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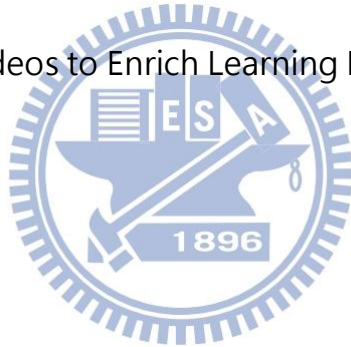
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應用藝術研究所

碩士論文

影片對於學習經驗之影響與脈絡研究

Using Videos to Enrich Learning Experience



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## 摘要

現今電腦科技的進步讓人們的生活充斥著多媒體科技，在現有眾多的多媒體科技當中，影片是最能夠用來分享生活經驗的工具，因為它能夠呈現生動且多元複雜的動態內容和事件脈絡，同時結合文字、圖像和聲音等不同的媒介來傳遞所需訊息。因此，每天有大量的影片透過網路傳遞到世界各地。

本研究目的在於積極了解現今的學習者透過影片學習和分享影片的環境，從而豐富學習者和分享者藉由影片交流生活點滴或專業領域知識的經驗。烘焙在此被作為研究影片學習的主題研究內容。

研究透過文獻回顧和深度訪談蒐集烘焙影片使用者，也就是烘焙影片的學習者和分享者現今使用影片的經驗脈絡和比較其使用不同多媒體學習的行為差異。親和圖和教育目標理論 Bloom' s Taxonomy Table 被用來作為分析和組織訪談後的使用者資料。

研究之發現幫助了解台灣烘焙人的學習行為，及其透過影片和多媒體學習分享的經驗，與各媒體的特質對學習者和分享者的影響，且特別針對影片介入學習和分享的脈絡做討論，研究結論為影片投資者、設計者和研究者建立設計建議，以期未來能創立更具競爭優勢的影片學習環境。

*關鍵字：使用者經驗研究、影片學習、多媒體學習、教育目標理論、烘焙、影片分享、生活經驗分享*

## Abstract

Multiple computing technologies bring our life filled with multimedia. Among multimedia, video technology is the most proper way to provide life experience sharing because it conveys and presents information in more lively ways. Moreover, various information society needs people learn new things quickly in both the aspects of knowledge and skill.

The aim is to study baking learning as well as sharing condition at present and enrich learners' learning and their sharing experience through videos. Baking subject has been chosen in this thesis to approach the objectives.

The thesis was conducted mainly through literature reviews as well as in-depth interviews. The collected data were organized in affinity diagram with learners' learning pattern. Besides, Bloom's Taxonomy Tables were utilized to analyze the users' baking experiences, especially with videos.

Baking learning, sharing characteristics, and social activities of baking learning with multimedia were provided in the result. Also, the design implications were proposed for video stakeholders, designers, and researchers to create a better video learning environment.

**Key words:** *User experience research, video learning, multimedia learning, Bloom's Taxonomy Table, baking, video sharing, experience sharing*

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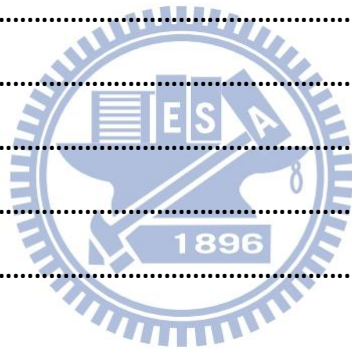
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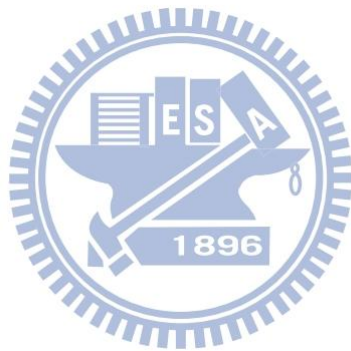
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## **-Chapter 1- INTRODUCTION**

The background and motivation of this thesis as well as the objectives of the study will be introduced in the first chapter, and followed by the limitations of this research. Then the outline of thesis will give readers a sketch of content in each chapter.

### **1.1Background**

As the result of rapid development of technologies, nowadays people's life was surrounded by state-of-the-art media and devices. Multiple computing technologies bring our life filled with multimedia. The tendencies toward media integration and convergence transformed video into a dominant medium. Also, the improvement of network environment made video content become a predominant part of users' daily life on the Internet. Videos have pervaded the Internet and supported users creating new types of interaction with them. (Wei Ding & Gary Marchionini, 1997; Teresa Chambel & Nuno Guimarães, 2001)

Because the proportion of videos in multimedia has continuously increasing, it was expected that this type of medium will be as widely accessible to users as a text. In networks generation nowadays, video does have a wide spread. Also, it is more approachable than the other media like book or text for certain people. (Fabr'ico Benvenuto, Tiago Rodrigues, Virgilio Almeida, Jussara Almedida & Keith Ross, 2009)

Moreover, various information society needs people learn new things quickly in both the aspects of knowledge and skill, and have adaptability to live well in the new condition. Experts had mentioned that life-long learning will be a major requirement in the 21<sup>st</sup> century. Fortunately, the convenience of information and technologies present-day shortened the distance of people and knowledge. (Teresa Chambel et al., 2001)

In the meanwhile, people have multiple choices to access with learning activities through books, videos, television programs, or on-line courses, so life-long learning can be achieved easily by multimedia. It means people can learn anytime and anywhere if they want to access the technology. Because video and multimedia technologies have been widely used in education fields, it is believed that digital media and the Internet communication technologies will transform learning activities from the linear and sequential curriculum to learn through multiple ways. (Richard Lacy & John R. Supra Jr., 1997)

## **1.2 Motivations**

Owing to easier approach of multimedia, users are allowed to generate and distribute their own ideas for sharing. The issue had widely discussed. Since about fifteen years ago, information and communication technology can promote knowledge sharing by shortening the spatial and temporal barriers among people. The pervasion of multimedia makes knowledge and information more sharable and accessible through many devices and interfaces. (Paul Hendriks, 1999)

Furthermore, among the variety of multimedia technologies currently available, video technology is more proper to provide learning because it presents information and knowledge in a more lively way. Also, the complicated content and the context can be communicated by videos. An individual is motivated to share something or learn something by videos' content delivery. People use video to express their thoughts as well as present their thoughts to the world. (Yun-Maw Cheng, Wai Yu & Tzu-Chuan Chou, 2005)

In addition, the popularity of mobile devices provides user spontaneously capturing or recording their life experience not only by photos but also by video and audio. There are a large number of possibilities for people to learn through video browsing. In other words, the fact is that if there is something that someone knows, there are ample opportunities to share it through video, and also there is a chance for everyone to learn. (Fabr'ico Benvenuto et al. 2009; Lada A. Adamic, Jun Zhang, Eytan Bakshy & Mark S. Ackerman, 2008)

As all of the reasons mentioned above, it is more relevant to realize that video has the potential to promote learning activities and gets much closer to users if learners use it correctly. Learning environment will become colorful with people using videos in life experience sharing and learning. In the future, media providers will face the challenge that how to provide a personalized and various media content which is suitable for individuals; meanwhile, proper to all kinds of people. However, in terms of learning through video, it should be considered how to utilize videos in a meaningful way and engage learning activities more powerful through this medium tool when getting along with it. (Fan Chen, Damien Delannay & Christophe De Vleeschouwer, 2011)

### **1.3 Objectives**

People get used to learning traditionally through books or teachers, but in progressive technology age, multimedia has had highly impacts on learning activities, especially videos. Videos as the new pervasive media for life-long learning definitely have its own potentials to provide the better learning sources and contents. We assume that it is not adequate for learners learning in online learning environment with highly social activities at present. Although being able to access new technology does not necessarily mean that we need to decide how the technology will then be used. Nevertheless, if there is no irreplaceable position provided to video learning, it might be because we have not yet made one. If we do not understand the potent relationship between video and learning, it is quite likely that the video learning environment will not be respected.

In order to access the research goal, a topic has been chosen as learning activities and concentrating on learners' learning behaviors as well as current learning environment with videos. Because we regard videos as the non-traditional learning tools and the aid of learning activities take place anytime as long as learners want to. The interesting and not so serious subject-baking was picked to be the research content. The formal qualitative study methods will be used to reveal the answers of research issues. To be more specific, sentences below are brought up to help us clarify the objectives:

A. Reveal the basis of baking learners' social activities without media.

First, baking learners' learning activities in the traditional way will be found out. It will focus on their learning through social behaviors among teachers and classmates or bake friends in order to compare the differences between with media and without media.

B. Build the realizations of baking learners' social behaviors with media.

As the objective A mentioned above, the changes of baking learners' learning behaviors from with media to without media will be clarified. That is, the tools or media which baking learners get used to, the interactions between learners and sharers with different media, and the pattern of baking learners' sharing and learning activities through media will be revealed here.

C. Construct the knowing of baking learners' video learning activities.

What is more, through baking videos, the interactions between baking learners and sharers are the most principal issues to be focused on in this qualitative research. The basic questions are like how baking learners learn from videos with different media or without any media.

D. Develop the design implications for enriching video learning experience for learners.

It is assumed that in the social context, video as information delivery vehicle with its dynamic representation will be greatly helpful to learners. Following the objectives of the interactive patterns of baking learners with videos, with different media, and without any media, it will be known that videos at present are prevalent for learners. The constructive suggestions will be given to improve online video learning environment in order to approach the prospects of the pervasive learning experience with videos for different subjects.

## 1.4 Limitations

As the thesis was modeled in the scope of baking learning with videos, and the whole research was taken place in Taiwan. There are the limitations with study.

Firstly, learning and sharing activities are not restricted to a single country or region. Research sources that were taken into account during research process only based on baking learners in Taiwan. Therefore, the study might be conducted in a narrow perspective comparing to various learning and sharing activities and cultures. A wider range of insights should be involved as to know the differences between learners live in separate locations.

Secondly, the deeply grounded study involves the long term observations and the co-experiences of life with users, that is, the study of ethnography. Otherwise, compared to the ethnography, the qualitative study like interview might be too short and fast to know users' life with videos and their learning activities deeply and precisely. Moreover, there were a few actively videos sharing actions from interviewees. It might make findings a little far from objectives with holistic considerations, although interviewees as the learners have shared some information and perspectives related to baking sharing actions.

Thirdly, as for learning experience in this thesis, baking subject was chosen to help this study focusing on certain context of activity. Baking is a kind of subject more related to skill application, and there is a large difference between skill learning and theory learning. The subjects based on pure theories without skills did not include in the scope of this study. Therefore, in order to improve better learning experience, the activities or subjects with skill learning are more appropriate to refer the suggestions and conclusions of this thesis.

In addition, in the case of video learning, this study have put more attention on video's learning environment and indicated a general direction of procedural content providing by videos. Which of content should precisely be put in the video for better learning experience did not being discussed. The one trying to provide a better quality of video content might not find the know-how actually in this thesis.

Finally, three models were chosen from the large numbers of educational objective taxonomies and Bloom's Taxonomy Table was picked to be the main model analysis using in this thesis. Because Bloom's Taxonomy Table put efforts on the dimensions of cognitive and knowledge level analyzing, there might be lack of different perspectives such as the aspects of affective and pshychomotor to discuss videos' content completely. Two aspects were introduced in the Krathwohl's Taxonomy and Simpson's Taxonomy as the other two educational objective taxonomies mentioned in this thesis.

## 1.5 Outline of this thesis

The thesis consists of six chapters.

**Chapter one**, introduction, it consisted of the background, motivation, objectives and limitations of this thesis. **Chapter two**, literature review. It interpreted the references of this thesis as a small library. The literatures will be reviewed and discussed on multimedia learning, video learning, learning activities, baking, and research methodology respectively. **Chapter three**, research methodology, the conscientious research methodologies of interview and analysis methods of affinity diagram, Bloom's Taxonomy will be interpreted in this chapter. Also, research process, research issues, and methodologies we utilized in this thesis will be introduced here.

**In chapter four**, findings, the collected data from in-depth interviews about learners' baking learning patterns, the content shown in baking videos, videos' characteristics, and specialties in baking learning fields will be organized in this chapter. **In chapter five**, discussion, the arguments and design implications about video learning will be shown to access practically for the one who wants to develop progressive video learning and sharing environment. **In chapter six**, conclusion, the overall conclusions and contributions summarized from chapter one to five and the recommendations to further research will be shown in this chapter.



## -Chapter 2- LITERATURE REVIEW

The following sections discussed the basic knowing of thesis. The literatures will be reviewed in this chapter and owing to the thesis is related to video learning and sharing topic, we will discuss multimedia learning, video learning, learning activities, baking, and research methodology, respectively.

### 2.1 Multimedia Learning

The following sections will interpret the definitions of multimedia. The relationship between multimedia and learning will also be discussed in order to have the basis of video learning in multimedia context.

#### 2.1.1 The Definition of Multimedia

Scientific research with regard to multimedia learning are mature at a rapid pace, so it requires interpreting of multimedia in practical from definition of the term to the related researches. Multimedia technology has changed our way in communication, learning, and socialization. But, the question is, what is multimedia? (Richard E. Mayer, 2001; Carol Anderer, Paul Hyde & Jean Neff, 2007)

As a Professor of Psychology and author of book *Multimedia Learning*, Richard E. Mayer stated the term “multimedia” included various meanings. For example, one who is sitting in a room watching the pictures drawing on the blackboard and hearing the commentary or narration about the pictures through speaker, multimedia environment includes. For another example, one is sitting in front of the screen which presents the images about online learning courses, meanwhile, he or she is listening music as the course background form the earphone, the one is also immersed in multimedia.

Multimedia is a live performance which includes words and pictures presenting. Words, for sure, consist of the spoken texts which are spoken by people and the printed texts which are showed on the papers or the screens. Pictures are the visual elements such as illustrators, photos, animations, and videos. Mayer also mentioned that one possible condition of multimedia is watching a video while listening to the corresponding words, music, and sounds or reading the captions on the screen. It indicates that video is a part of members of multimedia. In the discussion of visual literacy, Janet Collins, Michael Hammond and Jerry J. Wellington (1997) pointed out that we were not moving away from verbal knowledge towards visual literacy, but to a "*world of multimodality*" where images and words work together. (Beth Snoke Harris, 2006)

### **2.1.2 The Rationale for Multimedia Learning**

We have already known that multimedia combines the words and the pictures. Multimedia learning first came to our mind while one is learning from words and pictures at the same time. That is, while people building mental representations from words and pictures, the multimedia learning occurs. Mayer (2001) stated that learners will be able to learn more deeply from words and pictures than from words alone. The original definition of multimedia learning is based on the cognitive theory of multimedia learning of Mayer, Sweller's cognitive load theory and Schonotz's intergrative model of text and picture comprehension. (Richard E. Mayer, 2005)

In the book, *The Cambridge Handbook of Multimedia Learning*, Mayer has proposed many principles to construct the theory of multimedia learning with the perspective of cognition in the field of psychology. He suggested the thoughts to approach multimedia learning. One of them in to find the right time to add verbal words into a pure picture or to insert the instructional messages into an audio-visual material for a better learning mode. However, Mayer said that we have known from previous researches that presenting words and pictures once, no matter how they are static or dynamic, is presenting the material twice and giving learners twice as much exposure to explanation. The repeated interpretations certainly benefit people to learn more. Next section will discuss the influences of different

media. (Richard E. Mayer, 2005)

### 2.1.3 Different Medium or Vehicle as a Learning Tool

While discussing about how to support learners' learning activity through medium, the thoughts should go back to the earlier stage to see the vehicles that learners used to use. Humankind has the flexible abilities to learn through the changes of environment. Although in the real world, technology continuously brings people different impacts and restrictions, humankind can still live well as usual by adjusting their behaviors. As for learning books, the vehicles to deliver a large amount of information, have been used for learning for hundreds years. The advent of technology, in recent decades, has made media become a quicker tool to convey information. Media was then positively used to teach and learn. The term of "media" in Oxford Online Dictionary (2012) is *"the main ways that large numbers of people receive information and entertainment, that is, television, radio, newspapers and the Internet"*. People were familiar with different media and get used to learning something through media no matter in class or out of class. Mass media and multimedia then came out followed by the trend of media.

In this thesis, we try to remind readers that the differences between media and learning vehicle according to the descriptions of the Oxford Dictionary. Learning vehicle here included the books printed on papers, and of course from the perspectives of technology. It includes videos, blogs, vlogs, television, radio, e-newspapers online. The definition of learning media is normally in the scope of learning vehicle. But for interpretations convenience in this thesis, media will be used in all descriptions to indicate the tools or vehicles which convey information with multiple modalities like words, images or videos. Multimedia itself is a narrow meaning of media, focusing on multiple presentations simultaneously. On the other hand, videos can be a part of multimedia representation; or a multimedia itself.

## 2.2 Video as a Medium to Learn

Researches related to videos and various studies focusing on video learning matters will be introduced as follows.

### 2.2.1 Knowing Videos

Every medium has its advantages and disadvantages. Videos allow people viewing dynamic objects in actual scenes, seeing the motion in sequence, and listening to narration of motion as if we were present. The definition of video in Oxford Online Dictionary (2012) is *“a short film or recording of an event, made using digital technology and viewed on a computer, especially over the Internet”* and also known as *“video clip”*.

Over the last few years, a large number of studies have been explored on the aspects of video using. Microsoft Research evaluated video browsing software application through watching six different video content types—classroom lectures, conference presentations, sports, television dramas, news, and travelogues. Those content types were presented the resulting data for analysis and discussion in 1999. Research from Institute for Infocomm Research in Singapore proposed the mid-level representation framework of sporting video for event detection, highlight extraction, summarization by 2003. Content-based video managements were also widely studied. These researches addressed video automatic indexing, retrieval, parsing and semantic segmentations in order to create a powerful system for the convenience of video viewing. (Stephen W. Smoliar & Hongliang Zhang, 1994)

Telefonica Research in Spain and KAIST in Korea provided an in-depth study on YouTube (the world’s largest UGC VoD system) compared with the other similar UGC (user generated content) system and gave the insights on the potentials of more efficient UGC VoD (video-on-demand) system. IBM Almaden Research Center tracked and browsed users’ behaviors to determine what interest users and previewed videos’ potential in the generations of 2001.

