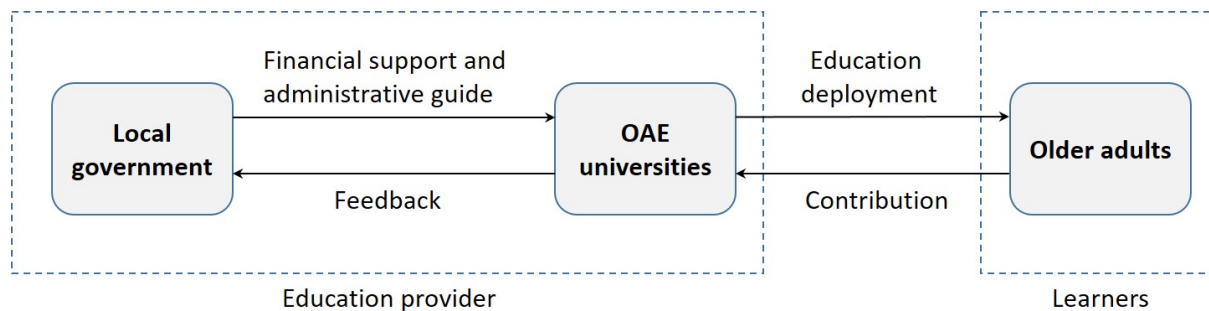


Figure 3.2: The outline of service system of OAE universities

U3As are open to all old/retired people on a first-come-first-served basis and become increasingly popular among the seniors and the registration is very competitive. Older adults even have queued in the early morning to register for a course.

The U3As operate education programmes under the overall guidance and support of relevant authorities such as the local old cadre bureaux, education bureaux, or cultural bureaux, varying from place to place, while U3As have the autonomy to operate education programmes that are not degree-based and have their own campus or buildings.

In O3As, the course development is very rapid. There were only nine courses in 1983 when the first U3A was built; however, now universities and schools all over the country offer more than 200 kinds of courses. In general, the majority of courses are related to life enrichment and promotion of good health. The courses can be divided into eight categories: (1) news and laws; (2) literature and history; (3) language; (4) calligraphy and painting; (5) arts and sports (including singing, musical instruments, tai-chi, etc.); (6) health care (including Chinese medicine, massage, nutrition, etc.); (7) family financial management and household craft; (8) modern technology (such as computers and photography). Many courses are classified into different levels, primary courses, intermediate courses and advanced courses. The courses usually open once a week, taking about 45 min to 2 h every time. The classes are delivered by full-time or part-time teachers. Most instructors have a senior or intermediate level professional title recognized by the government (Findsen and Formosa, 2016).

The education system of OAE university can be considered as a service system which are consisted of two groups of people, education provider and older learner. Figure 3.2 shows the outline of service systems in Chinese O3As. The education provider includes local government and OAE university. The older learners are older adults who meet the qualification of registration. In the service system of OAE university, the local government gives financial support and administration guide to OAE universities, and the universities deploy the education activities and provide them to older learners. On the other hand, the older learners give their feedback and contributions to education providers. For the OAE universities, they give the feed back to local government.

Three OAE universities chosen in case studies

In case study, we take the education activities in Shanghai University for the retired Veteran Cadre (SURVC), Shanghai University for the Elderly (SUE) and Jingan University for the Elderly (JAUE) as examples. There are two main reasons for choosing the three Shanghai OAE universities. One reason is Shanghai's nationwide leading role in OAE in China. The percentage of older people among Shanghai population is 30.2%, which is almost one time larger than the average (15.5%) of the country, according to a government report in 2015 (Williamson, 1998). OAE in Shanghai is at the top level among all Chinese cities. By the end of 2015, there are 4 municipal level OAE universities, 68 district level community universities or colleges, 212 OAE schools and more than 10000 teaching centers in Shanghai.

The other reason is that governments play dominant roles in promoting OAE in various aspects: overall guidance, funding, places and facilities, which makes OAE in China differ from those in other countries. Although the history of OAE in western countries is longer than that in China, OAE in western institutes may not be suited to Chinese institute due to Chinese traditional culture and the history after the foundation of new country. Moreover, there is a big gap between the rhetoric of national policy and the practice on the ground (Findsen and Formosa, 2016). Such situation forces Chinese OAE universities to develop their own education style from scratch to meet the demands from older learners.

For the above reasons, we choose three typical and famous OAE universities from Shanghai as cases, each one has its own characteristics, but conduct successful education services. The case SURVC is a city level university with more than 30 years history. It is a very special OAE university open to retired leaders who once worked in government. For the case SUE, it is also a city level university, but open to all old people who are over 55 years old for female and 60 years old for male. The last case JAUE is a district level OAE university, and open to all old people. Even the university JAUE in the third case has been found for four years, the most typical characteristic of it is education principle which is not only driven by older learners' needs, it is also driven by education providers' motivations.

3.4.2 Data collection and analysis strategy in case studies

Data collection strategy

We use both qualitative and quantitative methods to collect data in three cases. The survey subjects include two groups, i.e., the education provider and the older learner, who are two major groups in education system. Table 3.1 shows the sketch of the design of our survey approach used in the three case studies.

We survey older learners mainly by questionnaire and interview. The questionnaire consists of 24 questions which include personal information of respondents, learning experience, satisfaction with provided education, necessity of education reformation, consciousness of student involvement and suggestion. We distribute questionnaires to older learners randomly. We first choose about 10 classrooms which are from different schools, departments or courses. Then We go to these classrooms before or after class to distribute nearly 10 pieces of paper-based questionnaires to older learners randomly with the help of administrators and lecturers. We collect questionnaires from respondents and remove the invalid ones. Finally, we use SPSS 17.0 tool to do statistics about older learners' data. In addition, we also interview several students representatives for more deep information of learning experience. Most of interviewees are class monitors who usually are more motivated and positive to participate education activities.

We survey the education provider mainly by the means of face-to-face interview. Semi-structured interview and face to face talk are useful methods to dig deep data of education mechanisms of OAE. We interview education providers in order to gain deep understanding of the situation of each university such as the objectives of the universities, the means of interaction with older learners to explore their requirements, the processes and mechanisms of course development, the characteristics of education and teaching and suggestions to ideal OAE university. The interviewed providers are university directors, department deans, lecturers, researchers, administrators, class advisors.

Table 3.1 shows the detailed survey contents in case studies which are mainly based on the former mentioned five criteria. Questionnaires and interview questions are designed focused on the five criteria and try to get real data in three cases on five criteria.

Observation and document records have also been used as complementary methods to procure more information for case studies. Participating student meetings is an useful way to see how education provider interact with older students. The observations of website allowed us to study the dynamics of targeted cases and give us additional information for analysis. The records of official documents consist of existing data such as evaluation result, curriculum plan or annual report. That information contribute greatly to the data collection.

Data analysis strategy

We analyze the collected data mainly on the basis of the three criteria proposed in Section 3.3 and divide these collected data into 5 aspects: (1) learners satisfaction with the education service; (2) objective consistency of education providers and learners; (3) the role of education providers in the education service development; (4) The role of older learners in the curriculum development; (5) Development mechanism of OAE curriculum

Table 3.1: Design of the survey subjects, methods and contents used in case studies

Subject	Method	Content
The older learner	Questionnaire & Interview	<ol style="list-style-type: none"> 1. Learning objective and requirement: What is your purpose of attending the university? What extent can your requirement be achieved? 2. Learning experience and degree of satisfaction: What have you learned from the university? Does the provided service meet your needs? 3. Service co-creation experience: Do you have experience on giving your suggestions to education providers? Do you think it is necessary for learners to join education improvement activities? Will you positively share your suggestions and experience? 4. Service innovation for OAE: Do you think the current education situation should be reformed? What should be improved? Do you have any ideas? What is the ideal OAE university in your mind? What is good relationship between education providers and receivers?
Education provider	Interview	<ol style="list-style-type: none"> 1. Education objective: What is education objectives? What extent and how does it be achieved? 2. Education situation: what is overall education situation? What are provided education activities? What are students' response to the activities? 3. Education content: How to develop new education contents? What is principle of developing new courses? What is the process of designing new education contents? How to test new idea? 4. The role of older learner in education activity: Is there any interaction experience? How to interact with older adult? In what ways do the university interact with students? What is effect of collaboration? 5. Service innovation for OAE: What is your feeling on OAE from your experience? What is the ideal OAE university in your mind? What is good relationship between education providers and education receivers?

The satisfaction of older learners are quantified by the data collected from questionnaire. For each aspect of the satisfaction, we use the valid percent (question of single option) and percent of case (question of multiple option) respectively to analyze by using the tool of SPSS 17.0 to do statistics of the corresponding data.

We also calculate the distribution of older learners' objectives of engaging OAE university based on the data collected by questionnaire. The distribution is used to be compared with the objectives of education providers, which we obtain by summarizing the interview data we do with education providers. The comparison results show whether the objectives of the two sides are consistent or not.

The roles that older learners and education providers play in the process of OAE course development are identified by surveying older learners using questionnaire and interviewing education providers. On the one hand, we analyze the data from older learners on their awareness of student involvement and experience of sharing feedbacks. On the other hand, we analyze the data from education providers on means of interaction with older learners to explore learners' requirements and process of designing new education ideas, and also teaching characteristics. Through these analyzed results, we can understand the roles of learners and providers in the process of education service

In each case study, we use a concrete curriculum development example to describe the contributions of the learners and education providers to the curriculum development by summarizing the responses of the both sides. From the example we can not only identify the roles of the both sides, we can also obtain a general mechanism of developing curriculum in each case, such as the structure and process of designing curriculum.

After data analysis of learners' side and education providers' side and an example of curriculum development, we summarize the mechanism and process of curriculum development in each case.

3.4.3 Hypothesis validation strategy

We compare the summarized analysis results with research hypothesis with respect to the three criteria proposed in Section 3.3. First, we examine if the satisfaction of older learners with the education in the OAE university in case studies is high. Higher percentage means higher quality of the education provided by the university.

Then we check the consistency of value co-creation structure with analyzed curriculum development structure in each case. We first check the objective consistency of older learners and education providers by comparing the calculated distribution of older learners' objectives with the objectives summarized from education providers' response in the interview. If the result is consistent, it means that this criteria is met. We then check the roles of older learners and education providers in the curriculum development. If in the process older learners are collaborative and education providers play leading roles to

develop education courses based on learners' experience. These sub-criteria are met, and consequently the proposed value co-creation structure model is validated.

Finally, we compare the process of curriculum development with the process of service value co-creation in KIKI model. If the two processes are consistent, the hypothesis is therefore validated. If there are inconsistencies between the two processes, we need to identify the differences and propose a new model, which is specific to curriculum development.

3.4.4 Proposal of curriculum development model

After three case studies, we summarize and discuss the differences between the three cases in their education experience, differences between formal education, differences between OAE university and other modes of non-formal OAE, differences between non-formal education formal education and informal education and difference between OAE and general school education. Through these comparisons, some new characteristics for development O3A courses are identified. Based on the identified characteristics of O3A curriculum development, we propose a new curriculum development process model by tailoring the existing KIKI model to make it well suited to O3A situations.

Chapter 4

Case I: Shanghai University for the Retired Veteran Cadre

4.1 Overview of Case I

Shanghai University for the Retired Veteran Cadre (SURVC) was founded in 1985 by Shanghai local government, and developed rapidly to be a national advanced older adult university and a demonstrative university in Shanghai. It was set up mainly for the retired leaders who once worked for the party and government organizations to have a place to learn after their retirement.

As one of typical non-formal OAE universities, SURVC conducts successful education services, and provides relatively concentrated courses to retired veteran cadres for meeting their requirements.

- **Basic information of SURVC:** There are 9 departments, 40 classes and around 4000 students in SURVC. It has own building and provides more than 40 types of inner-classroom courses to students. In addition, it has outstretched education activities, such as learning salons and student associations. A special type of college was found, like Oriental College of Art, an association that was founded by the older students. It is outer-classroom learning activity and organized by older students voluntarily based on their hobbies and higher level requirement of education contents. They are also one of ways for students to make contributions to society. The government gives financial support, and administrative guide to the university. The administrators and working staff deploy education activities autonomously, and provide them to retired veteran cadres.

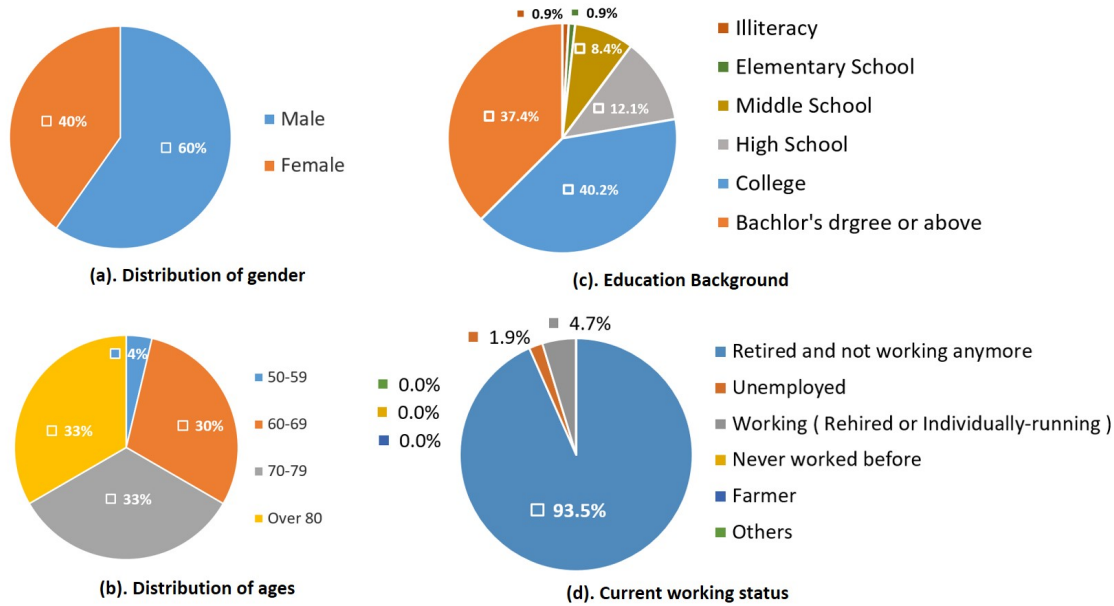


Figure 4.1: The distribution of personal information of respondents in Case I

- **The service system of Case I:** The education system of this university can be considered as a service system from service science perspective as shown in Figure 3.2, where the education provider includes Shanghai municipal Bureau of Retired Veteran Cadres and the university. The education receivers are retired veteran cadres who get educated by attending to the education activities and then make contribution to the university, the government and even the society.

- **The statistics information of questionnaire and interviewees:**

We design questionnaire according to survey contents shown in Table 3.1 with 24 questions, and then distribute paper questionnaire to older learners randomly in SURVC. Finally, we got 100 pieces of valid questionnaire. Figure 4.1 shows the distribution of personal information of respondents in Case I. Figure 4.1 (a) and (b) show the percentage distribution of gender and age of respondents, 60% of them are male, and female is 40%. Most of them are over 60 years old. The percent of aged 60-69, 70-79 and over 80 distribute uniformly, they are 30%, 33% and 33%. Only 4% of respondents is aged 50-59. Figure 4.1 (c) and (d) show the overall distribution of education background and current working status of learners. We can find out that over 77.6% of respondents are college degree (graduated from higher vocational colleges) or above (have bachelor degree or above), and 93.5% of them are full retired and not working any more.

From above data of surveyed learners as shown in Figure 4.1, we can see that most of respondents are over 60 years old, full retired from workplace and have

Table 4.1: The statistics information of interviewees in Case I

Role	Name	Age	Position	Working or learning period
Education provider	Mr. Xu	70s	Education director	8 years
	Ms. Xiao	50s	Administrator	27 years
	Mr. Wang	30s	Lecturer, researcher	6.5 years
Older learners	Ms. Gu	80s	Learner, monitor	26 years
	Mr. Guo	70s	Learner, monitor	8 years
	Ms. Guan	60s	Learner, monitor	4 years

high education background. Due to the specialty of SURVC, the learners there are retired veteran cadres, therefore, the male has a higher proportion, and the education background is relatively at a higher level compared with general OAE organizations or universities. And also, there is no age limitation of enrollment in SURVC, the older students over 80 years old can have right to attend OAE universities freely.

We interviewed three student representatives and three working staff who have different roles and responsibilities in SURVC for detailed information on education practices and situation. The statistics information of interviewees is shown in Table 4.1.

4.2 Data collection and analysis

Based on the basic introduction of the case and the investigation design in Table 3.1, we conduct data collection from two groups of people, older learner and education provider, to get the results of survey contents. In this section, we present the collected data and analyze them in 5 aspects: learners' satisfaction with the education service, objective consistency of OAE service providers and learners, the role of education providers and older learners in OAE service development, development mechanism of OAE curriculum in the case.

4.2.1 Learners' satisfaction with the education service

We survey learners' satisfaction degree with provided education service from 7 aspects (the overall degree of satisfaction with served education, reasonability of courses, appropriateness of teaching methods, dedication of teachers, scientificity of teaching contents, satisfaction with infrastructure, and helpfulness of learning activities). Figure 4.2 depicts the

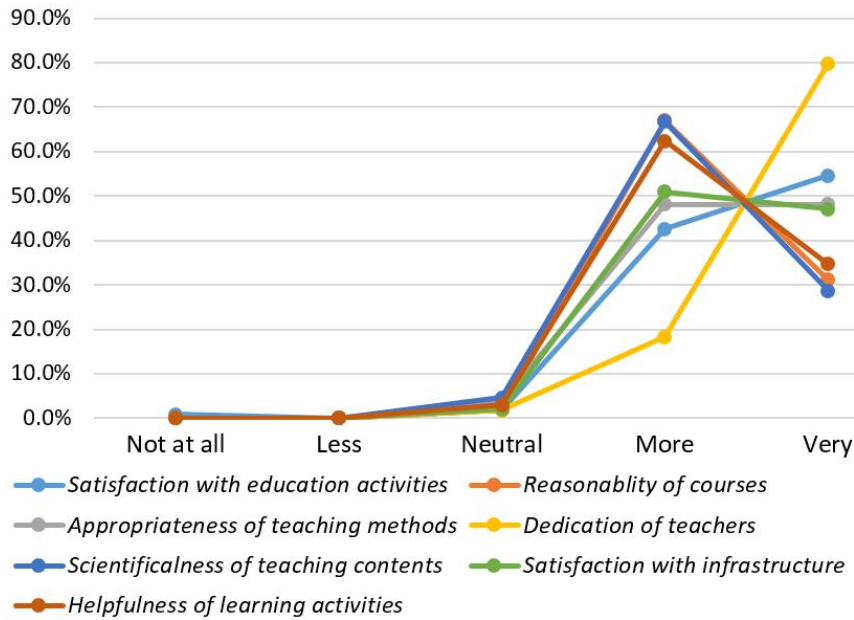


Figure 4.2: The satisfaction with the university in 7 aspects in Case I

satisfaction of the learners with the education provided by the university. More than 90% older respondents are satisfied with the current education in seven aspects. Less than 10% of students are not satisfied with provided service. These data reflect SURVC conducts successful education activities from the older learners' point of view. The older students feel satisfied with education service, although they think there are still space to improve it.

Different students have different interest for education contents. We surveyed the learned contents and expected learning contents of students to check if their requirements are meet or not. Figure 4.3 shows the percentage of learned contents and expected contents. The green line shows that *calligraphy and photography* are the most welcome courses to students, the percent is 61.6%. And the next is *medicine and health*, the percent is 46.8%. Moreover, the course of *singing and dancing, literature and foreign language*, and *computer and network* are also welcome to older learners. The percentage is around 30%. The percent of learning economy, science, cooking, planting, philosophy, law, clothing and knitting are very low, below 5%. The red line shows the distribution of expected contents what students want to learn. The most expected courses are *medicine and health, calligraphy and photography*, the percent is over 70%. The course *computer, network, literature, foreign language, singing and dancing* are also well liked by students, the percents are around 50%. The popularity of other course are very low. By comparing learned contents with expected contents, we can see that the overall tendency of percent distribution of two lines are similar. It can be concluded that students' interest is well meet in SURVC. Most student are learning what they expected to learn. The survey

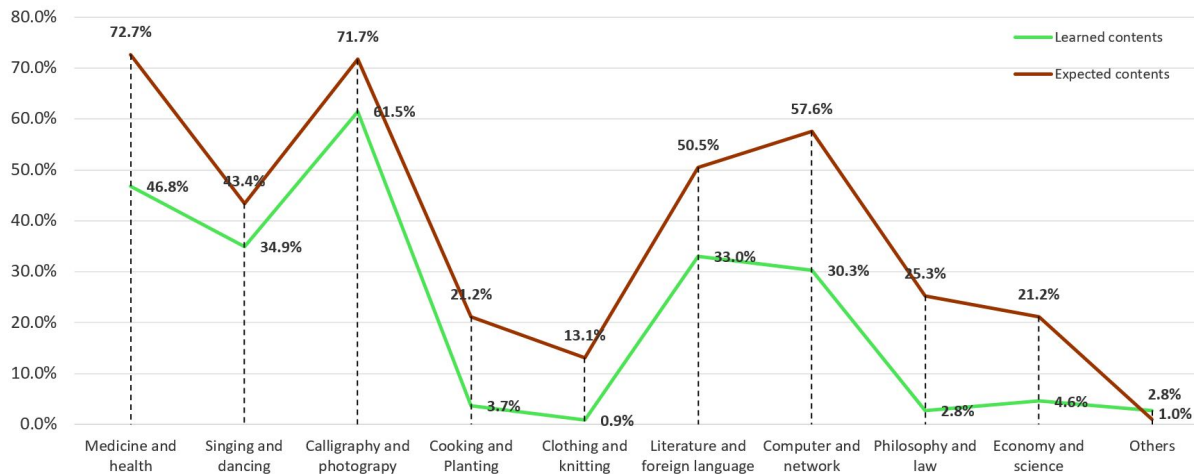


Figure 4.3: The distribution of learned contents and expected contents in Case I

result also reveals the purpose of students to attend OAE university, like to enrich lives and keep healthy.

The above data analysis reflect SURVC conducts successful education activities from the older learners' point of view. The older students feel satisfied with education service and their learning requirements are well met, although they think there are still space to improve it.

4.2.2 Objective consistency of education providers and learners

Objectives of the university

The interviewed education director said that the objective of university is changed with the development of society, and the current objective is *“to make it a base to advocate innovative theory of the party, to spread new knowledge, to study Chinese traditional culture, and to make examples of retired veteran cadres”*. He also mentioned that *as the OAE university, we have the same objective as other OAE universities, but as the university for retired veteran cadre, our objective is at a higher level, not only for happiness of older adults, but also for the all around development of them*. The researcher said they advocated the philosophy of quality education, that *the nature of OAE is for the development of personal quality rather than exam-oriented education*.

Due to the specialty of students in Case I, its target is different from general OAE university. The general OAE university aims to improve the QoL (quality of life) of the elderly, but here the target should be a higher level. It is pointed out that the OAE is a kind of quality education which is aimed at all around development of learners, it is need-oriented education and improve overall quality of old people.

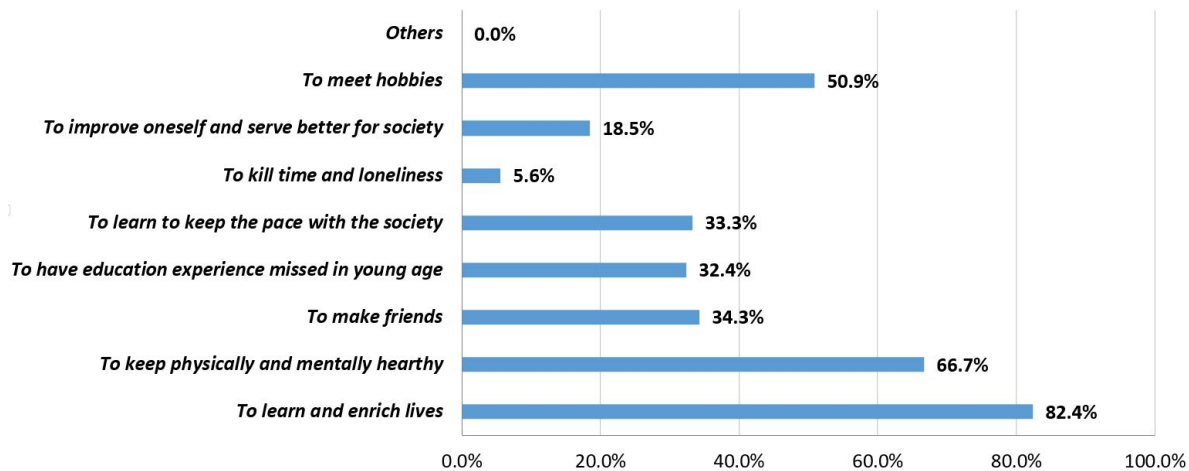


Figure 4.4: Learners' purpose of participating OAE university in Case I

Objectives of older learners

In the learners' questionnaire, we list 9 options of the purposes of studying in SURVC. The respondents can give multiple options according to their own experience. Figure 4.4 shows the percent of each purpose of attending OAE universities. The purpose distribution of learners to attend OAE university is shown in Figure 4.4. The first three purposes include *to learn and enrich lives*, *to keep physically and mentally healthy* and *to meet hobbies*, the percents are 82.4%, 66.7% and 50.9% respectively. While the percentage of learners who have other purposes such as *to make friends*, *to keep pace with society* and *to serve society* are quite low, i.e., under 35%. The percentage of choosing *to improve oneself and serve better for society* and *to kill time and loneliness* are lower, only 18.5% and 5.6%. From these data, we can conclude that most of older students studying in SURVC for the purpose of learning knowledge and skills, keeping healthy and meeting hobbies. Some students may want to make friends, to learn to keep with society and to make up for the inadequacy of education in the past. Only a few learners study just for killing time and loneliness.

Figure 4.6 (a) shows the expected learning level of respondents. It can be seen that 53.5% of respondents want to study at a systematical level, and 29.3% of them pursue professional learning service. The others just want to get an elementary understanding about some knowledge and skill. Last but not the least, we also explore the students' gain from learning activities. Figure 4.6 (d) shows the percentage distribution, it can be seen that older adult get a lot from education service. Through attending OAE university, they enjoy the learning practice, make many new friends and their retired lives are enriched.

There is no perfect education service. Even the satisfaction degree of students is very high, there are still some pointed need to be improved or reformed. Figure 4.5 (a) shows percent of reformation necessity from students point of view that 80% of respondents

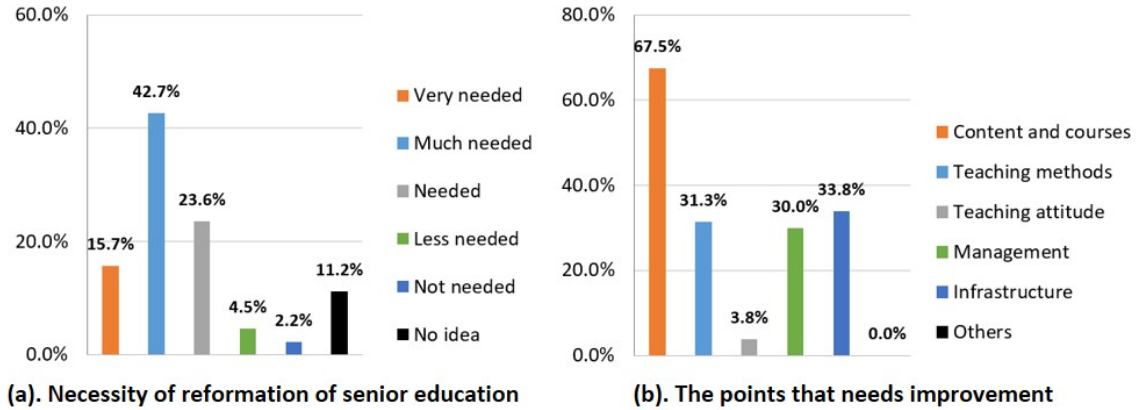


Figure 4.5: Data analysis result on education reformation in SURVC

think there are still space needed to be reformed. And there are 11.2% of students have no idea for this question. Also, we asked the older learner what points need to be improved, and the result is shown in Figure 4.5 (b). The percentage of choosing *contents and course* is very high, it is 67.5%. The percent of choosing *infrastructure, teaching method* and *management* are 33.8%, 31.3% and 30%. From these data, it can be refer that education content and course are the most related to students' learning. In Case I, the first need to be improved is education contents so that it can better meet learners' demands. Moreover, education infrastructure, teaching forms and education management are needed to be changed.

From the above analysis, we can conclude that, on the one hand, older learners in SURVC want to learn and enrich lives, to keep healthy and meet hobbies through learning activities which are similar to ordinary elderly learning objectives. On the other hand, as high educated older learners and retired veteran cadres, they have higher requirements for learning levels and courses which is quite different from other types of OAE universities.

Objective consistency of providers and learners

In case I, the university conducts a type of need-oriented education. Education providers design education activities based on the learners' objective. Their education services are conducted at a higher and concentrated level which is for meeting learners' education and working experience. From the percent distribution of learners' purpose and requirement and providers' statement, we can see the objective consistency of providers and learners.

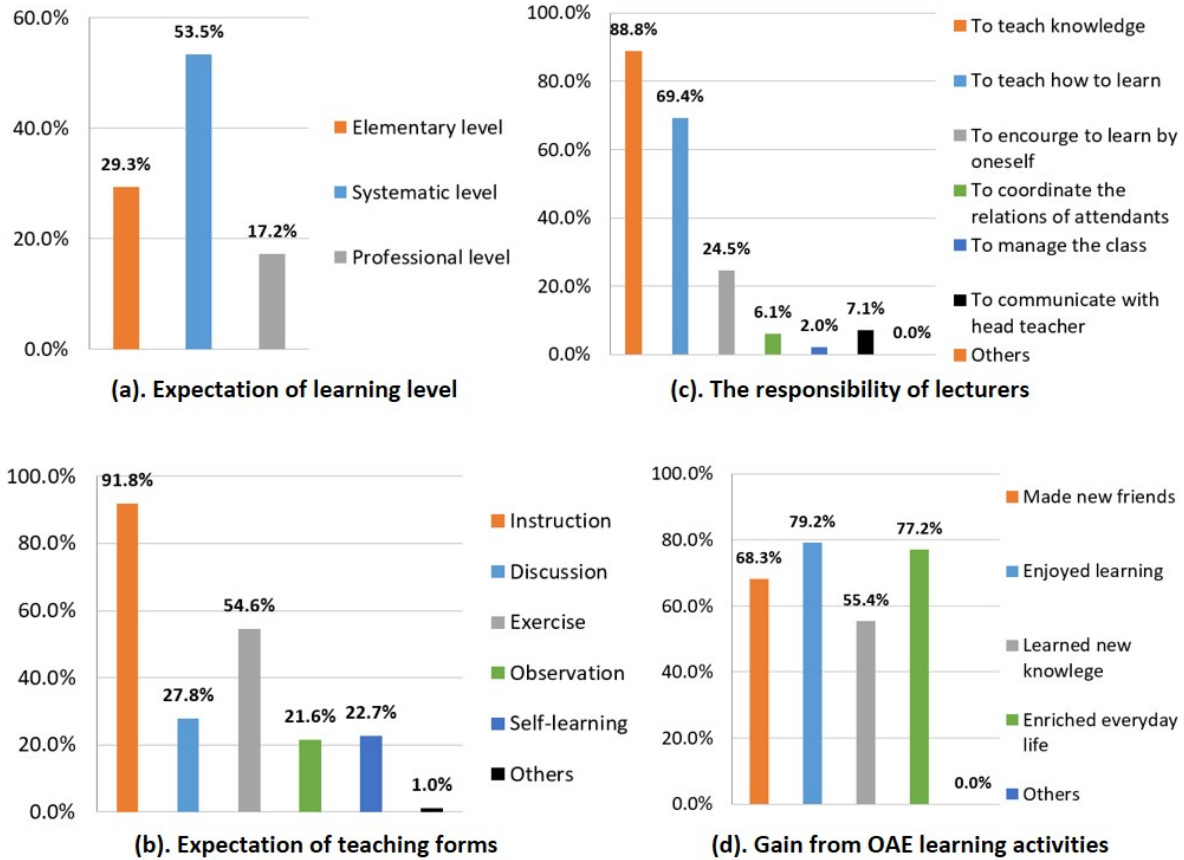


Figure 4.6: Data analysis results on the learning experiences in SURVC

4.2.3 The role of education providers in OAE service development

On the role of providers in education service design and deployment, it can be analyzed from learners' data and interviewed providers' data.