Some papers summarized their work on semantics extraction, editorial content creation with adaptation for sporting video analysis and applications. Others presented a comprehensive survey of videoblogging (vlogging for short) which was a new technological trend and the answer of humans' need. The Mixed Reality Laboratory and Microsoft Research Cambridge in United Kingdom derived a lifecycle of video work to frame the practices users engaging in when working with video technologies at home, and uncovered two broad types of video usage therein. Knowing the researches in relation to videos, then, it could be moved forward to video learning issues. (Changsheng Xu, Jian Cheng, Yi Zhang, Yifan Zhang & Hanqing Lu, 2009; Wen Gao, Yonggong Tian, Tiejun Huang & Qiang Yang, 2010)

### **2.2.2 Videos with Learning**


In earlier days, Teresa Chambel and Nuno Guimarães (2001) mentioned that there had been many expectations on using videos to influence educational environment and learning. Boyle and Tom (1997) also proposed that the video clips can greatly enhance the authenticity of a computer based learning environment. But after so many years, there has no revolutionized impact on education or learning environment. Two reasons caused this situation. One was the constraints of technology. Besides, there are small groups of researchers put effort on using videos to support learning.

Nevertheless, with the advanced computational power nowadays, learner-centered design for learning was possible with no more restrains of technique. As the constraints of technology were reduced, it came up the issues of designing or using videos effectively to support learning. Perhaps educational videos or videos which consist of learning elements will never replace the role of teachers, but it can give more people in the world opportunities to learn quicker or more convenient. Videos cannot only help learners learn anywhere and anytime but also shorten the limitation of time and money between learning sources givers and receivers. (Beth Snoke Harris, 2006)

Afterwards, video learning had been widely studied due to its tremendous potential in presentation. Some studies provided a basis for video using in classroom. For example, the

effect upon teaching disability students in cooking subject, getting the realization of comprehensive methodologies for teachers to teach by video assistance, or finding the potentials of video in history class for junior high school students in contrast with the youth. Some focused on learning activities out of class. For instance, accessing the impact of interactive video on e-learning, enhancing the content of multimedia course for distant learning students via video, using video as an recording and self-reflecting medium on extending and enriching learning writing assignment, or researching on video games for learning promoting. The other video learning studies discussed the advantages and disadvantages of interactive videos versus non-interactive videos for learners.

Audiovisual media- video plays an important role in giving support for learning. But neither films nor videos was used in an optimal way. Why is that? How can the videos be fulfilled on teaching and learning? There have been definitely a large number of these doing research about video learning, yet few focused on understanding what people actually want to see while learning with videos. A thesis grounded on user study of video learning should be conducted to know how people utilize videos in their real life for improving video learning environment. (Teresa Chambel et al., 2001)



Some experts reviewed and integrated the preceding literatures to know the history of videos, but most of them solved video learning problems by using the advanced techniques. For instances, presenting a technical model for multimodal content of video recording for e-learning, meanwhile, discussing the role of hypervideo in learning environment for education field. But the principal point is that, as the normal learners, users do not use videos for their technical achievements or powerful functions, users use videos for their proper contents and the characteristics which are closed to their life. (Teresa Chambel et al., 2001)

Fortunately, some educational and anthropological researches of instructional videos concerned with people's needs. Some video studies deeply grounded on users' sharing behaviors. Where there is sharing, there is learning. These studies focused on video conferencing as friends' conversation and life sharing at home which informed the design of

future domestic communication technologies. (Tejinder K. Judge & Carman Neustaedter, 2010)

In order to support different learning modes effectively, we need to use different media or redesigned existent media in the different ways. When video are constructed properly, it will be powerful to foster learning activities. Carnegie Mellon University's just-in-time lecture suggested that the effectiveness of video-based education and training system are almost equal to the face-to-face instruction. (Teresa Chambel et al. 2001)

Researchers of the dissertation, *Instructional video in e-learning- assessing the impact of interactive video on learning effectiveness*, said that lack of interactivity is a major problem with the use of instructional video because most of the learners cannot catch the key point of the instruction in video. They projected that browsing a non-interactive video consumes the energy and time, and even browsing a textbook is much easier. (Dongsong Zhang, Lina Zhou , Robert O. Briggs & Jay F. Nunamaker Jr., 2006)

Because people have to concentrate on the screen and listen to the sequential narration to avoid losing any information, it makes learning activities through videos become harder and annoying. However, we still want to find if there is the underlying demand with video learning. Through potential requirement seeking, the better video learning environment can be provided. People's cognitive learning styles might be heavily influenced by television programs and videos, so the challenge of this time is to carefully find out right directions which improve learners' learning; meanwhile, do not overburden them or disturb their mind. (Valmont, W., 1995)

That is why we discuss the opportunities to leverage the niche videos market that are not reached today. We argue that the need of appropriate content presentation as well as videos platform to enrich videos learning experience. It is believed that designing an apt video by enhancing its service for users can truly enrich the video learning experience and help knowledge as well as skill of certain subject construction.

## 2.3 Learning Issue should be Taken Place in the Border Context

Learning types and background knowing of learning activities will be presented in order to clarify learning perspectives in this thesis.

### 2.3.1 The Definitions of Learning Types

Different terms of learning and their meanings which were proposed by prior experts will be introduced as follows.

The first one, also the most common and general one, is the *traditional learning*. At the early stage, *traditional learning* typically referred to face-to-face learning in the classroom with lectures or seminars. As advent of the Internet, *e-learning* or *electronic learning*, *augmented learning*, *distance learning*, *on-line learning* or *web-based learning* were created to draw all the learning activities which involve the Internet or electronic environment. *M-learning* is the abbreviation of *mobile learning*, and it clearly means learning through mobile devices. *Discovery learning* and *experiential learning* are the activities or life experience associated with playing or trial-and-error. *Informal*, *formal*, *non-formal learning* are classified according to learning places weather within a teacher in class or without teacher in daily life. Although formal learning traditionally means official and regular learning settings with classes, Julian Sefton-Green (2004) proposed that there can be a formal learning happened in our home or an informal learning at school. The words that she said bring a thought about lifelong learning. Life-long learning says that one cannot live without learning in his or her whole life.

Moreover, the *blended learning*, a popularity term in educational field for recent years, refers to a mixture of different learning conditions. Blended learning can shape in many forms, depending on teachers' and learners' decisions. There are various approaches of blended learning. No specific definition for blended learning has been defined. The terms "blended," "hybrid," and "mixed-mode" are all used to present the mixed learning ways and they are interchangeably in the current research literature. (Wikipedia, 2012)



In addition, Valiathan (2002) provided another concept of learning: skill-driven learning, attitude-driven learning, competency-driven learning. So far, different learning terms are too many to put in this thesis. Learning can be explained in many ways from the mixed points of pedagogic, learning objectives and motivations, learning contexts, learning styles, learning media, learning theories, learning environment, different perspective of cognitive, behavioral, experiential, and who or which devices involve in learning activities.

Besides, the whole descriptions above were almost taken from the interpretations of teachers, instructors and course designers in pedagogic or instructional field. The breadth and variety of learning definitions nearly represent that anything can be regarded as a part of blended learning or lifelong learning. Obviously, understanding the use of all these learning terms do not help us to enrich the users' learning experience in the actual way. (Martin Oliver & Keith Trigwell, 2005)

### **2.3.2 Learning Everywhere**

There is no need to distinguish clearly what type of learning will be focused on this thesis. We want to emphasize more is the concept of lifelong learning rather than the term or a definition of lifelong learning itself. Early in the former decade, Julian Sefton-Green (2004) said that the state and understanding of out-of school learning need to be accorded while talking about informal learning. The essence of lifelong learning and informal learning both require learning experience not only in school but also in the wide range of our life time with sustained periods.

Furthermore, in the age of great interest in learning, especially the era called knowledge economy. Learning should be regarded as an easy, interesting activity that even it can be done in leisure time. Then, the realization of learning will be more relevant to the viewpoint of this thesis. Learning can be more meaningful, understandable and interesting. It will be no longer connected only with school books, examination for pursuing better career, college or position. Learning with no pressure can border the understanding of learning activities in a

more meaningful way. Learning in daily life without stress will make learners more flexible and free. This kind of learning can be taken for granted. It is invisible and people would not recognize learning without stress a type of learning. It sometimes happens with self-directed or intentional strength to learn, sometimes it just occurs casually with no purpose to learn. No matter where or when it appears, the truth is that people in modern society must be a learner until the end of their days. (Michael Eraut, 2004; H.G. Wells, 1938)

Learning activities are pervasive as the air. The role and impact of videos in the era of knowledge economy will be found out in this thesis. The research focused more on video learning in leisure time and daily life rather than learning with instructions, teachers or any school assignments. Also, the term “learners” mentioned in this study are closer to indicate the one who learn positively by himself or herself in a more casual way rather than the one learning certain knowledge seriously by forces of others.

As a consequence, an interesting, universal topic-baking was picked to understand how people learn with videos during their leisure time. Even learners learn with self-added pressure and the conscientious attitude can be in learning scope of this study, as long as there is no harsh test accompanied with curriculum. Because there have already had so many video learning studies focusing on formal learning with instructors, the thesis will concentrate video learning more on learning in life experience or leisure time.

This kind of learning activity face the problem that context of learning from users' experience is not easy to observe. Educational formal learning at school was settled and preformed in regular place. It can be predicted and estimated by changing the controllable condition. When researching in the real school, the area of studies was nearly well controlled. But the border definition of learning we referring can take place anytime at everywhere. The acquired knowledge of life experience learning is hard to test in an examination even though the benefit of learning might be explicit. It is hard to measure if there is no outcome of the performances. Therefore, baking was chosen to be the research content because it will certainly have some productions after baking. (Julian Sefton-Green, 2004)

### 2.3.3 Knowledge Construction

For the purpose of understanding learning, basic realization about how people learn and how instructional media actively influence our learning experience should be constructed first.

Knowledge cannot be simply transfer from the instructors to learners, as a result of learners had not experienced all that the instructor has. Although the instructor shares an experience in detail, learners' interpretation of that experience would be very different from the instructor's because it is related to prior personal experience. As Wegerif, R. (2002) proposed that learning is seen as the process of adjusting our mental models to accommodate new experiences; therefore, it is normal to have a gap between instructor and learners. Although the term "instructor" was used in this thesis, but the role like professor or advisor in formal teaching and learning way are not the meanings we want to communicate. It is much more similar to mentor who share information or knowledge or life experience with others who want to learn. (Julian Sefton-Green, 2004; Hee Jun Choi & Scott D. Johnson, 2005)

In knowledge construction process, multimedia messages are the aids to sense making; while in information acquisition process, multimedia messages are as information delivery vehicles. (Mayer, 2001) Furthermore, some argued that professional, managerial and technical performances of learning are normally complex and typically involve use of several different types of knowledge and skills concurrently. Baking can be a technical or special in professional performance for humankind which requires many knowledge and skills to do. This type of learning has to be learned more holistically in order to construct it comprehensively. (Michael Eraut, 2004)

But how we create the holistic learning environment for baking learners? What is holistic for them? *"Applications of the new technologies should provide ways for the variety of minds to gain access to knowledge."* (Shirley Veenema & Howard Gardner, 2001) The idea

gave us the expectation on building a better comprehensive video learning environment. We need to know how variety of minds access in baking learning.

In addition, the daily learning vehicle like television, video, and the Internet are providing learners with a new profile of cognitive learning skills. Learners learned most of the time following with the presenting of media. It differs from the former learners in earlier stage when the technologies had not been provided. What is more, video, as a tool to communicate, play an important role for producing an appropriate content for learning. It carries various materials so that it can bring great impact on users.

### 2.3.4 Baking

Most of people know baking much about bakery food related to sweet. For instance, cake, cookies, bread or dessert. Besides this, baking culture and customs could differ from country to country. This section will introduce what is baking, and roughly describe the common products of baking in Taiwan.

Baking is the food cooking process by using dry heat in an oven. *"It is primarily used for the preparation of bread, cakes, pastries and pies, tarts, quiches, cookies and crackers. Such items are sometimes referred to as "baked goods," and are sold at a bakery. A person who prepares baked goods as a profession is called a baker. It is also used for the preparation of baked potatoes, baked apples, baked beans, some casseroles and pasta dishes such as lasagna, and various other foods, such as the pretzel."*(Wikipedia, 2012)

According to Taiwanese bakers, the temperature and time controlling are the major factors to make a good bake. Bakers need recipes to bake. In general, a recipe includes ingredients and steps of baking procedures. Some attentive recipes even show the time and the temperature at every stage. It is goodhearted to put photos with gestures and status of materials or pictures of the required tools and facilities in recipes for Taiwanese bakers.

Some common baking ingredients like gluten, flour, dough, yeast, lactic acid, rye, and

special baking procedures like chiffon method, cream method, piping decorations for cakes, whipping egg white, and some baked goods like croissant, pastry, cupcake, chiffon cake, macarons will be mentioned in this thesis for further illustrations.

## 2.4 Research Methodology

The educational objective taxonomy is a framework for classifying the status which teachers anticipate or intend students to learn with levels. The taxonomy not only help teacher to achieve their teaching goals but also instruct students to learn step by step in a proper way. Therefore, the taxonomy of educational objective can be used for instructors on goal teaching settings. For learners, it can be adopted to evaluate their learning effectiveness. This section has been written as thoughts that readers are coming to the topic fresh with taxonomy of educational objective in the educational fields. As for the taxonomy of educational objective, it can be categorized into three domains: cognitive, affective, psychomotor. (David R. Krathwohl, 2002; Clark, D., 2001)

The most widely used Taxonomy of educational objectives assessment is Bloom's Cognitive Domain. (1956) The other two domains, Krathwohl's Taxonomy of Affective Domain and Simpson's Taxonomy of Psychomotor Domain, are the best known in all the categories. Both methods will be introduced here in research methodology paragraphs. Also, Bloom's Taxonomy of Cognitive Domain, especially in revised version-Bloom's Taxonomy Table, which was utilized in this thesis, will be interpreted in the following sections with more details. Table 1 below shows the comparisons among three taxonomies. (Imrie, Bradford W., 1995)

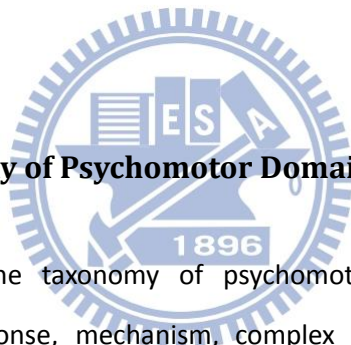
<b>Taxonomy</b>	<b>Domain</b>	<b>Year</b>	<b>Objectives</b>	<b>levels</b>
<b>Bloom's Taxonomy</b>	Cognitive	1956	Remember, Understand, Apply, Analyze, Evaluate, Create	6
<b>Krathwohl's Taxonomy</b>	Affective	1964	Receiving, Responding, Valuing, Organization, Characterization by a value or	5

			value set	
<b>Simpson's Taxonomy</b>	Psychomotor	1972	Perception, Set, Guided response, Mechanism, Complex or overt response, Adaptation, Origination	7

Table 1. The Comparison Among Three Taxonomies

### 2.4.1 Krathwohl's Taxonomy of Affective Domain

Among three famous taxonomies of educational objective, the affective domain is the most abstract one. It is widely used to evaluate the objective of attitude, interest, belief, value, and emotional style. The affective domain deals with learning, including five objectives: receiving, responding, valuing, organization, characterization by a value or value set. See Appendix A for more information about Krathwohl's Taxonomy of Affective Domain and the Table of its hierarchy.



### 2.4.2 Simpson's Taxonomy of Psychomotor Domain

Simpson (1972) built the taxonomy of psychomotor domain into seven levels: perception, set, guided response, mechanism, complex or overt response, adaptation, origination. It is concerned with the skills performance. It generally utilized on actions or behaviors which are concrete. See Appendix B for more information about Simpson's Taxonomy of Psychomotor Domain and its hierarchy. (Imrie, Bradford W., 1995)

### 2.4.3 Bloom's Taxonomy Map

The Bloom's Taxonomy Table of Education Objectives is fruitful to utilize here for analyzing learning and sharing data from interviews, because it is the best known taxonomy of educational objectives and the widest utilized in many subjects. It can be used in classifying the memory, thinking, discrimination, and application of people, events and activities as long as with related to learning objective. As a result, it has been discussed as a way to concern about classified levels of intellectual behaviors for learning a long time.

Also, it has served as the most useful structure for writing and setting measurable learning objectives. Bloom's Taxonomy map will be utilized in thesis to help the research goal approaching. (Dian A. Dooley, Ph.D., 2004)

In 1956, a primary framework of Bloom's Taxonomy map for categorizing educational objectives was firstly announced by the book, *The Taxonomy of Educational Objectives and The Classification of Educational Handbook I: Cognitive Domain*, and the editor was B.S. Bloom.(see the Appendix C with the interpretation of Bloom's Taxonomy map in 1956 version.) The authors of the *Handbook* believed that the Bloom's Taxonomy might be used to help teachers plan and deliver appropriate instruction, design valid assessment tasks and strategies, and ensure that instruction and assessment are aligned. Bloom (1971) stated that each major subject should have its own taxonomy of objectives in its terminology with more detailed, specific language and thoughts of its experts.

After 45 years, Bloom's Revised Taxonomy was published by Lorin Anderson who addressed that as new knowledge economy providing a basis for change and developing in learning environment, the revision is overdue and expected. Since 1956, the first Bloom Taxonomy was created, there had been broadcasted several Taxonomy adjusted from the original. In 2009, Andrew Churches provided a digital version to cope with the age of modern technology society, called Bloom's Digital Taxonomy. (See the Appendix D with the interpretation of Bloom's Digital Taxonomy map in 2009 version.) It changed some elements in each level from previous one, but the structure was the same. Andrew Churches emphasized the taxonomy is just a medium. It is not about how we use while standing at different levels; it refers to these tools to achieve the objectives. (Lorin W. Anderson, David R. Krathwohl, Petter W. Airasian, Kathleen A. Cruikshank, Richard E. Mayer, Paul R. Pintrich, James Raths & Merlin C. Wittrock ,2001; Andrew Churches, 2009)

Having objectives help learners concentrate on one direction they have chosen, objectives indicate that learners could make effort toward it and accomplish it. Good learning activities and experience ought to be consistent with the selected objective. Objective can be clearly or fuzzily conceived, explicit or implicit. The term of objective might

be changed to aim, purpose, goal, and guiding outcome. Stated simply, learners firstly have an objective, then, they will know where to begin and what to learn next. (Lorin W. Anderson et al. 2001)

As a consequence, the revised one from Lorin Anderson released in 2001 was utilized in the thesis which changed the original version into two dimensions to measure objectives. It is more handy and helpful to analyze in order to approach the research the aim. It used the statement of the objectives to classify. A statement of an objective usually includes a verb and a noun. The verb generally indicates the intended cognitive process, and the noun normally represents the knowledge learners are expected to construct or acquire.