Data and analyzed results from learners' side

Figure 4.6 (b) and (c) show the survey results of learners on teaching forms of lecturer in class and their responsibility as education providers. The percentage of choosing *instruction* and *to teach knowledge* is very high, about 90%. The respondents also emphasize the responsibility of teachers for providing various forms to learning, leading them to study, coordinating the relations of attendants, managing class and communicating with administrators. From the collected data, we can infer that besides giving instruction which is the most important one, lecturers need to create good environment and atmosphere for students to exercise, discuss, observe and encourage self learning and teamwork as well. In addition, good relationship between learners and lecturers is not only lay on giving

knowledge and skill, it also needs their cooperation and coordination in or out classroom.

Data and analyzed results from providers' side

Education providers play leading role to interactive with older learners to explore their requirements to development curriculum. The university develops multiple ways to interact with the learners. Older learners are organized by classes, and in each class a monitor is assigned, who is mainly responsible for recording the feedback of his classmates every day. Such record is called *Class Diary*. These class diaries are the main data source for university administrators to analyze their education quality. One of the interviewed monitors said that "*we mainly serve students and play a role of medium between students and lecturers. We collect students' feedback and deliver these data to lecturers, and lecturers will pass the collected messages to administrators and find some possible solutions.*" Another interviewed monitor from vocality class shared her experience of interaction with education providers. She said "*two years ago, some of students in our class thought the learning of vocality in classroom is far from enough to meet their hobbies. The education provider learnt this and made an investigation in the class and also communicated with some student representatives. Finally, a chorus was set up for us to go out of classroom and give more preferences for others. Now our chorus is well-known in Shanghai and won several prizes as well. We very enjoy the process of making preferences for others. It is really amazing.*"

The researcher told that they also set up the College of Art, aiming at meeting the advanced demands like creation and self-establishment of those students who finished their regular lectures in the university but want to pursue more advanced learning. Another purpose of setting up the college is to provide a platform for the older learner to make attribution to society with their professional skills and knowledge. For instance, in the college there is a group of calligraphy learners who are almost professional. They make creative works under the supervision of experts, and then denote their works to charities. They also frequently go to communities to teach calligraphy amateurs.

The researcher and administrator emphasized that "*older learners are the first consideration factor of all education activities*" in their education system. At the end of each term, the university also organizes meetings for class representatives, monitors and administrators to listen to their opinions with each other.

According to the description of the interviewed education providers, it is clear to see that education providers engage into the whole process of education activities as facilitators of education service for older learners. They play a leading role in education service design and deployment that they collaborate with learners in many ways to explore their experience, requirements, and design, test and improve education contents according to learners' feedback. Not only are they policy makers and university administrators, but

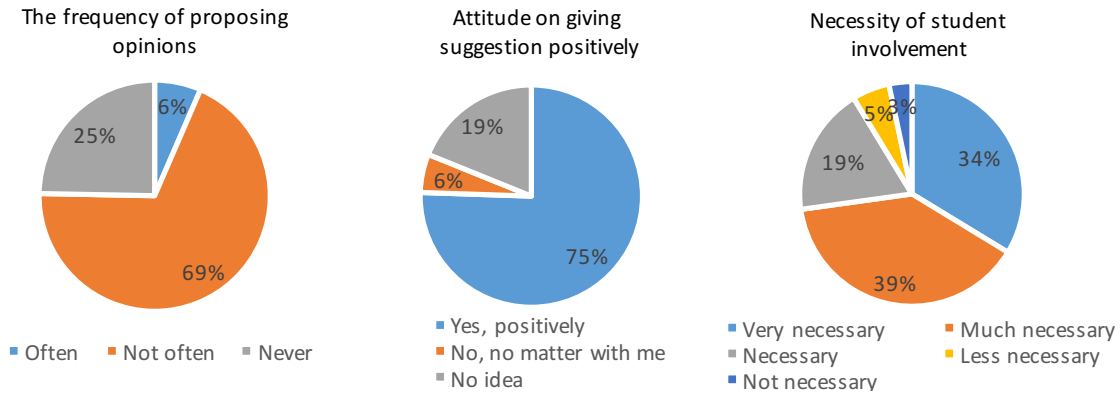


Figure 4.7: Data analysis result on consciousness on self involvement of learners in SURVC

education designers and providers based on learner-oriented principle.

4.2.4 The role of older learners in OAE service development

On the role of older learners in the process of OAE course development, it can be analyzed from learners' awareness of self-involvement and providers' attitude on learners' role in OAE service.

Data and analyzed results from learners' side

Figure 4.7 depicts the percent distribution of learners' self-consciousness. More than 90% of them thinks that it is necessary for student involvement to improve education quality. 75% of students express their positivity of giving opinions. Even the learners have high awareness of student involvement, but the reality of proposing opinion to provider is low. That only 6% of respondents often convey their opinions to education providers. More than 94% of them not often even never propose their feelings to university. These data reflect that learners have high self consciousness in service development, but need more channels and encouragement from providers to positively convey their needs and feedbacks.

Data and analyzed results from providers' side

We also interview education providers about the role of learners in OAE course development. The interviewed education director said that *it is mainly based on the needs and interests of older learners*. They also design some new courses based on the objectives of university and then give some directions to learners to help them develop their inter-

ests. Besides, some state-of-the-art courses like computer skills are provided to help older learners to keep pace with the society.

The director also said that *the process of developing our education system consists of following several steps: Investigation on the requirement of students through formal and informal forms, like questionnaire, face-to-face conversation, etc. Our research teams collect the data, conclude the effective information and design some new education ideas, and then conduct the second investigation to get the overall attitude of students towards new ideas. If the percentage of acceptance is high, then the idea can be tested by using seminar four times a term. We will collect students' interests again at the end of each term. If the result is good, the course can be applied as a regular course. The university evaluates the course by using our own evaluation system at the end of the first year of it.*

According to the description of the interviewed education providers, they take learners' experience into consideration seriously and see them as collaborators in the process of curriculum development. The education providers use many means to interact with older learners to explore their requirements and think older learners are active participants and collaborators in the process of curriculum development.

4.2.5 Development mechanism of OAE curriculum in SURVC

For the development process of OAE curriculum in Case I, we take one of the most popular curriculum, i.e., Ancient Chinese Literature as an example to explore the mechanism that makes its education successful in practice. The curriculum of Ancient Chinese Literature is about learning ancient Chinese poetry, novel, and biography. In SURVC, most of the older students are retired veteran cadres and usually have higher education experience. According to our survey, more than 50% of respondents have strong preference to learning Ancient Chinese Literature. Their requirements are put at the first place in the education. The development of their curriculum are usually requirement-oriented. We study the requirement-oriented curriculum development from the aspect of process and stage respectively.

Requirement-oriented curriculum development: an example on Ancient Chinese Literature

We interviewed the education director, administrator and lecturer (researcher) on the development process of Ancient Chinese Literature (ACL). From the administrator, we learned that the curriculum is first provided in 2009. Initially, lecturers just simply taught in classroom older learners to interpret some classical poems that were selected from literature books, but now a complete curriculum has been developed. They have published textbooks on ancient Chinese literature that are particularly written for older adults, and



(a) An occasion of campus talk-in on ancient Chinese literature



(b) A workshop on curriculum development research



(c) Published books and pamphlets



(d) An older learner show his calligraphy work in a meeting

Figure 4.8: Some scenarios and published documents during the development of the Ancient Chinese Literature curriculum in SURVC

use such textbooks in their courses. They also introduced multi-media technique in the teaching. Besides formal lectures in classroom, they also designed and organized many activities in free style to make older learners get satisfied by sharing what they learned from the lectures. Figure 4.8 shows some scenarios during the development process of and some published books and documents.

On the development process of the curriculum, the education director said: *the process of developing our curriculum consists of following several steps:*

1. *To investigate the requirement of students through formal and informal forms, like questionnaire, face-to-face conversation, etc.;* As aforementioned, education providers in SURVC organize formal seminars twice a term for administrators, lecturers, monitors, student representatives to share their working or learning experience, such as problems, preferences, requirements and possible suggestions. They also interact with students using their investigation system to collect information from student systemically. At the end of each term, they distribute questionnaires to students to investigate their preferences of courses for next term. Regarding informal ways, they randomly have face-to-face conversation with learners and lecturers to obtain first-hand information in order to determine what to teach next.

2. *To collect the data and identify effective information from it;* The education provider set up a professional quality education center, aiming at studying OAE and exploring the mechanism of conducting all round education. The center publish campus newspaper per month and a journal paper per term to report their latest research.
3. *To design new education ideas;* One the basis of the identified requirements of older learners, administrators design new courses including teaching plan, syllabus, teaching methods or corresponding solutions to students' demands.
4. *To conduct the second investigation to get the overall attitude of students towards new ideas;* The education provider tests the new service ideas before putting them into practice. For instance, they invite famous professors or scholars to give talk-ins several times in each term to examine the popularity of the new courses in older learners. The purpose of organizing talk-ins is not only to example the popularity, but also to attract the attendance of other students who may not be aware of the new courses.
5. *To collect students' feedback again at the end of each term, and determine if the course can be applied as a regular course.* By collecting the feedback from the participants to the talk-ins, the education provider improves their new service and put those highly welcomed new courses into practice as regular education contents.
6. *The university assesses the course by using our own evaluation system at the end of the each year, and improve the courses.* In SURVC, the new education contents are evaluated in their first two years using the evaluation system developed by the university. Then, the education provider also organizes seminars to get students, lecturers and administrators together to share their opinions and suggestions on improving the new courses.

The researcher also emphasized that they do not just completely rely on older learners' feedback passively, but positively introduce new courses and new teaching methods to interest them. For instance, they set up a online group using the most popular social network mobile application WeChat on smart phone to break the limitation of location for learning. Such positive actions help older learners learn not only the literature, but also the new life style changed by new technologies.

The university take the feedback from older learners seriously to establish their curriculum. The lecturer whom we surveyed said that they provide multiple ways to collect feedback from older learners. Older learners are organized by the unit of classes, and in each class a monitor is assigned, who is mainly responsible for recording the feedback from his classmates every day. Such record is called *class diary*. These class diaries are the main data source for university administrators to analyze their education quality. At the

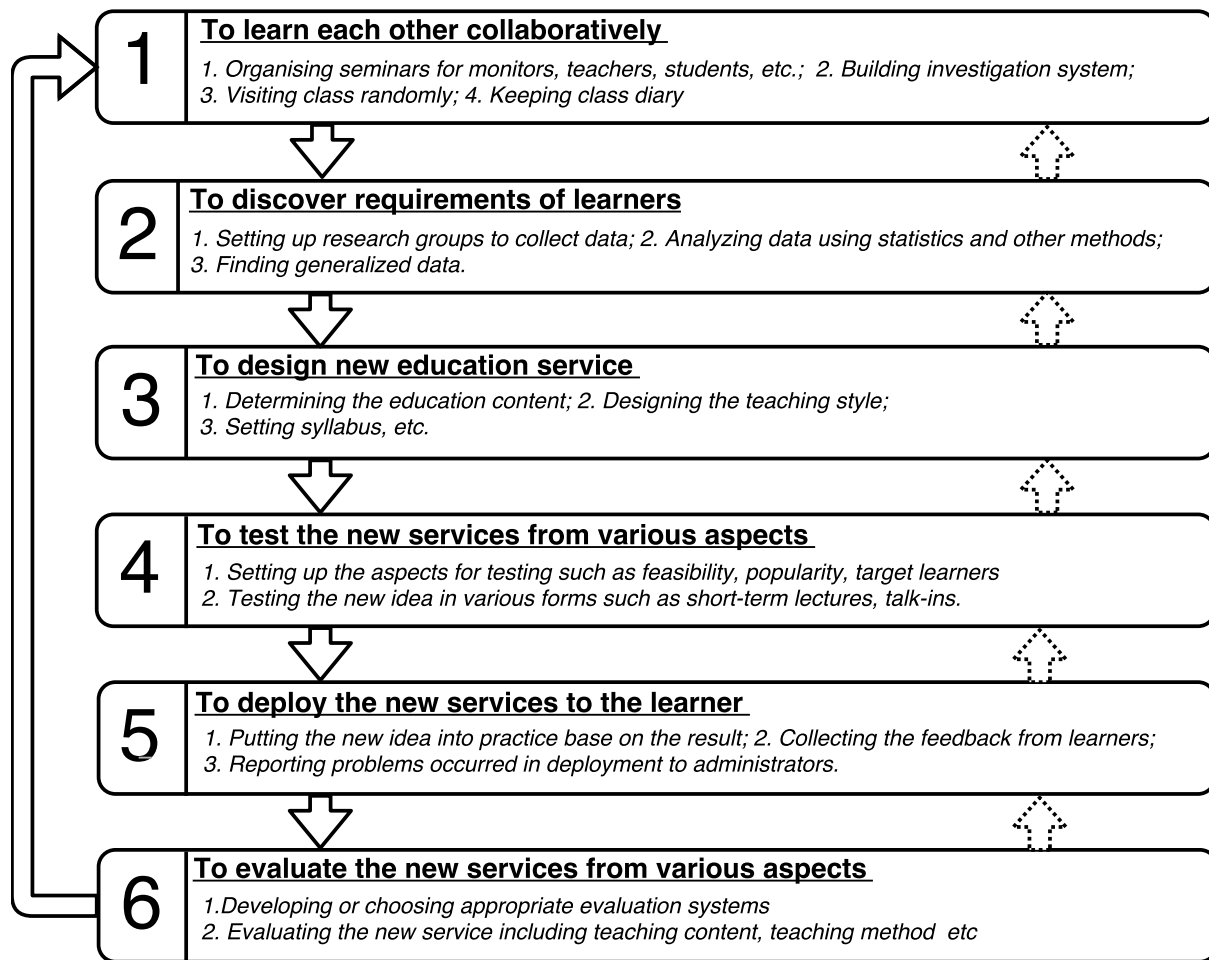


Figure 4.9: The process of education design and deployment in Case I

end of each term, the university also organizes meetings for class representatives, monitors and administrators to listen to their opinions on the courses they have studied. The above statements show that the education providers interact with the students frequently in many ways and take their needs as the main factors to determine the courses.

Assessment also plays an important role in development of the curriculum. An assessment system is developed in the university to check if a newly opened course indeed achieves its objectives based on the data collected from class and the feedback provided by older learners.

Waterfall process of the curriculum development

From our aforementioned survey and the example of curriculum development, the university conducts a type of need-oriented education. In the process of designing and deploying new courses, the needs from older students play central roles in service consideration. We divide the process of establishing new education service into six steps, as depicted in

Figure 4.9:

Step 1: *Education provider collaborate and share knowledge with older learner through both formal and informal ways.*

Step 2: *Professional research teams collect and analyze data to discover learners' requirements what are important to service designing.*

Step 3: *Education provider create new education services which are based on analysis result.*

Step 4: *Education provider test the new education services by using the form of short term lecture to attract the interest of students.*

Step 5: *The new service idea with high participation in the talking is deployed as general education content.*

Step 6: *Education provider evaluate the new deployed education service and teaching activity through collaboration with older learners and other education providers.*

At each step except the first one, it can be rolled back one step when the results at the previous step are not consistent or sufficient, as depicted by the dashed arrows in the figure. By iterating the whole process, a new education service grows mature as a regular service. However, due to the variety of new learners and progress of society, requirements may change and the existing education services need to keep up-to-date by following the whole process iteratively.

Although education providers are the subjective of the operations in each step, the development of a new education service is mainly driven by the requirements from older learners. Therefore, the participation of older learners play a dominant role in the process.

Three-stage development of the curriculum

According to the description of the interviewed administrator, we learned that this curriculum has been being developed for more than seven years. There are some landmarks that divide the development into three stages as follows:

1. (*Stage 1: 2009 - 2010*) In 2009, the curriculum was proposed. The goal in this period is to investigate the background of older learners such as what they expect to learn from the curriculum, the education experience, etc, and to design a prototype such as determining potential courses and teaching methods.
2. (*Stage 2: 2010 - 2011*) From 2010 to 2011, an applicable curriculum was developed after considering the feedback from older learners on the prototype one, and then

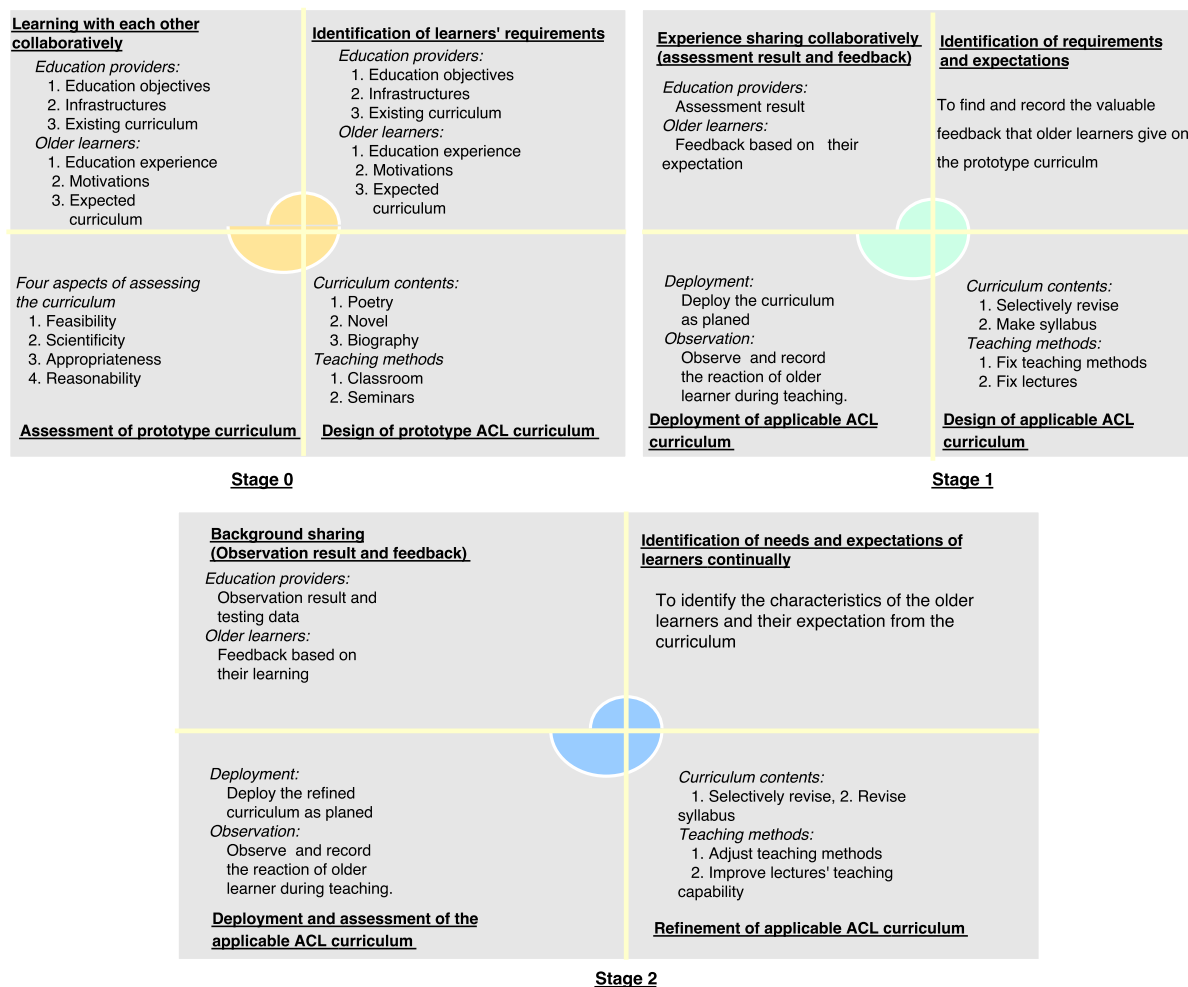


Figure 4.10: The three stages curriculum development of Ancient Chinese Literature in Case I

deployed to older learners. In this period, the administrators gathered the feedback from older learners, and lectures observed and recorded the reactions in the class for further analysis.

3. (*Stage 3: after 2011*) Since 2012 the curriculum has been reformed to solve the problems that emerged in the curriculum. For instance, they shortened the time of each course and divided one class into smaller classes based on older learners ages, education level, and interests to increase the flexibility of the curriculum. They also provided tablets and computers so that older learners could learn the literature while learning computer skills.

The three-stage development of the curriculum is shown in Figure 4.10. In each stage, it is an iteration of waterfall process. Figure 4.10 depicts the three stages and the main work at each step in different stages. It can be seen that although the four steps are iterated repeatedly in each stage, the role that a step plays in a stage may be different

from the one that it play in another stage and the dominant step may be different in different stages. For instance, in the first stage, the first two steps are dominant steps and the work in this two steps is more than work in other two steps. In the second stage, the last two steps are the dominant steps because in this stage the requirements have been identified and become stable, the main task in this stage to improve the curriculum to meet the requirements. In the third stage, the last step is the dominant one because some obvious problems in the first two stages have been solved and systematic assessment is required to detect those problems hidden under phenomenon.

4.3 Research hypothesis validation and findings

In this section, we validate the research hypothesis on the basis of the analysis results that are obtained by evaluating the data according to the five criteria in the previous section to check if our proposed model is suitable to OAE universities for retired veteran cadre. We first validate the structure model and process model of OAE curriculum development separately by comparing them with analysis results, and then summarize findings obtained from the validation.

4.3.1 Validation of the structure model of requirement-driven curriculum development

In the previous section, we learned that older learners feel satisfied with provided education services and have consistent objectives with education providers. In the process of course development, learners positively contribute to the development of curriculum and education providers serve as facilitators to improve the quality of education. Such collaboration lasts in the whole development process of a curriculum. Figure 4.11 depicts the collaborative structure of the curriculum development, including their objectives, roles, collaboration forms and steps, and the stages of the collaboration.

We compare the structure shown in Figure 4.11 with the value co-creation structure model in Figure 3.1(a), which is the research hypothesis from the structure point of view. Table 4.2 presents the detailed comparison of the two structures, and shows their commons and differences. Obviously, the structure is shown in Figure 4.11 is the same as the one in in Figure 3.1(a) in terms of the consistency of motivations of older learners and education providers, the collaborative relation between the two sides, the serving relation from education providers to older learners and the contributing relation from older learners to education providers.

In the structure in Figure 3.1(a), we assume that older learners are co-creators of OAE service values. As a service value co-creator, one should be collaborative, positive and

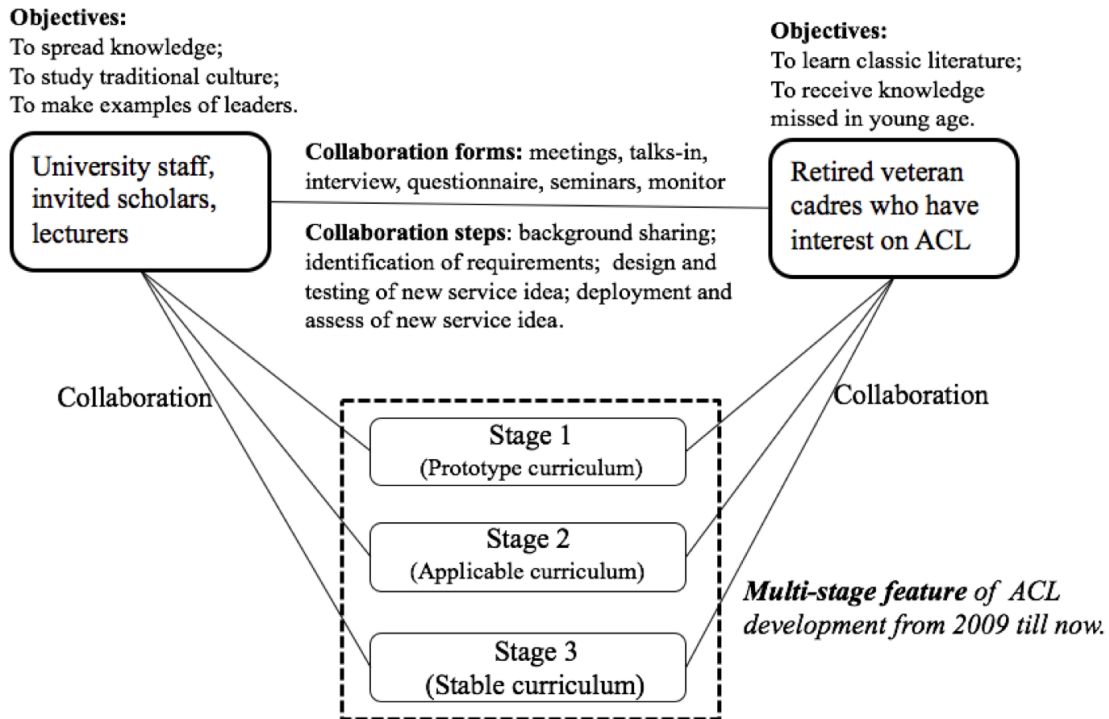


Figure 4.11: The overall mechanism of collaboration in the curriculum development of ACL in Case I

contributive. Both the structure show that older learners meet the three requirements.

With the above comparison, it is clear to see that value creation of OAE is essentially achieved by co-creation and older learners plays an important role in the co-creation as co-creators. The collaboration structure faithfully conforms to the one in KIKI, and the process overally follows the one in KIKI model but with some new features such as rollback and the emphasis of the importance of testing and evaluation.

4.3.2 Validation of the process model of requirement-driven curriculum development

We validate the research hypothesis on the process of curriculum development by comparing the process of service value co-creation in KIKI model with the water-fall process of the curriculum development in Case I. We first compare each step with the corresponding steps in the waterfall process that we summarized from the three case studies, and then compare the two processes as a whole. Table 5.3 shows the comparison results, including the commons and differences of each step and of each process as a whole. We give the details of the comparison as follows:

Table 4.2: Comparison of the structure model with investigation results

Structure model in the hypothesis	Curriculum development structure summarized in Case I	?
<p>The structure model shown in Figure 3.1(a)</p> <ol style="list-style-type: none"> 1. Consistency of motivations 2. Collaboration relation 	<p>The collaboration structure shown in Figure 4.11</p> <ol style="list-style-type: none"> 1. Motivations of education providers and learners are consistent, e.g., older learners want to learn Chinese literature, and providers want to spread Chinese traditional literature and culture. 2. The curriculum development structure is collaborative, e.g., learners have intention to express their opinion, and providers take the feedback of learners seriously. 3. The curriculum development experiences multiple stages, i.e., three stages of ACL curriculum. 	✓
<p>Older learners are co-creators of service values. They contribute to the development of education services by collaborative interacting with providers.</p>	<p>Older learners positively participate into the development of curriculum. The relation from older learners to education providers is contributing in that:</p> <ol style="list-style-type: none"> 1. Older learners collaborate with education providers, e.g., learners collaborate with providers by giving their requirement, experiences and opinions on improving curriculum. 2. Older learners' participation is positive, e.g., even not being asked, learners also give feedbacks to providers. 3. Older learners contribute to the creation of service values, e.g., older learners feedback are the main criteria to change curriculum. 	✓
<p>Education providers play leading roles as facilitators of OAE service design</p>	<p>Education providers play leading roles to interact with older learners to explore their requirements to develop curriculum:</p> <ol style="list-style-type: none"> 1. Education providers are the principal designer of all courses based on learners' requirements. 2. Providers provide multiple ways to learn feedback from learners. 3. Providers are responsible for evaluating courses and changes them correspondingly. 	✓

- The first step in the hypothesis is *Knowledge sharing related to collaboration*, which says that education providers and older students understanding each other, sharing their motivations, experience through collaboration. It corresponds to the first step *background sharing* in the waterfall process, which says that education providers and older learners interact with each other and share their background such as objectives of the education, requirements of older learners.
- In the second step called *Identification of service field* in RH4, we assume that education providers find the factors that can help them design corresponding services

Table 4.3: Comparison of the research hypothesis and the investigation results with respect to the process in Case I

	The process in hypothesis	The waterfall process summarized from Case I	?
Comparison of each step	Step 1: <i>Knowledge sharing related to collaboration</i>	To understand each other better through survey and conversation, etc. 1. Providers provide various means to listening to learners' requirements to design ACL curriculum. 2. Learners give their requirements to ACL.	✓
	Step 2: <i>Identification of service field</i>	To identify what ACL courses, e.g., novels, poetry, calligraphy, are welcomed by learners by data analysis.	✓
	Step 3: <i>Knowledge creation for new service idea</i>	To transform the requirements into practical courses. 1. Course design 2. Course testing The difference is that testing is emphasized as a separate step in the waterfall process.	✓
	Step 4: <i>Implementation of service idea</i>	To provide courses and evaluate their effects. 1. Course deployment 2. Course evaluation The difference is that evaluation is emphasized as a separate step in the waterfall process.	✓
Overall process	Features of the process: 1. Collaborative 2. Stepwise 3. Spiral	Features of the process: 1. Collaborative 2. Stepwise 3. Spiral Flow of the process allows rollback, which is different from the hypothesis.	✓

Legends: ✓: consistent; ✓: almost consistent but with some differences

to maximally satisfy their older learners. This step is consistent to the second step in the waterfall process i.e., *data analysis* because in this step education providers analyze their collected data to find the requirements of older learners that are the basis for them to design their education services.

- In the third step called *Knowledge creation of new service idea* in RH4, we assume that education provider design new education service based on the results obtained in step 1 and 2. The corresponding step in the waterfall process is *education service design*. In that sense, the two steps are consistent. However, the step of *education service design* in the waterfall process is followed by *education service testing*, which is emphasized as a separate step for its importance in the process. Although we can consider *testing* as a successive step of *design* in the process, it still makes this part different from the hypothesis.