The verb and the noun are translated into two dimensions of revised Taxonomy Table about cognitive process and knowledge dimension. (See Table 2) The cognitive process dimension, that is, the levels of figure 1 and the columns of Table 2, contains six categories: *remember, understand, apply, analyze, evaluate, and create*. The cognitive levels underlying is assumed to be learning with lower order thinking skills and less complexity.

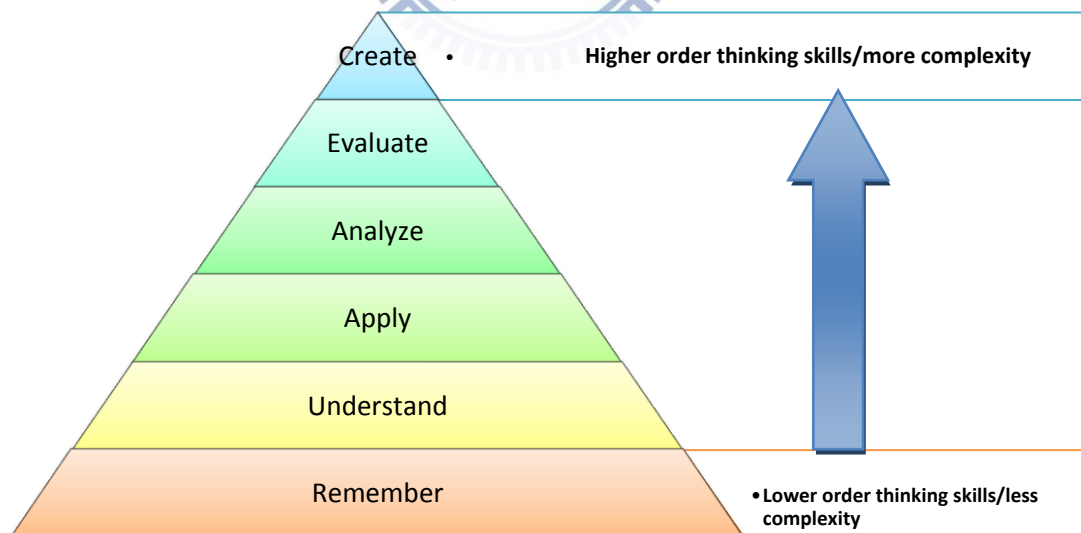


Figure 1 The Cognitive Process Dimension of Bloom Revised Taxonomy

The knowledge dimension, namely, the rows of Table 2, contains four categories: *factual, conceptual, procedural, and metacognitive*. Four categories are assumed to be the



continuum arranges from concrete (factual) to abstract (metacognitive).

<i>The Knowledge Dimension</i>	<i>The Cognitive Process Dimension</i>					
	<b>1.</b> Remember	<b>2.</b> Understand	<b>3.</b> Apply	<b>4.</b> Analyze	<b>5.</b> Evaluate	<b>6.</b> Create
<b>A.</b> <i>Factual Knowledge</i>	A1					
<b>B.</b> <i>Conceptual Knowledge</i>			B3			
<b>C.</b> <i>Procedural Knowledge</i>						
<b>D.</b> <i>Metacognitive Knowledge</i>						



Table 2 The Taxonomy Table

Now consider how to classify the objectives to fit in the Table. For example, “*learners want to learn the names of the major works of American and British novelists.*” “*Learn the framework*”, in the Revised Taxonomy Table, indicates recognizing or identifying, as at the level of *remember*, and “*names of the major works of American and British novelists*” was suggested to be the *factual knowledge*. (Please refer to the Appendix E for the knowledge dimension and Appendix F for the cognitive dimension)

Thus, the objective of the statement means that learners want to remember some factual knowledge and this objective can be put in A1 in Table 2. Then it can be predictable that when learners at the stage of “*remember some factual knowledge*”, trying to learn the factual knowledge-namely being a novice, they might also access with some terminologies or specific details or information related to novice.

For another example, *“learner wants to learn to use laws of electricity and magnetism (such as Lenz’ law and Ohm’s law) to solve problems.”* To place this objective in the Taxonomy Table, the verb and noun phrase in relation to the categories of the table should be examined first. Clearly, the verb is *“use”* and the noun is *“laws of electricity and magnetism”*. The verb, *“use”* can be translated into implementing at the level of *apply* referring to the cognitive process dimension Table. With respect to the noun, *“laws of electricity and magnetism”*, laws are principles and generalizations and it is associated the *conceptual knowledge* referring to the knowledge dimension table. (Please refer to the Appendix E for Table of knowledge dimension and Appendix F for Table of the cognitive dimension) Thus, we know the learner wants to learn applying conceptual knowledge and it is B3 to fit the table 2.

The statements of the objectives or actions are clarified according to two Tables- the knowledge dimension Table and the cognitive dimension Table. Yet, some might say that it is difficult when objectives lack important words or phrases. Sometimes what the words and phrases people expressed did not always mean what they exactly mean. Therefore, placing the statements of objectives in the Taxonomy Table requires the one knowing the actual purpose of the learner or their learning intentions of the words.

When engaging in categorizing the objective in the Table, two important points should be noted here. To begin with, different types of objectives require different learning approaches, namely, different learning activities, materials, instructors, media and learners should be involved in different objectives separating from one to another in Bloom’s Revised Taxonomy Table. Secondly, similar types of objectives, regardless of differences in the topic or subject matter, may require similar learning approach.

It is about how to apply the Table to enhance research and advance the issues of video learning, it is not how to categorize the statements precisely. Two considerations above are also the reasons why this taxonomy model had been chosen to use in this study. The hope of research is that video learning issues could be applied widely in the future. (Lorin W.

Anderson et al. 2001)

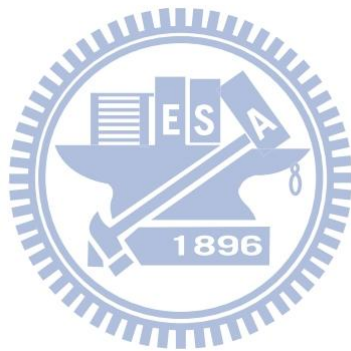
Although two dimensions were used to classify the objectives of learning process, it does not represent that learners should start at the lowest taxonomy level of cognitive or either at the end of the concrete side or the abstract side to start their learning. To be more precise, the learning process can begin from any point of the taxonomy. The lower levels will be encompassed within the scaffold learning task only. Some people might argue that it is not each learning task, action or process needs all stages of it, the others debated that we need not reach to the create level in the certain professional learning. (*Andrew Churches, 2009*)

Some experts emphasized that no matter learners begin at which level, the inherence of learning is still going to go along from prior stages. However, it depends on the learners. Learning can start and end up at any point of the Bloom's Revised Taxonomy. It is not expected to use it to fix learners' step and limit where they should go or what they should do. The stages of Bloom's Revised Taxonomy Table truly provide the means to promote learning process to more directional way. It gives perspectives to guide learning decisions. Discussing the other arguable issues does not help the research here. Learning objectives of baking activities with different media and video will be organized in Taxonomy Table in the chapter four.

## **2.5 Summary**

The chapter was used to be as the role of reference for readers reading. It was separated into four parts by multimedia, video, learning and research methodology, respectively. The section of multimedia describes the definition, the rationale combined with learning, and classifications of different media in order to know multiple media using at present. Video section provides the former researches and discussions about videos in different aspects, and also the studies about how video learning has been reviewed. The third section related to learning, gave the realization about what is learning, where it takes

place, and how learners learn from instructors. It is for readers to know what authors think of while talking about learning. Baking section is for the readers who were unfamiliar with the subject. Finally, research methodology, makes the comparison of three educational objectives taxonomies and the best one was chosen to use in the thesis.



## **-Chapter 3- RESEARCH METHODOLOGY**

Video as the new pervasive medium for lifelong learning, definitely has its own potentials to provide better learning sources and content. However, it is still not adequate for learners to learn with videos at present. This thesis expect to find the answers of the basis of baking learners' social activities without media, the realizations of baking learners' social activities with media, the knowing of baking learners' video learning activities, and the implications for improving video learning environment in social context.

In order to access the research goal, in-depth interview was conducted for user experience research. Affinity diagram and Bloom's Taxonomy were used to analysis the users' data. Three conscientious methodologies will be interpreted in this chapter. Research process and research issues will be provided to follow the procedure of this study easily.

### **3.1 Research Issue**

The main purpose of this research is constructively approaching the potential of video learning in social environment. The research addresses unanswered issues based on using videos as the baking learning media. The context of video using for learning based on user study will be realized. However, the particular questions should be replied first in order to access the objectives.

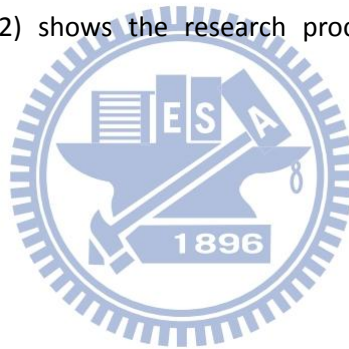
How do baking learners learning present-day? What is the pattern of social learning environment nowadays? How bakers utilize multimedia to learn? What are different characteristics among various media for improving bakers learning? What can videos provide to help bakers to have a better learning experience? What are the advantages and disadvantages while bakers learning and sharing with videos? What happened when people learning through videos in social learning context? How can we use the power of pervasive

video as a constructive learning tool in the highly social environment?

The research methods of interview, affinity diagram, and Bloom's Taxonomy Table will be implemented to present the answers of the issues; meanwhile, getting closer to the objectives of this thesis step by step.

### **3.2 Research Process**

To find learners' video learning context as well as videos' potentials and characteristics, so this study was based on user' video learning experience. Baking was chosen to be a topic of the study content. The research process will pay attention to users' video learning and their sharing experience with regard to baking for research conducting. The following figure (figure 2) shows the research process with its deliveries and its belonging stages.



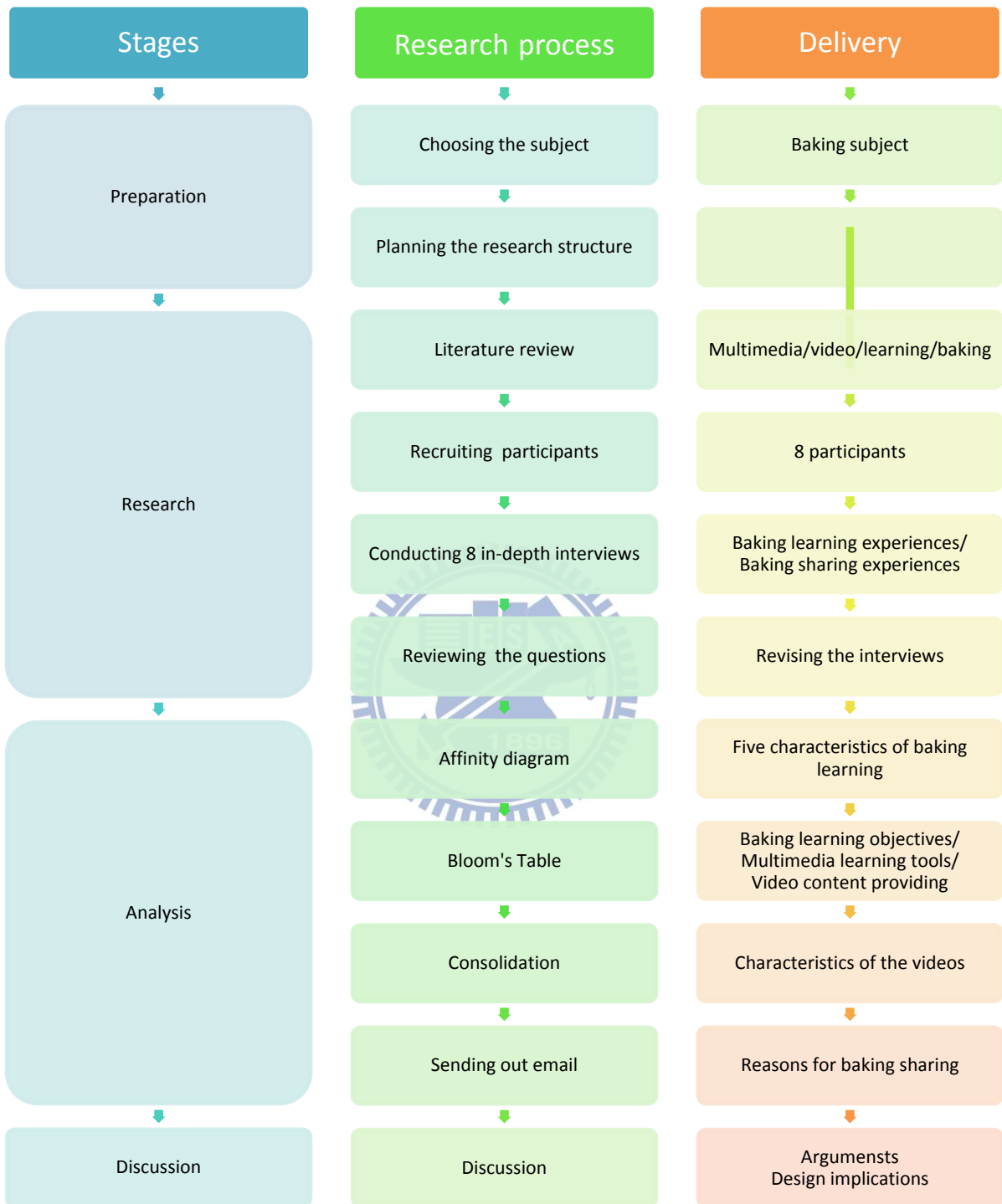


Figure 2 Research Process

### 3.3 User Study

In order to figure out how modern people learn with baking, the in-depth interviews were conducted firstly to understand learners' baking learning experience. The steps included planning the interview, recruiting, writing the structure of it, interviewing, and reviewing the questions.

#### 3.3.1 Recruiting

The extent of learners' baking experience, namely, how is he or she good at baking, will present different learning patterns with different learning objectives when they learn. It is anticipated to recruit different levels of learners in this study. Information related to learning baking was widely collected. Also, the Internet is helpful to scope the baking conditions in Taiwan and find the bakers in certain places.

Then, people doing baking in Taiwan almost work in the following places: the traditional bread or cookie store, coffee shop, food ingredient store, light meal or business meal restaurant, baking technology and management department of university, the baking class in community, the club of baking in school, and the association of baking held by private company or government. We sent the invitations to almost thirteen people who reach the requirements. The requirements are people who have baking learning experience and have ever used videos to learn baking information or skills.

Finally, eight participants were recruited. Table 3 shows the profiles of eight participants.

	Gender	Age	Career	Seniority/years
Participant 1	<i>Female</i>	<i>39</i>	<i>Pharmacist</i>	<i>Too long ago</i>
Participant 2	<i>Male</i>	<i>25</i>	<i>Designer</i>	<i>Too long ago</i>
Participant 3	<i>Male</i>	<i>27</i>	<i>Designer</i>	<i>Too long ago</i>
Participant 4	<i>Male</i>	<i>20</i>	<i>Student</i>	<i>3</i>



Participant 5	<i>Female</i>	<i>30</i>	<i>Bakery boss</i>	<i>10</i>
Participant 6	<i>Female</i>	<i>50</i>	<i>Finance</i>	<i>5</i>
Participant 7	<i>Female</i>	<i>41</i>	<i>Cake-modeling</i>	<i>8</i>
Participant 8	<i>Female</i>	<i>44</i>	<i>Housewife</i>	<i>13</i>

Table 3 Participants' Profile

### 3.3.2 In-depth Interview Structure

The interviews were taken place in different coffee shops which offers light meals and during March 2012; each interview in an average length of 1.5 hours. The structure of interviews followed ordinary interview structure: introduction, warp-up, general issues, deep focus, and wrap up.

The part of introduction and warm-up is the time using to make interviewees feel comfortable staying with us. The background of us was introduced. Then, we had a small talk with each other; meanwhile, the recording equipments were set. Sequentially, interviews began with general issues and followed up with in-depth questions.

The wrap-up time was utilized to ask the participants about their feelings or thoughts through interview from his or her experience in order to receive the feedback and for the interview reviewing afterwards. Table 4 shows the outline of the interview. The interview questions in detail will be placed in Appendix G.

---

#### Stage One- Introduction & Warm-up

Object-Getting both interview and interviewee comfortable in talking

Average time cost-10mins

1. *Introduce myself*
2. *A small talk*
3. *Interpret the interview*

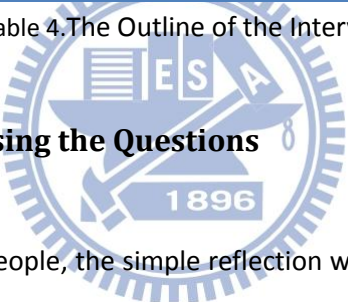
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#### Stage Two- General Issues

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<p>Object-Understanding the interviewee’s background and general baking learning experience</p> <p>Average time cost-25mins</p> <ol style="list-style-type: none"> <li>1. <i>Personal profile</i></li> <li>2. <i>Background of baking learning experience</i></li> <li>3. <i>Technology usage background</i></li> </ol>
<p>Stage Three- Deep Focus</p>
<p>Object-Drawing out the detail of baking learning experience</p> <p>Average time cost-40mins</p> <ol style="list-style-type: none"> <li>1. <i>Get deep in baking learning experience</i></li> <li>2. <i>Positive sharing baking experience</i></li> </ol>
<p>Stage Four- Wrap-up</p>
<p>Object-Getting feedback of the interview experience</p> <p>Average time cost-15mins</p> <ol style="list-style-type: none"> <li>1. <i>The perspective of interviewee in the interview</i></li> <li>2. <i>Appreciation</i></li> </ol>

Table 4. The Outline of the Interview



**3.3.3 Reviewing and Revising the Questions**

After interviewing three people, the simple reflection was held to review the questions. The notes of three interviewees were roughly integrated. Then, it shows that there are some questions lost in the interview might be helpful to the research. For instance, what is the important baking learning method for you? How do you learn different things? What is your learning habit? As you know, how to construct the knowledge of baking? What is the expertise of baking do you think of while talking about it? How to learn well in baking field? How to achieve the better quality of bake? What is your suggestion for baking novice? How to teach baking according to your experience? What information or material do you need and what is the most vital for you when you need to do a bake? How is video important for your baking learning experience?