- The last step is *Implementation of service idea*, which corresponds to the *deployment* step in the waterfall process. The main goal of the two steps in the two processes is the same, i.e., to provide the designed service to the learner. In that sense, the two steps are consistent. However, in the waterfall process there is a following step after *deployment*, in which deployed services are evaluated. This step is emphasized in the waterfall process as a separate step. Therefore, although in HP4, the *implementation* step implicitly include the work of evaluation according to its original service value co-creation model (KIKI model), the two counterparts are not completely consistent.

By comparing the two processes as a whole, it is obvious to see that they share common features. For instance, both of them are collaborative, stepwise, and spiral. However, the process in the hypothesis is unidirectional in that one has to move next step after finishing the present one, while the waterfall process is bidirectional which allows one to move backward one step when he/she finds it is necessary to do that.

In the whole development process, the collaboration of education providers and older learners plays an important role. Both sides positively participate into the development to refine the curriculum and make all the participants get satisfied from it. It is worth mentioning one feature of OAE makes such collaboration feasible. That is, students in OAE universities can study as many years as they want and they may never *graduate*. They can also study repeatedly the course which they are interested in. Such feature makes older learners be capable of participating into the curriculum development.

To sum up, the process of service value co-creation in the hypothesis and the waterfall process are consistent in a coarse sense. However, compared with the process in the hypothesis, the waterfall process is more concrete and more operable. In that sense, the waterfall process is not simply an instantiation but an extension of the process in KIKI model. This conclusion is not surprising because the process in the hypothesis is assumed based on KIKI model while the waterfall process is summarized from concrete case studies.

4.3.3 New findings obtained from the validation

The validation results in the previous section demonstrate that the proposed model is consistent with investigation results, which makes it theoretically feasible to apply service value co-creation theory to those OAE universities where the learners are highly educated. Through the validation of research hypothesis, we also realize new findings that are not reflected by the hypothesis and KIKI model.

Finding I: Highly educated learners have strong awareness of giving opinions.

In Case I, the learners in the university are retired veteran cadres who have had power and high status. They have rich education background and their objectives of participating the education are clear. Their requirements must be met in principle. For this feature, the learners have strong awareness of giving their opinion on how education activities should be designed and implemented in order to make them satisfied. Education providers in the university play as facilitators to satisfy the learners.

Finding II: There are multiple stages of the curriculum development.

In Case I it is shown that the development of a curriculum usually takes a long time e.g., several years. It experiences different stages and at each stage the forms and contents of curriculum varies. We emphasize the concept of stage of curriculum development for two reasons. One reason is that the collaboration forms in different stages are different, and the other is that each step in the waterfall process plays different roles in different stage. With the consideration of stage, we can identify clearly what collaboration should be made and which step should be emphasized.

Finding III: The curriculum development process is not simply spiral, but spiral with rollback.

In the hypothesis, we assume a spiral process for the curriculum development in OAE universities based on the spiral process in KIKI model. In Case I, it turns out that although the curriculum development process is spiral, there are rollbacks in the practical process. On one hand, the rollback makes the process more flexible, and on the other hand, the flexibility of education activities and variety of requirements make it necessary to move back and force in the curriculum development in order to improve the quality of the education.

Finding IV: The importance of testing and evaluation is emphasized in the curriculum development.

Another finding is that the importance of testing and evaluation is emphasized in the curriculum development, which is not reflected in the hypothesis. We assume four-step spiral process for curriculum development in the hypothesis based on the process of KIKI model. In the four-step spiral process, testing and evaluation is considered as parts in the fourth step. Our survey shows that testing and evaluation are as important as other steps in the curriculum development and should be considered as separate steps. Another reason for considering them separate steps is the rollback feature of the waterfall process.

Testing is the key step where rollbacks often take place. Compared with the process in the hypothesis, the six-step waterfall process is more faithfully reflects the curriculum development.

Chapter 5

Case II: Shanghai University for the Elderly

5.1 Overview of Case II

Shanghai University for the Elderly (SUE) was also founded in 1985, aiming at *being spiritual home of the elderly and getting high satisfaction of student with the running of university*. It provides 150 kinds of course to nearly 10000 older students, and has no enrollment limitation, unlike SURVC in Case I.

- **Basic information of SUE:** SUE has one main campus and 20 branch campuses. In the last 31 years, it developed gradually from a very small college of further education into a well-known OAE university in China. Now it is governed by Shanghai municipal education committee who offers financial support and gives principle guidance. SUE is a city level OAE university, which is the same as Case I. Until the years of 2014, the main campus has 9 schools, 150 courses and 370 classes. It also set up classes for students who want to get degree from the university. In the Case II, the collected data are from the main campus.
- **The service system of Case II:** The education system of SUE can also be considered as a service system from service science perspective as shown in Figure 3.2. In the service system of Case II, the education providers include Shanghai Municipal Education Commission and SUE; the older learners are older adults who reach retired age. All old people can enroll in SUE without any limitation.
- **The statistics information of interviewees:** In Case II, we collected 112 pieces of valid questionnaires from older learners, and interviewed three students for more

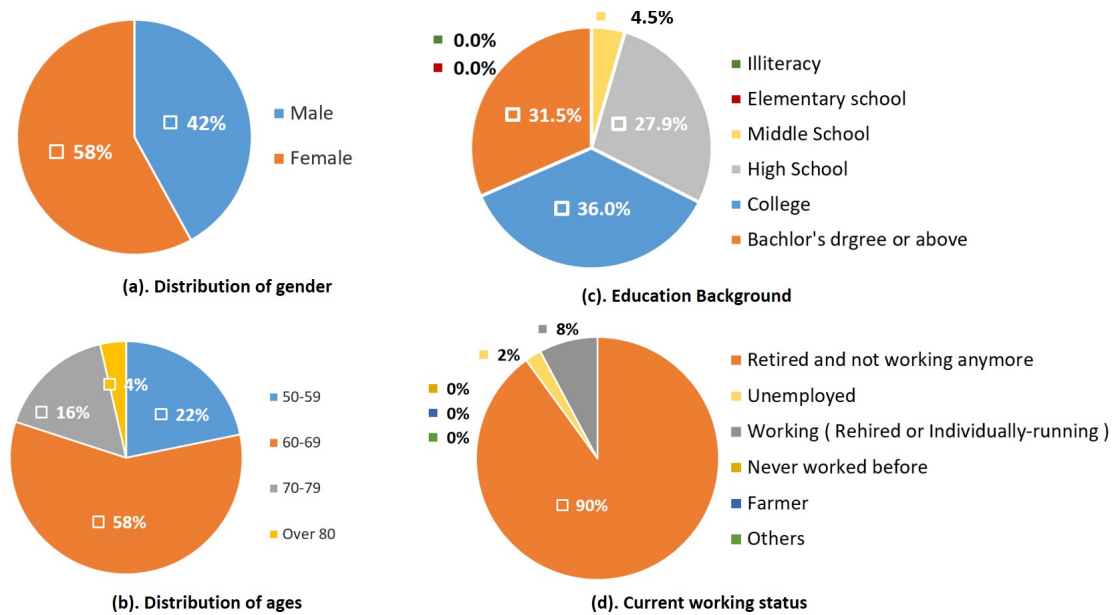


Figure 5.1: The distribution of personal information of respondents in Case II

detailed information about learning experience.

Figure 5.1 (a) and (b) show the percentage distribution of gender and age of respondents, 58% of them are female, and male is 42%. Most of them are less than 80 years old and more than half of them are 60-69 years old. The percent of aged 50-59, 60-69, 70-79 are 22%, 58% and 16%. Only 4% of respondents is aged over 80 years old. Figure 5.1 (c) and (d) show the overall distribution of education background and current working status of respondents. We can find out that over 67.5% of respondents are college degree or above, and 91.7% of them are full retired and not working any more.

From above data of surveyed learners, we can see that most of students are below 80 years old, full retired from workplace and have high education background. Compared with the personal information data in Case I, the percentage of female is larger, the students are younger and have relatively lower education level.

For the education providers' side, we interviewed four staff of the university to survey the education mechanism. The four interviewees have different duty and responsibilities in SUE. The statistics information of all interviewees in Case II is shown in Table 5.1. Besides interview and questionnaire, we also attend the third classroom activity for getting more information about the education experience.

Table 5.1: The statistics information of interviewees in Case II

Role	Name	Age	Position	Working or learning period
Education provider	Mr. Lü	70s	Academic dean	8 years
	Mr. Mao	60s	Lecturer	26 years
	Mr. Xu	70s	The third classroom leader	10 years
	Ms. Gu	60s	Lecturer, department head	15 years
Older learners	Ms. Cai	70s	Learner, monitor	6 years
	Ms. Guan	70s	Learner, monitor	8 years
	Ms. Gu	60s	Learner, monitor	4 years

5.2 Data collection and analysis

For collection data of education mechanism in SUE, we survey both the older learner and working staff in the university and analyze the collected data from with respect to five criteria which is the same with Case I. The following we present analyzed results in each criteria.

5.2.1 Learners satisfaction with the education service

We survey older learners satisfaction degree with provided education service in 7 aspects (the overall degree of satisfaction with served education, reasonability of courses, appropriateness of teaching methods, dedication of teachers, scientificity of teaching contents, satisfaction with infrastructure, and helpfulness of learning activities). We also investigate the learned contents and expected contents to check if their learning requirements are well met.

Figure 5.2 depicts the satisfaction of the learners with the provided education services . More than 90% older respondents are more or very satisfied with the current services in seven aspects. Less than 10% of students feel neutral or not satisfied with provided education services. These data in Case II are very similar with that Case I. We can conclude that SUE conducts successful education activities from the older learners' point of view. The older students feel satisfied with education service, although they think there are still space to improve it.

Figure 5.3 shows the comparison of learned contents and expected contents. The green line shows the learned contents of respondents. It can be seen that the percent of learning *singing and dancing* is highest, 46.4%. And the next three courses are *literature and foreign language*, *calligraphy and photograph* and *computer and network*, the percent

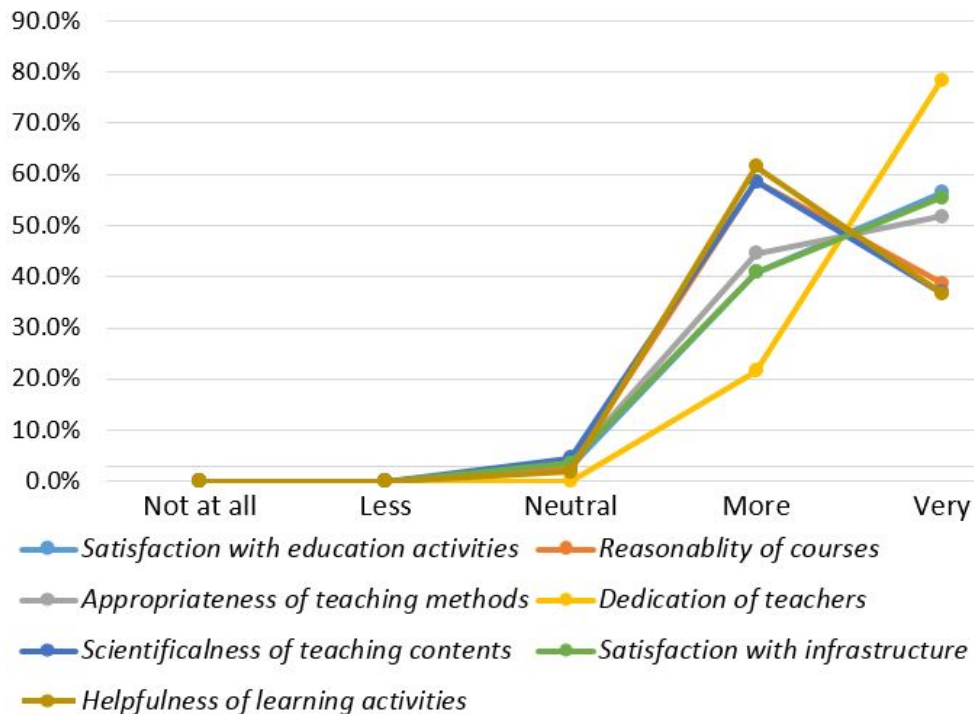


Figure 5.2: The satisfaction with the university in 7 aspects in Case II

are 39.3%, 36.6% and 28.6%. The percent of learning other courses is low. The purple line is the percent of expected learning contents. The most welcome courses are *medicine and health*, *singing and dancing*. The next three courses are also have high portion, the percent of choosing *computer and network*, *literature and foreign language* and *calligraphy and photograph* are 53.3%, 52.4% and 51.4%. The other options have lower percentage, such as economy, science, cooking, planting, philosophy, law, clothing and knitting.

By comparison of learned contents and expected contents, the most typical difference of two lines is the the course medicine and health. The students have very high preference for learning the course, but the real attendance is low. From the data, we can infer that the education contents of university should be improved to better satisfy the needs of students. With the exception of course medicine and health, the tendency of choosing other courses in two lines is similar. It can be concluded that students have strong interest for learning courses, most student are learning what they expected to learn. An important point needs to be strengthened is providing more chances for students to meet their purpose of keeping healthy.

The above data analysis reflect SURVC conducts successful education activities from the older learners perspectives. The university provide education services to older learners and get high satisfaction of older students. Learners' requirements for education contents are quite met but with some gaps. The education providers need to improve the curriculum to achieve higher satisfaction of learners.

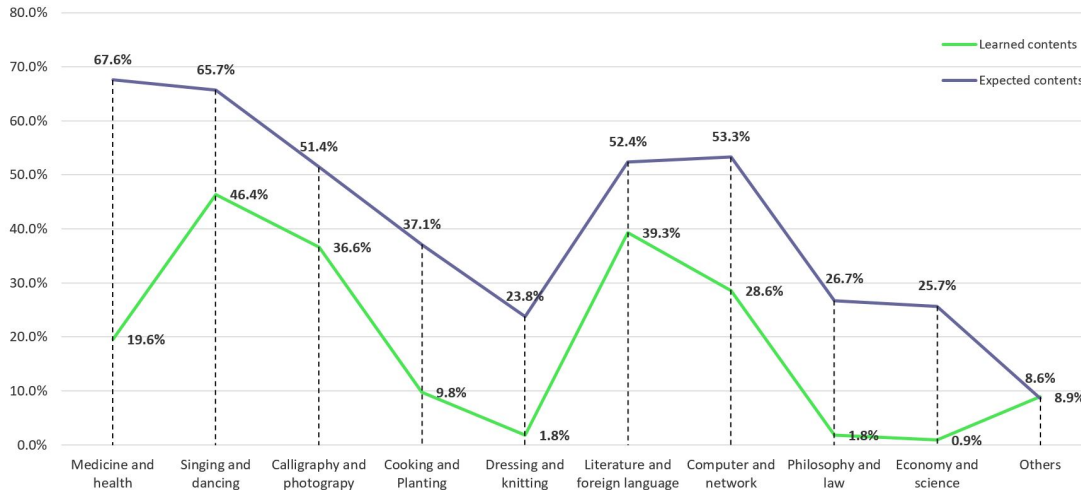


Figure 5.3: The distribution of learned contents and expected contents in SUE

5.2.2 Objective consistency of education providers and learners

We survey education providers' objective and learners' objectives respectively and check the consistency of their objectives.

Objectives of the university

The slogan of SUE is *To be an OAE university to maximize satisfaction of old people*. The target can be simplified as follows: learning to learn, learning to be virtuous, learning to be healthy and happy, learning to do (make contributions to community and society). Specifically, on the one hand, it aims to satisfy the requirements of old peoples mental needs, to enhance the psychological and physical condition, to improve the quality of life and to help the all-around development of old people. On the other hand, it aims to improve the morality of the elderly and to re-develop the human resource of old people to make contributions to community and society continually.

OAE is different from general school education; it has own particularity. The OAE service in SUE is multi-faceted, multi-level, board coverage and convenient.

Objectives of older learners

We investigate learners' objectives and expectation in 3 aspects: purpose of attending the university, expected learning level and gains from learning activities, improvement points.

Figure 5.4 shows the percentage distribution of purposes of participating OAE university in 9 options. The first purpose is *to learn and enrich lives* which is 90.2%. The percentage of choosing *to meet hobbies* and *to keep physically and mentally healthy* is also

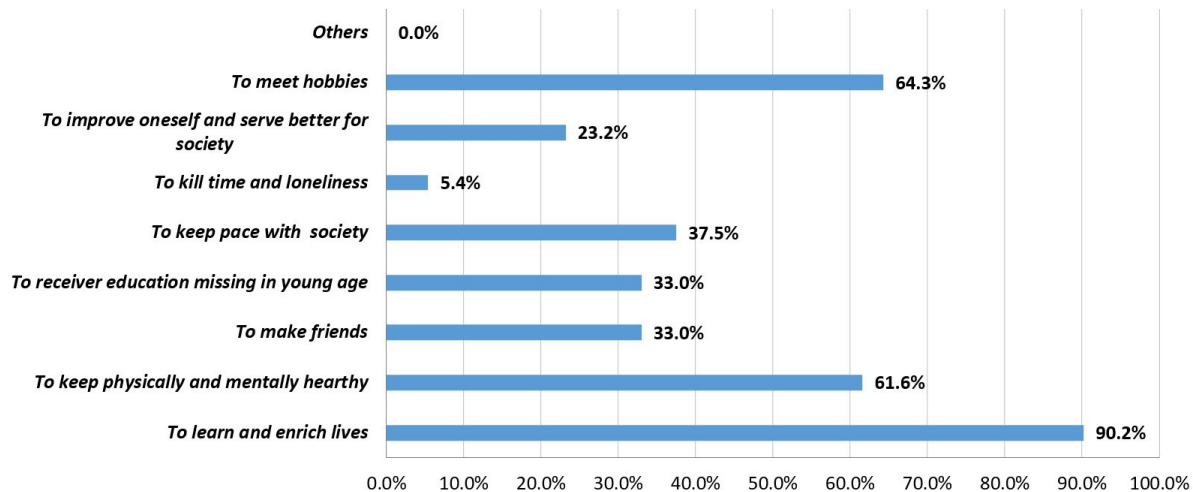


Figure 5.4: Distribution of the older learners' purposes of studying in SUE

very high, they are 64.3% and 61.6%. While the percentage of other purposes such as *to learn to keep pace with society*, *to make friends*, *to receive education missed in young age* and *to improve oneself and serve better for society* are quite low. From these data, we can see that the older adults have multiple purposes of attending OAE learning activities. They not only want to get knowledge to meet their hobbies and keep healthy, but also want to refresh their knowledge to keep pace with society serve better for it. Compared with the data in Case I, the overall distribution of percentage is similar, even they have different education level, they are all old people.

Even the satisfaction degree of students are very high, there are still some points need to be improved or reformed to achieve objectives. Figure 5.5 (a) shows the necessity of reformation from students point of view that 52.1% of respondents think it is very or much needed to improve the current education situation. And 15.3% of them have no idea for this question. Also, we asked the older learner what points need to be improved, and the result is shown in Figure 5.5 (b). The percentage of choosing *contents and course* is very high, it is 54.8%. The percent of choosing *teaching methods*, *infrastructure* and *management* are 35.6%, 26% and 23.3%.

Besides the investigation of purpose, we also survey the older learners' expectation of learning level. Figure 5.6 (a) shows that 56.5% of respondents want to study at a systematical level, and 24.1% of them just want to get an elementary understanding level of learning. The rest 19.4% of them pursue professional learning service. Figure 5.6 (d) shows the percentage distribution of gains from learning activities, it can be seen that older adults get a lot from education service, their knowledge and skills are enriched, many new friends are made as well.

From these data, we can conclude that the learners' purposes of attending OAE are multiple and most of them pursue systematical and professional learning level. Older

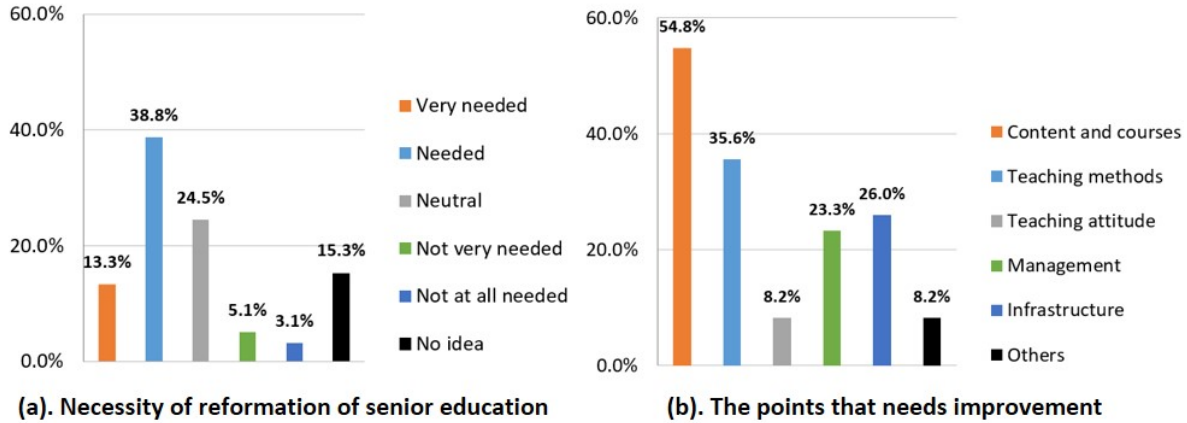


Figure 5.5: Data analysis result on education reformation in SUE

learners have high requirements for curriculum and teaching methods. For achieving their various requirements, the first need to be improved is education contents so that it can better meet learners' demands, which is almost the same with Case I. Moreover, education infrastructure, teaching forms and education management are needed to be changed.

Objective consistency of providers and learners

Through the summary of education providers' objectives and older learners' objectives, it is obvious to see that their objectives have many consistent parts. Education providers want to improve the life quality of the elderlies and keep them healthy; older learners want to learn knowledge and skill to meet hobbies, to enrich life and keep healthy. Education providers also provide multi-level, board coverage courses for learners to meet their various needs for OAE services.

However, there is new finding needed to point out is that education providers want to re-develop the human resources of older adults through teaching activities and let them make contributions to society, but most of learners have low awareness about this purpose. More interaction is needed for two groups of people to match their objective in this aspect, especially the education providers should play a leading role to encourage older learners to serve society better.

5.2.3 The role of education providers in OAE service development

The role of education providers in the development process of OAE service design can be analyzed by learner's expectation of providers' responsibilities and education providers'

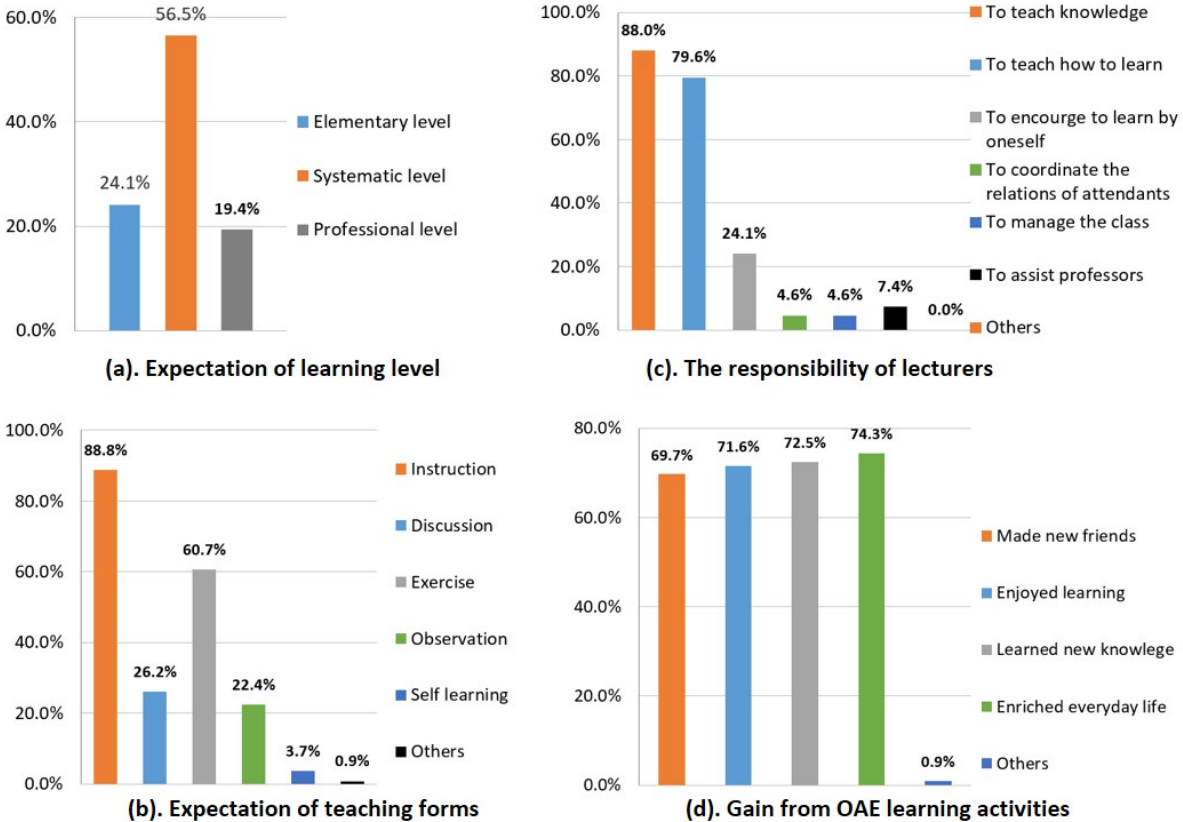


Figure 5.6: Data analysis result on the learning experience of students in SUE

experience of development OAE services.

Analyzed results from learners' side

Figure 5.6 (b) and (c) show the survey results of teaching forms of lecturer in class and their responsibility as education providers. The percentage of choosing *instruction* and *to teach knowledge* is very high, about 88%. The respondents also emphasize the responsibility of teachers for providing various teaching methods to lead students to learn, especially creating good environments for exercise, discussion and observation. From the above data, we can conclude that besides teaching knowledge which is the most important part, lecturers should be coordinators of teaching activities and be responsible for managing classes and communicating with administrators and learners positively. The good relationship between learners and lecturers is not only lay on giving knowledge and skill, it also needs their cooperation and coordination in or out classroom.

Analyzed results from providers' side

Education providers have responsibilities to design courses, to create good environments and manage education activities. The interviewed providers explained their roles in course development and service design. The interviewed academic dean said that "*the development of new course and service is mainly based on the needs and interests of older learners.*" For instance, many older students meet health problems with the growth of age, and they present strong desire for learning some knowledge on health care. The education providers got such message and conduct many courses on health care, such as Chinese Medicine, Tai Chi, Acupuncture. The participation rate of such courses is very high.

The university providers also explore some unknown needs of learners and lead them to learn. These needs may be unconscious to old people but they are really interested. For example, several years ago, the education providers learnt from feedback of students and lecturer that the number of students in Department of Literature and History was only 600 which is low compared with past record. With this phenomenon, the university opened up some classic talk-ins to attract interest of other students. After two years, now the number of the department is more than 1400. Some state-of-the-art courses like photo shop course are provided to help older learners to keep pace with the development of society.

The interview education director introduced the channels of teaching in the university. He mentioned that *there are three kinds of classrooms: the first classroom, the second classroom and the third classroom. The first classroom is the traditional one which is conducted in the classroom; the second classroom is called club or after-school activity which is organized by students who have same interests, and the university also give some support for them. The third classroom can be named social activity, which is an important way for student to make contributions to community and society.* In addition, there are two basic ways for student to study: online learning and off-line learning. The old people can learn everywhere and anytime. The director told us the ways of teaching that teacher inspires first, and then student should co-operate with teacher and should be the master of learning activity. The course system university offered looks like a supermarket and buffet service that suit the different requirements and characteristics.

There are three ways to qualify the students learning. The first is the certificate of completion of a course, which is issued to students whose attendance is over 70% and do the homework well. Someone excellent can get a recommendation letter that enable them to do work of older adult education in community. The second certificate is more high level, called professional honorary certificate. The student who finish the studying a major can get it. The last one is certificate of degree, it is similar to mater or doctoral degree. The university set up such types of certificate to meet the needs of the elderly. They not also want to get skills and knowledge, but also want to be qualified after learning.

For the suggestion of future plan, the interviewed academic dean said that "*rapid development of OAE needs support from the whole society but not only depends on education providers*". He also mentioned that the essence of OAE is for the all-round development of human beings but not only for the entertainment of older adults. More research work is necessary to improve the quality of curriculum.

From the above data, we can learn that the education providers in SUE play active role as facilitators of elderly learning. They take responsibilities to design courses, to create good environments and manage education activities based on learners' needs.

5.2.4 The role of older learners in OAE service development

The role of older learners in the OAE service development can be analyzed from two aspects: learners' self awareness of student involvement and providers' interaction experience with older learners.

Data and analyzed results from older learners' side

The older learners play important role in the reformation of OAE university, especially the self consciousness of student involvement. Active participation of learners helps to improve the education quality of OAE. We survey the older learners' frequency of proposing opinions, attitude on giving suggestion positively and necessity of student involvement in Case II, too. Figure 5.7 depicts the percentage distribution of three questions. We can see that only 6% of respondents often convey their opinions to education providers. More than 94% of them not often even never propose their feelings to university. Even the frequency is very low, their attitudes towards giving suggestion are very positive, 59% of students express their positivity of giving opinions. More than 90% of them thinks that it is necessary for student involvement for a good OAE university.

Besides the data collection of questionnaire, we also interview some students randomly and participate their education activities by observation and noting students' learning actions. The interviewed students are all satisfied with provided education service, their requirements are well meet. They also point out that the university provide many ways for student involvement and encourage them convey ideas freely, and also feed back students' opinions quickly.

From these data, we can infer that students in SUE have strong consciousness of self involvement in education activities, and more than half of respondents have strong self consciousness that they think they play important roles in the education activities and give their suggestions even though they are not often convey their ideas to university.