Gaining so many questions in interviews makes interviewing time become longer and probably makes the interviewees too tired to answer the questions actively. Therefore, we shortened the introduction and warm-up time as well as wrap-up time from 10minutes and

15minutes to both 5minutes separately. The revising questions with the same interview structure were sequentially done later with the other five participants.

### **3.4 Affinity Diagram of Baking Learning**

The collected data from interviews can be done as a full analyze in different ways. Affinity diagram method is collecting the observations or interviewees' statements into clusters of trend in a hierarchy. It was largely using in qualitative research to analysis the key points of findings. It will be used to organize our users' data in this study.

The transcripts were taken down by listening carefully to the recorded tape after interviews. Four hundred and fifty notes were created from eight interviewees. Each of notes was translated into statements, then, organized into forty groups. The statement which is single to have a group had been filtered out. Finally, four clusters were generated in the top levels of affinity diagram. There are four strata in affinity diagram.

### **3.5 Bloom's Table with Baking Videos**

User study allows researchers to ask fundamental questions about learners' baking learning experience, motivations of using video, and their methods of learning. Apart from user study taking deeply understanding with users, the analysis method from educational filed was borrowed. To uncover the time that learners using videos to learn and the objectives of their learning, Bloom's Taxonomy Table was utilized.

Learners' baking learning behaviors and context were realized through interviews, especially with regard to learners learning through different media and videos. Baking learning objectives of learners will be classified with Bloom's Taxonomy Table because previous literature reviews and interviews have shown that learning activities are followed by objectives. Furthermore, people nowadays in the age of progressive technology, get accustomed to learn through multimedia for the purpose of convenience. Also, getting from interviews, baking learners adjust their learning activities through different media with

different goals and stages. Therefore, Bloom's Taxonomy Table will be utilized in order to know the relationship between baking learning objectives and multimedia, especially videos.

First of all, we extracted the main common objectives they generate in their baking learning daily life according to interviewees' words through interviews. When they wanted to learn something, the objectives show, and followed by how to make it or refer to what tools or people to learn. The gateways of baking learning and the used media will be listed with objectives in the chapter four.

Learning objectives followed by different accessing gateways and multiple media using have interpreted. Then, for the convenience of reading and understanding, the same objectives mentioned above from A to N will be organized in the Table. But the media using with each objective was replaced into major objectives items. Besides, the term "narration" to was changed to "audio" for a better understanding.

Finally, Bloom's Taxonomy Table of baking video learning objectives was provided with highlights on the blanks of baking learners video using. As long as they had ever used videos to reach the objective, the blank will be filled with a check sign.

### **3.6 Baking Video Sharing Reasons Collecting from Emails**

After multiple organizations of our findings, the context of baking learners learning and the data of learners' videos as well as multimedia using were enough to approach our issues. Yet, a small doubt needs to be fixed. All the learners from interviews did not actively share their baking experiences through videos, but in the meantime, they learn a lot from other video sharing. Losing active sharers' points of view makes this study uncompleted while considering that video learning should involve sharing activities.

Therefore, the emails were sent to the baking sharers who actively shared their baking information and experience on blogs, books, especially videos. They are all discovered by the directions of interviewees in the user study. These interviewees may not highly rely on those

sharing resources to learn, but they have ever heard them or found them while searching the learning sources before. The questions are: why sharing? Usually doing what with sharing? Usually share to where/ whom? When to share? The frequency of sharing? How do you think about sharing? Using what tools to share? How much time do you spend on sharing? When do you start to bake? When do you start to share? Care about sharing feedback or not? Often use what method to learn baking?

The questions were sent to twelve sharers by emails and for the one who has a blog. The messages were sent to invite them to see and replay their emails. Among twelve actively sharers, there are four people who have baking video sharing experiences. After three weeks, only five responses were received. Four of them actively share through their blogs or books and without any video sharing experience. The other one, the most active sharing person, has lots of experience on baking sharing through books, blogs, classes, and videos. Her sharing is owing to her wish of being a good baking teacher and the author of baking blog as well as baking books. She likes to teach and help others to improve baking skills. This participant will be mentioned in the chapter four and five as *respondent 1*.

### 3.7 Summary

The conscientious methodologies of interview, affinity diagram, Bloom's Taxonomy, were conducted to get the data of video learners and sharers in this chapter. The research process and research issues in this thesis were provided here to clarify the stages and procedure of this study.

## -Chapter 4- FINDINGS

After research and analyze methods including interviews, affinity diagram, and Bloom's Taxonomy, the findings will be organized in this chapter. It will be separated into four parts as showing the characteristics of baking learning from affinity diagram, the content provided by baking learning videos from Bloom's Taxonomy Table, the characteristics of videos, and the reasons making bakers learn worse from sharing sources.

### 4.1 Baking Learning Background from Affinity Diagram

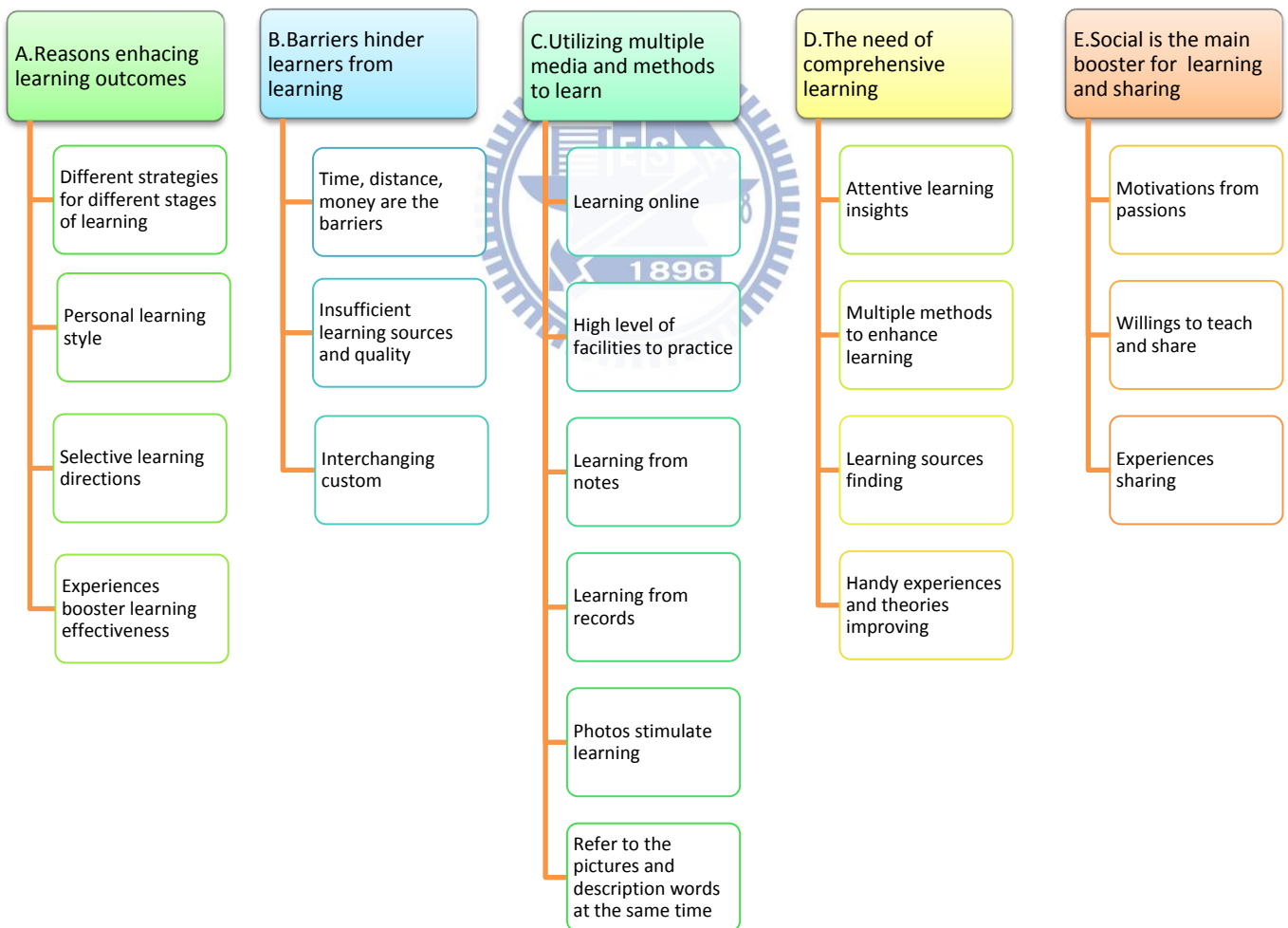


Figure 3 Baking Learning Affinity Diagram in Two Strata

Five clusters of affinity diagram shows the thoughts to help us know the learning environment at present, especially baking learning experience with regard to different media and videos. Five characteristics-A to E of baking learning environment with instances are as follows. (Three strata affinity diagram of forty notes in Mandarin Chinese will be put in the Appendix H)

A. Reasons enhancing baking learning outcomes

- knowing what they need to learn, where the professional way they are, and how to improve.

In the statements, we found that most of baking learners are clearly know what they want to learn next. They set different goals based on their own ability and learning experiences. As they were novice in baking field, they learned step by step. They begin to learn with terminologies of baking. They practice and practice in order to get familiar with particular process and understand common combination of the ingredients. As they had the basic knowledge above, they learn comparatively much quicker with the key elements supported.

*Participant 6: "Generally speaking, now I can do anything new with a glance of the recipe."*

Experienced bakers have abilities which beginners do not have. They make use of the knowledge and baking experience to new bake making. Furthermore, they can distinguish which teaching or sharing source is suitable and helpful for them to fix baking weakness of their own.

*Participant 7: "If I found the skills in baking learning video is too tough to understand, I will stop watching it and find another easier video at once."*

*Participant 5: "I often click the timeline of youtube video randomly rather than watching it from the beginning to the end, because usually I only want to watch a certain part which I am*

*interested to learn in baking videos.”*

In conclusion, there was a difference between all these active, self-pushed learning behaviors and the traditional learning activities within teachers. With traditional learning, learners have no choice to decide what they want to learn next and they can only follow the teachers' instructions. Baking learning is the kind of learning activity we will do during our leisure time. Owing to lower stress of learning, baking learners are willing to learn. They clearly know their goal of baking and what to access. They are able to choose what they would like. As a result, the videos or learning resources show clearly that those tools have actually provided both in title and content for making learners' convenience of choosing, or they will be disappointed about the sharing resources.

*B. Barriers hinder learners from learning*  
*- the immature baking learning environment*

Though they are interesting to baking and positively willing to learn everything associate with baking, even more, with food, they still cannot learn well while they want.

*Participant 6: “I am busy enough on my work and I get used to practicing baking off duty at the night of the week. I usually spend my weekend with my children, so, if I want to improve my baking skills besides spending practicing time, I would rather go finding a teacher to instruct me and answer my questions! That’s more effective! But I have not taken cake decoration class to do flower decorations which I always want to learn. The tuition is too expensive, and also the place is far away from mine. And of course I know there are lots of cake decoration videos online, but I am not used to search the Internet and I think videos are often too long for me to watch it over.”*

Furthermore, foreign baking videos with foreign languages are comparatively much more than the videos sharing from Chinese. Unable to understand the words and the captions showing in the video cause learning barriers, even some have difficulty searching the right videos for personal learning.



*Participant 4: "The more learning experience you have in the fields, the more you get used to finding the constricted sharing baking environment it is."*

They said most of baking source in Taiwan, including baking books, baking blogs online, video, materials in class, even teachers' words are fragmental. It often makes them frustrated while referring to the recipes, especially as they were a novice. The reason might be the profession of baking is more skilled. It should pay much more attention on self-practicing with handy experiences. So, it is hard to share or learn actually in details from others. Or, the old stagers of baking in Taiwan were mostly beginning from practical apprentice. They know what and how to do rather than why to do it. In the baking class, they give the demonstrations, then, students watch and do likewise. But they never give the reason why they should add yeast power at this time. That is similar to one of the interviewees mentioned below.

*Participant 1: "If the baking videos just show me the way of baking, and sometimes more kindly by giving ingredients and steps in detail, I probably could not make it next time without the video instruction in sight, even it is not easy to make it now if I just watched it a minute ago. It is too hard to remember so many details and steps, but if I know why, the reasons, I can conjecture the sequence and what should add next."*

Above all, the reasons which sway learners' baking learning determinations were mentioned. To be more specific, time limitation, far distances, high tuition, questions answering, accessible of technologies, videos' length, language limitation, the fragmental baking sharing environment, the suitable context, and the holistic realizations of baking can all make baking learning more difficult.

C. The custom of utilizing multiple media and methods to learn  
- the contribution of technologies

Literature reviews said that pervasive technologies have great influenced our daily life,

but how? Here, the evidences of users who highly rely on computing technologies, networking and media will be presented.

Seven eighth of interviews said when they make a decision to learn something new, the first thing that come to their mind is searching on the Internet.

*Participant 8: "I used to type the keywords and find baking recipes sharing in others' blogs. There are several good baking writers who periodically update new bakery information in their blogs, daily or week. I have subscribed two bloggers who I think their sharing are more up-to-date, understandable and in detail. While searching, I get used to referring to certain unsubscribe bloggers that I trust."*

*Participant 6: "With the convenience of email, I can get the information of new bakery books in the bookstore. Every time I receive new book information, I click and link to the web pages of books at online bookshop and check if I am interested in it or not. Also, name of the authors, related recommendation of books from bookstore, the starts giving from cyber friend for books, relevant topics of baking will be drew out as other keywords to open new searching with powerful engines."*

They are proficient at searching keywords, they know how to key in a right word and some of them even enjoy in giving the keywords with Boolean limitations to find new baking things. When we asking about what they do with the technology last time and how they think of it with regard to an impact on them, one of them replied with astonished as below.

*Participant 7: "You must be kidding. What a question is that, who can live without the Internet. It is nearly my whole life! I am fancy at everything associated with baking, and when I am free, keying in any bakery name which comes out to my mind to dig something different is my hobby, and I really like to do it." "By the way, baking videos online were equal to my life before, at the time I began to learn baking. It is useful to learn baking with videos at the beginning."*

The other said that video provides sequential motions and gestures which often guiding her correct baking process. As the one who have no sense with handy experience, videos are easier to learn rather than referring to static books or websites. Some of them think the Internet with worldwide characteristics and searching function can partially replace traditional roles of teachers. Because sometimes they can luckily get the references of their questions with multiple sharing online resources, but most of the time they cannot find the answers.

*Participant 1: "Perhaps it has already shown in my sight, but I do not recognize that it is the right answer for me."*

Baking learners also utilize computers to record their learning information and practicing reflection. They type down the useful information or inspirations from bakery store, online searching, television programs, and baking class.

*Participant 8: "I have an account special for baking matters recording online. I add my favorite baking photos, useful steps, ingredients texts sharing, try-and-errors articles, valuable baking videos and helpful links in my account closet online. I do not share it to others, but it is worthwhile to do so many collections, especially when I forgot the know-how and details while doing baking, or when I need to refer to something new. It recalls me the key points I had ever remembered to help me fix the failure."*

However, with the convenient technology assistance, baking learners still face some difficulties to learn.

*Participant 6: "Up to date, I have learned various kinds of pastries and cakes, each of them were following the notes. You can imagine I have a large numbers of documents and files in my computer with baking knowledge representing by texts, images, photos copying from others' baking blog, and there are videos or maybe some vlog links saving in My Favorite. But when I want to bake, I am so lazy to find out the resource I need. I might be unable to find them if I really searched them. "*

Yet, two of them were afraid that the files were damaged and deleted accidentally, so they made all of them practical notes copying on the notebooks. In the case of video, interestingly, two of them do not know how to download the original files of online video; and further, they worried about the stop of videos sharing from cyber friends, so they have accustomed to use their own camera to shoot the computer screen which is playing baking videos from others' sharing. One interviewee said he gets used to utilizing his smart phone to shoot the key frames in videos, but he prefers referring and searching the sharing information presented by photos than by videos.

*Participant 4: "Because it is impossible to bake while watching a video, the personal computing devices are not suitable to put in the bake room. Although it can put in front of me while baking. I have no time to watch it. You know time control is vital for baking profession. Even if I have time to watch it, I might hardly keep up with its pace and absolutely I have no hand to pause it. And further, images and texts sharing can be easily posted on the wall of baking room after printing, but I do not know how to extract the information I want from the videos."*

They are all good at referring to multiple sharing resources from different media such as blogs, social networks, video stations, television programs, books, classes, different exhibitions, and even bakers of the pastry store. And if the baking learners were motivated by a baking television program, they will visit the official programming website to find more information.

*Participant 3: "I do not rely on single media to learn, that would be too restrictive."*

Video is sequential. Blog often have ingredients. Photos have key changes status of baking process. Books have grounded theories. Each of media has its own advantages and disadvantages in showing skills of baking.

D. The need of comprehensive learning

-both in implementation and understanding

Learners need to be able to organize and integrate learning information with well digested. In the subject with skill implementation, learning should have not only knowledge in mind but also handy experience by practicing. So does baking learning. If a baking learner knows a lot of baking knowledge but with no handy experience, he or she definitely will not have a good bake.

*Participant 5: "Thinking and realizing well are far from implementations, only practicing by hand can make you discover the problems in baking process." One senior baker in the interview stated.*

The words have indicated some thoughts to reflect. We just mentioned in the C point paragraph that videos are indispensable for novice baking learners cause they provide sequential demonstrations and easy to follow. Also, it reveals that watching the videos is difficult for learners while baking, then, how the novices learn baking with videos actually?

*Participant 1: "Do not laugh at me. I am used to watching the videos many times before starting to do. The ingredients have written down for preparing and shopping few days ago, so that I just need to put them in order on the baking table with my notes. The special terminologies and specific procedures which need more comprehension with it have already been searched from the Internet and printed out referring from others' blog. With regard to the steps, which are essential but the most difficult part to follow, I just watch it over and over again from videos to remember it. Because I do not ask myself to bake perfectly, the rough shape of production with sweet flavor is okay for me. Sometimes I failed, yet I did nothing but video watching and practicing again. By the way, there is a word, do one thing at a time. I have ever thought of that question, and I feel comforted when coming out that swimmer can not learn swim in the pool while watching the videos."*

*Participant 5: "Basically, I failed all the time by learning through video watching, so I do not like to refer to the videos. Comparing to taking the baking class, video learning is less of instructors; comparing to the books, video learning is lack of giving know-how in details, and performances of the noisy presenter." However, other one stands on the opposite side.*

*Participant 7: "I enjoy learning baking with videos shot from certain professions, they are good at making jokes and telling the stories, and their shows and interpretations are dedicated and attentive. But it is a little bit sad without touching the texture of the dough when the presenter said "add the liquid now with this status.""*

For learners, there are various gateways to learn in the advanced society. They should know how to organize the sharing resources and adjust them with personal practicing experiences.

*Participant 8: "If I found different steps and ingredients sharing in the videos, I would choose each part of them which making sense and combine them."*

E. Interactions motivates baking learners learning and sharing

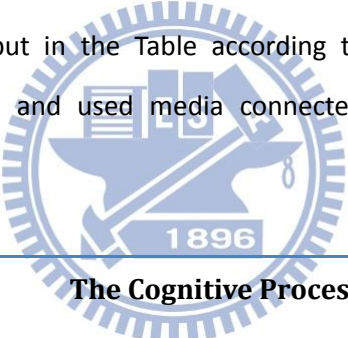
All the interviewees expressed that they need encouragements and realizations from friends or family members to support their hard baking learning process. They also need to find someone who know baking or have baking experiences to have baking discussions and experience interchanging to improve their baking learning skills, motivations and confidences. The intimate friends of baking can similarly be the mentors on life experiences sharing. With less familiarity, baking friends still can exchange baking news like baking classes, tuitions, and teachers. Two interviewees as baking learners motivate their learning by teaching others and share their personal experiences. They are willing to see other baking learners' advanced. They have found that sharing and teaching is the best encouragement to make them keep learning and getting highly professional. Moreover, baking is the professional subject about eating, so that the whole baking learners enjoy sharing their good final baking product to their friends and families with anticipating for the praises.

## 4.2 Bloom's Taxonomy Table

The following three Bloom's Taxonomy will be given to answer what does baking videos provide for learners in multimedia environment. It will be interpreted by Bloom's Taxonomy Table with baking learning objectives, multimedia learning tools, and with baking videos learning using in sequence.

### 4.2.1 Baking Learning Objectives

The common objectives for their baking learning from interviews were extracted. When bakers wanted to learn something, as the objectives shown, they followed by how to make it or refer to what tools or people to learn. The Table below shows main baking objectives from A to N, each objective was put in the Table according to its cognitive and knowledge dimension. Learning gateways and used media connected with each objective will be introduced in next paragraph.



The Knowledge Dimension	The Cognitive Process Dimension					
	Remember	Understand	Apply	Analyze	Evaluate	Create
<b>Factual</b>	A	B				
<b>Conceptual</b>		C	D	E	F	
<b>Procedural</b>	G	H	I			J
<b>Meta-cognitive</b>			K	L	M	N

Table 5 Bloom's Taxonomy Table with Baking Learning Objectives

A. Objective: Baking learners want to recognize the special ingredients and their appearances or terminologies. For example, gluten flour and its appearance.

Learning gateways: Taking handy classes, asking friends, searching websites, and recording.

Used media: words of the articles or narration, and pictures in the blogs

- B. Objectives: Baking learners want to find the specific details in baking recipe and steps, and then note them down in their notebooks. For example, recipe and steps of making muffin.

Learning gateways: blogs from television program official websites, PTT baking on Bulletin Board System (know as BBS), baking groups in Facebook, and baking books

Used media: words of the articles or narration, and pictures

- C. Objectives: Baking learners learn to compare and summarize between different methods. For example, the Cream Method and Chiffon Method.

Learning gateways: taking handy classes, baking instruction books, youtube

Used media: words of the articles or narration, pictures, and videos

- D. Objectives: Knowing time controlling of the ferment principles in order to apply it to various kinds of bread making. For example, using natural yeast to make different kind of bread.

Learning gateways: taking handy classes, asking friends, practicing with try-and errors, theory books, and recording.

Used media: words of the articles or narration, and pictures

- E. Objectives: Organizing how different characteristics of the ingredients influencing the time and temperature or finding the comprehensive knowledge of baking certain kind of item structures. For example, realizing the texture and density of wheat in the cross section pictures and its characteristics.

Learning gateways: theory books, attending seminars

Used media: words of the articles or narration, and pictures

- F. Objectives: Finding the reasons of failure. For examples, evaluating and detecting whether the cake making matches the right principles of whipping egg white.

Learning gateways: asking friends, searching websites, recording, and practicing

Used media: words of the articles or narration, and pictures



G. Objectives: Identifying the overall procedure of baking. For example, mousse cake made process.

Learning gateways: searching the video online, baking books which tell the general stories of baking, television program

Used media: words of the articles or narration, pictures, and videos

H. Objectives: Clarifying the changing of bake in different stages. For example, understanding the changing appearance and changing sequential of dough at different time and when to add more pastry margarine.

Learning gateways: practicing, watching the online video with repetition, and recording

Used media: videos, the words and pictures from own recording notebooks

I. Objectives: Learning to do the cake decorations on the basis of cake decoration knowledge. For example, using the piping gestures of the rose decorations skill on the basis knowledge to make lily decorations of the cake.

Learning gateways: practicing, and watching the online video with repetition.

Used media: videos

J. Objectives: Generating new procedure of baking. For example, creating quicker methods and steps with specific skills to make cup cakes.

Learning gateways: practicing, and watching the online video with repetition.

Used media: videos

K. Objectives: Applying the new ideas in baking from multiple resources. For example, knowing about the strategies to apply the new elements which learning from baking program in the process of pastry making

Learning gateways: multiple ways like taking classes, discussing with friends, attending activities, watching television program, searching websites and youtube, reading theory and baking books, practicing, and recording, et cetera.

Used media: words of the articles or narration, pictures, videos

L. Objectives: Knowing self advantages and disadvantages. For example, differentiating that softness and texture of the croissant from personal one to others

Learning gateways: sampling various kinds of bakery, taking classes, and a great deal of experiences

Used media: words and pictures from class materials, and narration

M. Objectives: Detecting the pros and cons of bakery making. For example, critiquing and judging the flavor and skills of new sweet on the basis of baking knowledge and experiences.

Learning gateways: multiple ways like taking classes, discussing with friends, attending activities, watching television program, searching websites and youtube, reading theories and baking books, practicing, and recording, et cetera.

Used media: words of the articles or narration, pictures, videos

N. Objectives: Creating their own special sweet. For example, designing a new, healthy but beautiful cakes for women

Learning gateways: multiple ways like taking classes, discussing with friends, attending activities, watching television programs, searching websites and youtube, reading theories and baking books, practicing, and recording, et cetera.

Used media: words of the articles or narration, pictures, videos

The objectives from baking learners are presented above from A to N, each objective followed with its learning gateways and media using to approach. The reasons why these objectives were classified into different places of Bloom's Table can be found in the section of research methodologies in literature reviews' chapter which interpret the Bloom's Table more clearly.

Noticed that these objectives are shown at learners leisure time, most of them have their own professional work in other fields. So the goals provided below do not represent one can become an experienced bakers from novice with going through all objectives,

namely, we do not supposed to give the guidance with what objectives should make to access baking. The purpose of the section is trying to find the advantages and disadvantages of different media through classifying the objectives in Table.

#### 4.2.2 Multimedia Learning Tools

Learning objectives are followed by different ways and multiple media using. The Table provided below was for reading convenient putting in the same objectives mentioned above from A to N, but each objective was replaced by the using media. Besides, we changed the term “narration” to “audio” for focusing on the modality of media itself.

The Knowledge Dimension	The Cognitive Process Dimension					
	Remember	Understand	Apply	Analyze	Evaluate	Create
<b>Factual</b>	words, audios, pictures	words, audios, pictures				
<b>Conceptual</b>		words audio, pictures, videos	words or audio, pictures	words or audio, pictures	words audio, pictures	
<b>Procedural</b>	words audio, pictures, videos	videos, words, pictures	videos			videos
<b>Meta-cognitive</b>			words, audio, pictures, videos	words, audio, pictures	words, audio, pictures, videos	words, audio, pictures, videos

Table 6 Bloom’s Taxonomy Table with Multimedia Learning Tools

As it can be seen in the Table, baking learners do not use video to learn factual knowledge. *Factual knowledge* can be regarded as the basic elements or terminologies that learners must know when involving in a new field. The *factual knowledge* here-what the gluten flour is, what it look like, or what the recipe and steps to make muffin, are as the basic knowledge which baking learners must learn when they are a novice in baking or when they want to do something new but have no related experience with it. We have mentioned the baking learners' characteristics from affinity diagram that some novices are highly rely on videos at the beginning.

However, interviewees also complained that videos seldom give clear recipes or steps which make them put extra effort on searching other baking sharing articles. Reason might be most of subtitles in video play the role of an assistant for video content and video presenter. For learners who have no basic knowledge of baking items, their scant information might be insufficient.

Furthermore, even if the novice learners utilize other baking sharing articles searching from the Internet to learn with videos, they still can easily fail to bake a good cake. The novices do not have the *conceptual knowledge, the interrelationships among the basic elements within a larger structure, which enable them to build a comprehensive baking knowledge structure*. As most of the new learners have expressed in the interview when they search the Internet, they often want to find the websites which shows baking photos and interpretation words together.

*Participant 4: "When I was new (in baking field), the resources I am referring no matter baking books or baking blogs must be written in detail. Seeing the words explaining recipe and steps, the images of baking products should occur to readers' mind at that time. It is the only way for me to understand the baking process, or I cannot link up the words with real status while practicing."*

The changing of baking status and sequential steps of baking procedure had not been constructed in less experiential learner's mind, so it should be noted that if we want to

provide the materials for novice baking learners, the complete structure with details will be needed. Video as the most popular multimedia in the media space have potential to do it for learners, although videos present-day are not powerful enough to provide the best learning content.

The Table shows that baking learners have ever used video to learn to understand the conceptual knowledge. The foregoing examples are learners want to learn the differentiation between Cream Method and Chiffon Method. Videos have been used to reach the goals because both the Cream Method and Chiffon Method are sequential procedure with steps and cannot be learned without knowing its continuous changing. It can be ideally presented by videos, or detailed words with large numbers of photos. But, the other three objectives in the level of conceptual knowledge, learners did not learn through videos. What are the learners used to learn with baking videos? Why the novice learners watch videos so often? Are there any other occasions that baking learners need to use videos to learn? The time to use video to learn baking will be discussed next.



### 4.2.3 Content Provided by Videos

Bloom’s Taxonomy Table of learning baking through videos was provided below to spotlight on the knowledge which baking learners had ever used videos to learn. The data were all from Bloom’s Taxonomy Table with multimedia learning tools foregoing.

The Knowledge Dimension	The Cognitive Process Dimension					
	Remember	Understand	Apply	Analyze	Evaluate	Create
<b>Factual</b>						
<b>Conceptual</b>		✓				
<b>Procedural</b>	✓	✓	✓			✓
<b>Meta-cognitive</b>			✓		✓	✓

Table 7 Bloom’s Taxonomy Table of Learning Baking through Videos

The Table shows that videos often used to learn procedural knowledge and sometimes it also benefits meta-cognitive knowledge. Learners seldom use them to learn conceptual knowledge and hardly use them to learn factual knowledge.

The procedural knowledge helps learners know how to do something. It is the knowledge of subject-specific skills and algorithms, the knowledge of subject-specific techniques and methods, and the knowledge of criteria for determining when to use appropriate procedures. The previous examples with videos are like learning mousse cake making method, learning to understand the changing appearances of dough at different time and learning the right time to add more pastry margarine.

Moreover, learning to use the piping gestures for rose decorations on the basic knowledge of lily decorations making and learning to create quicker methods and steps with specific skills for cup cake making are also the instances. All these learning have obvious characteristics of continuity. The method to make mousse cake has the continuous steps to follow. Learning the changing sequential appearances of dough at different time is of course the continuous process. Learning to make the cake decorations need to focus on the motions of the gestures.

Finally, learning to create quicker methods and steps with specific skills to make cup cake is also the procedural knowledge. All these procedural knowledge should better be provided by videos. Some interviews stated that they sometimes find some baking stories in books with context to help their learning. Sometimes they also found there was a suitable television program to learn or sometimes they learned by reviewing their own notes recorded before. Most of the time, they learn procedural knowledge with the online videos, especially learning the skills of cake decorations.

The skill of cake decoration is delicate and easy to fail once learners neglect a piece of detail. Even if they using the piping bag to pipe carefully and slowly with the movements, it is still easily to fail. Cake decoration is the highly skilled action. Learning this should pay more attention on every motion in every minute. Therefore, learners who have ever learned cake

decorations stated that learning cake decorations definitely cannot live without watching online videos. In the interviews, they said some cake decorations classes are too expensive and teachers only instruct one type of decoration at a time.

Moreover, when learning through videos, learners can watch it over and over again or stop the screen anytime with a click to concentrate on the specific motions. Videos online sharing from worldwide bakers are the best medium to learn various types of cake decorations. This shows the opportunity of videos as the sequential information provider and a consequence of its dynamic might not be replaced by any other media. Any activities or subjects which included the delicate skills or needed the sequential images to interpret the concepts can be shown completely by videos.

The Table shows that learners learn meta-cognitive knowledge through videos as well. Meta-cognitive is the knowledge or awareness of personal cognition, such as strategic knowledge, knowledge about cognitive tasks including appropriate contextual and conditional knowledge, and self-knowledge. It is the integration of knowledge and needs multiple methods to construct the holistic knowledge. The instances above are: the strategies applying to the new elements in the process of pastry making, differentiating that softness and texture of the croissant from personal to others, critiquing and judging the flavor and skills of new sweets on the basis of baking knowledge and experiences, and designing a type of new, healthy but beautiful cake for women. To reach these objectives needs to learn as complete as possible through taking classes, discussing with friends, attending activities, watching television program, searching websites and youtube, reading theory and baking books, practicing, or recording. Video as the tool conveying multiple learning sources is one of the ways to get closer to meta-cognitive knowledge, but it is not the only way to approach meta-cognitive knowledge.

In conclusion, the pattern was analyzed by knowledge dimension of the Table. It was found that the more procedural or meta-cognitive knowledge need to learn, the more learners utilize videos for learning. On the contrary, baking learners learn most of basic knowledge like factual knowledge, principally and frequently from static media. The

cognitive process dimension was not analyzed in the Table because the cognitive process dimension of learning activities can start from any stage which is mentioned in the literature reviews. It depends on how the learners use the knowledge and what their objectives are. The same level of knowledge, for example, conceptual knowledge, can be classified into the different stages of the cognitive dimension owing to the different depth and goals which learners want to achieve.

### 4.3 The Characteristics of Videos

The rationale of utilizing videos to learn procedural or meta-cognitive knowledge, and seldom conceptual knowledge will be provided here by listing the current state of baking videos' advantages and disadvantages from the interviews and analyses above.

#### 4.3.1 The Advantages of Videos

The following three paragraphs will indicate the advantages of videos on three aspects: from the characteristics of videos, from the view of online videos environment, and from the perspective of providing videos' content. Figure 4 shows the advantages of videos in organization.

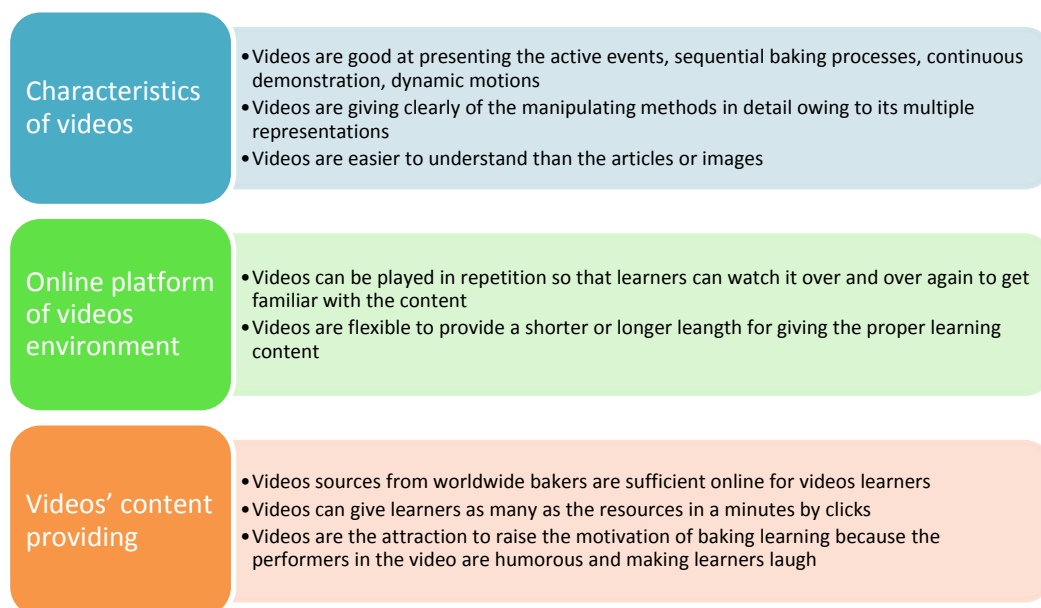


Figure 4 The Advantages of Videos



Firstly, it is about the characteristics of videos. Videos are good at presenting the active events, sequential baking processes, continuous demonstrations, dynamic motions, and any learning content which need to present the audio, video, pictures, and words at the same time. Also, videos are giving clearly of the manipulating methods in detail owing to their multiple representations. It is helpful to understand each of baking concept by learning through the videos. Sometimes video is easier to understand than the articles or images because it often demonstrate the baking process with presenters' dynamic narrations and the aid of captions.