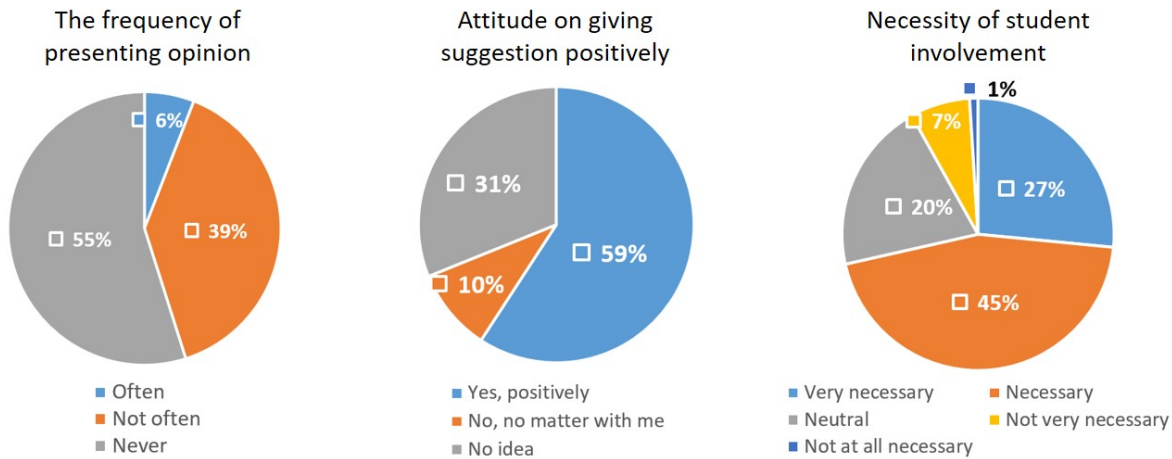


Figure 5.7: Data analysis result on consciousness on self involvement of learners in SUE

Analyzed results from providers' side

The university lays emphasis on the comments and reflect of student on teaching activities and learning experience. The dean said *"the main method we used is monitor responsible system under the leadership of department dean. Every classroom keeps a dairy note to record the detail of student information, needs, questions and the Monitor transfers these details to the dean. There are also seminars for monitors to share their opinions."* The university organizes seminars twice a term for all monitors to come together to report learning situation and problems of their classes to education leaders.

The forum of teacher representatives and student representatives are also held twice a term to get more detailed information of provided services. The form of forum is very important activity for university, and all leaders will attend it. The feedback from students and lecturers are important part of annual report of university.

BBS is also accessible for learners to reflect their problems anytime. The lecturer told that *"the course system we offered looks like a supermarket and buffet service that suits the different requirements and characteristics."* An evaluation system is developed in the university to check if a newly opened course indeed achieves its objectives and also be used to evaluate teaching quality of lecturers.

From the collected data of learners and statements of education providers, we learn that the SUE conduct successful education service, and education providers take learns' requirements and experience seriously. The education providers interact with learners through many ways to design new services to better meet their requirements.

5.2.5 Development mechanism of OAE curriculum in SUE

In Case I, we gave an example of developing a curriculum that is mainly motivated by the requirements from older learners. However, requirements from older learners are not the only factor of developing new curriculum. In Case II, we present an example of curriculum development that is driven by the progress of societies such as the changes of life styles, living conditions and the progress of information technologies. We call it society-driven curriculum development. In this part, we introduce an example of society-driven curriculum development and analyze the overall mechanism of it.

Society-driven curriculum development: an example on Information Technology

In SUE, there is a curriculum on Information Technology (IT), which is very popular in older learners. According to our survey, the curriculum has been being developed for more than 8 years. Initially, they started the curriculum by teaching basic computer skills and how to use Internet, and at present in 2016 the curriculum consists of more than 24 courses. The interviewed academic dean said that they are developing a buffet-style curriculum so that older learners can freely choose the courses which they are interested in. The courses are mainly determined by the necessary information technology skills in everyday life such as online shopping, online chatting using WeChat and Skype, and Digital Image Processing. Figure 5.8 shows some scenarios and documents in the development of the curriculum in the university.

The process of developing the curriculum of IT consists of the following steps:

1. *To investigate the emerged technologies that are commonly used in everyday life.* They may be a software tool, a new product, and a specific skill. The main criteria of choosing them is that they should be commonly used in everyday life. For instance, tablets have become more and more popular and important in everyday. Online shopping and communication has become easier on tablets than on computers. However, many older learners cannot use tablets skillfully. A course of teaching some basic skills of using tablets would be very useful. Another example is digital image processing. Digital cameras have become the main stream for photography. An accompanying problem is how to use some digital image process software to process their digital photos. To get such information, it requires education providers to investigate the situation of the development of information technologies.
2. *To identify the topics that are actually needed by older learners.* Among the emerged technologies investigated in the first step, education providers should identify those that are actually needed by older learners. To achieve this, they communicate with older learners and learn their requirements to these technologies. For example, many



(a) An occasion of class meeting



(b) An occasion that older learner representatives reported their feedback on the curriculum



(c) An occasion of faculty meeting



(d) Recorded problems that are collected from older learners during teaching

Figure 5.8: Some scenarios and documents in the development of the Information Technology curriculum in SUE

older learners hope to learn how to use WeChat on tablets because they want to make video call to their children staying abroad. For this requirement, they start a new course of teaching how to use tablet and some basic applications on it.

3. *To conceive the prototype courses on the emerged technologies.* Unlike young people, older learners are usually not very sensitive to information technologies, and it takes longer time to learn some basic skills of using them even though such skills seem very easy to learn to young people. Thus, the teaching contents and forms of a courses are very important. One criteria of such new courses is that they must be as simple and practical as possible.
4. *To organize small classes and check if the popularity of the course among older learner.* Before opening a new course to older learners, education providers organize a small class and check if the course is welcome by older learners. They them determine to increase or decrease the capacity of each class depending on the test result.

5. *To improve the new course based on the feedback from learners and open the new service as a regular one to all older learners.* In the above step, education providers also collect feedback from older learners and record the emerged problems, and then find solutions to improve the source. Finally, they open the course as a regular one to older learners.
6. *To assess the new course according to the outcomes and feedback from both lecturers and older learners.* Each regular course should be assessed by the end of a term after the course is finished. The assessment are usually based on three aspects, i.e., how much the older learners learn from the lecture, feedback from older learners and opinions from lectures. With these information education providers will modify and update the course correspondingly in next term.

A feature of the IT curriculum is that courses should be updated frequently because of the rapid development of information technologies and the variety of older learners' requirements. That requires the providers to examine existing courses, eliminate obsolete courses, and introduce new courses every terms. In SUE, the administrators repeat the above six steps every terms to keep their courses up-to-date. Another feature is that older learners can not learn such new technologies as fast as young people, and hence the contents of such courses should be simple and the schedule should not be too tight. With the increasing experiences accumulated in the curriculum development, the IT curriculum in the university has become one of the most popular curriculum among older learners.

Waterfall process of curriculum development

The example of IT curriculum development in the previous section reflects the overall process of how a curriculum that is driven by the external environment is developed in SUE. Based on the example, we conclude a waterfall process of developing education service driven by external environment. Figure 5.9 depicts the waterfall process which consists of the following six steps:

Step 1: *To conduct comprehensive survey*

Step 2: *To determine feasible topics for the new services*

Step 3: *To design new education services based on the new topics*

Step 4: *To test the new services in small classes*

Step 5: *To deploy the new service as a regular one*

Step 6: *To assess the service and find possible solutions to emerged problems*

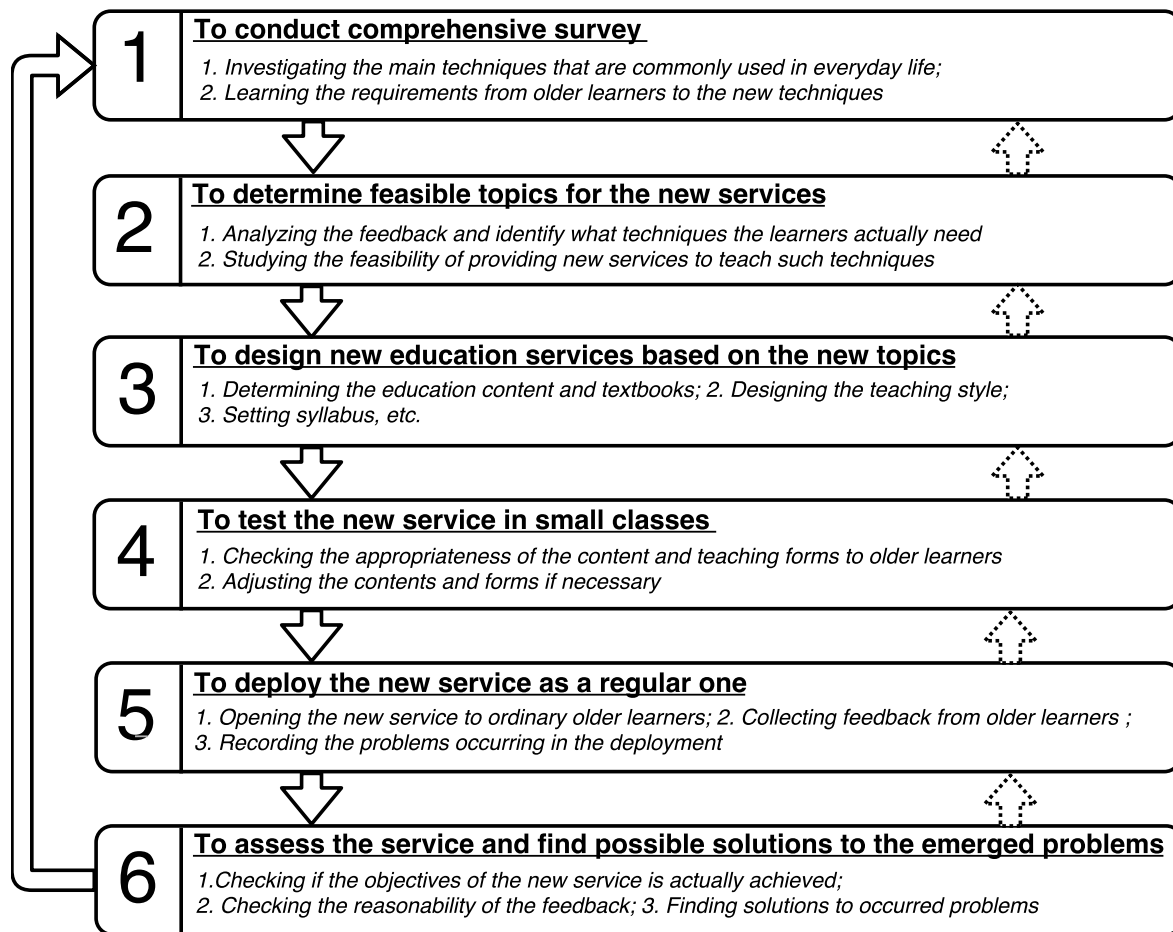


Figure 5.9: The process model of developing new OAE services in SUE

The six steps are conducted basically in stepwise order. In the figure we also list some typical operations in each step. The whole process is iterated repeatedly in the development of an education service. The process reflects the interaction between education providers and older learners to develop new services, deploy them, evaluate and improve them.

Compared with the waterfall process in Case I, it is obvious that the process of developing new education services that are driven by external environments is in general same as the process of the developing new education services that are driven by the requirements from older learners, although the concrete operations in each step are different. A major difference between the two process is that education providers and older learners play equivalently important role in the process, while in the process in the first case older learners play a dominant role.

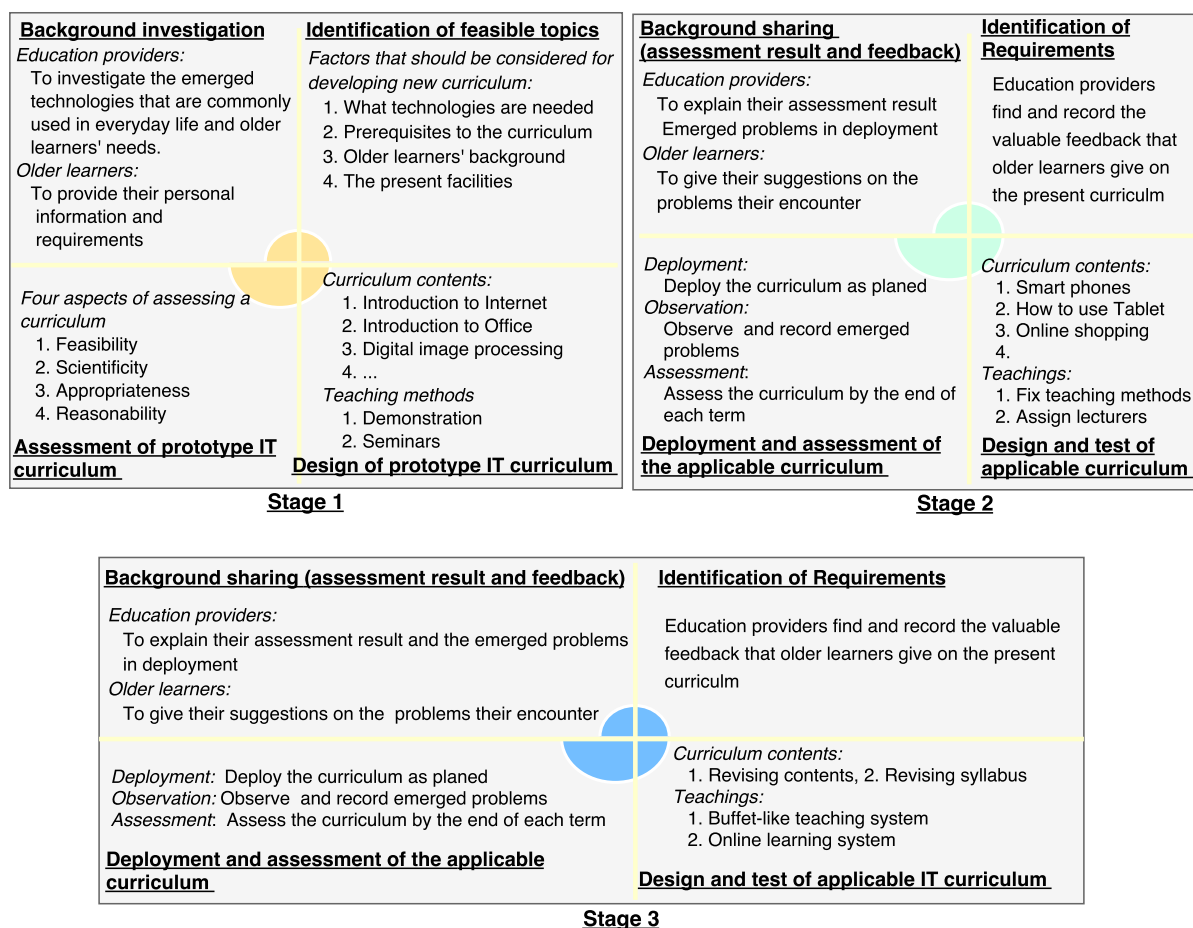


Figure 5.10: The three stages in the curriculum development of Information Technology in Case II

Three-stage development of the curriculum

From the statement of providers, we can see that the curriculum of IT also experience several stages. Like in Case I, we formally model the development stages of the IT curriculum in SUE as shown in Figure 5.10. Although the curriculum was started from 2011, it has been quickly developed and reached a relatively stable status for its practicality, the rapid progress of information technologies, and ample resources for teaching. After five-year development, the curriculum consists of more than 20 courses. Almost every term some obsolete courses are eliminated from the curriculum and some new courses are introduced.

Figure 5.10 depicts the first three stages of the curriculum development.

1. (*Stage 1: 2011*) The idea of developing IT curriculum was first formally proposed in Fall, 2011. At that time, personal computer was still the mainstream tool used for both work and entertainment, while smart phones have been emerging. After studying the market and lifestyle, the university provided some courses on how to

use computers such as *Introduction to Internet*, *Introduction to Office* and *Digital image processing*. Such courses require many facilities such as computers, projectors, software, which are not only costly but also time-consuming to prepare. Before the university administrators were convinced that older learners can get interested in these courses, they tentatively provide them to small groups.

2. (*Stage 2: 2012*) The courses for IT curriculum were highly praised welcomed and got popular quickly among older learners once they were tentatively provided. The university determined to found a computer center for the curriculum. With the popularity of smart phones and mobile computing, the requirements of learning mobile devices were increased. In this stage, more and more courses were proposed and deployed, such as *Introduction to tablets*, *How to use WeChat*.
3. (*Stage 3: since 2013*) Problems emerged with the drastic increase of the courses in 2012 such as the lack of lecturers, classrooms, and facilities, which lead to the decrease of older learners' satisfaction with these courses.

Unlike young people, older learners usually need to learn many times to manipulate some instruction. Instructors have to repeat their lectures, which resulted in drastic increase of their workload. The university realized that traditional teaching methods are not suited to the curriculum. They creatively proposed a *buffet-like* teaching approach in that they record videos for each course and put them on the website so that older learners can learn by themselves online. With the system becoming stable, the development of the curriculum goes to the mature stage.

Although not depicted in Figure 5.10, it is worth mentioning that some course may decline in the development with the progress of information technologies and the change of lifestyle even at maturity stage of the development of the curriculum. For instance, participants to the courses on personal computers are becoming fewer and fewer due to its marginalization in everyday life and the complexity of their instructions. The university has stopped updating these courses and they are gradually declining. If we consider each course as an independent service, the decline of the course can be divided into the last stage in the spiral model.

The development stage of IT curriculum in Figure 5.10 is almost the same as Figure 4.10 except that the concrete objectives and the methods adopted are different in each step of each stage, especially in the first and third steps.

5.3 Research hypothesis validation and findings

In this section, we validate the research hypothesis on the basis of the analysis results as we do in Case I. We validate both the structure model and process model of OAE

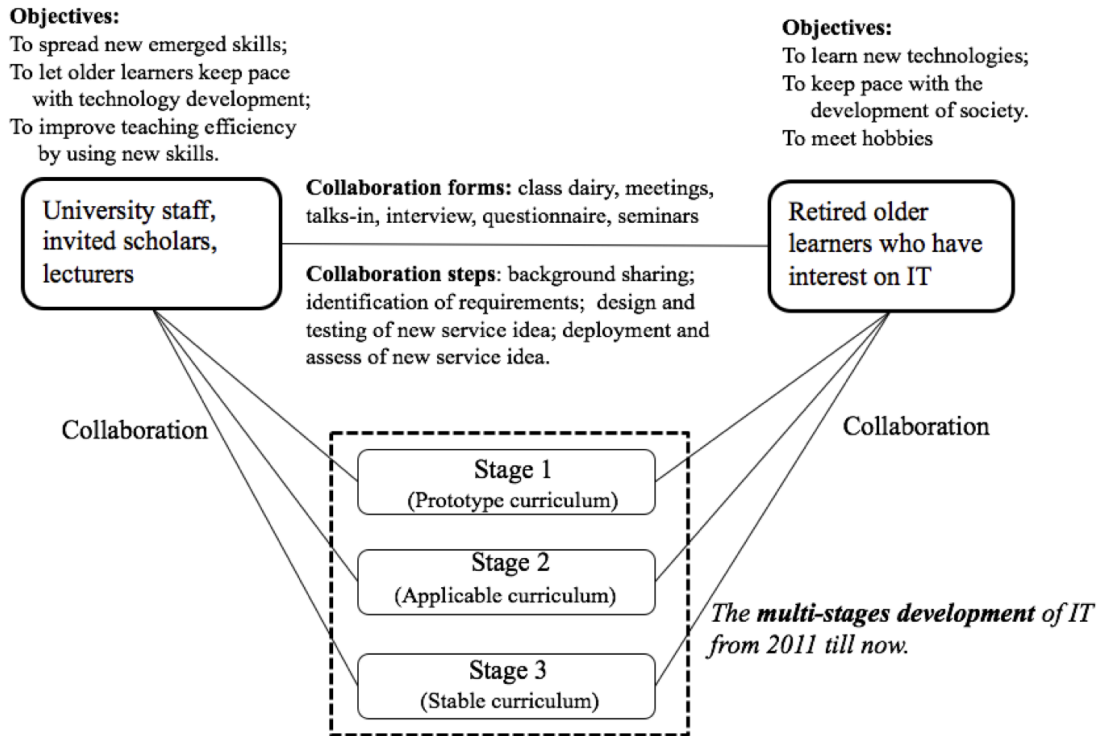


Figure 5.11: The overall mechanism of collaboration in the curriculum development of IT in Case II

curriculum development separately by comparing them with analysis results in Section 5.2, and then summarize findings in this case obtained from the validation.

5.3.1 Validation of the structure model of society-driven curriculum development

Unlike the example of curriculum development in Case I where older learners have specific requirements to ACL courses, in this example both providers and learners do not have specific requirements to the under-developing IT curriculum because the development of the curriculum is driven by the factors from neither providers nor learners. In such cases, the roles that both education providers and learners play are equivalently important, and collaboration is essential and necessary to the development of curriculum.

The structure of the curriculum development of IT in Case II can be summarized as depicted in Figure 5.11. On the one hand, education providers realize that IT technologies can help older learners to obtain new knowledges and improve their life quality. On the other hand, older learners have motivations to learn the new knowledge to keep the pace of progress of society. Thus, the objectives of the two sides are consistent, making it feasible to develop this curriculum.

Table 5.2: Comparison of the structure model with investigation results in Case II

Structure model in the hypothesis	Curriculum development structure summarized in Case II	?
<p>The structure model shown in Figure 3.1(a)</p> <ol style="list-style-type: none"> 1. Consistency of motivations 2. Collaboration relation 	<p>The collaboration structure shown in Figure 4.11</p> <ol style="list-style-type: none"> 1. Motivations of education providers and learners are consistent, e.g., older learners are motivated to learn IT knowledge, and providers think IT knowledge is helpful to improve learners' life quality. 2. The curriculum development structure is collaborative, e.g., they play equivalent roles in the development process. 3. The curriculum development experiences three stages from germination to maturity. 	✓
<p>Older learners are co-creators of service values. They contribute to the development of education services by collaborative interacting with providers.</p>	<p>Older learners' collaboration is necessary to the development of IT curriculum. They contribute to the development from three aspects:</p> <ol style="list-style-type: none"> 1. Older learners let providers know what IT knowledge is important to them. 2. Older learners positively participate into learning IT knowledge 3. Older learners let providers know what are the difficulties for them to learn IT knowledge. 	✓
<p>Education providers play <i>leading</i> roles as facilitators of OAE service design</p>	<p>Education providers play <i>equivalent</i> roles to interact with older learners to explore their requirements to develop curriculum:</p> <ol style="list-style-type: none"> 1. Education providers prepare candidate IT courses for older learners to confirm if they need such courses. 2. Providers communicate with learners in various ways to learn their feedback. 3. Providers are responsible for evaluating learners' feedback to improve their courses. 	✓

A challenge in developing the IT curriculum is that the requirements are not clear in that both older learners and providers do not have specific contents to learn and to teach. The challenge forces the both sides collaborate with each other in the development of the curriculum. Thus, the relation of the two sides is collaborative, and they play equivalent roles in the development. The whole development process also consists of three stages.

Table 5.2 shows the comparison results between the structure in the hypothesis with the one obtained from the case study. Like Case I, we do comparison from three aspects, the overall structure and the roles that older learners and providers play in the curriculum development. From the table, it is clear to see that the structure of the curriculum development is almost consistent to the one in our hypothesis except that education providers play equivalent role but not leading role in this case. That is because the requirements of

both older learners and providers to the curriculum are not clear. Although providers are the facilitators to develop the curriculum, their leading role is weakened and they rely on the feedback of older learners to improve the curriculum.

5.3.2 Validation of the process model of society-driven curriculum development

We compare the process of service development in the hypothesis with the waterfall process of the curriculum development that is summarized in Case II. The comparison is made from two aspects, i.e., each step of the process and the overall process. It can be seen clearly that the two processes are consistent in a broader sense, especially the first two steps are exactly the same. There are also slight inconsistencies between them, e.g., testing and evaluation are emphasized in step 3 and 4 respectively in the practical development, but not in the hypothesis. Such result is similar to the one we obtain in Case I.

Because the comparison result of steps 2, 3 and 4 and the overall process is the same as the one in Case I, we omit the detailed explanation in this case. Instead, we focus on the comparison of step 1, which is different from the one in Case I with respect to the roles that older learners and providers play in this step. The purpose of step 1 in the waterfall process in this case is consist to the one in the hypothesis, i.g., to learn better with each other for learners and providers. In this case study, providers and learners play equivalent roles in that providers need to do survey on current IT development and prepare candidate IT courses to introduce them to older learners, while older learners choose what they want to learn from them and may introduce some new courses that are not in the list. Older learners are also asked what approaches are suited to them to learn such courses. Such information is the basis for the provider to design and deploy their courses in the subsequent steps.

To sum up, the waterfall process in the case is also consistent to the four-step spiral process in the hypothesis except that testing and evaluating are emphasized in the waterfall process. Another feature of the waterfall process is that it allows rollback, making it more flexible and operable in practice. Thus, we conclude that the development of those curriculum that is driven by external environment e.g. development of society and emergence of new technologies, but not internal requirements, can also be achieved by the collaboration of older learners and providers in a spiral way.

Table 5.3: Comparison of the research hypothesis and the investigation results with respect to the process in Case II

	The process in hypothesis	The waterfall process summarized from Case II	?
Comparison of each step	Step 1: <i>Knowledge sharing related to collaboration</i>	To understand each other better through survey and conversation, etc. 1. Providers prepare candidate IT courses and introduce them to older learners. 2. Learners gives their opinions, which techniques are what they want to learn, and what approaches are suited for them to learn.	✓
	Step 2: <i>Identification of service field</i>	To identify what IT courses are welcomed by learners by data analysis according to the data collected in the previous step.	✓
	Step 3: <i>Knowledge creation for new service idea</i>	To transform the requirements into practical courses. 1. Course design 2. Course testing The difference is that testing is emphasized as a separate step in the waterfall process.	✓
	Step 4: <i>Implementation of service idea</i>	To provide courses and evaluate their effects. 1. Course deployment 2. Course evaluation The difference is that evaluation is emphasized as a separate step in the waterfall process.	✓
Overall process	Features of the process: 1. Collaborative 2. Stepwise 3. Spiral	Features of the process: 1. Collaborative 2. Stepwise 3. Spiral Flow of the process allows rollback, which is different from the hypothesis.	✓

Legends: ✓: consistent; ✓: almost consistent but with some differences

5.3.3 New findings from the analysis and validation

Finally, we summarize some new findings obtained from this case. According to the comparison result, it is clear to see that the findings II, III and IV obtained in Case I can also hold in Case II. Hence, we omit duplicate discussion on them. Instead, we only focus on two new findings of this case.

Finding I: For those curriculum which is driven by external environment, collaboration is more important than those driven by internal requirements.

In this case, the example curriculum development we choose is mainly driven by the rapid developing IT technologies which have drastically change the life style of people. For

such kind of curriculum, both education providers and older learners do not have specific requirements of what should learn and in which way they should learn. Under such situation, collaboration becomes more important and necessary to develop the curriculum. From the validation process, we can see that the development of the curriculum would be important without the effort of either side, and neither of the two sides play dominant role in this development. Collaboration is the main means to drive the development of the curriculum. For those curriculum to which the requirements of both learners and providers are not clear, the leading role of learners is weakened and the role of older learners becomes more important.

Finding II: Learners even with relatively lower education also intentionally get involved in the development of curriculum.

In this case, older learners that we survey have a lower education background than those in Case I. However, we still find that they are very enthusiastic about participating into the development of curriculum. The reason is that their objective of participating the education is consistent to those of providers. They hope to learn something that is good to them and their life, which is also the objective of providers. Such consistency makes it reasonable for older learner to give their opinions and suggestions to improve the curriculum because they are also the beneficiaries from such collaboration. Such conclusion is consistent to the fundamental assumption in service value co-creation theory that consistent objective is the prerequisite of service value co-creation.

Chapter 6

Case III: Jingan University for the Elderly

6.1 Overview of Case III

Jingan University for the Elderly (JAUE) was founded in 2012 as an independent OAE organization and directly under the administration of Jingan District Education Bureau of Shanghai. It is developed from the Shanghai Municipal Experimental Public Schools which was found in 1945. Even the formal JAUE was established in 2012, it has more than 60 years experience of conducting education service for common people. The university is famous for its standardized management among all OAE universities. By the end of 2015, there are nearly 4000 older learners and 70 kinds of courses developed in the university.

- **Basic information:** The aim of the university is providing a nearby place for older

Table 6.1: The statistics information of interviewees in Case III

Role	Name	Age	Position	Working or learning period
Education provider	Ms. Wang	30s	Education director	7 years
	Mr. Zhou	20s	Researcher, lecturer	5 years
	Mr. Song	40s	Researcher, lecturer	10 years
	Ms. Shen	60s	Class adviser	3 years
Older learners	Ms. Shen	80s	Learner, monitor	3 years
	Ms. Yang	50s	Learner, monitor	1 year
	Mr. Yao	60s	Learner, monitor	3 years

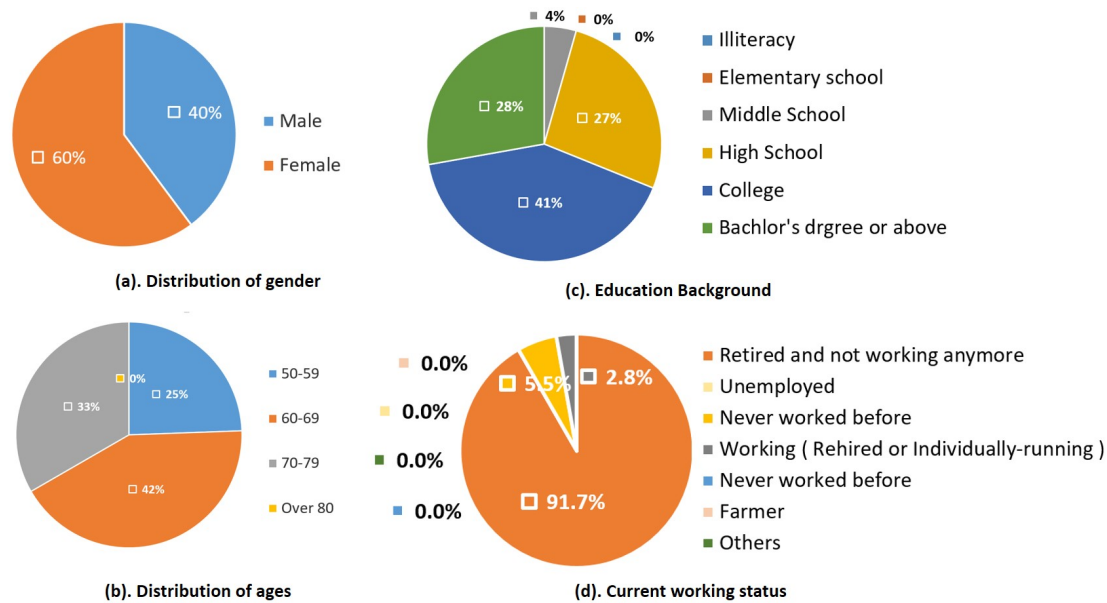


Figure 6.1: The distribution of personal information of respondents in Case III

adults to learn. The university is famous for its standardized management among all OAE universities. By the end of 2015, there are nearly 4000 older learners and 70 kinds of courses developed in the university. Compared with Case I and Case II, it is a district-level OAE university with shortest history.

- The education system of Case III:** The overall service system of Case III is shown in Figure 3.2. The education providers are Jingan District Education Bureau of Shanghai and JAUE; the older learners are common old people who reach the retired age which is the same as Case II.
- The statistics information of questionnaire and interviewees** In Case III, we collected 90 pieces of paper-based questionnaire from older learners. Figure 6.1 (a) and (b) show the percentage distribution of gender and age of respondents, 60% of them are female, and male is 40%. All of them are less than 80 years old and the percent of aged 50-59, 60-69, 70-79 are 25%, 42% and 33%. The overall distribution of gender and age in Case III is similar to Case II. Figure 6.1 (c) and (d) show the percent distribution of education background and current working status of respondents. We can find out that over 68.9% of respondents are college degree or above, and 90% of them are full retired and not working any more.