Secondly, in the case of online video environment, video can be played in repetition so that learners can watch it over and over again to get familiar with the video content. Owing to the related videos and hyperlinks of videos are provided on the same web pages, they will enrich the learning resources of videos for learners, unless the learners have no willing to link it or watch it. Besides, the video length can be short or long to give the proper learning content, it can be thirty seconds long to show a small baking skill or it can be thirty minutes long to teach the whole process of certain kind of pastry.

Thirdly, with regard to providing the videos' content, there are plenty of online videos sharing from worldwide bakers, if learners have ability to search the suitable videos for their own, they do not need to take so many baking classes. Compared to the baking classes only teach one thing a time, videos online can give learners as many as the resources in a minutes by clicks. Online video nowadays has the irreplaceable role to give the content of any cookies' and bakeries' cake decoration learning and creative decorations skills. Moreover, videos can motivate baking learning because sometimes the performers in videos are humorous and making learners laugh, and there is even a lovely song in the background of the narrations to build learning activities more heart-warming.

### **4.3.2 The Disadvantages of Videos**

The reasons will be provided to uncover the disadvantages or conditions nowadays why

baking learners learn thoroughly from videos. Three paragraphs present three aspects: videos and technology with users, baking videos providing nowadays, and learning with videos, respectively.

Although there are pervasive sharing videos online, these technologies still have something to improve to create the better environment for users. For example, it often takes much time to watch videos, not all the learners have patient to watch it over, and it waste time to find the right content of certain part which learners want to learn. Learners who do not get accustomed to immerse themselves in front of the computers and stay online for a long time do not like to utilize videos to learn even they know there are plenty of baking sources there.

Moreover, the delivery from videos was thrown away by learners after watching them. Learners cannot remember the whole baking things from videos because there are large amount of information providing at once. Information provided in the video is not similar in the books or blogs which are static and easier, quicker to record or note it down. Of course video content would never disappear suddenly after watching it, but its dynamic characteristics make the action of finding the certain content again become more difficult.

Also, the video is hard to save in personal documents and many learners do not know how to keep those video files. Some of them even use cameras to record it again on the computer screen while playing it online in order to have a copy for their own. Finally, baking classes surpass comparing to videos if learners want to ask baking questions, although some teachers or classmates might not be willing to answer all the questions for learners. Figure 5 shows the disadvantages of the videos in organization.



Figure 5 The Disadvantages of Videos

In addition, online videos usually have no recipe included; it is always inconvenient for learners to find the other resources to help their knowledge construct completely. Also, many videos sharing from other online bakers present the characteristic of performing or showing something rather than teaching something for learners, so the boring details but vital for learning might be lost in the videos and make the learners confused. What is more, video as the online medium shared by worldwide people have multiple resources from foreigners, but local learners with no foreign language abilities are unable to use these videos because they cannot understand not only what the performer saying but also the captions showing on the screen.

Except for the problems foregoing, there are some reasons why learners have difficulties using videos to learn baking. With skilled learning activities such as baking, only

watching the videos to learn without feeling the real dough, touching the texture, sensing the temperature while baking, and no handy practicing is not helpful to practical learning. Also, without instructors beside, video learners can easily lose the important but small techniques to make a successful baking owing to doing wrong with no detected. Some interviewees said that it is not convenient to watch the videos while baking at a time, because baking environment now do not provide the space for video seat, and also the limitation of the time and handy learning experience make the videos hard to control.

#### 4.4 Reasons Making Bakers Learn Worse from Sharing Sources

There are five characteristics make baking learners unable to sharing baking resources and learning well through media in highly social environment. The Table below shows them in the list of A to E.

<b>A</b>	It is inconvenient and time wasting to record baking process
<b>B</b>	It is hard to share baking without experiences, basic knowledge, and the care of details
<b>C</b>	Recipes and baking experiences are worthy of preservation
<b>D</b>	Taiwanese baking resources are less scientific than the foreign resources
<b>E</b>	Sharing with entertainment is not helpful to learn baking skills

Table 8 Reasons Making Bakers Learn Worse from Sharing Sources

##### A. **It is inconvenient and time consuming to record baking process**

It is impossible to share baking experiences online without any baking process recorded both in pictures and videos. Some of baking processes need time controlling, especially cakes making. There are some interviewees' words below.

*Participant5: "There is no time to wait for a camera shot, because whipping the egg white might produce the sediment or mixed poorly. If I made a good photo of baking process,*

*then I definitely fail to make the good bake at that time.”*

*Participant 4: “There is no way to take a shot by my own. Quickness is the most important factors while baking. It is hard to raise one hand to whipping egg white, and use the camera with the other hand.”*

*Participant 7: “There is no place to set the tripod and digital video in the baking kitchen, and never mention that I can record the baking process and do baking at the same time by my own.”*

*Respondent 1: “I always ask my sisters to record the video for me if she is free. But most of the time, I just take the shot with one hand, but the photo might not be pretty and clear.”*

**B. It is hard to share baking without experiences, basic knowledge, and the care of details**

There are so many details required while teaching and learning baking.

*Participant 8: “Some friends called and asked me why they always fail to make a good bake, they do the process, add the ingredients step by step as I told them. My answers were always the same. “Next time, call me to bake with you. I cannot tell you what you do wrong only if I see the whole baking process. Because if you can ask me which points were right or wrong in detail, then, you can find the problem by yourself. If you cannot tell what you had done clearly, then, I cannot find the problem only by your descriptions either.””*

*Respondent 1: “Those free sharing resources online like websites, videos, even the publishing books, provide incomplete recipes. I guess it is that they skip too many tips which they think it is the way for sure, but not certainly for the other learners.”*

*Participant 8: “There are no online baking resources that I can trust, if I do totally according to their sharing, I will fail for sure.” “It is interesting that I find baking requires*

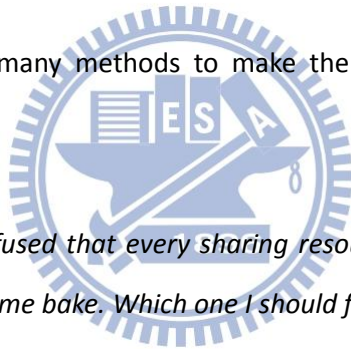
*more attention and patience than cooking.”*

*Participant 4: “You cannot make the good bake until you find the problem and solve it. You might be successful once by chance, but you cannot make it next time.”*

Baking is just like cooking food. We can use different ingredients or change a little bit steps but still come out the same kinds of food. Doing so, the outcome of food cooking might taste strange and not good to eat. However, while doing the same thing on baking, the outcome of bake will probably fail to become a good looking shape which you want to eat.

*Participant 7: “You are kidding me! Skip one small tips makes the egg white whipped up! Then, I need to do the whole things again.”*

Moreover, there are so many methods to make the same bake, based on skills or theories.



*Participant 1: “I was confused that every sharing resource gave me different methods and ingredients to make the same bake. Which one I should follow with?”*

Many bakers learned from the practical apprentices. They have professional baking skills but have no ideas with baking theories, that is, they know how, but cannot tell you why. So when learners were confused with different sets of methods and asked their instructors, most of them failed to get the right answers.

*Participant 2: “I had the experiences of failing to make the chiffon cake by trying hundreds of times, and I could not get the right answers from baking teachers until I read the baking theories books and found the reasons and tips which caused me fail.”*

Besides, baking is about the implementation and understanding learning matters. Having handy experiences can quickly get closer to access baking profession in a specific level.

*Participant 5: "As I told you before, baking needs practices and handy experiences. Many baking learners took baking classes where they can only stand and watch master's demonstrations. If you do not do it yourself, you will not know when, at what extent of the dough should do to the next step." "Learning is one thing, do it by yourself is another."*

*Participant 6: "The best way for a baking novice to learn is to find someone to teach you. Because only when you touch and feel them (ingredients, temperature, time... etc.), you can be familiar and have the sense of baking. The one who teach you can find the small problems which you miss. Also, you can get the answers of the questions, and there is nothing to say with baking learning, besides "practices make perfect!""*

Finally, there is an extreme example to prove that baking learning should follow with learners' own experiences.

*Participant 1: "There are too many kinds of bakes to taste. I had ever found the pumpkin cake recipe which seems delicious and I followed it to make one. Yet, I did not know whether I was successful or not, because I had never eaten that before and had no ideas with its flavor. The only thing I knew was that the flavor I made tasted strange, but I was wondering because I did not like the taste of the nuts which in its ingredients."*

All in all, that is no use to learning baking totally from discussions or social media only; doing and practicing are more vital for learning. It is the reason why so many novice baking learners tend to learn from baking classes or friends who are baking instead of learning by themselves through videos.

### **C. Recipes and baking experiences are worthy of preservation**

Not every baking learner is able to find someone to teach them bake at anytime, so they utilize multiple media to learn. But every interviewee expressed that most of baking sharing resources were incomplete and fragmental. They confessed there are truly many

details in the baking process, but it is hard to teach or share something with the detailed descriptions. Not only it consumes time and mind but also it is easy to lose something if incautious.

However, they said there was one more reason causing baking sharing incomplete and hard to social with others. Three of baking experts, who regard baking as their profession, found that baking environment in Taiwan is self-absorbed. They had already had lots of experiences in baking field, and they can create their own specials, exclusive cake for sales by highly baking skills.

The narrations below provide the thoughts of preservation phenomenon. We gave two questions to them in the interviews. *“Some of the interviewees expressed in our interviews that they had the difficulties to learn by referring to the free sharing resources. How do you think of that?” “Why not sharing or discussing baking with others?”* Unexpectedly, their answers were provided below.

*Participant 8: “The sharing and learning baking environment is better now. Compared to the past, I used to ask the questions but no response. My baking masters were unwilling to tell me only if I paid for it. The traditional masters covered a bit tip while teaching to their apprentices. After hiding and teaching ten turns, the special recipes were gone, especially the traditional Chinese breads, cookies and cakes.”*

*Participant 5: “I had discussions with baking classmates, but we only discussed around the surface but not deeply in details. We get used to reserving the words while discussing baking.”*

They communicated to their baking friends who met in baking classes or online websites but with precautions.

*Participant 7: “Some masters in classes warned me against telling the recipes to others. They said it was the recipe of their own which cannot be shared and recorded. If someone*



wanted to learn the baking methods, I would only recommend them to take the class. After all, bakers like us who have had lots of baking experiences, have ability to know how to do the same thing by a quick glance of a picture.”

Even though the recipe are general to see and the masters did not urge them not to tell others, they still unwilling to share actively.

*Participant 7: “I have spent so many time and money to pay for baking classes, buying books, searching the Internet, watching the videos, finding the answers, trying and errors by myself. Some baking friends want to know the tips by asking me questions from my blogs without paying any efforts. Why I should tell them? Besides, we would become competitors if they know the tips. After all, I am not sure whether they will use it for business or only for their own eaten.”*

*Participant 6: “Who should I share with? All my friends and relatives cared about my business; they always asked do I made profit or not while I am sharing baking experiences with them. There is no sincere baking friend in this field. Most of them want to learn and steal something from me. Some of them who are highly skilled or professional in baking might have their own baking business, and they did not want to share their ideas even I shared mine with them; so what is a good reason to share again?”*

Sometimes they wanted to share but they got few feedbacks. Furthermore, one of the interviewees did not regard baking as her career, but she also knew the role of it.

*Participant 1: “I do not share the recipes or the baking processes from others because those are not mine. As a result, you can only see the pictures on my blog focus on happy faces while baking with a few process descriptions but no recipes there. I will tell you where I referred to or found the recipe privately if you asked me.”*

After they had been frustrated many times, they had their learning strategy to deal with the problems.

*Participant 8: "You will be frustrated if you are relying on others' sharing resources to learn. Find many references as many as possible at once, and compare as well as combine them together. You should have ability to know which step is correct or incorrect and have patience to try for many times. Then, you will come out the recipe which is the best for your own. At that time, you have learned the bake."*

**D. Taiwanese baking resources are less scientific than the foreign**

It is hard to have social activities between baking learners and sharers in Taiwan, but there are lots of great baking sharing resources come from foreigners. There are many new baking ideas in Taiwan came from Japan, owing to the taste of baking are similar to Taiwanese. Also, many cake decoration books were translated from Japanese. There were lots of Taiwanese baking masters learned in Japan. Some of them, who have touched with the translations of baking books or online foreign videos and blogs, said that besides the foreign languages, it is easy to learn from foreign sharing resources because they are used to providing more details and tips with the correct descriptions and photos.

*Participant 2: "I prefer to learn from foreign baking articles online rather than Taiwanese baking articles. Because most of foreign recipes, like French and German, provide detailed tips and describe with scientific theories; I can know how to do if baking condition like temperature or oven had changed."*

So there is higher possibility to make a good bake when consulting referring the foreign resources. However, there are still some problems to social between learners and foreign sharers.

Firstly, their foreign languages ability is not good enough to deal with all baking learning materials, so most of time they learned from the Chinese resources or transcriptions. It is difficult to refer the foreign language resources without great foreign language skills for baking learners, not to mention that having interactions to interchange baking information

with sharers. Secondly, baking learners cannot copy the whole recipes owing to the ingredients with seasonal variation, tools, weather, and baking facilities are different from foreign sharers in Taiwan.

*Respondent 1: "Some flavors of French bakes are suitable for Taiwanese and I have bought the translated books of them, but the techniques for bake are too hard to learn."*

They cannot have the discussions of practical recipes with the sharers, sometimes they might luckily find the adjusted answer translating in Chinese from searching engine.

*Participant 1: "I knew that lots of good sharing resources come from foreigners, but I do not like their taste of baking. Those flavors are not suitable for Taiwanese."*

In conclusion, though it seems to have plenty of baking sharing resources everywhere, learners still cannot learn well from sharing and learning media.

E. **Sharing with entertainment is not helpful to learn baking skills**

Some people might argue that they can easily find the sharing articles or videos online from amateur bakers. We know that it is impossible that no one shares his baking. But have you noticed that most of sharing materials focused on their feelings while baking, and their reflections from baking process. Most of their words tend to express their emotions, and most of their photos tend to shot the interesting baking elements or people who have lots of fun with baking like busying in baking, ingredients standing in orders, the powerful tools, or the funny bakers with some flour on their faces. Some bakers are used to sharing, and they posted parts of baking processes with their feelings and photos of final product when they baked. All of the interviewees have their own places online-blogs or facebook websites to share their baking experiences.

*Participant 6: "I really enjoy baking and sharing with others, because everyone likes to eat. I felt satisfied when I saw my cakes were eaten by my families and friends or coworkers."*

*Participant 4: "I felt satisfied when others ate my pastries or saw my beautiful baking photos sharing on the websites, and screened. "You are amazing! It seems delicious and it tastes great!""*

But those sharing can only let their friends know they had done so much fun or they are great of baking. No one can learn from their sharing and making the same bake. They were asked in the interviews why they did not provide more details of baking process online. We asked: *"Maybe some other baking learners will be grateful to find your website and learn baking easily. It is also a good way to share your baking joyfulness."* However, the answer is as below.

*Participant 2: "I did not think so much; I am busy and also lazy to do that. Sharing for me is just for fun."*

Sharing customs exist in Taiwan, but fewer of them have patience to share the actual knowledge and skill with conscientiousness. They might think it is boring to do that, so they only share the most interesting part of it. Teaching activities are so serious for Taiwanese that no one wants to do during their leisure time.

#### **4.5 Summary**

The sketch of baking learning environment nowadays and some reasons which strongly influence baking learning activities have been drawn above. The pros and cons of videos as a procedure knowledge of providing media and the characteristics of baking learners have also been presented in the chapter four.

## **-Chapter 5- DISCUSSIONS**

The methods of interviews had been conducted in this research and it has been introduced in the chapter three to deeply understand baking learners' learning patterns through multimedia and videos in the social context. Then, in the chapter four, we analyzed the research data with affinity diagram and Bloom's Taxonomy, and divided them into four parts to discuss. "The aspects of baking learning characteristics", "the content providing by baking learning videos", "the pros and cons of baking learning videos and environment", and "some reasons prevent baking from sharing and learning well" had also been stated.

To positively approach the objectives of this thesis, in the chapter five, the discussions will be based on the data of literature reviews and findings. The arguments will be provided here to implement the objectives from three aspects: 1. Learning activities without media. 2. Social activities with media. 3. Videos. Finally, the design implications to design for video sharers, video learners, different subjects, and video sharing as well as learning environment will be constructed in the last section.

### **5.1 Learning Activities without Media**

Without media, their social behaviors of the learning activities can generally group into two parts. One is happened with teachers and classmates in baking classes; the other is with their baking mentors who had already known in private and not familiar because of baking.

#### **5.1.1 Social Activities of Learning Often Begin in Class**

The most common and general learning activity is the traditional learning. It had been mentioned in chapter two, typically referred to face-to-face learning in the classroom with lectures or seminars. In the baking field, lots of baking learners tend to learn from baking classes as they were novice bakers. We have found in the interview that half of baking

learners of eight interviewees had been attended in baking classes outside held by bakery, private cram school, or government. Another one is still a student and he learned his baking skill mostly from bake club in school. The other three had never learned from classes but learn a lot from their friends. Baking learners learn a lot through the traditional way. It is inevitable for them, especially novice bakers.

The interactions between learners and teachers in baking class are different. Baking is a skilled profession so teachers normally demonstrate in the class to teach, and sometimes learners do the steps following with teachers; sometimes they could only watch and take the notes. The interviewees had complained that most of baking masters in class teach roughly. They always fail if following the instructions sharing from teachers while practicing after class.

However, the complaints might be partially incorrect. The words had been said in the chapter two that Knowledge cannot be simply transfer from the instructors to learners, as a result of learners had not experienced all that instructor has. Although the instructor shares the experience in detail, learners' interpretation of the experience would be very different from the instructor's because it is related to different personal experiences. (Hee Jun Choi et al. 2005) Therefore, learners should ask to learn. Some of them stayed until class ended in order to ask baking teachers privately; some of them are willing to be an assistance to help teachers in class in order to get familiar with teachers and ask more questions.

### **5.1.2 Mentors are Irreplaceable for Learners**

Asking can be easily opened the discussions among people. Baking learners get used to discussing baking with the ones who have already been their friends in the past. They prefer to interchange baking ideas with old friends in chores rather than the ones who have known many years in baking classes. Owing to this phenomenon, positive social interactions of learning nearly happen all in their private close friends or relatives.

All bakers from interviewees have closed friends as their mentors to interchange or to

share baking as well as life experience. Two mothers have their own “Baking Mother’s Kitchens” which a few baking mothers were involved. They regularly gather together to practice and bake for their children. One of them is the member of baking club. He said he always learn from his seniors and share information to the juniors. He really enjoys talking baking among their groups. Two of them get used to learning from their families. Once they have had a question, they ask their mother and sister to help. One of them discusses with her boyfriend who also has experiences in baking. She tried multiple cake flavors and continuously innovated with her boyfriend. They make up each other’s disadvantages to learn.

The other two of them enjoy going around and tasting new sweets with friends. They regard trying new bakery in shops as the major motivations for baking learning. They implement the lifelong learning as we said in the chapter two that one cannot live without learning in his or her whole life even out off the school or during their leisure time. Moreover, they are all willing to teach their friends, families, colleagues, and children to bake and spend time demonstrating for them.

Compared to old friends they originally have, they treat the friends who have known many years in baking classes less cordial; that is, the interactions with their baking friends from classmates are less sincere and passionate. They discuss baking events like baking exhibitions, new baking classes from new teachers, the tuitions of classes, the ingredient shops, rather than the temperature of the cake making, the failing experiences of baking yesterday. They share shallow baking information but do not discuss baking in depth even though they had been taken the same class and learned together. Most of them do not want to share the whole baking things they knew to other baking friends. However, some of them still spend lots of time having interactions with others and make themselves improving from sharing because they have become real friends after contacting frequently.

## **5.2 Social Activities with Media**

As the descriptions in the literature review, multimedia technology has changed our way in communication, learning, and socialization. (Carol Anderer 2007) But, how? We look forward to finding more about it. How multimedia change our life and learning experience? The interactions among different media, baking learners, and baking sharers will be discussed in the section. Baking learners' and sharers' social activities through videos will be provided in next section.

### **5.2.1 Online Friends Help Learners Learn a Lot**

The perspective has been remarked in the chapter two that the convenience of information and technologies present-day shortened the distance of people and knowledge. (Teresa Chambel et al. 2001) Truly, owing to the Internet and online social environments, baking learners can communicate with each other quicker through websites. From the data of interviewees, there are three platforms showing their baking interactions-baking blogs, facebook groups for baking, and social networking for certain locals.

As for baking blogs, they firstly posted encouraging words to say hello with new baking bloggers and waited for the responses. In order to leave the messages in blog, they must have their own account of certain website; therefore, they for sure had their own baking blogs. Then, they get used to subscribing new articles from baking blogs and checking their email to learn new baking information regularly. One of them subscribes all of her online baking friends' blogs and the others do the same things to her. They recommend other online friends to visit each others' blogs and provide the links in the articles. Over a few years, they become real friends. One of the interviewees said that she often call them and discuss the baking matters.

Moreover, they have their own facebook closed groups for baking. Only their baking mentors who are invited can see it. They post new baking information frequently to create a



new discussion. One of them has a baking facebook group which everyone can see and a personal page on social networking specifically for her own baking business contacts. She had a few discussions of baking process on her business page. She has confessed that; in fact, she did not like to share with strangers online because she had spent a great amount of tuitions and countless hours of time on baking classes to learn so why could they have chances to learn more for free.

However, some baking sharers sharing their baking experiences positively because they are willing to teach. These positively sharers have become the important origins of sharing resources online. Once they shared new articles or respond the questions, the other baking learners learned. What is more, online friends are inevitable because the evaluations of sharing recipes from large anonymous friends seem to have great reliability than the one from official websites. Baking learners tend to trust the recommendations from online friends rather than the workers of professional baking store. Also, different sharing recipes from multiple online friends make baking sources plentiful.

### **5.2.2 The Purpose of Sharing is for Entertainment Only**

Almost all baking interactions online are for the purpose of entertainment but not interchanging the experiences conscientiously. They actively shared without expecting the feedbacks of baking professional knowledge or skills. One baker in interviews expressed that he often bake French desserts and post some of the photos in facebook, sometimes with recipe roughly written or links with photos.

*Participant 2: "I had never shared my baking work to another place because I am lazy to do s. If checking on my facebook then you can see all the bake I have ever made."*

Every time he shared the photos, his friends on facebook wrote the comments with praise; mostly the words were like *"Bravo, it looks delicious!"* Or *"I want to learn with you next time."* Or *"Ha, ha, your action is funny."*

One of young bakers said that her baking blog is used to recording life experiences but for popularity or skills sharing.

*Participant 5: "If I want to be famous in the baking field, I could choose a hotter website to share but I did not. There are a few articles about innovative recipe and practices on my blog; you can go online to read it. But I only update it three times a month. Managing blog wastes countless hours of time and I have no passion to do that."*

However, when she was asked *"honestly saying, without time and tool limitations, are you willing to share what you know of baking to others while answering?"* She replied.

*Participant 1: "Sometimes other baking learners might post questions in my blog and I would reply them without so many details."*

One attending the baking club in school mentioned, as a teaching leader of baking students, he need to edit and record baking recipes learning from baking masters for sharing to the juniors. He also said that:



*Participant 4: "Recently, I have more time to manage the baking group in facebook, so I will post some baking pictures if the final product is pretty."*

On the other hand, one of them doing baking for business expressed that she put new baking pictures regularly with some written interpretations owing to raise the popularity and attract customers.

In addition, sharers in Taiwan get accustomed to sharing without conscientious attitude. They share for personal fulfillment but not for others learning well. The famous baker who has the ability to bake well does not write their recipe scientifically with details. The famous recipes from foreign country normally describe baking methods with reasons and show baking process with scientific ways. In Taiwan, many sharers regard baking as a kind of life art, their recipes cannot exist with gorgeous baking photos but with no detailed interpretation in,

especially online recipes.

### 5.2.3 Media are Irreplaceable for Learners

It has been mentioned in the chapter two that people, who have multiple choices to get in touch with learning activities like books, videos, television programs, or on-line courses, so life-long learning, can be achieved easily by multimedia. In fact, in addition to a little bit sharing, most baking learners in Taiwan act with media only for the purpose of learning. Generally speaking, their learning media include television programs, books, searching engine, and specific baking bloggers.

Baking learners expect to watch television program of baking or cooking to find new ideas. They record special ingredients or shapes provided by programs by taking the notes. They will search for more information online if they find something interesting. The performances of programs stimulate their motivations to practice baking.

As for books, there are three types of interactions. Half of them get used to buying baking recipes to read. They go to libraries or bookstores to buy or borrow the one with specific recipe when they want to do something new. They do baking process and add ingredients according to the books and they sometimes search the Internet to fill a lack of information in recipes. Baking recipe books often provide plenty of pictures with cute baking stories but not with a little bit interpreting words.

In contrast, three eighth of interviewees have the habits to learn from books. While learning, they tend to know the reasons why they should add it at this time rather than what should add in now. They read the theories of baking published by professional institute of governments or some professional food press. The theory-oriented baking books often contain full pages of words but with a little bit pictures showing principles or ingredients' structures. For example, the books with topic of wheat could provide the longitudinal and cross sections of wheat in order to see the density as well as stoma to cope with the changing conditions of wheat while heating.

Besides, one interviewee said that she is a baking book nut. She had bought nearly all of the books related to baking in certain online bookstore. She subscribes the news of the bookstore; once receiving the email of new baking book, she buys it immediately.

*Participant 6: "There is no problem with buying a book I do not want to read online. The bookstore nicely provides seven days on probation. I can return it without any lose if I do not like it. But most of times I keep the book because it is inconvenient to send it back."*

Because she read a lot, she found that baking recipe books from foreign countries are more holistic and details in information providing. In the case of blog, they subscribe the certain baking bloggers they trust; some of bloggers are their teachers or classmates in baking classes; some of them are found by search engine.

*Participant 3: "Actually, those baking sharing are too easy for me to follow, but there may be some new shapes or ingredients from foreign countries that I do not know."*

Blogs are the aids of baking learning for professional bakers. Although they check subscribing emails frequently, they do not read its content actually. But for novice learners, if they could find a good sharing blog, the blog might become a major way for them to learn because it is free. One as a baking teacher in junior high school expressed that as a good teacher, she likes to share and teach others. Lots of online baking friends have found that she generously answered all the questions in her blog, so they regard her blog as the first choice to learn baking. In contrast, books became the minor way for them to learn baking.

### **5.3 Videos**

In the chapter two, the words have been mentioned that *"Specific multimedia can be used to help people learn specific kinds of information."*(Lawrence J. Najjar, 1996) How to help people learn with videos and what are the interactions with videos presented from

baking learners? These will be discussed in the following. The content which video usually provides and the advantages as well as disadvantages were already given in the findings of the chapter four. We will discuss the interactions from the responses of emails and interviewees' data only.

### **5.3.1 Videos are Important for Procedure Learning and Ideas Inspiration**

Baking learners tend to learn through videos when learning elements are accompanied with successive concept. In the interviews, some of them expressed they could not live without videos with regard to baking learning.

*Participant 1: "When I want to do certain kinds of bake, I would find videos firstly by searching online. Video is the most helpful learning method to me." "If I find the demonstration is too quick to understand, I would search the other videos." "If unluckily, there are no videos suitable for me, I could only search others' blogs."*

The other baking learners tend to find new baking ideas through searching videos. One baking learners gets use to searching and watching baking video during her leisure time in order to supply her skill and knowledge from baking classes, books, as well as blogs. She usually types the Chinese keywords into searching bar and utilizes the recommendations or related video lists to find the right English video resources.

In the case of watching baking videos of foreign language, she is used to watching the visual motions only. Sometimes it is no need to listen to the narrations or watch the captions. She gets used to watching dynamic images of baking looks or materials or gestures and then refers to the books or blogs to get the words information from recipe.

*Participant 4: "Videos are good ways to learn, but they still lack of static information."*

Truly, owing to the above reason, the other baking learners find that searching others' blog and baking books are the better ways to learn the fragmental knowledge rather than

videos. The fragmental knowledge is like the answer of some small questions.

Some baking classes provide baking teaching process with official videos in class to learners, but none of the interviewees had reviewed that after class. One interviewee said:

*Participant 6: "The volume of the videos is large. Often teachers shared it with a disk or a link or a usb and asked us to copy the files in each own computers. I cannot remember where I saved them after a long time from files sharing. Also, videos is helpful to novice learners but not for me, as a baker with more skilled and experiences."*

Furthermore, if the names or instructions or displaying images in video appealed to baking learners while they searched on the Internet, they would click the video to see whether it is interesting or not. Even the one who regards video as the time wasting and unhelpful for learning method do the same. Photos and videos of the finished baking products are easy to catch the learners' attention, make click into it to find more, and raise their motivation to do that kind of baking as long as the static image is beautiful.

### **5.3.2 Learning through Videos Interchanging Activities is not Easy**

In fact, the baking learners' actions with videos we learned from interviews have no actively sharing video experiences. Only one who responds from email has recorded lots of baking videos and shared them in her blogs; because as a baking teacher, it is more convenient to teach baking if students had seen the certain process before class.

*Respondent 1: "I am used to recording the baking process while practicing before class, especially I know which process is basic or specific for every baker to know, or complicated and hard to learn. Although the learning effectiveness might be better if my students previewed the videos with introduction, I still prefer sharing and recording baking procedure by photos. Because most of the photos can be shot by myself, but all of the videos needed to record by others help. Sometimes I need to ask a helper to pause DV owing to the waiting or preparing time. Besides, a good baking teaching video requires many preceding preparations*

*and editing after recording.”*

*Respondent 1: “In fact, videos require while learning a new concept, but most of time for experienced baking learners, instructing photos and words are enough.”*

But in our literature reviews, all discussions indicated that videos have the potentials to improve learning activities and bring learning and sharing environment better, not only of its characteristics of media but also of the age of positively online sharing environment. *“Even at a duration of 3-5 minutes, the videos can certainly be effective learning vehicles and highly informative.”*(Paul Hyde, 2008) Owing to the belief that videos are pervasive, dynamic content providers, and easy to access online, we reviewed and then organized our findings as well as discussions in the chapter four and the former words in this chapter, and will provide some implications for designers and developers who want to know more know-how about providing the suitable learning videos environment for users to learn.

## **5.4 Design Implications**



There are a large number of possibilities for people to learn through video browsing; the fundamental belief of it is that everyone knows something. In other words, the fact is that if there is something that someone knows, there is certainly ample of opportunities to share it through video, and also there is a chance for everyone to learn. (Fabr'ico Benvenuto et al. 2009; Lada A. Adamic et al. 2008) However, in the baking field, there are few learning activities with videos present-day and it is uncommon to share baking videos online or interact with others through videos. It is obvious that sharing and learning environment through videos still has many spaces to improve. The implications will be separated into four parts to discuss: for video sharers, video learners, different subjects, and video learning environment.

### **5.4.1 Design for Sharers**

The whole video sharing and learning procedure can be followed by these steps: 1.

Sharers generate sharing motivation, 2. Sharers create online personal pages for sharing, 3. Sharers record the videos and photos, 4. Sharers upload the files to computers, 5. Shares retouch the videos' content, adding effects, captions and introductions in the videos, 6. Sharers share the links or video files. 7. Learners find proper videos for themselves. 8. Learners learn, try and practice. 9. Learners record, give the feedback to sharers. Finally, sharers get the feedback and response to the feedback.

The following paragraphs are the implications of designing for sharers in different steps. First, motivation is a reason which makes a great impact on learning and sharing activities with videos. The knowledge owners might have no passion to share or learn new things from others or to review their abilities from feedback as well as comments of the videos. The one who has motivation to share or teach with the professions at certain area will definitely benefit to the culture of videos sharing. Learners who have strong willing to learn will learn with videos conscientiously, and if sharers did not record their activities with conscientious attitude, learners might think that video is too rough to provide enough learning information.

Second, for sharers who want to build online personal pages for sharing, we should create a customized website for easy editing an identifiable personal page. Third, the better recording digital video or camera should be provided in the baking kitchen for easier setting and manipulating.

Moreover, when uploading the files to computers, the sharers' unfamiliarity or have less knowledge to computers make themselves unable to use videos to share profession. If a skill which needs to be shared by the master who is unfamiliar with technology, he would only share it by face-to-face teaching. Besides, some sharers were stopped from sharing because they find others' sharing videos were recorded and retouched well but they do not have the software ability to edit videos after recording. What is more, some subjects of learning activities require highly visual elements of beauty like painting learning, sculpture learning, embroidery learning, sharers of these activities need more convenient and quick way or easier learning tool to make beautiful as well as graceful videos.



In addition, videos files now are too large to share quickly through different devices or peers; some learners may want to record their practicing and send it to instructors or friends who can help them review and correct their defects of learning. The multiple resources providing by videos is a merit of the video, meanwhile, it is also the demerit for video. Learners will not know what they should actually focus on if video provides the demonstrations with a person's wonderful narrations and captions on the screen and also the interpretation for extra knowing of images beside and with the graceful music as the background.

In that condition, learners may learn a lot at once, but also remember nothing after watching the whole video. If the video providers of a system expect to supply the whole process of learning activities with different subjects for one learner, they should provide a system which allows learners to see and review their improvement. And the videos can be classified into different levels for them because learners are motivated with learning feedbacks and learning with levels of objectives.

The sharers cannot find the suitable places to share and get the feedback to learn again may be the third problem with videos technique systems. Some of them want to share but they do not know who need these videos. Also, they do not want their videos to share to everyone in the world and shown randomly by someone's searching. They make their videos with conscientiousness and hope videos will be shared to someone who really wants to learn and they also hope to have some discussions with their video learners.

The system providers should provide a proper platform to connect specific learners and specific sharers. The captions of videos cannot be commonly use to edit or translate to popularities which might make some foreign videos sharers have no chance to share their videos to different language users. The one with foreign language skill and be willing to translate the videos for people may have a difficulty using the software to modify the captions.

After getting feedback from other learners, sharers need to have more convenient way to reply the comments and getting the responses quickly. All in all, once active sharers have a difficulty doing any steps of all above, the sharing videos activities might be fail to achieve.

### **5.4.2 Design for Learners**

As for learners in actively sharing and learning video procedure, they first want to find the proper video content to learn. Then, they learn from it, practicing, trying, and recording, and also, they might give some feedbacks to the video sharers.

Some learners might have difficulty staying in front of the computers for a long time to watch a video and learn if they are not familiar with technology products. The learners who have practical social abilities might prefer learning from friends or some certain group members, so it is important for them to have the convenient sharing devices to share videos among people. The one who highly relies on the Internet and social networking with virtual worlds might prefer learning in front of the computers, so it is necessary to provide the multiple entries of the videos, like links or advertisements to let learners easy access the videos.

To provide the suitable content as well as topic for learners and give the apt answers of videos is the secondary one as for videos technology for learners. Learners might complain that videos are so long that they waste time watching and they do not know what exactly a video content is while searching. Therefore, it is bothersome for them to watch and stop and search the new videos again while they find the content that they do not want. The techniques which are undertaken like content retrieval, summarization, annotation, analysis, indexing, filtering by semantics and objectives or other new helpful developments should be used here in order to help them approach the learning content quickly. In the age of searching engine, learners tend to gain the information by search or browse rather than reading it in conscientiously words by words. We assume after the technique develops, those learners might search the content in a video to start at precise time intentionally which shows the content them want.

The medium characteristic of the video might be a minor reason that should be considered. Learners tend to learn through videos the procedure knowledge more than factual or cognitive knowledge. Procedure is the process that easier to show or demonstrate in videos as any activities. Learners now still learn lots of factual and cognitive knowledge by books or online articles. If videos are of stories or more interesting ways to interpret the boring knowledge that originally conveyed by words and do not waste the time of learners, then videos might also be good tools to supply the factual and cognitive knowledge. Learners' background knowledge of baking affects whether they need to know the holistic knowledge providing from videos or not.

In addition, learners have some typically learning styles. For examples, some of them get used to learning from books, but some of them are accustomed to learning from large amount of pictures. It could be hard if the video providers forced learners who get used to learning with only words on the books from videos. Also, once the learners adapted and enjoyed with certain videos, they might be get used to learning from those specific sharers' style and content. Then they are not willing to search or link the other videos. The personal habit might be a reason to influence leaning with videos.