From above data of surveyed learners, we can see that all the investigated students are below 80 years old, most of them are full retired from workplace and have high education background. Compared with the personal information data in Case I, the percentage of female is larger, the students are younger and have relatively lower

education level. The overall distribution of personal information of respondents in Case III is very similar to Case II even they are the different level of OAE universities.

We interviewed 3 older learners and 4 working staff respectively. The statistics information of interviewees is shown in Table 6.1. Document record is another way for us to get more information about the learning experience.

6.2 Data collection and analysis

We survey both the older learners and education staff in the university for the data about their learning or working experience as we did in Case I and Case II. The survey contents follows the design in Table 3.1. The following we present the collected data from older learners side and education providers side, and give corresponding analysis with respect to 5 aspects: learners satisfaction with the education service, objective consistency of education providers and learners, the role of education providers in the education service development, the role of older learners in the curriculum development and development mechanism of OAE curriculum in JAUE.

6.2.1 Learners satisfaction with the education service

We investigate students' satisfaction degree with provided education services in 7 aspects and their learned education contents and expected contents.

Figure 6.2 depicts the satisfaction level of learners. More than 90% older respondents are satisfied with the current education in 7 aspects and Less than 10% of students feel neutral or not satisfied with provided education services. These data in Case III are very similar data in Case I and Case II. Same with the preceding two cases, the Case III also conducts successful education activities from the older learners' point of view. The older students feel satisfied with education service, although they think there are still space to improve it.

Besides the investigation of satisfaction, we also surveyed the learned contents and expected contents of respondents in Case III. Figure 6.3 shows the comparison of learned contents and expected contents. The green line shows the percentage of learned contents of respondents. It can be seen that the first three options have high percentage, they are *calligraphy and photograph*, *medicine and health* and *singing and dancing*, the percent are 47.2%, 41.6% and 40.4%. The next is *computer and network*, the percent is 33.7%. The percent of learning other courses is quite low. The purple line is the percent of expected learning contents. The most welcome four courses are *medicine and health*, *calligraphy and photograph*, *computer and network* and *singing and dancing*. The percent are 70.4%,

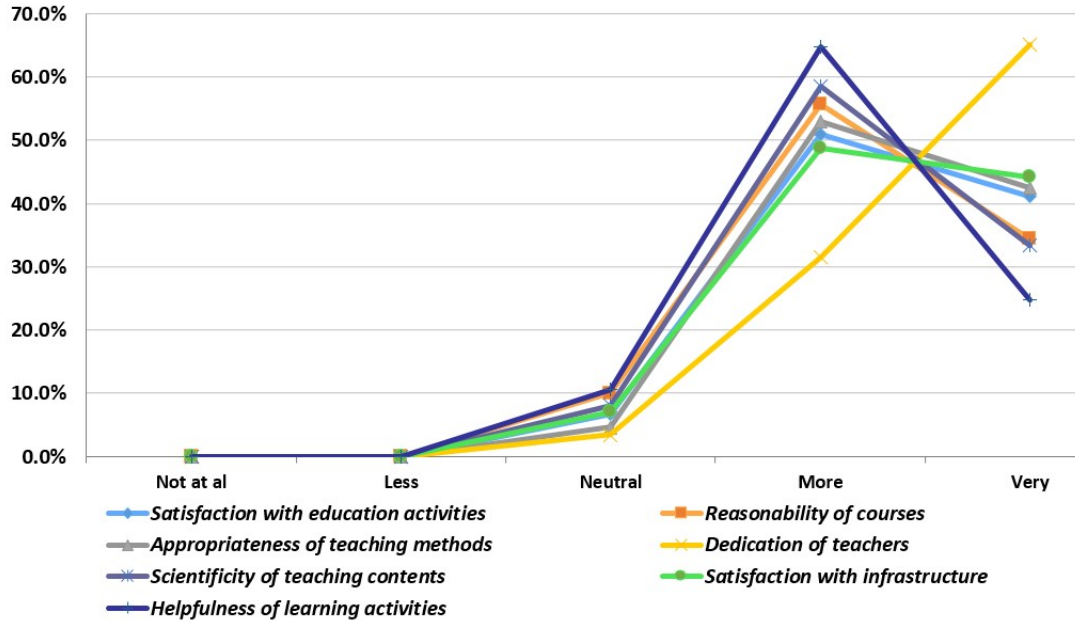


Figure 6.2: The satisfaction with the university in 7 aspects in Case III

61.7%, 58% and 56.8% respectively. The other options have lower percentage, such as economy, science, cooking, planting, philosophy, law, clothing and knitting.

By comparison of learned contents and expected contents, the overall distribution of two lines is similar, the course what the students are learning are contents they expected to learn. It can be concluded that students have strong interest for learning courses, most student are learning what they expected to learn. However, the current content is far from enough to full meet students' requirements. The contents should be enriched and courses should be strengthened in the future.

The above data analysis reflect JAUE conducts successful education activities from older learners' perspectives. The university provides education services to older learners and get high satisfaction of older students. Learners requirements for education contents are well met.

6.2.2 Objective consistency of education providers and learners

We survey education providers objective and learners objectives respectively and check the consistency of their objectives.

Objectives of the university

The interviewed education director said that *"the first aim of our university is providing a close-range place for older adults to learn and serving better for them.* She also mentioned

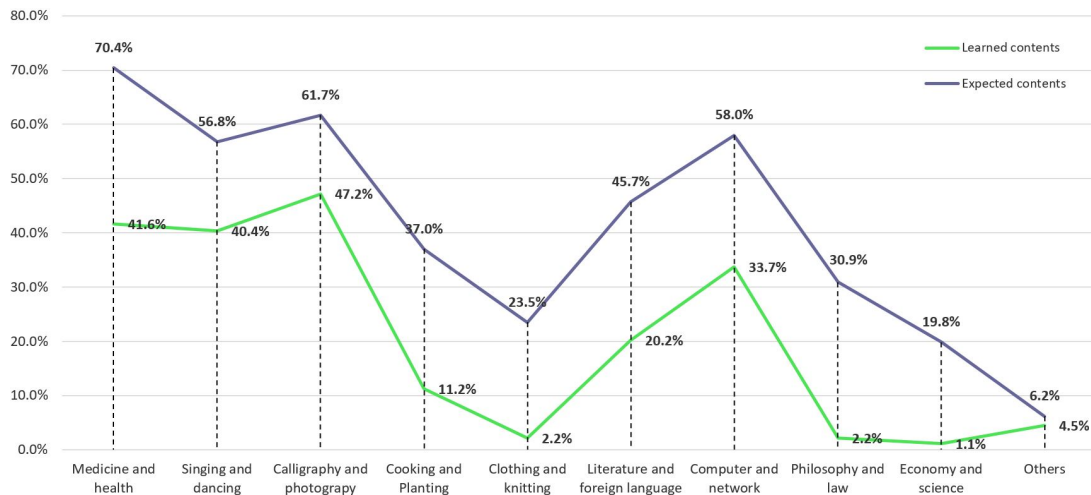


Figure 6.3: The distribution of learned contents and expected contents in Case III

the slogan of university ”*we are learning, we are enjoying, we are happy, we are healthy*”, which is printed in the magazine of university called *Golden Pond*.

From the education objective of Case III, we can learn that the founding of university is mainly for the happiness and entertainment of elderlies.

Objectives of older learners

We investigate learners objectives and expectation in 3 aspects: purpose of attending the university, expected learning level and gains from learning activities, improvement points.

Figure 6.4 shows the percentage distribution of purposes of attending OAE university in 9 options. The first purpose is *to learn and enrich lives* which is 80.9%. The next two

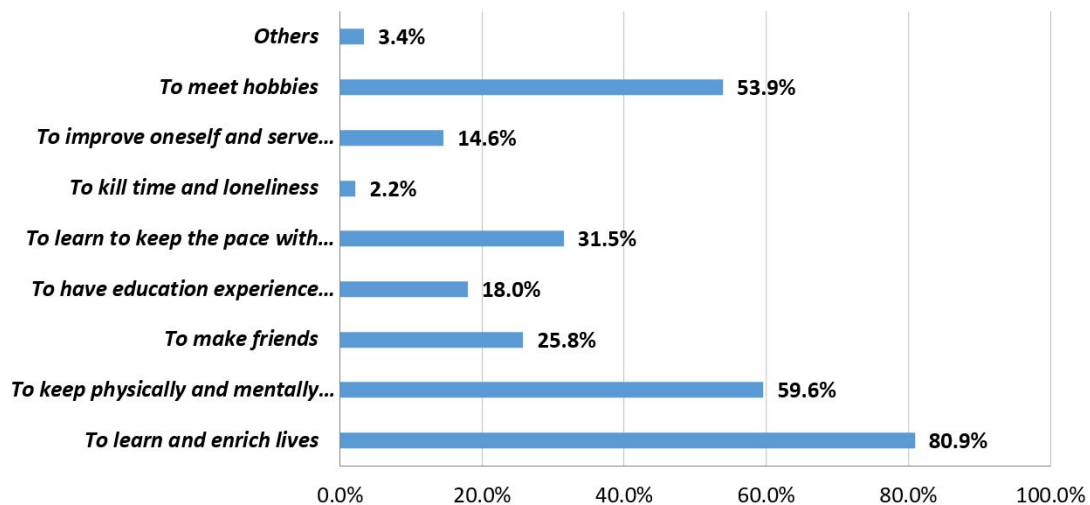


Figure 6.4: Purpose of participating OAE university in Case III

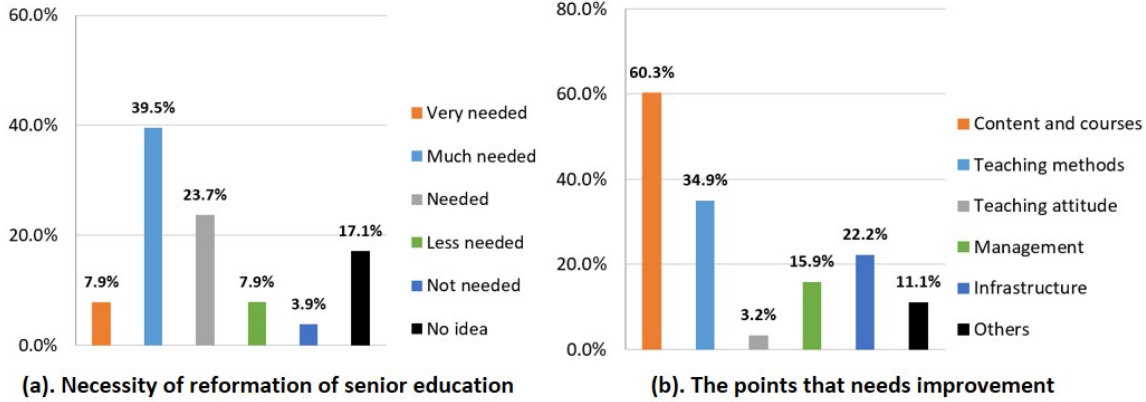


Figure 6.5: Education reformation in JAUE

purposed are *to keep physically and mentally healthy* and *to meet hobbies*, the percentage are 59.6% and 53.9%. While the percentage of choosing other purposes such as *to learn to keep pace with society*, *to make friends*, *to receive education missed in young age* and *to improve oneself and serve better for society* are quite low. From these data, we can see that even the older adults have multiple purposes of attending OAE learning activities, the most important three purposes in three cases are learning knowledge to enrich life, keeping themselves healthy and meeting their hobbies. Moreover, some of them not only want to get knowledge to meet their hobbies and keep healthy, but also want to refresh their knowledge to keep pace with society and serve better for it. Even there is a little difference in percentage of purpose in each case and education background, the overall distribution of purpose in three cases is similar.

Even the satisfaction degree of students are very high, there are still some points needed to be improved or reformed. Figure 6.5 (a) shows the necessity of reformation from students point of view that 47.4% of respondents think it is very or much needed to improve the current education situation. And 17.1% of them have no idea for this question. In addition, we asked the older learner the points needed to be improved, and the survey result is shown in Figure 6.5 (b). The percentage of choosing *contents and course* is the highest, it is 60.3%. The percent of choosing *teaching methods* and *infrastructure* are 34.9% and 22.2%. From these data, it can be inferred that education content and course are the most related to students' learning activity. In case III, the first needed to be improved is education contents so that it can better meet learners' demands, which is almost the same with case I and case II. Moreover, education infrastructure, teaching forms and education management are also needed to be improved in some extent.

Besides the investigation of purpose and content, we survey the older learners' expectation of learning level, teaching forms and responsibility of teachers as well as we did in preceding two cases. Figure 6.6 (a) shows that 50% of respondents want to study at elementary level, and 43% of them want to get systematical understanding level of

learning. Only 7% of them pursue professional learning service. Figure 6.6 (d) shows the percentage distribution, it can be seen that older adults get a lot from education service, their knowledge and skills are enriched, many new friends are made and life quality is improved as well.

Objective consistency of providers and learners

Through the summary the education providers objectives and older learners objectives, it is obvious to see that their objectives have many consistent parts. Education providers want to improve the life quality of the elderlies and keep them healthy; older learners want to learn knowledge and skill to meet hobbies, to enrich life and keep healthy. Education providers also provide multi-level, board coverage courses for learners to meet their various needs for OAE services.

6.2.3 The role of education providers in OAE service development

The role of education providers in the development process of OAE service design can be analyzed by learners expectation of providers responsibilities and education providers experience of development OAE services.

Data and analyzed results from learners' side

Figure 6.6 (b) and (c) show the survey results of teaching forms of lecturers and their responsibility as education providers. The percentage of choosing *instruction* and *to teach knowledge* is very high, about 88%. And choosing *To teach how to learn* is also very high, around 70%. The respondents also emphasize the responsibility of teachers for providing various teaching methods to lead students to learn, especially creating good environments for exercise, discussion and observation.

From the above data, we can conclude that besides teaching knowledge which is the most important part, lecturers should teach students how to learn by themselves effectively. Moreover, lecturers should be coordinators of teaching activities and be responsible for managing classes and communicating with administrators and learners positively. The good relationship between learners and lecturers is not only lay on giving knowledge and skill, it also needs their cooperation and coordination in or out classroom.

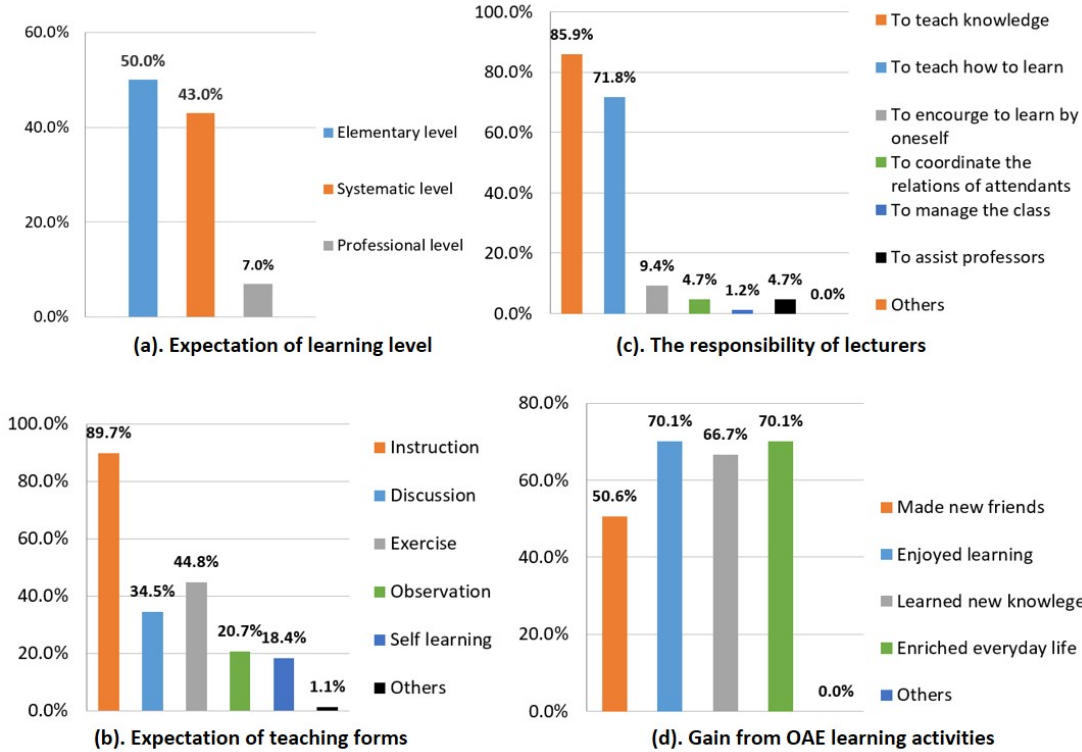


Figure 6.6: Learning experience of students in Case III

Data and analyzed results from providers' side

On the mechanism of designing education services, the university learns the requirements of students firstly and takes it the main basis for development new services.

Besides the aforementioned ways of collaboration with older learners to evacuate information for designing new education services, the education providers also learn some experience from other universities for the design of new ideas. The interviewed lecturer said "we also pay attention to the dynamic of other OAE learning organizations and learn from each other. Their successful experience is very important reference for us to improve the education service". In addition, Some lecturers also give some suggestions for the open of new course. The other researcher shared a story with us and said that "a very active lecturer come to the office one day and said to us that he wanted to open a new course called Study of Seal which is let students to learn carve seal. We took this suggestion into consideration and hold a specialized seminar for learners to introduce the new idea. Many students have such interest and now the course is deployed as regular teaching contents."

The university set up a research group to focus on the improvement of education service. The group members collect data from learners, study new policies and pay attention to new research progresses domestically and internationally. They then propose new service ideas. Any new proposition would be studied by them before putting into practice. The interviewed education director said that "we held faculty meeting before the beginning

of each term to discuss the detailed problems of curriculum development, teaching methods and something related to new proposed education ideas.”

The education provider broadcast the new education service through many ways to let older adults to participate it. Besides the traditional short lecture forms, they also make advertisements in some famous newspapers and telecasts to attract interest of other old people who are not students of the university.

When the registration number of new course is over 20 students, it will be deployed in the new term. The education providers keep records on new opened course and try to improve it as much as possible to meet requirements of learners well.

The university has its own magazine for transmitting information of school to students, and also it is a channel students to convey their feelings freely. Actually, it is a platform for sharing knowledge between education providers and older learners.

There are mainly two types of teaching channel: the first classroom and the second classroom. The characteristics of first classroom is similar to Case II which is conducted in the classroom; the second classroom is called student club or salon which is organized by the university for students who have same interests and extra energy to learn. And the university also encourage students to go out the campus to contribute for others. All of these channels of teaching are for meeting various requirements of learners.

The senior university set up certificate of course completion to qualify the students learning to meet the needs of the elderly. They not also want to get skills and knowledge, but also want to be qualified after learning.

6.2.4 The role of older learners in OAE service development

The role of older learners in the OAE service development can be analyzed from two aspects: learners self awareness of student involvement and providers interaction experience with older learners.

Data and analyzed results from learners' side

The students' awareness of self involvement is very important for improving service value of OAE university. Active participation of learners helps to design needed education contents and course. We survey the older learners' frequency of proposing opinions, attitude on giving suggestion positively and necessity of student involvement in case III, too. Figure 6.7 depicts the percentage distribution of three questions. We can see that only 2.4% of respondents often convey their opinions to education providers. More than 97.6% of them not often even never propose their feelings to university. Even the frequency is very low, their attitudes towards giving suggestion are very positive, 54.1% of students

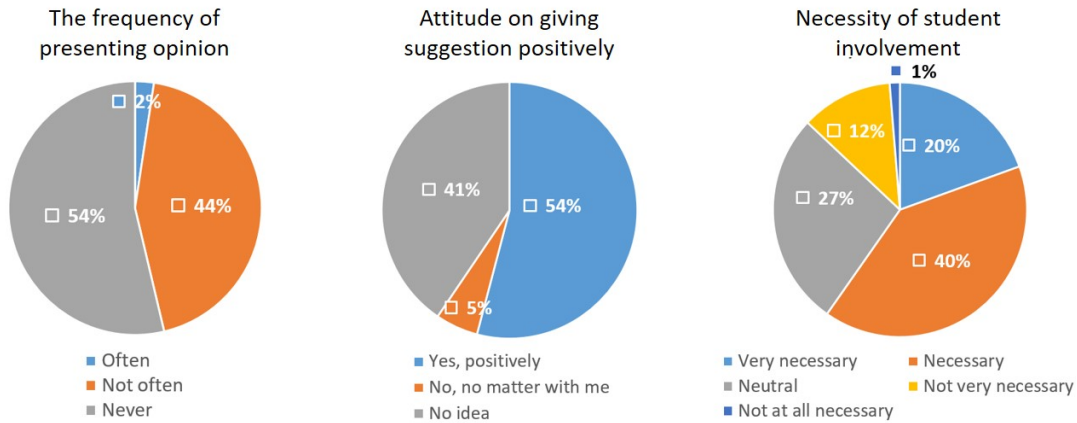


Figure 6.7: Consciousness of self involvement of learners in Case III

express their positivity of giving opinions. More than 80% of them thinks that it is necessary for student involvement for a good OAE university.

The interviewed education providers also gives some suggestions about improve the service value of OAE university. They pointed out that the self management of students is also very important to improve the effectiveness of managements of schools. Moreover, the environment building is very important for giving sense of belongings to students, especially the soft culture in the university.

Data and analyzed results from providers' side

The interviewed researcher Mr. Zhou told us that the design of education service is mainly based on the demands and interest of learners. He also said that *"we investigate students' requirements by two ways, face to face interview and questionnaire survey."* As a new founded OAE university, JAUE takes learners' feedback seriously and conducts school wide investigation in the end of each term. The education director pointed out that *we want to get two aspects of information: students' satisfaction and existing problems in this term, and expected education service or suggestions in the next term.* They also provide some new courses for students to choose for the new term. If the learners have high interest for some courses, the university would first evaluate the current condition and try to solve the problems of resources, facilities, finance and teaching staff, and then set up the expected courses.

The university has full time class advisers who take charge of the management of students. These class advisers have education working experience and retired from work place. Therefore they know older adults better than other people and are qualified for their work. As the intermediary of learners and university, their responsibility is providing assistance work for learners and delivery real-time information of learners to the education

providers. The interviewed class advisor Ms. Xiao told us that her mission as class advisor is let older learners to learn together happily. She said that "*I enjoy the work here very much as one of the older adults. I am managing 18 classes with my true love and remember all students' name clearly*". She shared her experience with us that her work is making inspection tours before and after class and taking note about the education situation in the class, and also giving the guidance for the mental health of old people. The university held meetings for all class advisors every week to let them to report the education situation, difficulties and possible solutions. It is one of important way for education providers to learn older learners and effective way to propose new ideas.

Class monitor is appointed in each class to help those class advisors to do some management work. They need to take notes in Class Daily to report detailed information from students and their feelings. They are also encouraged to submit some papers to the university magazine *Golden Pond*. Regular training for class monitors is provided to improve their ability and responsibility of managing class as assistants of class advisors.

Besides the data collection of questionnaire, we also interview some students randomly and participate their education activities by observation and noting students' learning actions. The interviewed students are all satisfied with provided education service, their requirements are well meet. They also point out that the university provide many ways for student involvement and encourage them convey ideas freely, and also feed back students' opinions quickly.

From the above data, we can learn that the university takes learners' demands seriously and build their own system to collaborate with learners directly and indirectly. Older learners are participators and collaborators of OAE service development. The class advisors and monitors are the direct way for collecting data from students. Their notes and feeling sharing are important sources to learn students' experience. Face to face interview and formal investigation by using questionnaires are another ways to interact with students.

6.2.5 Development mechanism of OAE curriculum in JAUE

In this part, we use an example of curriculum development to explore the development mechanism of OAE curriculum in JAUE.

Our survey show that interest-oriented curriculum is still the mainstream in Chinese OAE universities. Such curriculum is developed with the main purpose of meeting older learners' requirements. In Case I, we showed an example of developing a curriculum development driven by the requirements that are directly from older learners. There are also the cases where requirements may not directly come from older learners. Instead, education providers play the positive role in helping older learners realize some requirements that are important to them, and then providers develop corresponding curriculum to

them. In Case III, we present an example of curriculum development driven by education providers' motivations.

Providers' objective-oriented curriculum development: an example on Life Education

We consider the curriculum development of *Life Education* (LE) in JAUE as case to study. Unlike traditional curriculum such as calligraphy, literature and art, life education for older adults is a new curriculum and there is no example in Chinese OAE universities.

The university administrators decided to establish a curriculum that is suited to Chinese older adults from scratch. The interviewed administrator said that the development of the life education curriculum in JAUE has experienced the following steps:

1. *Conducting comprehensive survey*: Because it is a new curriculum and no existing related curriculum to learn, the administrators in JAUE determine to first conduct a comprehensive survey on this topic among older learners. The main objectives in this step are as follows:
 - (a) To introduce this new concept of life education to older learners.
 - (b) To understand better the background of older learners

Because life education is a new concept to older learners and many older learners usually do not want to share their private feelings with others, the administrators organize many informal programs such as seminar, tea party, one-to-one dialog to enhance the communication. Each class has a leader responsible for finding the class members who may suffer mental problems. The administrators also invite experts in life education to give public talks to attract older learners' interest and ask for their suggestions on both teaching contents and forms for the new curriculum.

2. *Data analysis*: The administrators analyze their collected information and find the main factors that are important in developing the new curriculum such as the objectives of the curriculum, background of older learners, and the expectation of older learners from the curriculum.
3. *Designing prototype courses and trying them in small classes*: The university administrators (including lectures) design new courses and try them in small classes to check the effect.

The interviewed administrator mentioned two courses as examples. A course called *To be a happy older*. The content is mainly about how to deal with the relationship between older adults and their young generations. It is a Chinese tradition that older adults live together with their children and grandchildren. It may cause many

domestic conflicts which make older adults upset. The course get popular as soon as it is opened.

4. *Assessing courses during experiment*: In the experiment of trying prototype courses, instructors also assess the effect and older learner's feedback. For instance, they found that many older learners are not good at expressing their feelings and emotions, which is common in Chinese culture. To overcome this problem, they develop another course called *Unforgettable memories*, a course to teach older learners to write compositions about their unforgettable memories.
5. *Organizing second-class activities to get more participants*: After several trials, the university administrators realize that only the time in class is not enough and the conversion in class is not efficient. They find older adults have strong requirement to express their feeling but do not know how. Therefore, they change their teaching policy. In the class, lectures teach methodologies of developing positive attitude. They organize some offline activities which they call *second-classroom* to encourage older learners communicate freely.
6. *Publishing pamphlets and textbooks*: Older learners share their experiences that bother them in everyday life. Lecturers gives suggestions to help them overcome problems. They select and edit typical cases as pamphlets and textbooks and use them in the class for future courses. They have established some regular courses and obtained many primary documents such as pamphlets and textbooks for these courses.

The interviewed lecturer said that the curriculum of life education is gradually getting mature and now very popular to older learners. Figure 6.8 shows an event that the university administrators in JAUE organized a promotion meeting to advertise their curriculum of life education.

In the development of the curriculum, the lecturers also realize some new forms of life education by the means of multi-media. The interviewed lecturer said that they are planning to take videos, or make posters to record the everyday life of those learners who are enjoying their later life. They can play these videos in their multi-media classroom and display the posters in the campus. They believe that such new forms would provide a good environment that helps older learners to get positive gradually toward their later life.

Waterfall process of the curriculum development

Based on the statements of the interviewed education providers in JAUE and the example of the curriculum development of the new course on Life Education, we summarize the process of education design and deployment in JAUE.



Figure 6.8: An event that administrators in JAUE organized a promotion meeting to advertise their curriculum of life education (*Taken on March 1, 2016*)

As depicted in Figure 6.9, the process of education design and deployment in JAUE also consists of six steps which are listed as follows:

Step 1: *To conduct comprehensive survey.*

Step 2: *To identify the expectations of learners from new concept.*

Step 3: *To design new education service based on the expectations.*

Step 4: *To assess the new service by experiment and attract more participants.*

Step 5: *To put the new service into practice and record problems emerging during the deployment.*

Step 6: *To evaluate the new service and summarize useful documents.*

The whole process is also similar to the processes in the previous two cases, although the concrete operations in each step are different. The main difference of the process in this case from other two cases is that the new services under design are initiated by education providers and education providers play a dominant role in the process. Consequently, in each step the main objective and the ways to achieve the objective may be different from the corresponding step in other two processes.

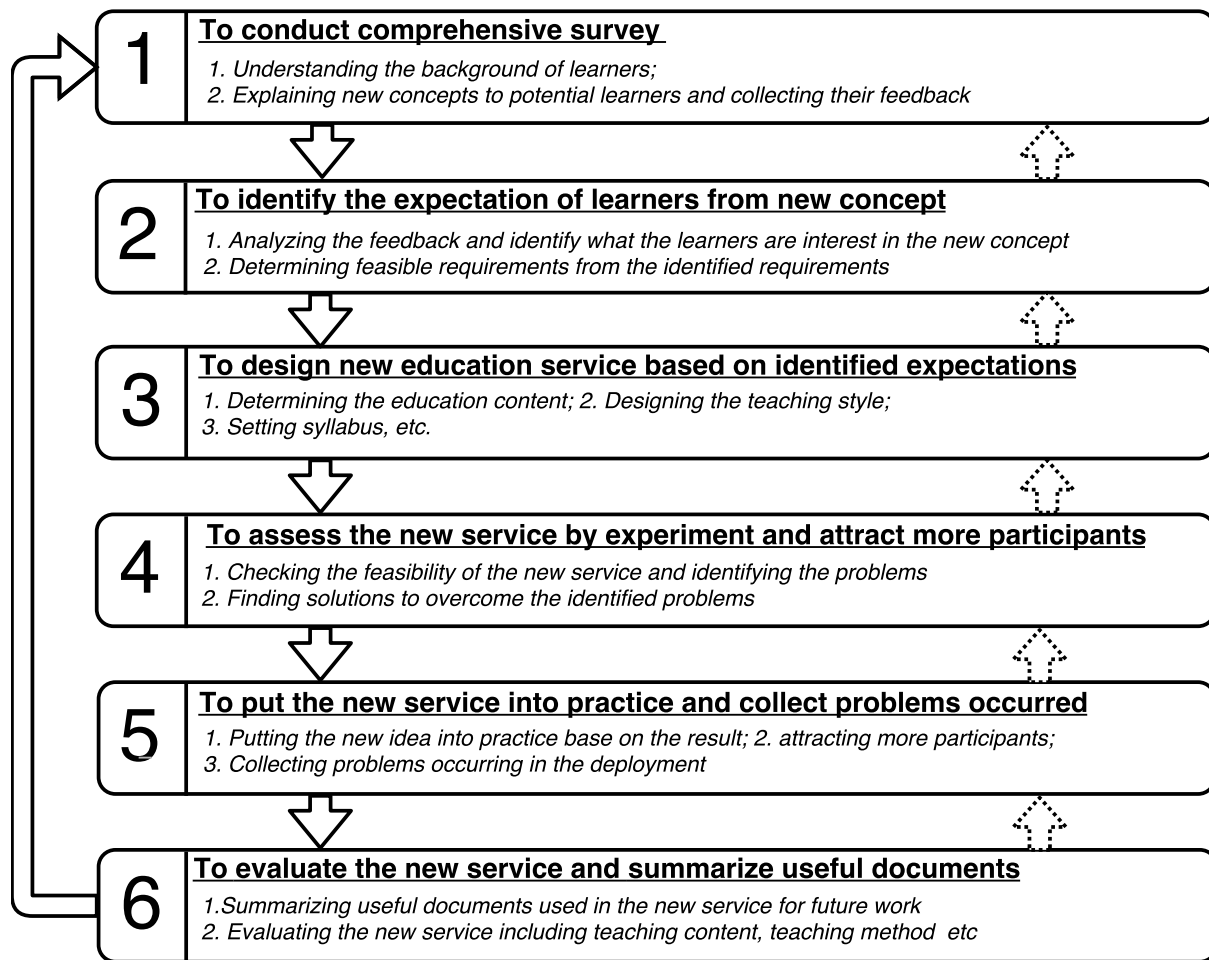


Figure 6.9: The process of education design and deployment in JAUE

Two-stage development of the curriculum

Because this is a new curriculum and there are no existing examples to learn, initially only a few older learners showed interest in it. At present the curriculum is still under development in that there still no mature course developed for it. We divided the development process of the curriculum from 2012 when the education providers first determined to develop the curriculum to the present in 2016 into two stages, i.e., *Stage 1* and *Stage 2* based on the applicability of the curriculum. Figure 6.10 depicts the sketch of each step in the two stages.

1. In stage 1, the curriculum is still at the conceptual level. The main task is to introduce this new concept to older learner, attract their interest and help them realize their requirements to this curriculum. The education providers in the university invite the experts in this field to give campus talks. They also interview older learners on the concrete topics that the learners hope to learn, and find the relation between the requirements and older learners background via data analysis. Based on these

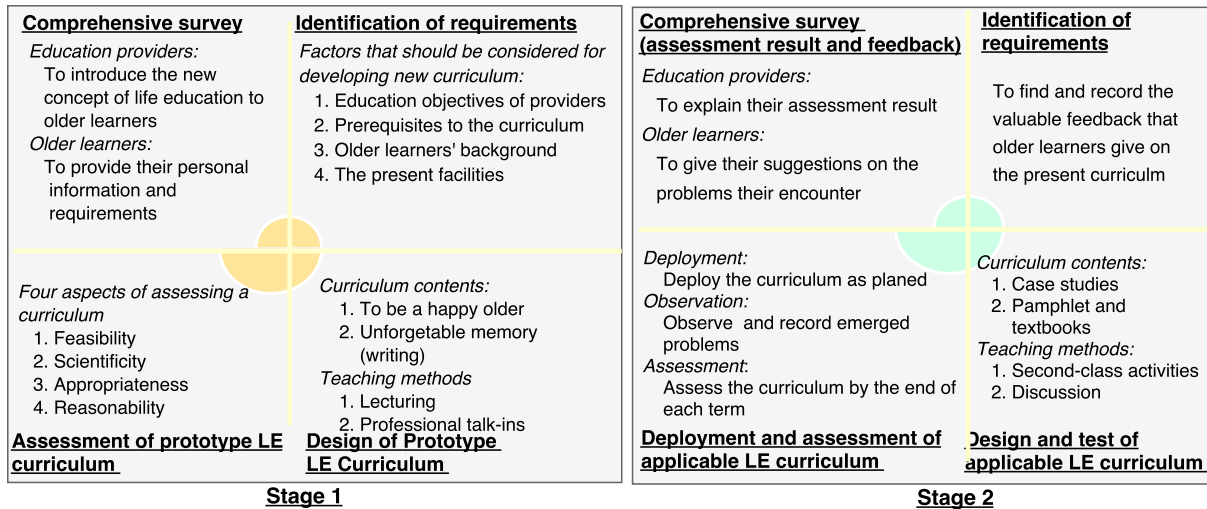


Figure 6.10: The two stages in curriculum development of Life Education in Case III

result, they design prototype courses, test them among small groups and improve them until the courses are applicable as regular courses to older learners.

2. In stage 2, the applicable courses are open as regular courses to older learners. However, there are still problems in the courses needing to be discovered and solved. The lecturers are responsible for recording all the emerged problems and collecting the feedback from older learners. The administrators are in charge of discussing and find feasible solutions to the problems. They improve curriculum by modifying the existing courses and introducing new courses every term. For instance, they introduce many second-class activities (activities that are organized outside classrooms) to help older learners realize the meaning of lives. They also make pamphlets and publish books of life education to enrich the library for older learners to learn. In this stage, the requirements of older learners to life education become clear and the courses become stable gradually. The number of participants is also increasing.

Like previous two cases, the dominant steps at the two stages are different. It is also clear to see the collaboration between administrators and older learners for the development of the curriculum. For instance, in the first stage the administrators introduce the new conception to older learners, and meanwhile the older learners share their personal information and expectation from the learning. The experiment of the new courses and assessment are also conducted by collaborating with the learners. Although the administrators play the dominant role in this case, older learners' participation is also equivalently important.

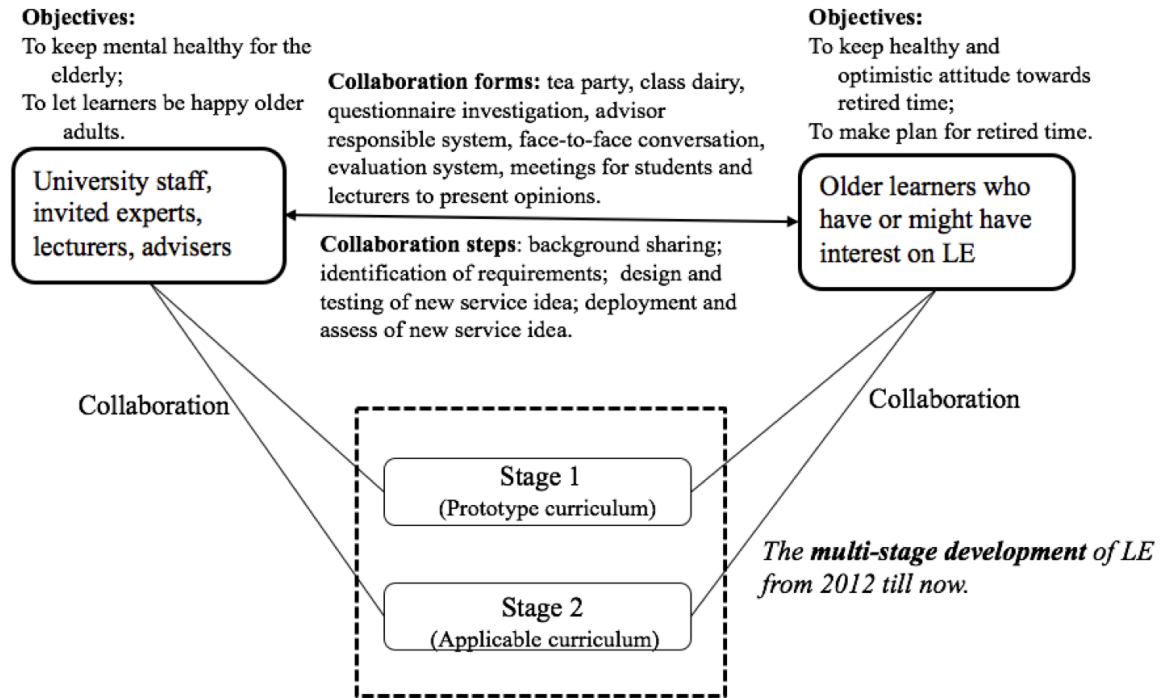


Figure 6.11: The overall mechanism of collaboration in the curriculum development of LE in Case III

6.3 Research hypothesis validation and findings

In this section, we validate the research hypothesis on the basis of the analysis results as we do in Case I and Case II. We validate the hypothesis in three criteria. From the investigation results of learners, we learn that most of learners are satisfied with provided OAE service, and the Case III also conducts successful OAE service. Therefore, the first criteria is met. We then validate both the structure model and process model of OAE curriculum development separately by comparing them with analysis results in Section 6.2, and then summarize findings in this case obtained from the validation.

6.3.1 Validation of the structure model of provider-propelling curriculum development

Unlike the example of curriculum development in Case I and Case II where education courses are driven directly by learners' requirements and society progress, in this example the development of the life science curriculum is initiated and driven by education providers. Older learners initially have few ideas about life science and do not realize whether they have requirements to it. Providers are the propeller of the curriculum.

The structure of the curriculum development in Case III is depicted in Figure 6.11,

which shows the objectives of both providers and learners from this curriculum, the role that they play in the development and the stages of the whole development process.

Education providers realize the value and the necessity of providing life education older learners. However, life education is new concept to older learners, and therefore the role of education providers is more important than the one of learners to develop the curriculum. They are responsible of organizing various activities to help older learners learn what life education is and realize the importances. During this process, requirements of older learners are inspired and identified, based on which the curriculum is gradually development by providers. In that sense, education providers are propellers of the curriculum, and they provides a dominant role in the development of the curriculum.

Although the role of providers is important, the requirements, opinions and feedback are also main factors based on which the curriculum is refined and improved. Older learners acknowledge the value of the curriculum, and positively shows their inspired requirements and suggestions. Such information determines toward which direction the curriculum should be developed.

6.3.2 Validation of the process model of provider-propelling curriculum development

Table 6.3 depicts the comparison result of the process in the hypothesis with the development process summarized from Case III. Like the comparison result in Case I and II, step 2 in the hypothesis is consistent to the one in the case study, and step 3 and 4 are slightly inconsistent in that testing and evaluation are emphasized in the two steps respectively. The overall process in the hypothesis is also slightly inconsistent to the one in the case except the rollback of the flow.

We mainly explain the difference in the comparison result from Case I and II. The difference mainly comes from step 1, where the role that education providers play is different from other two cases. In this case, education providers play guiding role by organizing various activities to introduce the new conception i.e., life education to older learners. To be more specific, before they collect the requirements from older learners, they inspire the requirements of older learners by explain what life education is. Another target in this step is to attract more older learner to get interested in this topic. Thus, in this step education providers play a dominant role to guide the learners to understand the new topic and inspire their potential requirements, which determine the success or not of the curriculum in sequent steps.

In summary, the waterfall process summarized in this case is basically consistent to the four-step spiral process in the hypothesis with slight inconsistency in the emphasis of testing and evaluating in the waterfall process and the rollback flow. Compared with the

Table 6.2: Comparison of the structure model with investigation results

Structure model in the hypothesis	Curriculum development structure summarized in Case III	?
<p>The structure model shown in Figure 3.1(a)</p> <ol style="list-style-type: none"> 1. Consistency of motivations 2. Collaboration relation 	<p>The collaboration structure shown in Figure 6.11</p> <ol style="list-style-type: none"> 1. Motivations of education providers and learners are consistent 2. The curriculum development structure is collaborative, although the role of providers is more important. 3. The curriculum development experiences two stages 	✓
<p>Older learners are co-creators of service values. They contribute to the development of education services by collaborative interacting with providers.</p>	<p>Older learners positively participate into the development of curriculum. The relation from older learners to education providers is contributing in that:</p> <ol style="list-style-type: none"> 1. Older learners participate into the activities organized by providers. 2. Older learners give their requirements inspired by the activities. 3. Older learners give their opinion in the development of the curriculum. 	✓
<p>Education providers play leading roles as facilitators of OAE service design</p>	<p>Education providers are propeller in the development of the curriculum to inspire and explore the requirements of learners:</p> <ol style="list-style-type: none"> 1. Education providers organize various activities to inspire older learners requirements. 2. Providers develop multiple ways to collaborate with learners to learn their requirements and feedback. 3. Providers analyze and evaluate the effect of the curriculum and find reasons and solutions. 	✓

process in the hypothesis, the waterfall process is more flexible and operable in practice. Thus, we conclude that the development of those provider-propelling curriculum such as life education in this case, can also be achieved by the collaboration of older learners and providers in a spiral way, although the role that education providers play in the development is more dominant than the one that older learner play.

6.3.3 New findings from the analysis and validation

Finally, we summarize some new findings obtained from this district-level OAE university. According to the personal information of respondents, analysis results and hypothesis validation, it can be found some common findings as Case I and Case II, such as the high educated learners have strong awareness of collaboration with education providers and

Table 6.3: Comparison of the research hypothesis and the investigation results with respect to the process in Case I

	The process in hypothesis	The waterfall process summarized from Case III	?
Comparison of each step	Step 1: <i>Knowledge sharing related to collaboration</i>	To understand each other better through survey and conversation, etc. 1. Providers introduce life education conceptions by organizing various activities 2. Learners gives the requirements that are inspired from participating the activities.	✓
	Step 2: <i>Identification of service field</i>	To identify what life education courses are welcomed by learners by data analysis.	✓
	Step 3: <i>Knowledge creation for new service idea</i>	To transform the requirements into practical courses. 1. Course design 2. Course testing The difference is that testing is emphasized as a separate step in the waterfall process.	✓
	Step 4: <i>Implementation of service idea</i>	To provide courses and evaluate their effects. 1. Course deployment 2. Course evaluation The difference is that evaluation is emphasized as a separate step in the waterfall process.	✓
Overall process	Features of the process: 1. Collaborative 2. Stepwise 3. Spiral	Features of the process: 1. Collaborative 2. Stepwise 3. Spiral Flow of the process allows rollback, which is different from the hypothesis.	✓

Legends: ✓: consistent; ✓: almost consistent but with some differences

giving opinions, spiral curriculum development process with rollback, the importance of testing and evaluation and multi-stage features of OAE curriculum development. Besides those, we also find new points that are not founded in other two cases.

Finding I: For those curriculum that is not familiar to older learners, the role that providers play is more important than the one that learners do.

In OAE universities, there is some curriculum which education providers want to develop but older learners are not familiar with. In the example of the curriculum of Life Education, it is not directly originated from the needs of older learners, but from the education providers' motivations of teaching learners how to scientifically understand life, getting older and older, disease and even dead.

To develop such curriculum which older learners are not familiar to , education

providers need to inspire the requirements of learners to the curriculum that they plan to develop by introducing them some basic information about it. Such work is usually not important in those requirement-oriented curriculum and environment-driven curriculum, because for those curriculum requirements are more specific than the ones which are not familiar to learners. Therefore, the introduction work of providers is very important. That is because older learners' interests and participations are the main factors to drive the development of curriculum, while introduction can attract more learners to get interested and inspire their requirements.

Finding II: For those curriculum that is not familiar to older learners, older learners active participation accelerate its development.

Although education providers plays more important role in the development of those curriculum which is not familiar to learners, learners' collaboration is necessary and their active participation can accelerate the development of curriculum, like the curriculum development in other two cases.

From the comparison result of the structure shown in Figure 6.11 and the process shown in Table 6.3, we can find that older learners participate the whole development process and their participation is necessary to the development of the curriculum. In step 1, older learner participate the activities organized by providers to get first impression to the curriculum and give their requirements arising out of the participation. In step 3, they help develop the curriculum by participating the testing, and in step 4, they give their feedback after learning the curriculum, which is the main information for providers to improve the curriculum. Apparently, the role that older learners play in the development of provider-propelling curriculum is basically the same as the one in other two types of curriculum, i.e., collaboration of learner and providers is still important to the development.

Chapter 7

Discussion and Proposal of A Four-stage Spiral Model for OAE Curriculum Development

In this chapter, we discuss differences and similarities of the three case studies in terms of the curriculum development mechanism based on the comparison result obtained in Chapter 4, 5 and 6. We also discuss the differences of the curriculum development in different forms of OAE, i.e., informal, non-formal and formal. Finally, we propose a four-stage spiral model for curriculum development of OAE university with high educated older learners.

7.1 Comparison of the three cases

In this section, we compare three cases in the aspects of their education mechanism and practice and summarize the similarities and differences between them. Table 7.1 shows the overall comparison results with respect to different criteria such as satisfaction, the structure and process of curriculum development which are proposed in Chapter 4, 5 and 6. We give detailed explanations to the results separately.

Table 7.1: Commons and differences of Case I, II and III

Criteria		Case I	Case II	Case III	Commons	Differences	
Learners' satisfaction		Very high satisfaction	High satisfaction	High satisfaction	Successful OAE curriculum	Case I conducts more successful OAE activities	
Value co-creation structure	Objective	Learners	Multiple as shown in Figure 4.4	Multiple as shown in Figure 5.4	Multiple as shown in Figure 6.4	Enrich life, improve QoL	Learning requirements and expected learning level
		Providers	Provide education to retired government officers.	Provide education to ordinary older learners in Shanghai	Provide education to ordinary older learners in local communities.	To help learner enjoy their later life by learning and contributing	Case I: more specific Case II and III: more general
	Role	Learners	Give their specific requirements	Give their general requirement	Participate as freshman	Collaborative	Case I: dominant Case II: equivalent Case III: less dominant
		Providers	Design and provide education	Investigate and provide education	Advocate and provider education	Collaborative	Case I: less dominant Case II: equivalent Case III: dominant
	Overall structure		Requirement-oriented	Environment-driven	Provider-propelling	Collaboration	Roles of collaborators
Value co-creation process	Step 1	Learn requirement	Discuss requirement	Inspire requirement	To understand each other	Means are different	
	Step 2	Identify requirement	Identify requirement	Identify requirement	Identify requirement	—	
	Step 3	Curriculum design and testing	Curriculum design and testing	Curriculum design and testing	Curriculum design and testing	—	
	Step 4	Curriculum deploy and evaluation	Curriculum deploy and evaluation	Curriculum deploy and evaluation	Curriculum deploy and evaluation	—	
	Overall process	Waterfall with rollback and spiral	Waterfall with rollback and spiral	Waterfall with rollback and spiral	Multi-stage	—	

7.1.1 Similarities of the three cases

From the results of three cases, we can find that all of three cases conduct successful education service from older learners' opinions. Their education mechanisms are almost consistent with our proposed hypothesis. Here, we summarize the similarities of three cases.

Similarity I: Collaborative structure in the process of curriculum development

From the investigation result of three cases, we can see the similar structure of collaboration to develop education courses as shown in Figure 4.11, Figure 5.11 and Figure 6.11. we summarized the main motivations of older learner and education provider. The purpose distribution of older learner participating OAE university in three cases are similar, even they are different level of OAE universities. For the older learners, on the one hand, they want to learn knowledge, skills to enrich lives, to meet hobbies, to make friends and keep pace with the development of society. On the other hand, they hope to keep mentally and physically healthy through attending OAE education services.

For the motivation of education provider, on the one hand, they aim to meet the older adults' demands that let them have something to learn, have something to enjoy and have something to do. On the other hand, they hope to maintain the stableness of society and reduce the burden coming with the aging society by providing education services for the elderly. The old people are very important human resources, especially the people who are in the phases of young-old (approximately 65-74). They have enriched working experience and much energy. Re-development of human resources of old people is another purpose of education providers.

By comparison with the motivation of older learners, we can see that there are common objectives between learners and education providers, that both sides pursue learning to learn, learning to be healthy and happy, and learning to do. These common objectives make it possible for education providers and older learners to collaborate with each other, to share their explicit knowledge and tacit knowledge, and to co-create the service value of OAE to get maximal satisfaction for both sides.

With the above analysis, we obtain a collaboration structure for OAE curriculum development which is depicted by Figure 7.1. In the structure, education providers organize education activities for older learners with multiple objectives, while older learners engage in the activities to meet their requirements and meanwhile contribute to education providers by making the objectives of education providers achieved. The collaboration lasts through the three stages of the whole development process.

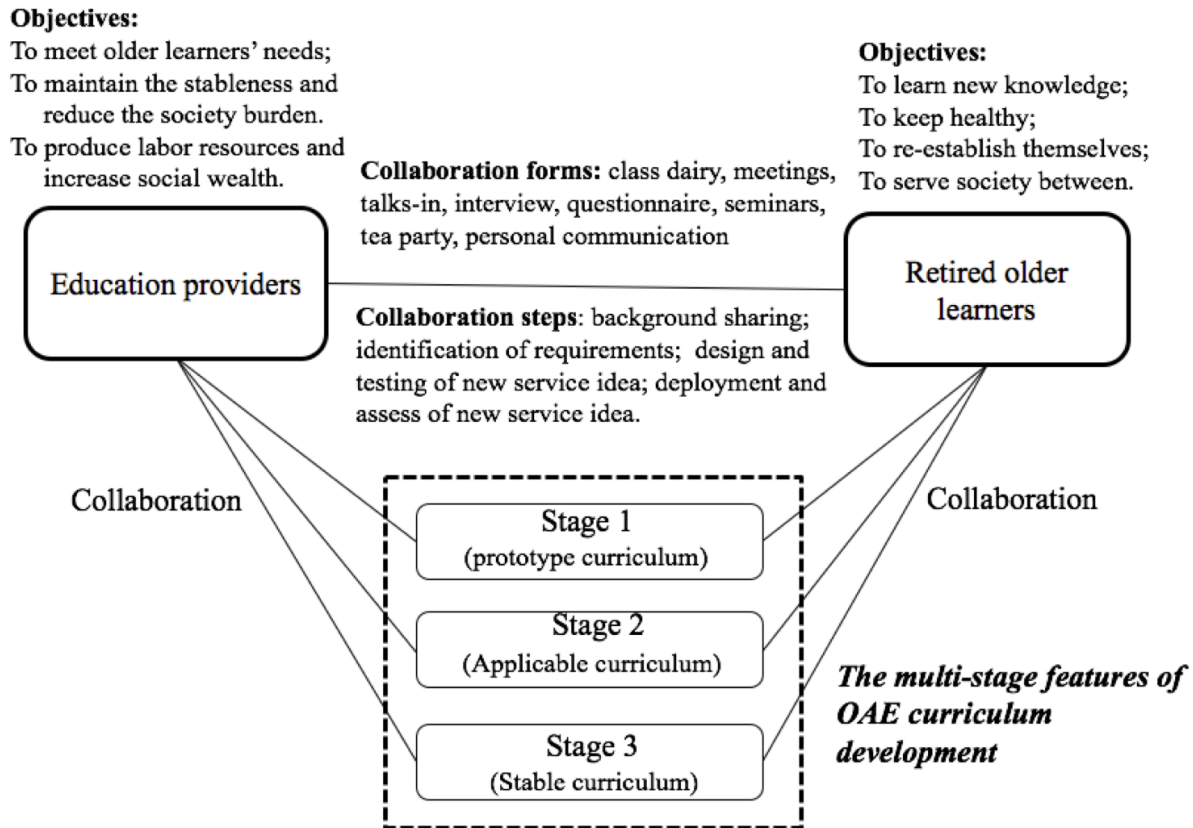


Figure 7.1: The collaboration structure for OAE curriculum development

Similarity II: Waterfall process in the curriculum development

In the three case studies, we summarized the processes of designing and deploying their education courses. In a broad sense, the processes in the three case studies are the same, although the development of the education services are driven by different factors, i.e., the requirements from older learners in Case I, the development of information technology in Case II, and the objectives from education providers in Case III.

Figure 7.2 depicts a practical waterfall process of service value co-creation of OAE curriculum development, which generalizes the three processes that are summarized from the case studies. The whole process consists of six steps, i.e., *background sharing*, *data analysis*, *education service design*, *education service testing*, *education service deployment*, and *education service evaluation*.

Step 1: *Background sharing*: We call the first step *background sharing*. In this step, the education provider and the older learner communicate to share with each other their background in various ways such as conversation, survey, campus talks, etc. It is worth mentioning that the education provider do not only passively collect data, but also heuristically introduce new education service ideas to older learners and listen to their feedback. After this step, the education provider collect useful

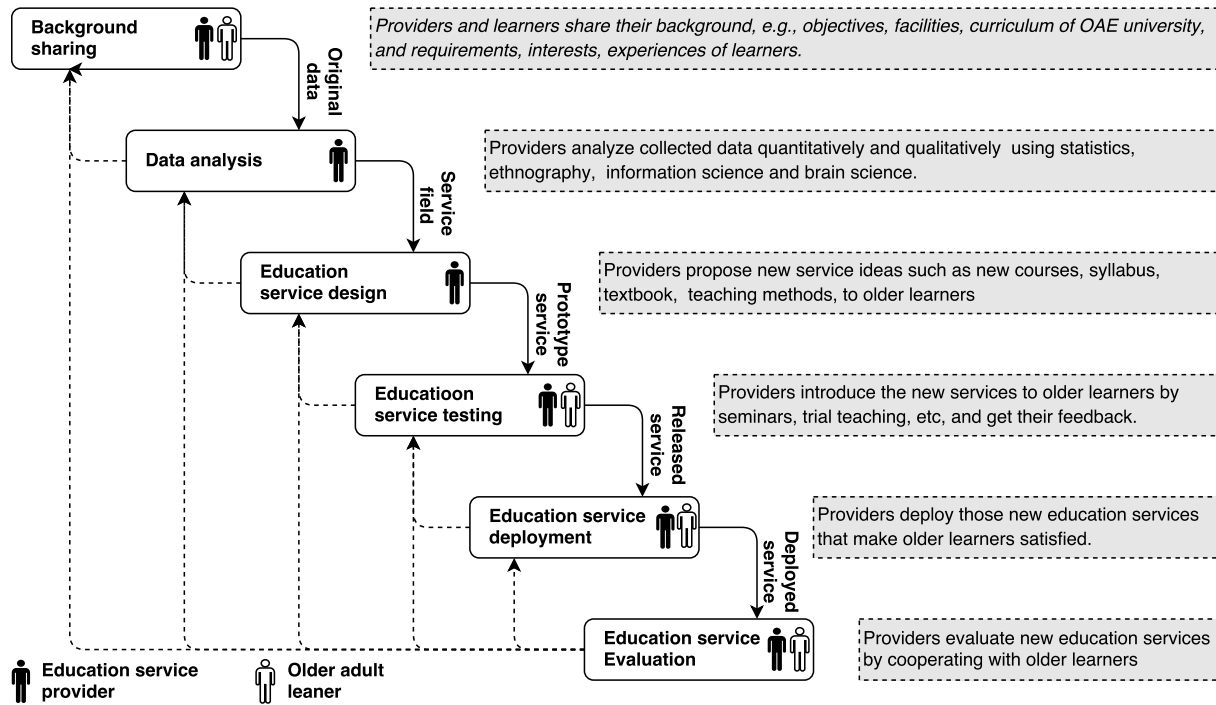


Figure 7.2: A practical waterfall process of service value co-creation of OAE from service science perspective

data based on which they can determine what kinds of education services are appropriate to the older learner, and the older learner also learn what are the objectives and what education services that the university can provide.

Step 2: *Data analysis:* In the step, the education provider analyze the data collected in the first step, by which they identify the requirements and expectations. Identified requirements and expectations are the main factors that determine what education services should be designed and provided to older learners. Some commonly-used data analysis methods are statistics, ethnography, information science and brain science, etc.

Step 3: *Education service design:* In this step, a prototype of the expected education service is designed, including the topic, content, form, and necessary facilities and documents. We call it a prototype because the service in its current status cannot be officially provided to older learners. There are several reasons. One is that it is still unclear if the course can be accepted by older learners including both the content and the form. Another reason is that corresponding lecturers and facilities may not be available presently. Last but not least, the provider must be sure the service will be definitely deployed before making the service applicable.

Step 4: *Education service testing*: The purpose of this step is to test the appropriateness of the new education contents including various aspects such as the popularity among older learner, the level of teaching contents, the teaching methods, the cost of the education service. To achieve this, the education provider usually organize some small classes and invite related experts to give publish campus talks to attract older learners to join.

Step 5: *Education Service deployment*: In this step, the education service is deployed as a regular one. During deployment, the education provider need to collect the feedback from older learners and record the problems encountered in the education.

Step 6: *Education service evaluation*: The last step is to evaluate the education service after it is finished. Unlike business services which should be provided continuously, education service are provided periodically. At the end of each term, an education service is finished. The education provider then evaluate the effect of the new service based on the collected feedback and recorded observations. Some systemic evaluation system may be developed to help evaluate new education services.

The whole process runs in a waterfall manner in the sense that each step produces an output and the output is the input of the next step. Figure 7.2 also shows the output of each step along the arrow and the participants in the step. The dashed arrow means that the process can be rolled back from the present step to any previous step when needed. For instance, when the result obtained by data analysis cannot reflect the fact, more survey or communications are needed to collect more data. When problems are found in the testing step, one may need to modify prototype service to solve the detected problems.

Figure 7.2 also shows the participants in each step. It can be seen that except the second and the third steps other four steps need participation of both education providers and older learners. It means that the collaboration of education providers and older learners is necessary and plays an important role in the development of new education services.

Similarity III: High education background of older learners and strong awareness of proposing opinions

Most of investigated older learners in three cases are high educated and have . From the statistics information of respondents information, the percent of college degree and above in Case I and Case II and Case III are 77%, 67.5% and 69%. We can see that the percents of high educated students in three cases are very high, especially in case I which is open to retired veteran cadre.

Due to the high education background, older learners have high strong awareness of student involvement and propose opinions positively. The percents of learners' attitude on giving suggestion positively in Case I, Case II and Case III are 75%, 59% and 54%. And learners also convey the high necessity of students involvement in OAE curriculum development.

7.1.2 Differences in the three cases

Even all of three cases conduct successful OAE service and older learners have strong awareness of student involvement. But the level in each case is different. Compared with Case 2 and 3, Case 1 conducts more successful service and learners have higher self awareness about proposing opinions. From Table 7.1, one can see that the differences in the three cases are mainly in the structure part, i.e., older learners and education providers. We summarize the differences in this section.

Difference I: Learners' awareness of sharing experience and the specificities of their requirements are different

Even older learners in three cases have high education background, but the percent distributions in the three cases are different. In general, education level in Case I is higher than the ones in Case II and Case III. The difference in education background leads to the difference in their awareness of sharing experience and the difference in the specificities of their requirements.

In Case I, older learners are very aware of sharing their experiences with providers in order to help providers learn their expectations and hence have good education services. Such awareness is useful for providers to identify the requirements of older learners and design corresponding curriculum. That is one reason why the learners in Case I have a higher satisfaction with the education than those in Case II and III. From this result, it shows the importance of the participation of older learners into the development of curriculum.

The specificities of older learners' requirements are also different. In Case I, older learners usually have specific requirements to the curriculum and they clearly know what they want to learn and participate. While in Case II and Case III, older learners in some cases do not have specific requirements to the curriculum and their requirements should be inspired and investigated by participating various activities before having curriculum. That is, older learners in Case II and Case III have potential requirements in mind but these requirements need to be inspired and clarified by interacting with providers.

Difference II: The roles that learner and providers play are different

Table 7.1 shows the difference in the role that older learners and education providers play in the three case studies.

In Case I, we say that older learners plays a dominant role in the development of curriculum because older learners' requirements determine toward with direction the curriculum is developed. Such curriculum is essentially oriented to learners' requirements. As mentioned in difference I, the learners in Case I is more aware of sharing their experience and requirements and their requirements are usually very specific. Providers' main task is to design and provide corresponding curriculum to meet such requirements.

In Case II, we say that older learners' role is equivalently important to the role of providers. That is because a challenge in developing the IT curriculum is that the requirements are not clear in that both older learners and providers do not have specific contents to learn and to teach. The challenge forces the both sides collaborate with each other in the development of the curriculum, and they play equivalent roles in the development.

In Case III, we say that education providers plays a dominant role in the curriculum development. As analyzed in Chapter 6, to develop curriculum which older learners are not familiar to, education providers need to inspire the requirements of learners to the curriculum that they plan to develop by introducing them some basic information about it. Because older learners' interests and participations are the main factors to drive the development of curriculum, while introduction can attract more learners to get interested and inspire their requirements, the work of providers on the introduction to the curriculum become important, and providers play a dominant role in guiding learners find their requirements from the curriculum.

7.2 Comparison with other types of OAE and school education

In the case study part, we mainly focus on the investigation of OAE university and compare the differences and similarities of three cases. In this section, we compare the OAE universities with other types of OAE and general school education and try to find the speciality of curriculum development in OAE universities.

7.2.1 Comparison of OAE university with other modes of non-formal OAE

As we mentioned in Chapter 3, there are several modes of non-formal OAE, universities for the third age, communities learning, long-distance learning and other types. Among these types, OAE universities are the most important and primary mode for elderly learning. It is often in large scale and set up by central, provincial, municipal and country governments. OAE university is supported by government but has autonomy to operate education programmes. Compared with other modes of OAE, it is often well organized and operated systematically. Most of courses are classified into different levels of subclasses and each course opens once a week and takes 45 minutes to 2 hours every time. OAE university has its own campus and all courses are conducted in the classroom.

Community education includes community schools, activity centres and spontaneous activity groups. Compared with OAE university, these community education are often at a relative low level and not well organized. The instructors there are often talented older adults, not fixed lecturer group, and the time and venue are decided by group members in a highly flexible manner. Moreover, the current situation of community learning is not very developed. The funds are not adequate and facilities cannot readily be improved, and human resources such as the instructors are not able to be attracted and retained.

Due to the specialty of OAE universities, it is more possible for systematical collaboration between older learners and providers and curriculum development based on learners' expectations and requirements.

7.2.2 Comparison of non-formal OAE with formal and informal OAE

As we mentioned in Chapter 1, there are three types of education for older adults, formal, non-formal and informal OAE. They are different from with each other in 5 aspects: teacher & student dynamic, environment, content, teaching & learning methods and teaching & evaluation. Table 7.2 shows the detailed information about their differences (Lubkina et al., 2012). These three types of education play different roles in process of old citizens learning, and they come together to promote the development of education for older adults.

In this research, we focus on non-formal education for older learners with the consideration that non-formal education plays a dominant role in OAE, compared with other two types of educations. Non-formal OAE emphasis the equal partnership among older learners and providers and self directivity of students in education service. Among non-formal OAE, University of the Third Age and institutions are more comprehensive organizations than other organizations such as learning centers and social organizations. The education

Table 7.2: Three types of education (Source: analysis research of EduSenior project, 2011)

	Formal (F)	Nonformal (N)	Informal (I)
Teacher/Student dynamic	F Pre-established hierarchy	N Equal partnership among facilitators and participants	I Learning may take place individually, or can be shared within a group
Environment	F Classroom environment	N Learning setting is more casual and impromptu	I Learning may occur in any environment
Content	F Determined by teacher or other authority	N Participants actively identify learning needs and methods, guided by a facilitator	I Determined completely by participants who assess own needs and identify solutions
Teaching/Learning methods	F Lecture primary source of information delivery	N Primarily participatory techniques	I Completely participatory methods; participants assess and reflect on their own learning
Teaching/Evaluation tools	F Formal test or "proof of learning"	N Formal tests are supplemented with students' application of learning within the community	I Learning is practical and related to real needs; applied in the lives of people within the community

systems in OAE universities and institutions are more complete, representative and stable and has its own campus established solely for OAE. Such characteristics of non-formal OAE make it more possible for value co-creation between older learners and education providers.

7.2.3 Comparison of OAE with general school education

As we described in Chapter 1, the education for older learners is different from regular school education in both contents and forms. Such difference makes existing education guideline for regular school education not well suited to OAE. General school education refers to those hierarchically structured, chronologically graded education system which runs formally from primary school through the university including a variety of specialized programs and institutions for full-time technical and professional training. While OAE means any educational activity outside the established formal system (Siguencia et al.,

2012) for older learners. These older learners are totally different from students in general school education that older learners have their own learning principles (Lubkina et al., 2012).

In OAE, older learners play a central role, while teachers are the key figure in the regular school education. They are classified as student-centered and teacher-centered education strategies respectively. Also, education service for OAE is on the basis of the needs of older learners in a bottom-up manner. While, in regular school education, education principle is in a top-down manner that both education providers and students have clear objectives, and the learning is generally more passive than active and individual students do not have much control over what and how they learn in the school.

7.3 New findings from comparison results

Through the former comparison, we summarize the new findings here for providing some tips for curriculum development in OAE universities.

Finding I: Higher education background of learners lead to higher quality of developed curriculum.

Most of investigated older learners in three cases are high educated. From the statistics information of respondents information, the percent of college degree and above in Case I and Case II and Case III are 77%, 67.5% and 69%. Therefore, we can conclude that our proposed research hypothesis are almost consistent with the education mechanism of OAE university with high percent of high educated older learners. However, the consistency of our hypothesis to other types of OAE is unknown.

Finding II: The roles that providers and learners play are different in the development of different types of curriculum

In the three case studies we consider the development of different types of curriculum, i.e., requirement-oriented, environment-driven and provider-propelling. In previous section, we discussed the differences in the roles that providers and learners play in the development of the three curriculum, from which we can find that the roles are different in this three different curriculum. Table 7.1 also shows the difference. In the development of requirement-oriented curriculum, learners play more dominant role than providers because their requirements are usually specific. In the development of environment-driven curriculum, because both the objectives of providers and requirement of learners are not specific, their communication and collaboration is necessary and then play equivalent roles

in the development. In the different of provider-propelling curriculum, providers' objectives are usually specific while the requirements of learners need to be inspired. Thus, providers' role is more important than learners. Although the roles are different, collaboration between them are still the effective means to the development of curriculum that satisfies both providers and learners.

Finding III: Rollback in the waterfall process makes the process practical to curriculum development

As shown in Figure 4.9, Figure 5.9 and Figure 6.9 of OAE curriculum development process, at each step except the first one, it can be rolled back one step when the results at the previous step are not consistent or sufficient, as depicted by the dashed arrows in the figures. An OAE curriculum evolves mainly from practice but not laboratory. When a problem emerges in practice, solutions should be found as soon as possible. For instance, if education providers realize some problems by testing, they should first modify their design instead of moving to the next to deploy the problematic services to older learners. In the three examples of curriculum development, education providers mentioned that in the process of designing OAE curriculum they often need to go back to step 1 and 2 to collect more data from learners for improving the designed services before testing.

Even during deployment, if older learners report some difficulties that they have in learning, education providers should provide solutions to overcome them as long as it is possible, but not leave them to solve in next term. Because some problems may not be found until an OAE curriculum is tested or deployed, the inverse operation is necessary and makes the development process flexible. Such flexibility is reflected by the inverse direction of the waterfall process.

Finding IV: Testing and evaluation in the waterfall process are important to curriculum development

As described in Section 7, the purpose of testing is not just to test an OAE curriculum, but to advertise the service to attract more attentions and interests from learners. Attracting more attendants is one the keys to the success of an OAE curriculum. It is possible to test OAE curriculum before they are deployed because older learners can accept prototype services, unlike services in the marketing, which must be well designed before being provided to customers.

Evaluation also plays an important role in the value co-creation of OAE curriculum. Although evaluation is also important to the value co-creation of the services in marketing, the difference between them is that older learners positively engage in the evaluation for the former one, while for the latter one evaluations are often based on some figures

such as market sharing and profits. The positive engagement of older learners help education providers quickly realize the problems and find corresponding solutions. Thus, the evaluation step is also emphasized in the waterfall process.

Fining V: Multi-stage feature of the development of OAE curriculum

Finally, we discuss another specialty of the development of OAE curriculum which is not reflected by the spiral process, i.e., the multi-stage feature of the development process of OAE curriculum. Namely, the whole development process of an OAE can be divided into several stages. As surveyed on the development of curriculum in the three case studies, some curriculum has being under development for more than eight years. Each curriculum has experiences many stages in the development. At different stages the role that each step of the waterfall process plays may be different, so is the work of each step. For instance, at the beginning of the development of an OAE curriculum, background sharing and data analysis are important steps to find the exact requirements of older learners. In the example of the curriculum development of life education in Case III, it almost take three years before the curriculum was provided as a regular one firstly. In the three years, education providers interact with older learners to convince them the significance of the curriculum and learn better their requirements to it. The multi-stage property of the development of OAE curriculum inspires a new property of OAE curriculum, which we call *life cycle* to mean the time when a new service is conceptually proposed to the time when it is eliminated. In the following section, we discuss in details life cycle of OAE curriculum.

7.4 A four-stage spiral model for OAE curriculum development

In this section, we first explain the new item of OAE curriculum life cycle which is a new findings of case study. Based on life cycle characteristic and other new findings of curriculum development in OAE universities, we propose a four-stage spiral process model for curriculum development of OAE university by instantiating and extending research hypothesis. Novelties of the extended model are that it formalizes the four-stage development of OAE curriculum through the whole life cycles and each iteration of the four steps in the model is a waterfall process. A detailed comparison between the new four-stage spiral model with KIKI model and other models is made.

7.4.1 Life cycle of OAE curriculum development

In this part, we first introduce the item of life cycle of OAE service, and then compare it with product life cycle to clarify the characteristics of OAE curriculum development.

Education service life cycle

Like creatures in natural environment, an education service also has a life cycle, experiencing from being created, getting mature to being eliminated eventually. The variety of the requirements of older learners push education providers to propose various education services to meet different requirements. Education services can be very flexible both in terms of contents and forms. New education services may be upgraded from some existing ones, or they are designed brand new. Their life cycles can be either as short as one term or as long as a decade, as shown in the three case studies in Chapter 4. No matter how short or long an education service could be, its life cycle can be divided into four stages, which we call *germination*, *growth*, *maturation*, and *decline* respectively.

Stage 0: (Germination) We begin with 0 but not 1 because we assume that initially education providers have little (almost zero) knowledge on the education service to be designed before they know the background of older learners. We call it *germination stage* in that during this period a prototype curriculum is gestated, but still needs to improve and validate before being put into practice. The duration of this period is usually the shortest in the four stages. In our case studies (see Chapter 4), it takes 2 to 5 months. However, the duration varies from case to case.

Stage 1: (Growth) This period is called *growth* in that the prototype curriculum is improved and become applicable in practice. In general, this period is longer than germination stage but shorter than the third one, as in the period the prototype curriculum becomes more and more specific quickly to get applicable.

Stage 2: (Maturity) We call this period *maturity stage*, when the applicable curriculum is refined repeatedly along with the variation of service fields. This period is the longest in the three stages as curriculum in this period becomes more stable and problems that emerges during deployment are gradually fixed.

Stage 3: (Decline) An curriculum is eventually out-of-date in terms of either contents or forms due to various factors such as the development of society, the progress of technology, the changes of human being's life style. An obsolete service declines gradually, and may be eliminated eventually or upgraded as a new one.

The four stages differ from each other in the form of the service under development and the strategies used for the service design. In germination stage, the form of service is prototypical, and in growth stage is applicable, in maturity stage is relatively stable, and in decline stage is out-of-date. There are basically five criteria to measure the applicability of an education service including a fixed group of regular older learners, clear scope of contents and forms, a fixed schedule, some regular lectures and the availability of necessary facilities. When all the five criteria are reached, an education service is applicable as a regular one to older learners. An education service is called stable when its objectives, contents and forms are basically fixed and the satisfaction of older learners with the service is at a higher level, compared with applicable ones. A stable service usually does not need drastic modification.

Difference between Education Service Life Cycle and Production Life Cycle

In the study of business market, Product Life Cycle (PLC) is a well-known concept to describe the development process of products. Researches in both marketing and strategic management shows that PLC is likely a fundamental variable that affects business strategies (Anderson and Zeithaml, 1984).

A traditional PLC concept consists of four stages, which are *introduction*, *growth*, *maturity*, and *decline*. In the literature four levels have been taken into consideration to study PLC, namely brand, product form, product class, and industry. Among the four levels, product form is considered the closest approximation to the PLC (Tellis and Crawford, 1981). As aforementioned, we divide the life cycle of an education service into four stages according to its form. In that sense, the basis of dividing PLC into four stages is the same as the one of ESLC.

The four stages of PLC are also similar to those of ESLC at the level of product and service form. The introduction stage of PLC corresponds to the germination stage of ESLC. In PLC, introduction has a meaning that product suppliers play a dominant role in this stage, while for education service both education providers and older learners are equivalently important in the germination stage of an education service. Namely, collaboration is important in the early stage of designing an education service. Unlike product consumers who usually do not want to participate into the design of new products, older learners are willing to collaborate with education providers to design new education services, as illustrated by the survey result in our case studies.

The second stage of ESLC is almost the same as the one of PLC in the sense that both the two sides of product and service play equal roles in this stage to improve the product and service. The difference between them is that the duration of this stage of ESLC may be shorter than the one of PLC. That is because education service is more flexible in terms of both contents and forms, compared with products, making it easier

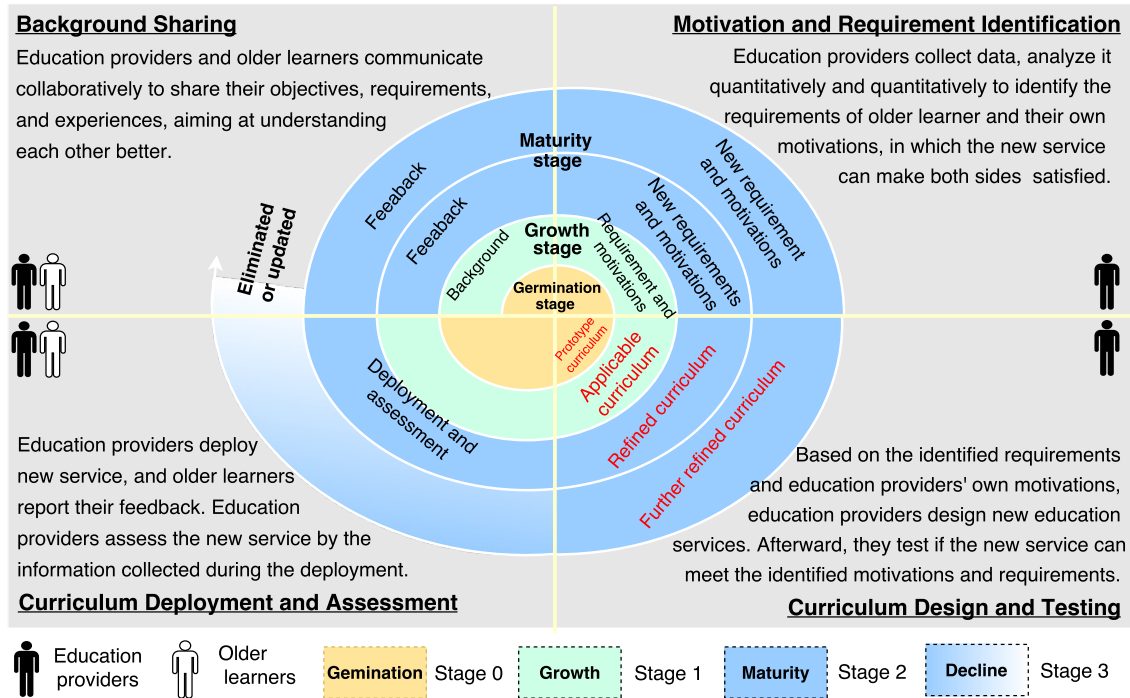


Figure 7.3: The four-stage spiral model of OAE curriculum value co-creation

to modify and refine. However, the improvement of a product may rely on new materials and technologies, and it should undergo comprehensive test before being put into market. Such factors make the growth speed slower, compared with the one of education service.

The major difference of the third stage of ESLC and PLC is that service contents may change more frequently than products in maturity stage. Although an education service has already become mature in the stage, it should change each term correspondingly, catering to the requirement from different older learners. Another difference is that the percentage of the duration of the third stage in the whole ESLC is usually longer than the one in the PLC. That is because an education service is mainly affected by culture and government policies, which are relatively stable and do not change in a short period such as in a decade. For instance, the development of a curriculum has taken more than five years in Case I. However, products are under the pressure of the time to market, and they are more sensitive to the feedback from the market such as the market share, cost and profit.

In the last stage, the decline of an education service does not mean that the service becomes useless and is eliminated in universities. Instead, in most of the case it is upgraded and is provided as a new one in terms of its content and form for the feature of intangibility of knowledge. Compared with education service, a product may be eliminated completely from the market once it becomes out-of-date.

7.4.2 The four-stage spiral model for curriculum development of OAE university

In the former Chapter 4,5 and 6, we chose three OAE universities as cases and investigated their education mechanisms and check the validity of proposed hypothesis with real situation. Through case studies, we find that the proposed model are almost suitable to practice of OAE universities with high educated older learners.

On the basis of the consistency of the research hypothesis to our investigation results and new findings from the validation and discussion, we consider the value co-creation of OAE curriculum development from service science perspective and attempt to investigate new approaches to OAE curriculum development inspired by service value co-creation models and new specialties of OAE curriculum development.

In our study, we choose the existing KIKI model as the prototypical model. There are three main reasons for choosing KIKI model. One reason is for the features of KIKI model such as service field-driven evolution and emphasis of the role of customers. The second reason is that its spiral four-step process is very close to the waterfall process of the OAE curriculum development obtained in our case studies. The third reason is that there are existing works on spiral process of curriculum development in some education fields. For instance, Peyton proposed a spiral curriculum development process for medical education in 1998 (Peyton, 1998). Densen proposes a spiral model format for a curriculum of medical education based on disease mechanisms in 2011 (Densen, 2011). A common feature of the curriculum development in medical education and the one in OAE is that the curriculum development in both fields is a long process and needs iterative refinement before getting well established. However, the target of Peyton's model and Densen's model are more specific, i.e., for the curriculum development in medical education, while KIKI model is a general-purpose model for business service.

In the case study and discussion part, we summarize some specialties of OAE curriculum development, such as the collaborative structure and waterfall process in the process of curriculum development, the different mechanism of collaboration for different type of curriculum (requirements-oriented, society-oriented and providers' objective-oriented), and role of providers and learners plays in different curriculum, and also the importance of learners' education background to collaboration.

Inspired by Peyton's and Densen's models and KIKI model, and also by case study results and discussion, we propose a new curriculum development process mode for OAE university called four-stage spiral model. This new model is a instantiation of proposed value co-creation process model for OAE service.

The model is depicted in Figure 7.3. It covers the whole life cycle of an education service, and in each stage four steps are iterated in spiral manner, following which an education service is conceived, concretized and optimized. The four steps are derived from KIKI model, but specially tailored to cover the six steps defined in the waterfall

process.

Step 1: The first step is called *Background Sharing*. In this context, background means the information which are closely related to curriculum development, such as the objectives of education providers, facilities, funding, current education activities, educations needs of older learners, experiences and expectations, etc. This step is achieved collaboratively by interaction between education providers and older adult learners by various means such as questionnaire, open campus, interviews, BBS, etc.

In this experience sharing stage, the strategy of simulation learners' learning motivation and sharing positivity are different from person to person. For those high educated learners who normally have high awareness of proposing opinions, providers should first use this advantage and let them to be leaders in the process of background sharing and be examples of other lower education level students. For those low educated students, providers need to create more chances and channels for them to convey personal expectation.

In brief, in the background sharing step, education providers should be provide flexible and multiple ways for different education and working background students.

Step 2: The second step is called *Motivation and Requirement Identification*, which is inherited from KIKI model. In this step, education providers collect data from the first step and analyze them both quantitatively and qualitatively to identify the requirements of older learners to the education services. Common analysis methods are statistics, information technologies, ethnography, big data, etc. This step is crucial because the service fields that are identified are the main references to forthcoming education services.

In this step, education providers should take advantage of each university and emphasis the important of creation of research team for studying learners' requirements and feedback. The collaboration between education providers from different apartment and different universities or institutions are very effective way for identifying learners' needs.

Step 3: We call the third step *Education Service Design and Testing*, in which new education ideas are proposed and designed by education providers on the basis on the identified service field from the previous step. Curriculum ideas include objectives, contents, lecture handouts, textbook, teaching methods, learning resources, etc.

In this step, rollback is often needed for collecting complementary data. Collaboration between older learners and providers is very important for testing new

designed curriculum. Several ways can be used for testing new curriculum, such as seminars, talk-ins, workshops, and group discussions. Another way is also useful for testing new idea, that is letting education providers be students to experience this curriculum and share feelings. This method is often deployed in OAE universities.

Step 4: The last step is named *Education Service Deployment and Assessment*, in which education providers deploy new education service to older learners, and older learners response their feedback to providers for assessment. The deployment approaches vary according to the stage of service development. The assessment approaches mainly include online evaluation system, expert review, questionnaire, seminars, etc.

The process of 4 steps is essentially a waterfall manner with rollback. In each stage of ESLC, there are many waterfall processes. With the iteration of 4 steps, the education service is proposed, improved, eliminated or updated. During the process, the education providers and older learner collaborate with each other and co-create the service value of OAE to get the maximal satisfaction for both sides.

The new curriculum development process model is proposed on the basis of case study results and existing other curriculum models. In case study part, we mainly check the research hypothesis in OAE universities, and the three selected cases have high portion of high educated older learners. Therefore, the new model is a value co-creation model for curriculum development of OAE university with high education older learners.

7.4.3 Comparison with existing models

Comparison with KIKI model

The spiral model proposed in previous section is derived from KIKI model. On one hand, they share some common points in a broad sense in terms of theoretical foundation, objective, overall structure and process. On the other hand, they are different in terms of their application domains, life cycle, and workflow. Table 7.3 shows the commons and differences between KIKI model and the spiral model.

Regarding the commons of KIKI model and the spiral model, we discuss from three aspects which are theoretical foundation, objective, the relation between service providers and recipients in the models, and overall structure and process of the two models.

- *Theoretical foundation:* Both of models are based on the orientation of service value co-creation that the creation of value is based on the interaction and collaboration of service providers and service receivers.

Table 7.3: Comparison between KIKI model and the proposed four-stage spiral model

	Aspect	KIKI Model	Spiral Model
Commons	<i>Theoretical foundation</i>	Theory of service value co-creation	
	<i>Objective</i>	Service value maximization	
	<i>Relation of service provider and recipient</i>	Collaboration	
	<i>Overall structure and process</i>	Four-step spiral process	
Differences	<i>Application domain</i>	Business service	Education service for older learners
	<i>Abstract level</i>	Abstract	Concrete
	<i>Life cycle</i>	Unmentioned	Through the whole life cycle of OAE curriculum
	<i>Workflow</i>	Stepwise	Waterfall with rollback

- *Objective*: The objective of both two models is to maximize the value of provided services. For KIKI model, the value of the business service is usually quantified by the profit in market, and the value of OAE curriculum is measured by the satisfaction of older learners.
- *The relation between service providers and recipients*: The both models emphasize the collaboration between service providers and recipients.
- *Overall structure and process*: Both the two models consist of four major steps and the four steps are iterated stepwise in a spiral manner. With the iteration, service is improved and its value is increased.

Although derived from KIKI model, the spiral model proposed in this work is different from KIKI model in following aspects:

- *Application domain*: As mentioned in Section 2.3.3, KIKI model is a general-purpose value co-creation model for business services and has been proved applicable in some industrial cases. A major difference between business service and OAE curriculum is that the former is used to make profit while the latter is usually non-profit but public as a social welfare provided by governments.

- *Abstract level:* A feature of KIKI model is its generality. Due to this feature KIKI model is more abstract than the spiral model in that it emphasizes the goals of each step but does not restrict to specific approaches to achieving these goals, while by the spiral model not only does it emphasize the goals of each step but provide concrete approaches to achieving them.
- *Life cycle:* In the spiral model we introduce the notion of *life cycle* of OAE curriculum, and discuss the role of the model in different stages through the whole life cycle. In KIKI model, it emphasizes the spiral process of service development but does not consider how the model works through the life cycle of business services.
- *Workflow:* Although both the two models are spiral in broad sense, the process in each iteration is different, i.e., KIKI model emphasize the stepwise process, while the spiral model emphasizes the waterfall process with rollback. A stepwise process is a unidirectional progression step by step. A waterfall process with rollback reflects the local repetition feature inside a single iteration, and hence is more flexible than the stepwise one. Moreover, the implementation step in KIKI models corresponds to the three steps *design*, *testing*, and *deployment*, in the spiral model, which also shows that KIKI model is more abstract than the spiral model.

In summary, both KIKI model and the four-stage spiral model share commons but are distinct from each other. The new proposed spiral model is not a simple instantiation of KIKI model, but an extension tailored for OAE curriculum value co-creation.

Comparison with other models

Comparison with PDCA cycle: PDCA (abbreviated for plan, do, check, act) cycle is a four-step model for improving performance. As shown by its literal meaning, it consists of four steps as follows:

PLAN Developing a plan involves setting an objective; identifying actions, responsibilities, timeframes; and defining the method of and frequency of measurement.

DO Teams implement or test the changes, documenting any problems or unexpected observations. Changes are tested before making widespread modifications to policy, procedures or systems.

CHECK Teams review measurement results and summarize the findings.

ACT Teams act based on the results of the check. Often, another change is tried. Sometimes a change is implementing in a broader setting. The team will continue to monitor the change in order to determine that the improvement is being sustained.

PDCA and the four-stage spiral model share some commons, e.g., the overall workflow and the spiral process. However, it can be considered as more abstract than the four-stage spiral model in that it does not emphasize in which each step should be achieved, while in our model the collaboration is emphasized. In addition, one iteration in our model consists of six steps where testing and evaluation are emphasized by being considered as separate steps. Another difference is that PDCA cycle does not consider the stages of developments of target systems. The role of each step in different stage may be different, as reflected in our model. Thus, we say that our model conforms to PDCA cycle but is more specific and practical.

Comparison with service dominant marketing model: Figure 2.6(b) in Chapter 2 shows the overview of service dominant marketing model for the co-creation of service values in market. The four-stage spiral model proposed in this work employs the theory of service value co-creation and the emphasis of collaboration between service suppliers and customers. However, there are also some differences between the two models. First, the service dominant marketing model is targeted to the services in market, aiming at maximizing the value of services, while our model is targeted to OAE education, aiming at maximally satisfying both providers and learners. The second difference is that the service dominant marketing model does not emphasize the stepwise process of service value co-creation, but discusses the four elements in the process of service value co-creation. In our model, we emphasize the stepwise waterfall process of curriculum development, which also allows rollback at each step. This makes our model more concrete and practical to apply, while the existing one is more abstract and generic. The third difference is that we emphasize the importance of testing and evaluation in the process that needs close collaboration with older learners. The role of testing and evaluation is not mentioned in the service dominant marketing. Compared with customers, older learners are more likely to participate into the collaboration because they are the main beneficiaries from good education activities.

7.5 Summary

In this chapter, we compared the differences of the curriculum development in the three case studies and the differences the curriculum development of formal OAE education from those of other types. Based on the comparison results, we summarized five new findings and then proposed a new four-stage spiral model for OAE curriculum development. Finally, we discuss the difference of the proposed model with those existing ones such as KIKI model, PDCA cycle and service dominant marketing model.

Chapter 8

Conclusion

This chapter concludes this dissertation by presenting the main findings and answering the set research questions that are proposed in Chapter 1. We discuss the theoretical and practical implication of the research results to service science and education science, especially to OAE research and practice. Finally, we point out the research limitation of the study, and give some suggestions for future research.

8.1 Main findings of the study

The objective of this study was to create OAE curriculum value by proposing approach for OAE curriculum development to make both older learners and education providers satisfied with OAE curriculum. The main and subsidiary research questions were:

MRQ: How to create service value of OAE and develop curriculum to get the maximized satisfaction of older learners.

SRQ 1: How to identify the requirements of older learners for education contents?

SRQ 2: What are roles of older learners and education providers in the OAE curriculum development.

SRQ 3: What is the process of OAE curriculum development.

We first proposed research hypothesis that OAE education as a kind of service share commons with business services. We conducted case studies on three representative OAE universities in China. We collected totally around 300 questionnaires from older learners and interviewed fact-to-face 20 education administrators in the case studies. Based on the

collected data, especially the development of three different kinds of concrete curriculum, we validate the research hypothesis in each case. By comparing the analysis results of each case with research hypothesis in three criteria, we check the consistency of hypothesis to real situation and summarize the new findings. After case study, We compare the three chosen OAE universities to find similarities and differences of them, and also compare OAE university with other modes of OAE to find the specialty of value co-creation of OAE university. Through these comparisons, we summarize the new findings and propose a new spiral model for curriculum development of OAE universities with high educated older learners.

To be more concrete, the following were established as the main findings to answer the above three subsidiary questions and main research question.

Finding I: Collaboration is one of the most effective means to identifying the requirements of older learners. It lasts through all the stages of the whole curriculum development process, and plays an important role in the development of OAE curriculum. Learners' education background influences the means of identifying their requirements. Common objective between providers and learners is premise for good collaboration.

From the investigation results obtained from the three case studies described in Chapter 4 and the examples of the development of three concrete curriculum in the case studies, one can find that the main impetus to drive an OAE curriculum to develop or evolve is the increasing requirements of older learners. Older learners' requirements are the main criteria of assessing the success of a curriculum. By collaboration, providers can learn the requirements to design their education activities, find the weaknesses in existing curriculum, and get inspired by older learners' feedback to improve curriculum. All these work needs the collaboration from older learners.

This finding is also supported indirectly by some other existing research works according to our literature review. Roberson claimed in his work (Roberson Jr, 2005) that self-directed learning of older learners had practical implication for facilitators of older adult learning, especially gerontologists. Knowles considered self-directed learning is the natural way for adults to learn which allows for the differences of each older person (Knowles et al., 1984) and Roberson advocates that self-directed learning should be encouraged as a part of any program (Roberson Jr, 2005). Schon suggested that facilitators should reflect on their own experience and practice to consider how to incorporate these ideas (Schön, 1987). Cervero and Forester have the similar conclusion that education providers should include the participants in the planning process of their activities or classes (Cervero and Wilson, 1994; Forester, 1988). When the older learner encounters unforeseen difficulties or involuntary disengagement during learning (Kleiber et al., 1999), this presents a natural opportunity for both the older learner as well as education providers to learn during these

teachable moments (Havighurst, 1972). Beatty and Wolf suggested that mature learner should be comfortable asking questions as well as speaking out in class or seminars during learning (Beatty and Wolf, 1996).

Finding II: Older learners are creators of OAE service and apt to engage into the curriculum development. The engagement of older learners into the development of OAE curriculum help education providers design appropriate curriculum to make not only older learners but themselves maximally satisfied, i.e., achieving the maximal value of curriculum. Education providers are facilitators of OAE service and play leading role in the whole process of curriculum development. The roles that providers and learners play are different in the development of different types of curriculum.

The case studies show that older learners are apt to engage into the curriculum development, regardless of their education background. Every step in the waterfall process, they collaborate with education providers by showing their requirements to the curriculum that providers want to develop, giving their feeling of participating into the teaching, and providing their feedback and suggestion on how to improve curriculum. Their active participation into curriculum development leads to continuous development of curriculum which gradually makes older learners obtain more and more satisfaction. Older learners' aptness to participate into curriculum development is the prerequisite for the collaboration with education providers.

Although the three case studies show that older learners play different roles in the development of different types of curriculum as discussed in Section 7.3, collaboration is still the main role that they plays. By the case studies it is also shown that the higher education background older learners have, the more participation older learners make into the collaboration, and the more successful the curriculum that they participate into become.

Finding III: The proposal of systematical methodology of curriculum development for value co-creation of OAE service in OAE university with high educated older learners. The new model includes 4 stages; In each stage, it is a spiral process of 4 steps. This model covers the whole life cycle of curriculum; In different stage of curriculum, the dominant step is different; All curriculum should be designed based on learners' demands to get maximal satisfaction.

The spiral development of OAE curriculum is similar to the one of service value co-creation model (KIKI model) but with some specialties. The commons and differences of the value creation of OAE curriculum and the concept of value co-creation in service science bring out a new four-stage spiral model from the existing KIKI model for value co-creation of

OAE curriculum.

The spiral process of the development of OAE curriculum and the process in KIKI model share commons in terms of the co-creation of service values, the role of collaborations in the two processes, the stepwise and spiral workflow and the correspondences of each steps, as we have discussed in Section 7.4.3. Such commons make it possible to study the value co-creation of OAE curriculum from the existing service value co-creation theory. However, the spiral development of OAE curriculum has its own specialties such as the bidirection of the waterfall process, the emphasis of testing and evaluating as two separate steps in the waterfall process, and the stagility of the evolve of OAE curriculum. Detailed explanation of these specialties are given in Section 7.1. Such specialties make it necessary to investigate a new value co-creation model tailored for OAE curriculum.

By generalizing a unified waterfall process of OAE curriculum development based on the processes of the curriculum development in the three cases, we instantiated and extended KIKI model value for the value co-creation of OAE curriculum and finally proposed a four-stage spiral model in Chapter 5. The effectiveness of the spiral model is also examined by checking the conformance of the development of the curriculum in the three case studies to the model.

In Chapter 5, a detailed comparison between the spiral model and KIKI model is also presented. Compared with KIKI model, there are two novelties of the proposed spiral model. One is that we introduce the notion of *life cycle* to OAE curriculum and the model formalizes the development of OAE curriculum throughout the whole life cycles. The other is that each iteration of the four steps in the model is essentially a waterfall process. The two novelties make the spiral model distinct from the KIKI model from which the spiral model is derived. Through three main findings, the main research question is answered.

8.2 Implications of the research results

The work presented in this dissertation is an interdisciplinary research between OAE and service science. In the research, we proposed a systematical methodology for curriculum development of OAE and value creation. The implication of the research results are both theoretical and practical. In this section, we discuss some implications of the research result in this two aspects.

8.2.1 Theoretical implication

As an interdisciplinary study, the results obtained from this study have theoretical implications for both OAE and service science. On one hand, the results show the importance

of collaboration between older learners and education providers in the development of OAE curriculum from service science perspective. The four-stage spiral model proposed in this work provides theoretical foundation for the value co-creation of OAE curriculum. On the other hand, as an extension of an existing value co-creation model in the research of marketing, the four-stage spiral model enriches the theory of service value co-creation in that it shows the applicability of the theory OAE curriculum, a kind of services that are different from market services.

Implication I: Emphasis of the importance of collaboration in OAE from service science perspective

There are many theoretical and empirical researches on OAE discussing the characteristics of older learners and claiming that older learners should play an important role in the education. Most of them are studied from the perspective of education, gerontology, and sociology. To the best of our knowledge, this is the first study of OAE from service science perspective. In the theory of service value co-creation, it is natural to see the importance of the collaboration between older learners in the whole process of the development of OAE curriculum. Not only can the result be considered a backup to the results in existing studies, but shows how older learners collaborate with education providers throughout the whole process.

Implication II: Provision of theoretical foundation for the value co-creation of OAE curriculum

Based on the theory of service value co-creation, we proved our hypothesis that values of OAE curriculum could be co-created collaboratively by older learners and education providers and proved the hypothesis by case studies. We further proposed a model for the value co-creation of OAE curriculum by extending an existing service value co-creation model (KIKI model) and tailoring it for OAE curriculum. Such results are complementary to the existing OAE theories on how to develop OAE curriculum and provide theoretical foundation for the value co-creation of OAE curriculum.

Implication III: Enrichment of the service value co-creation theory and emphasis the characteristic of life cycle of service design

The result of this work is an enrichment of the existing value co-creation theory, which is studied mainly on the services in the marketing. The major difference of OAE curriculum from the services in the marketing is that that the former are generally non-profit while the latter is mainly for pursuing maximal profits. The result of this study shows the applicability of the theory of value co-creation to such non-profit services. In addition,

an extended value co-creation model is proposed for OAE curriculum. All these results enrich the existing value co-creation theory.

8.2.2 Practical implications

We discuss the implications of the research results to OAE and theory of service value co-creation respectively from the practical perspective.

Implication I: Benefiting both older learners and education providers by developing desired OAE curriculum

The main objective of OAE is to improve the quality of life of older adults by providing them places and opportunities to learn knowledge, to kill loneliness and to reestablish themselves, etc. An important factor is to provide older learners desired OAE curriculum which can benefit both older learners and education providers.

This work provides a practicable guide for developing OAE curriculum. In practice, the proposed four-stage spiral model provides a practicable guide for both education providers and older learners on how to develop their OAE curriculum stepwisely to make both of them maximally satisfied. For older learners, their requirements of participating OAE can be met, and for education providers their objectives of providing OAE curriculum can be achieved.

Implication II: Demonstrating the usefulness of the service value co-creation theory

As an application of the service value co-creation theory to OAE, this work demonstrates the usefulness of the theory to even non-profit services, unlike most of the existing work which focus on studying the theory for business services in the marketing. This work would inspire more applications of the theory to the study of the value co-creation of other types of non-profit public services such as public transportation, library and health care.

8.3 Research limitations and future work

In this section, we discuss some limitations of the current work and mention some future work based on the results obtained from the work.

To the present of preparing the dissertation, we only chose three Chinese OAE universities as the cases to study. Although the quality of the education in the three OAE

universities are at the top level in China, it would be more desired to conduct some case studies on the OAE universities from different countries to make the collected data more representative and the model we propose more generalized.

Another work that should be improved is that the scope of respondents in the case studies can be enlarged. In the current work, the respondents we have interviewed only consists of the older learners that are learning in the university and the education providers that are working in the university. On one hand, as a public service one objective of OAE is to encourage more older adults to participate into the education. Thus, it is desired to collect the data from those older adults outside the university to identify their requirements. Such requirements are also valuable to develop desired OAE curriculum. On the other hand, governmental and social participations play important roles in OAE. Data from government and social organizations on their attitudes is also important to identify their objectives or requirements to OAE universities. This should be taken into consideration in the case studies to make the model we propose more generalized.

From the perspective of the service value co-creation theory, by collaboration not only does it mean that service suppliers collaborate with customers, but also different service suppliers collaborate with each other. In the domain of OAE, a university is not an isolated unit which develops all their OAE curriculum independently. In the model we proposed in this work, we only consider the collaboration between education providers and older learners. It is also desired to take into consideration the collaboration among education providers such as those from different OAE universities in order to develop a service value co-creation model that is more representative than the current one.

Bibliography

- Anderson, Carl R and Zeithaml, Carl P. Stage of the product life cycle, business strategy, and business performance. *Academy of Management journal*, 27(1):5–24, 1984.
- Association, American Psychological and others, . *Publication manual of the American psychological association*. American Psychological Association Washington, 1994.
- Beatty, Paulette T and Wolf, Mary Alice. *Connecting with Older Adults: Educational Responses and Approaches. Professional Practices in Adult Education and Human Resource Development Series*. ERIC, 1996.
- Benyon, John; Börger, Agnes; Briguglio, Giuseppe, and others, . *Getting Older People Involved in Learning*. University of Leicester, 2010. URL <http://www.associationforeducationandageing.org/ufiles/EuBiaGuide.pdf>.
- Blumberg, Phyllis. *Developing learner-centered teaching: A practical guide for faculty*. John Wiley & Sons, 2009.
- Cai, Jinfang and Kosaka, Michitaka. *Towards a Service Value Co-creation Model for Older Adult Education*, pages 15–29. Springer Singapore, Singapore, 2016. ISBN 978-981-10-2857-1. doi: 10.1007/978-981-10-2857-1_2. URL http://dx.doi.org/10.1007/978-981-10-2857-1_2.
- Cervero, Ronald M and Wilson, Arthur L. *Planning Responsibly for Adult Education. A Guide to Negotiating Power and Interests. Jossey-Bass Higher and Adult Education Series*. ERIC, 1994.
- Chang, Dian-Fu and Lin, Sung-Po. Motivation to learn among older adults in taiwan. *Educational Gerontology*, 37(7):574–592, 2011.
- Chen, Li-Kuang; Kim, Young Sek; Moon, Paul, and Merriam, Sharan B. A review and critique of the portrayal of older adult learners in adult education journals, 1980-2006. *Adult Education Quarterly*, 59(1):3–21, 2008.

- Cliath, Baile Atha; Rialtais, Oifig Dhíolta Foilseachán; Alliance, Teach Sun; Laighean, Sráid Theach; Rialtais, Foilseachán, and Post-tráchtá, An Rannóg. Learning for life: White paper on adult education, 2000.
- Commission, European. *Making a European area of lifelong learning a reality*. European Commission, Brussels, Belgium, 2001. URL <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2001:0678:FIN:EN:PDF>.
- Dehmel, Alexandra. Making a European area of lifelong learning a reality? Some critical reflections on the European Unions lifelong learning policies. *Comparative Education*, 42(1):49–62, 2006.
- Dench, Sally and Jo, Regan. Learning in later life: Motivation and impact. *Research report RR183*, 2000.
- Densen, Peter. Challenges and opportunities facing medical education. *Transactions of the American Clinical and Climatological Association*, pages 48–58, 2011.
- Doan, Minh Chau; Le, Nguyen Dinh, and Kosaka, Michitaka. A new service mediator for human resource management. *IJKSS*, 5(3):1–17, 2014.
- Dong, Wooseok; Shirahada, Kunio, and Kosaka, Michitaka. Experience sharing service value co-creation model (ESSVC) and its application to korean language service. *IJKSS*, 4(2):46–57, 2013.
- Ertmer, Peggy A and Newby, Timothy J. Behaviorism, cognitivism, constructivism: Comparing critical features from an instructional design perspective. *Performance improvement quarterly*, 6(4):50–72, 1993.
- Escuder-Mollon, Pilar; Esteller-Curto, Roger; Ochoa, Luis, and Bardus, Massimo. Impact on senior learners quality of life through lifelong learning. *Procedia-Social and Behavioral Sciences*, 131:510–516, 2014.
- Field, John. *Lifelong learning and the new educational order*. ERIC, 2000.
- Findsen, Brian and Formosa, Marvin. *Lifelong learning in later life: A handbook on older adult learning*. Sense Publisher, 2011.
- Findsen, Brian and Formosa, Marvin. *International Perspectives on Older Adult Education Research, Policies and Practice*, volume 22. Springer, 2016.
- Fitzsimmons, James A; Fitzsimmons, Mona J, and Bordoloi, Sanjeev. *Service management: Operations, strategy, and information technology*. McGraw-Hill New York, 2006.
- Forester, John. *Planning in the Face of Power*. University of California Press, 1988.

- Ginsberg, Barbara R. How education empowers older adults. *Activities, Adaptation & Aging*, 25(1):1–11, 2001.
- Goldstein*, Harvey. Education for all: the globalization of learning targets. *Comparative Education*, 40(1):7–14, 2004.
- Gredler, Margaret E. *Learning and instruction: Theory into practice*. Pearson/Merrill Prentice Hall Upper Saddle River, NJ, 2005.
- Grönroos, Christian. Adopting a service logic for marketing. *Marketing theory*, 6(3): 317–333, 2006.
- Gu, X. Zai guoji laonian daxue xiehui lishihui ji quanti huiyi shang de zhici [opening address on the plenary meeting of international association of universities of third age]. *Laonian jiaoyu (Laonian daxue)*, pages 8–9, 2013.
- Havighurst, Robert J. Developmental tasks and education (3rd edition) . new york: David mckay company. *Inc. I 1979*, 1972.
- Hornby, Albert Sydney and Wehmeier, Sally. *Oxford advanced learner's dictionary*, volume 1428. Oxford university press Oxford, 1995.
- Kameoka, Akio and others, . Service science. *NTS Inc*, page 39, 2007.
- Kearsley, Greg. Explorations in learning & instruction: The theory into practice database. *Jacksonville State University Encyclopedia of Psychology*, 1994.
- Kleiber, Douglas A and others, . *Leisure experience and human development: A dialectical interpretation*. Basic Books, Inc., 1999.
- Knowles, Malcolm S and others, . *Andragogy in action: Applying modern principles of adult education*, 1984.
- Kosaka, Michitaka. *A service value creation model and the role of ethnography*. INTECH Open Access Publisher, 2012.
- Kosaka, Michitaka; Zhang, Qi; Dong, Wooseok, and Wang, Jing. Service value co-creation model considering experience based on service field concept. In *9th International Conference on Service Systems and Service Management*, pages 724–729. IEEE, 2012.
- Lakin, Mary Beth; Mullane, Laura, and Robinson, Susan Porter. *Reinvesting in the Old Age: Older Adults and Higher Education*. American Council on Education, 2007.
- Lovelock, Christopher H and Wirtz, Jochen. *Services marketing: people, technology, strategy*. Pearson Prentice Hall, 2001.

- Lowy, Louis and O'Connor, Darlene. *Why education in the later years?* Lexington Books, 1986.
- Lubkina, Velta; Kaupuzs, Aivars; Usca, Svetlana, and Lubkins, Gatis. Analysis research pedagogy, 2012. URL <http://www.edusenior.eu/files/QEduSen%20-%20WP2%20-%20D2.1.d.%20-%20Requirement%20Analysis%20-%20Educational%20models%20-%20v.02.pdf>.
- Lusch, Robert and Wu, Christopher. A service science perspective on higher education. *Center for American Progress, August, 2012.*
- Lusch, Robert F and Vargo, Stephen L. Service-dominant logic: what it is, what it is not, what it might be. *The Service Dominant Logic of Marketing—Dialog, Debate and Directions, ME Sharpe Inc., NY*, pages 43–56, 2006.
- Lusch, Robert F; Vargo, Stephen L, and Wessels, Gregor. Toward a conceptual foundation for service science: Contributions from service-dominant logic. *IBM systems journal*, 47(1):5–14, 2008.
- Maglio, Paul P and Spohrer, Jim. Fundamentals of service science. *Journal of the Academy of Marketing Science*, 36(1):18–20, 2008.
- Marshall, Alfred. Principles of economics: an introductory volume. 1927.
- Merriam, Sharan B; Caffarella, Rosemary S, and Baumgartner, Lisa M. *Learning in adulthood: A comprehensive guide.* John Wiley & Sons, 2012.
- Michitaka, Kosaka; Kunio, Shirahada; Yasunobu, Ito, and others, . A concept of service field in service system for creating service value. [C] *In Proceedings of the 4th Japan-China Joint Symposium on Information Ststems*, 2011.
- Mulenga, Derek and Liang, Jr-Shiuan. Motivations for older adults' participation in distance education: A study at the National Open University of Taiwan. *International Journal of Lifelong Education*, 27(3):289–314, 2008.
- Nations, United; of Economic, Department; Affairs, Social, and Division, Population. *World Population Ageing 2015.* United Nations, 2015. URL http://www.un.org/en/development/desa/population/publications/pdf/ageing/WPA2015_Report.pdf.
- Nguyen, Dung Thuy; Shirahada, Kunio, and Kosaka, Michitaka. A consideration of value co-creation in branding of university research-laboratories. *IJKSS*, 7(2):40–57, 2016.
- Normann, Richard and Ramirez, Rafael. *Designing interactive strategy: From value chain to value constellation.* John Wiley & Sons, 1998.

- Organization, World Health and others, . Definition of an older or elderly person: proposed working definition of an older person in africa for the mds project. <http://www.who.int/healthinfo/survey/ageingdefnolder/en/index.html> [accessed 2017-02-08], 2013.
- Payne, Adrian F; Storbacka, Kaj, and Frow, Pennie. Managing the co-creation of value. *Journal of the academy of marketing science*, 36(1):83–96, 2008.
- Peterson, DAVID A. A history of the education of older learners. *Introduction to educational gerontology*, 3:11–19, 1990.
- Peterson, DAVID A; Sherron, RH, and Lumsden, DB. Toward a definition of educational gerontology. *Introduction to educational gerontology*, pages 1–29, 1978.
- Peyton, JW Rodney. *Teaching and learning in medical practice*. Manticore Europe, 1998.
- Prahalad, Coimbatore K and Ramaswamy, Venkat. Co-creation experiences: The next practice in value creation. *Journal of interactive marketing*, 18(3):5–14, 2004a.
- Prahalad, Coimbatore Krishnarao and Ramaswamy, Venkat. The future of competition. *Harvard Business School Press, Boston, MA*, 2004b.
- Roberson Jr, Donald N. The potential of self-directed learning: Practical implications for facilitators of older adults. *Activities, Adaptation & Aging*, 29(3):1–20, 2005.
- Schön, Donald A. *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. Jossey-Bass, 1987.
- Shaw, Arch Wilkinson. Some problems in market distribution. *The Quarterly Journal of Economics*, 26(4):703–765, 1912.
- Siemens, George. *Connectivism: A learning theory for the digital age*. 2014.
- Siguencia, Luis Ochoa; Gil, Alina, and Nowacka, Urszula. Analysis research educational models, 2012. <http://www.edusenior.eu/files/QEduSen%20-%20WP2%20-%20D2.1.d.%20-%20Requirement%20Analysis%20-%20Educational%20models%20-%20v.02.pdf>.
- Smith, Adam. An inquiry into the nature and causes of the wealth of nations: Volume one. London: printed for W. Strahan; and T. Cadell, 1776., 1776.
- Spillane, James P and others, . Local theories of teacher change: The pedagogy of district policies and programs. *Teachers College Record*, 104(3):377–420, 2002.

- Spohrer, Jim and Maglio, Paul P. The emergence of service science: Toward systematic service innovations to accelerate co-creation of value. *Production and operations management*, 17(3):238–246, 2008.
- Spohrer, Jim; Maglio, Paul P; Bailey, John, and Gruhl, Daniel. Steps toward a science of service systems. *Computer*, 40(1), 2007.
- Svensson, Göran and Grönroos, Christian. Service logic revisited: who creates value? and who co-creates? *European business review*, 20(4):298–314, 2008.
- Tellis, Gerard J and Crawford, C Merle. An evolutionary approach to product growth theory. *The Journal of Marketing*, pages 125–132, 1981.
- Vargo, S. Service-dominant logic: An alternative mindset for innovation. In *Presentation at the 2009 Ministry of the Knowledge Economy Conference on Service Innovation through R&D. Seoul, Korea*, 2009.
- Vargo, Stephen L and Lusch, Robert F. Evolving to a new dominant logic for marketing. *Journal of marketing*, 68(1):1–17, 2004.
- Vargo, Stephen L.; Maglio, Paul P., and Akaka, Melissa Archpru. On value and value co-creation: A service systems and service logic perspective. *European Management Journal*, 26:145–152, 2008.
- Wei, Chen; Jinju, Liu, and others, . *Future population trends in China: 2005-2050*. Monash University, Centre of Policy Studies and the Impact Project, 2009.
- Weiland, Steven. Critical gerontology and education for older adults. *Educational gerontology*, 21(6):593–611, 1995.
- Wikipedia, . Education — Wikipedia, the free encyclopedia, 2017. URL <https://en.wikipedia.org/wiki/Education>. [Online; accessed 2017-02-08].
- Williamson, Bill. Life worlds and learning. essays in the theory, philosophy and practice of lifelong learning. 1998.
- Wolfe, Martin. The concept of economic sectors. *The Quarterly Journal of Economics*, 69(3):402–420, 1955.
- Yin, Yi-Yin. Older adults’ motivation to learn in higher education. In *The 19th Annual African Diaspora Adult Education Research Pre-Conference*, pages 764–770, 2011.
- Zeithaml, Valarie A; Parasuraman, Ananthanarayanan, and Berry, Leonard L. Problems and strategies in services marketing. *The Journal of Marketing*, pages 33–46, 1985.

Zhang, Qi; Kosaka, Michitaka, and Nakamori, Yoshiteru. Streamlining efficient behaviors for knowledge creation in collaboration. *IJKSS*, 4(2):35–45, 2013.

Appendices

A The questionnaire used in the study

To the respected OAE learners:

This questionnaire is used for an service value co-creation research on studying the current situation of the OAE. We would like to learn your experiences of participating OAE universities, your opinions and suggestions to your university. This survey is completely anonymous. We promise all the collected information are used only for research purpose. Please choose the answers that reflect your case for each question. We sincerely thank you for your kind collaboration.

A. Personal information

a1. *Your gender:*

- ① Male ② Female

a2. *Your age:*

- ① 50-59 ② 60-69 ③ 70-79 ④ over 80

a3. *Your education background:*

- ① Illiteracy ② Elementary school ③ Middle school
④ High school ⑤ College ⑥ Bachelors degree or above

a4. *Your current working status:*

- ① Retired ② Unemployed ③ Working (Rehired or individually-running)
④ Never worked before ⑤ Farmer ⑥ Others

B. Experience on OAE

b5. *What is your purpose of attending OAE university?* (multiple options)

- ① To learn and enrich lives
② To keep physically and mentally healthy
③ To make friends
④ To have education experience which was missed in young age
⑤ To learn the new things and to keep the pace with the society

- ⑥ To kill time and loneliness
- ⑦ To improve oneself and serve better for society
- ⑧ To meet hobbies
- ⑨ Others

b6. *What have you learned in OAE university?*

- ① Medicine and health
- ② Singing, dancing and instruments
- ③ Calligraphy and Photography
- ④ Cooking and Planting
- ⑤ Clothing and Knitting
- ⑥ Literature and foreign language
- ⑦ Computer and network
- ⑧ Philosophy and law
- ⑨ Economy and science
- ⑩ Others

b7. *Your satisfaction on OAE served by OAE university:*

- ① Very satisfied ② Much satisfied ③ Neutral ④ Less satisfied
- ⑤ Not to all satisfied ⑥ No idea

b8. *Do you think the courses in OAE university are reasonable*

- ① Very reasonable ② More reasonable ③ Neutral
- ④ Less reasonable ⑤ Not to all reasonable

b9. *Do you think the ways of teaching the old people are appropriate?*

- ① Very appropriate ② More appropriate ③ Neutral
- ④ Less appropriate ⑤ Not at all appropriate

b10. *What do you think the attitude of the teachers in OAE university?*

- ① Very dedicated ② More dedicated ③ Neutral ④ Less dedicated
- ⑤ Not at all dedicated

b11. *Do you think the contents in OAE university are scientific?*

- ① Very scientific ② More scientific ③ Neutral ④ Less scientific
- ⑤ Not at all scientific

b12. *What do you think the infrastructure of OAE university?*

- ① Very satisfied ② More satisfied ③ Neutral ④ Less satisfied
- ⑤ Not at all satisfied

b13. *In overall do you think the courses in OAE university are helpful to you?*

- ① Very helpful ② More helpful ③ Neutral ④ Less helpful
- ⑤ Not at all helpful

b14. *Which level do you expect to achieve if you learn in OAE College?*

- ① Elementary level ② Systematic level ③ Professional level

b15. *In which form do you think the lectures should be given better?* (multiple options)

- ① Instruction ② Discussion ③ Exercise
④ Observation (such as visiting, tour) ⑤ Self-learning ⑥ Others

b16. *What do you think the responsibilities of teachers in OAE university?* (multiple options)

- ① To teach knowledge
② To teach how to learn
③ To encourage to learn by oneself
④ To coordinate the relations of attendants
⑤ To manage the classes
⑥ To communicate with head teacher
⑦ Others

b17. *What have you got from your learning in OAE university?* (multiple options)

- ① Made new friends ② Enjoyed learning
③ Learned new knowledge and skills ④ Enriched everyday life ⑤ Others

C. Your suggestions to Senior university

c18. *Which courses do you think OAE university should better provide?* (multiple option)

- ① Medicine and health
② Singing, dancing and instruments
③ Calligraphy and Photography
④ Cooking and planting
⑤ Clothing and knitting
⑥ Literature and foreign language
⑦ Computer and network
⑧ Philosophy and law
⑨ Economy and science
⑩ Others

c19. *Do you think the current OAE activities should be reformed and improved?*

- ① Very needed ② More needed ③ Neutral
④ Less needed ⑤ Not at all needed ⑥ No idea

c20. *Which do you think needs to be reformed and improved in OAE university?*

- ① Content and courses ② Teaching methods ③ Teaching attitude
④ Management ⑤ Infrastructure ⑥ Others

c21. *Have you ever tell the organizers of OAE university your opinions?*

- ① Often ② Not often ③ Never

c22. *If you are invited to take part in the interaction activities of OAE university, will you want to?*

① Yes, positively ② No, no matter with me ③ No idea

c23. *Do you think it is necessary for participants to get involved into organization?*

① Very necessary ② More necessary ③ Neutral ④ Less
necessary

⑤ Not at all necessary

c24. *Any of your opinion on OAE?*

The end! Thank you for your cooperation!

B Questions for Interview

B.1 Questions for interview of OAE providers

1. Whats your name?
How long have you been working in this university?
What is your work mainly about like research, administration or teaching?
2. What do you think the purpose of the university?
What do you think the current situation of education service?
Are there many participants as you expected?
Do you think the current education achieve the purpose?
What do you think the problems existing in the education services?
3. What do you think the differences between the OAE and general youth education?
In which way are these differences reflected?
4. What is the criteria in which the courses are determined?
Have you done some survey on the elderlys interest?
Do you think it is important to learn their interest before determining the courses and activities?
In which way do you think you can learn better the elders requirements to the OAE?
5. How are new courses developed in OAE?
What is the criteria of developing such new courses?
Are the new course given in a period for trial?
6. In which form these courses are given?
Do you achieve your expected results?
In which form do the participants prefer to learn?
7. Do you often gather the participants to survey or collect their opinion to the teaching style and contents?
Do you think their opinion and requirements are important?
Do you often ask the participants for their feedback on the existing courses?
Do you think their feedback are important
8. Do you think the old participants should join the teaching reform of OAE university?
Have you ever sincerely invite the participants to join the education service design and courses development?
9. What results do you hope OAE service can achieve?
Has it already achieved or not?
In which way can the expected result be achieved?
Do you have any suggestions?

B.2 Questions for interview of OAE learners

1. Whats your name? How old are you?
How long have you being study in the university?
2. Why do you decide to attend OAE university?
What are your purposes?
What have you learned?
Have you already achieve your purpose?
3. In which way did you learn OAE?
4. Are you satisfied with the current situation of the learning services? What your opinion?
5. What do you expect to learn from the OAE university?
What do you think OAE university should look like?
6. Do you think the current education services should reform and what should be improved?
Do you have any ideas on how to improve them?
7. Do you often discuss with other participants the teaching contents and forms?
Do you think it is necessary for participants to join the OAE reform?
8. If you get involved into the reform of OAE, will you positively give your suggestions?
9. Do you have any suggestions to OAE?

C Information of Interviewees

Case	Role	Name	Age	Position	PR	DU	PL	DA
Case I	Education provider	Mr. Xu	70s	Education director	8y	2h	SURVC	2015.12.17
		Ms. Xiao	50s	Education staff	27y	1h	SURVC	2015.12.17
		Mr. Wang	30s	Lecture, researcher	6.5y	2h	SURVC	2015.12.17
	Older learners	Ms. Gu	80s	Learner, monitor	26y	2h	SURVC	2015.12.17
		Mr. Guo	70s	Learner, monitor	8y	1h	SURVC	2015.12.17
		Ms. Guan	60s	Learner, monitor	4y	1h	SURVC	2015.12.17
Case II	Education provider	Mr. Lü	70s	Academic dean	8y	3h	SUE	2015.12.19
		Mr. Mao	60s	Lecturer	26y	1h	SUE	2015.12.19
		Mr. Xu	70s	Third classroom leader	10y	1h	SUE	2015.12.21
		Ms. Gu	60s	Lecturer, department head	15y	1.5h	SUE	2015.12.19
	Older learners	Ms. Cai	70s	Learner, monitor	6y	1h	SUE	2015.12.19
		Ms. Guan	70s	Learner, monitor	8y	1h	SUE	2015.12.19
		Ms. Gu	60s	Learner, monitor	4y	1h	SUE	2015.12.19
Case III	Education provider	Ms. Wang	30s	Education director	7y	1.5h	JAUE	2015.12.20
		Mr. Zhou	20s	Lecturer, researcher	5y	1.5h	JAUE	2015.12.20
		Mr. Song	40s	Lecturer, researcher	10y	1.5h	JAUE	2015.12.24
		Ms. Shen	60s	Class adviser	3y	45m	JAUE	2015.12.20
	Older learners	Mr. Shen	80s	Learner, monitor	3y	30m	JAUE	2015.12.20
		Ms. Yang	50s	Learner, monitor	1y	45m	JAUE	2015.12.24
		Mr. Yao	60s	Learner, monitor	3y	1h	JAUE	2015.12.24

* PR: Working (learning) period; DU: Interview duration; PL: Interview place; DA: Interview date; y: year; h: hour

Publications

International journals:

1. Jinfang Cai and Michitaka Kosaka. A Collaboration-based Spiral Model for Curriculum Development of Older Adult Education: A View from Service Science Perspective, *International Journal of Knowledge and Systems Science (IJKSS)*, 8(2):27-42, 2017.

International conference proceedings:

1. Jinfang Cai and Michitaka Kosaka. Towards a Service Value Co-Creation Model for Older Adult Education, In *the 17th International Symposium on Knowledge and Systems Sciences (KSS 2016)*, Lecture Note, CCIS, 660:15-29. Springer Singapore, Singapore, 2016. (Kobe, Japan, Nov. 4-6, 2016)
2. Jinfang Cai and Michitaka Kosaka. Towards Value Co-Creation of Older Adult Education from Service Science Perspective: A Case Study on a University in Shanghai. In *the 5th Asian Conference on Information Systems (ACIS 2016)*, IEEJ, 2016. (Krabi, Thailand, Oct. 27-29, 2016)