With regard to videos technology for learners, how to save the videos may become their biggest problem. Firstly, learners may need to watch the files on different devices and perhaps their specific place has no connection to the Internet then they cannot approach the videos saved in the clouds. Secondly, sometimes learners need to remember the specific shot or information of the videos, but nowadays they could only quickly take notes on the paper or type them in computers. If the technique makes learners easy to derive image or fragmental information quickly and to save with the videos files as the post-its on the videos, it might be more convenient for learners to learn. Thirdly, users might be afraid of videos files damaged or delete it accidentally because those files are not concrete enough to touch. They clearly know if there is a problem with the computer device or the Internet connection, the videos would not be widely open to watch then.

Although the users finally trust that it's ok to save and share videos, we still have to solve the videos management problem nowadays. If we expect to provide a video social environment with learning activities, we should know that each learner might want to save all the videos helpful to them and manage the information grasping from each part of the video. Then, there may be hundreds of videos in their favorite data base, so videos should be easy to manage as images management of name, classification, and organization. However, the problems are convinced to disappear or be smaller owing to the advent of technology in the future, and we just need to wait new development of technique to make our technology environment more mature with humanity.

Furthermore, learners tend to ask questions so some researchers who are dedicated to develop the good interactions videos online. The interactions may not be a best way to solve the problem while learners having questions at all. Some subjects' information should be easier to access while they are learning to supply the need they might have when learning process on certain subject. The present-day interactions related to videos is the comment from video spectators and response from videos sharers.

Finally, do not forget the original advantage of the videos to going forward; we should provide a better video technology based on the benefit of giving dynamic content with multiple information, and hypermedia with recommendations at present.

### **5.4.3 Design for Different Subjects**

The content of activities might be changed through different subjects. Some subjects with special culture background or highly skilled might not be appropriate to share to everyone worldwide like magic learning. Take baking for example, it is not as popular as swimming, dancing or playing game, which could happened during our leisure without spending lots of time and effort. Baking regarded as a highly skilled subject and only the primer knowledge could be easily shared. In fact, most of the professional activities have the primer level and advanced level to learn. When achieving to a certain high professional level, some professional people may enjoying in creating new personal specific skill to refine their

ability and performance, and then that kind of knowledge or skill will not be expected to share through the videos.

Some specific subjects have the final static performances to show; for instances, learning baking, make-up, photography, trimming the shape of a tree. People learn with these subjects may get used to sharing with the photos of final products rather than the whole learning process because it is easier to do. Sharing the beautiful final performance is good enough to get satisfied with enjoyment and fulfillment for sharers, so they would prefer sharing photos to sharing videos of learning.

Also, learners who want to find these subjects which have the final static performance to show tendency and see the gorgeous pictures first while searching. A video with the representing photo of ugly performance will not attract learners to click and watch more about it. However, other learning activities, like swimming and golf, may be less influenced by static image of videos. In addition, some subjects which were known for a few people may also have difficulties sharing and learning from videos. After all, the environment utilizing the videos to share and learn needs a certain quantity of people who are professional and willing to exchange their information.

The subjects with skilled implementation and handy experiences like ceramics, naprapathy, and learning, should include not only knowledge in mind but also practice. Baking is also a subject having to learn with touching and feeling, even tasting. These reasons cause the subjects harder to learn from videos because learners do not really feel the texture or temperature of the making objects; they will be confused with what status and steps are now while practicing practically next time.

Moreover, some subjects needed to learn with practice at the real place, may show the similar problems to learn and share with video except that videos are benefit to learners wanting to learn the certain action and watching it in repetition. For instances, the most effective learning method without instructors but videos may be the same as learning ball games skill, boxing, wrestle, swimming or skateboarding at an advanced place to practice

and with a giant screen to play the videos at the same time. Yet, this luxurious learning facility still needs to face whether it is convenient to manipulate and control the actions like stop, play, as well as rewind and easy to record for sharers. Some subjects which can be held at different places like dactylology, penmanship or hairdressing will be okay for learners to learn through videos.

#### **5.4.4 Design for Sharing and Learning Culture**

People may not have obvious reasons why not sharing although they have never shared. The reason can be very small but also a big problem that they are lazy and with not motivated to share. Improving and considering the factors above will be helpful to build a better learning and sharing environment with videos. However, with the whole improvements in pocket, they still might not be willing to share to enhance the learning resources in society even though they have time to do so. Therefore, there are three background elements essential to construct the social learning interactions through videos.

First, good quality of sharers is important. The good videos sharing for learners should provide the right knowledge and with the ones who really know the skill or profession. Also, it should be recorded in clear motions or images with conscientious attitude. It can be shown with relaxed pace but prank with poor content. Without instructors besides, video recorder should have patience to record narrations or type in the interpretations or remind the tips at key point for a better understanding. Some sharers record the videos for fun and their videos may be of lots of theatrics of showing rather than instructions of the activities actually. All these points can be improved.

Nevertheless, we cannot set the limitations to sharers nowadays or they will not want to share. Secondly, in a society which has not built the sharing custom, we should only provide as more stimulations as we could motivate sharing activities. The videos providers might have to create some mechanisms to encourage sharing actions. As for those limitations which cannot be constructed on sharers above, we will give the responsibility to videos providers. Thirdly, we similarly need good quality of learners involved. Video

providers can filter the bad quality of videos for learners and give them an appropriate video to learn, but they need to know what they prefer or want to watch firstly. Besides, they need to know how to search for the right videos they want. And they are willing to learn to use the technology to support their video learning activities.

People in the social learning videos environment should be accustomed to once their sharing and interacting with others, they will learn more from others' feedbacks which will motivate them to share and learn more. Rich resources of videos will also make them as learners learn quickly and easily to approach the content they want.

## **5.5 Summary**

In this chapter, we have provided some practical reasons for others who want to develop the progress of videos learning and sharing in social environment. However, users can put their learning activities into a good condition with the other learning media if the video sharing culture or environment is bad. Users, that is, learners are flexible to adjust the limitations of society. If the considerations above could not be better, then the video sharing and learning environment will not be improved.

## **-Chapter 6- CONCLUSION**

The findings and implications were uncovered in the chapter four and the chapter five followed deeply grounded researches of qualitative methodology and literature review; in the chapter six, we will summarize the overall values creating based on the chapter one to five; those will be presented in conclusions, and contributions, respectively. Then, some recommendations for the further researches will be provided.

### **6.1 Conclusions**

In addition to providing valuable patterns for video learning, our study uncovers typical user behavioral patterns in video-based environments and shows evidence of opportunistic behavior for improving videos learning in the social context. We need to regard video learning as a potential event and look closer into life context in the field to make the sense of video learning, sharing, and interactions. To reach our original vision, the stages of researches have been done and here is our conclusion of this study. It can be separated into four parts to present.

#### **6.1.1 Baking Learning and Sharing Characteristics were Uncovered**

Five patterns have been uncovered to figure out how users learn baking. 1. Reasons enhancing baking learning outcomes- knowing what they need to learn, where the professional way they are, and how to improve. 2. Barriers hinder learners from learning- the immature baking learning environment. 3. The custom of utilizing multiple media and methods to learn- the contribution of technologies. 4. The need of comprehensive learning-both in implementation and understanding. 5. Interactions motivates baking learners learning and sharing.



The other five reasons have been listed to know how baking learners think of sharing and why not sharing. 1. It is inconvenient and time consuming to record baking process. 2. It is hard to share baking without experiences, basic knowledge, and the care of details. 3. Recipes and baking experiences are worthy of protection. 4. Taiwanese baking resources are less scientific than the foreign ones. 5. Sharing with entertainment is not helpful to learn baking skills.

### **6.1.2 Videos Learning Characteristics were Obtained**

The characteristics of learning with videos were obtained with the perspective of videos, online videos learning environment, videos' content providing, technologies, users' learning behaviors, other media comparing, baking learning objectives, multimedia learning tools, and learning baking with videos using.

### **6.1.3 Social Activities of Baking Learning with Multimedia were Uncovered**

The social patterns of baking learning with multimedia consist of interactions between baking learners and teachers without media, interactions between baking learners and their classmates, interactions between baking learners and their mentors, interactions with baking online friends, actively sharing or not with baking friends, and how baking learners learning as well as sharing with media.

### **6.1.4 Design Implications were Proposed**

The factors should be considered in designing or providing videos in the social context to achieve learning and sharing interactions. The design implications were given from the perspective of video learners, video sharers, for different subjects, and for video learning and sharing environment.

## 6.2 Contributions

This study came at an opportune moment to probe the potential of social videos learning and sharing environment. For stakeholders who expect to open up and develop the investment, we provided some users' characteristics of baking learning as well as sharing, and some social patterns of baking learning with multimedia for their baking marketing. Also, several implications of users for videos development and the characteristics of learning with videos were given to them for videos marketing.

For people who are interested in baking whether they had ever learned or shared to others, we sketched the baking learning environment at-present in Taiwan; they can learn how other baking learners learn, how they utilize media to learn, how they interactions with others, and how they think of baking. For engineers or technical developers, people's point of view nowadays to using videos and the videos using conditions from the technology perspective were supplied.

For designers, the users' behaviors with video learning and sharing pattern, especially for baking fields were indicated in this thesis for them to start at the niche points and come out the good design. For researchers who are interested in baking, learning, sharing environment, multimedia, videos, or any related topics; this thesis gave the base of literature review and research methodology and some findings for them to step further.

Although this approach goes beyond current efforts, everything discussed in the paper is possible today and will benefit those various experts who anticipate doing something on these subjects.

## 6.3 Recommendations to the Further Research

Understanding learning and sharing activities with video isn't just a question of filling in the gaps or fixing the existent problems; it is much more an area of study which may shed

new light on how we implement life-long learning in highly social and advanced technology environment. The perceptions of the further work will be provided here from different aspects.

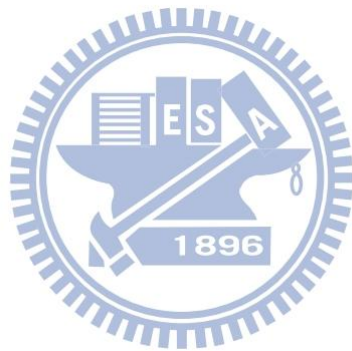
First, we need more careful empirical evidences to justify the findings and implications we indicated. The practical impacts of multimedia resources and social networking and techniques of videos as well as the Internet for learners' learning should be tested. For example, we had known that many learners utilize search engine to search the videos, but we do not know, for what extent, if search engine can decrease learners learning well through videos. The users' actual actions in sequential with search learning videos they want for different learning objectives and subjects should be realized.

Second, the understanding of conditions and interactions of users through videos learning should be carried out in the real life. Further researchers can pick certain series videos providing from the same origins to conduct the contextual inquiries with both sides -videos providers or sharers, and videos learning or audients. Also, their actions with video content and their thoughts can be found in details.

Thirdly, learning experience more related to theory explanations or without skills' performance can be another topics to discuss in order to provide the completely great quality of video learning environment. Further studies can put more attention on giving the specifications of video content in an actual way. Besides, in terms of video content, the other two objective models mentioned in this thesis, which are based on the perspectives of affective and pshychomotor to analyze learning objectives should also be conducted for holistic consideration of video content providing.

Finally, the other suggestion is to undertak deeper and longer observations for finding out learners learning activities in different areas, places, time, and subjects so that researchers can use the key learning need of users to apply on videos. Doing these requires expenditure of time and effort. But it is worthy to do. Owing to this study is conducted on the background of immature videos interactions culture and less relying on videos to learn

during leisure time, we cannot find holistic interaction cycle with video learning activities. But researchers can begin at drawing more details in users' life to probe the usage of videos and informal or life-long learning happened in our daily lives.



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Krathwohl's Taxonomy of Affective Domain  
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Penn Sate Learning Design Community Hub

<http://ets.tlt.psu.edu/learningdesign/objectives/affective>

Psychomotor Domain Taxonomy

<http://users.rowan.edu/~cone/curriculum/psychomotor.htm>

Needs Analysis, Part I: What is Needs Analysis?

[http://www.philblock.info/hitkb/n/needs\\_analysis1.html](http://www.philblock.info/hitkb/n/needs_analysis1.html)

Psychomotor Domain taxonomy

<http://ets.tlt.psu.edu/learningdesign/objectives/psychomotor>

Bloom's Taxonomy Blooms Digitally

<http://www.techlearning.com/showArticle.php?articleID=196605124>

Wikispaces

<http://echucaelearning.wikispaces.com/Thinking+Skills>



## Appendix A

**Krathwohl's affective domain taxonomy** is perhaps the best known of any of the affective taxonomies. "The taxonomy is ordered according to the principle of internalization. Internalization refers to the process whereby a person's affect toward an object passes from a general awareness level to a point where the affect is 'internalized' and consistently guides or controls the person's behavior (Seels & Glasgow, 1990, p. 28)."



**Receiving** is being aware of or sensitive to the existence of certain ideas, material, or phenomena and being willing to tolerate them. Examples include: to differentiate, to accept, to listen (for), to respond to.

**Responding** is committed in some small measure to the ideas, materials, or phenomena involved by actively responding to them. Examples are: to comply with, to

follow, to commend, to volunteer, to spend leisure time in, to acclaim.

**Valuing** is willing to be perceived by others as valuing certain ideas, materials, or phenomena. Examples include: to increase measured proficiency in, to relinquish, to subsidize, to support, to debate.

**Organization** is to relate the value to those already held and bring it into a harmonious and internally consistent philosophy. Examples are: to discuss, to theorize, to formulate, to balance, to examine.

**Characterization by value or value set** is to act consistently in accordance with the values he or she has internalized. Examples include: to revise, to require, to be rated high in the value, to avoid, to resist, to manage, to resolve.

Affective domains deal with changes in attitudes and changes in behaviors related to changes in attitudes. An example of a content areas with affective objectives would be diversity awareness and relating to peoples from different backgrounds.

**Retrieved from:** Krathwohl's Taxonomy of Affective Domain

<http://classweb.gmu.edu/ndabbagh/Resources/Resources2/krathstax.htm>

## Taxonomy

This taxonomy table lists levels of commitment (indicating affect) from lowest to highest.

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### Levels of Affective Domains

Level	Definition	Example
<b>1. Receiving</b>	Being aware of or attending to something in the environment	Individual would read a book passage about civil rights.
<b>2. Responding</b>	Showing some new behaviors as a result of experience	Individual would answer questions about the book, read another book by the same author, another book about civil rights, etc.
<b>3. Valuing</b>	Showing some definite involvement or commitment	The individual might demonstrate this by voluntarily attending a lecture on civil rights.
<b>4. Organization</b>	Integrating a new value into one's general set of values, giving it some ranking among one's general priorities	The individual might arrange a civil rights rally.
<b>5. Characterization by Value</b>	Acting consistently with the new value	The individual is firmly committed to the value, perhaps becoming a civil rights leader.

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Retrieved from: Penn State Learning Design Community Hub

<http://ets.tlt.psu.edu/learningdesign/objectives/affective>

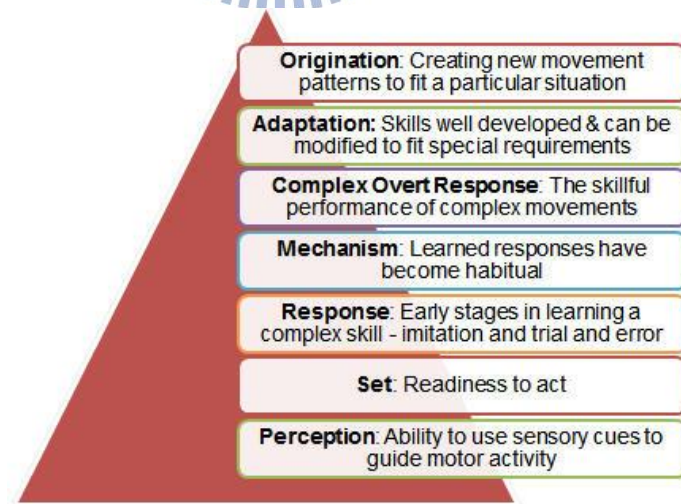
## Appendix B

### Psychomotor Domain Taxonomy

This domain is characterized by progressive levels of behaviors from observation to mastery of a physical skill. Several different taxonomies exist.

Simpson (1972) built this taxonomy on the work of Bloom and others:

- Perception - Sensory cues guide motor activity.
- Set - Mental, physical, and emotional dispositions that make one respond in a certain way to a situation.
- Guided Response - First attempts at a physical skill. Trial and error coupled with practice lead to better performance.
- Mechanism - The intermediate stage in learning a physical skill. Responses are habitual with a medium level of assurance and proficiency.
- Complex Overt Response - Complex movements are possible with a minimum of wasted effort and a high level of assurance they will be successful.
- Adaptation - Movements can be modified for special situations.
- Origination - New movements can be created for special situations.



#### Retrieved from:

Psychomotor Domain Taxonomy

<http://users.rowan.edu/~cone/curriculum/psychomotor.htm>

Needs Analysis, Part I: What is Needs Analysis?

[http://www.philblock.info/hitkb/n/needs\\_analysis1.html](http://www.philblock.info/hitkb/n/needs_analysis1.html)

**Psychomotor objectives focus on physical and kinesthetic skills** (including keyboarding, using technical instruments and other skills).

This domain is characterized by progressive levels of behaviors from observation to mastery of a physical skill.

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#### Psychomotor Domain

Level	Definition	Example
1. Observing	Active mental attending of a physical event.	The learner observes a more experienced person in his/her performance of the skill. Asked to observe sequences and relationships and to pay particular attention to the finished product. Direct observation may be supplemented by reading or watching a video. Thus, the learner may read about the topic and then watch a performance.
2. Imitating	Attempted copying of a physical behavior.	The learner begins to acquire the rudiments of the skill. The learner follows directions and sequences under close supervision. The total act is not important, nor is timing or coordination emphasized. The learner is conscious of deliberate effort to imitate the model.
3. Practicing	Trying a specific physical activity over and over.	The entire sequence is performed repeatedly. All aspects of the act are performed in sequence. Conscious effort fades as the performance becomes more or less habitual. Timing and coordination are emphasized. Here, the person has acquired the skill but is not an expert.
4. Adapting	Fine tuning. Making minor adjustments in the physical activity in order to perfect it.	Perfection of the skill. Minor adjustments are made that influence the total performance. Coaching often very valuable here. This is how a good player becomes a better player.

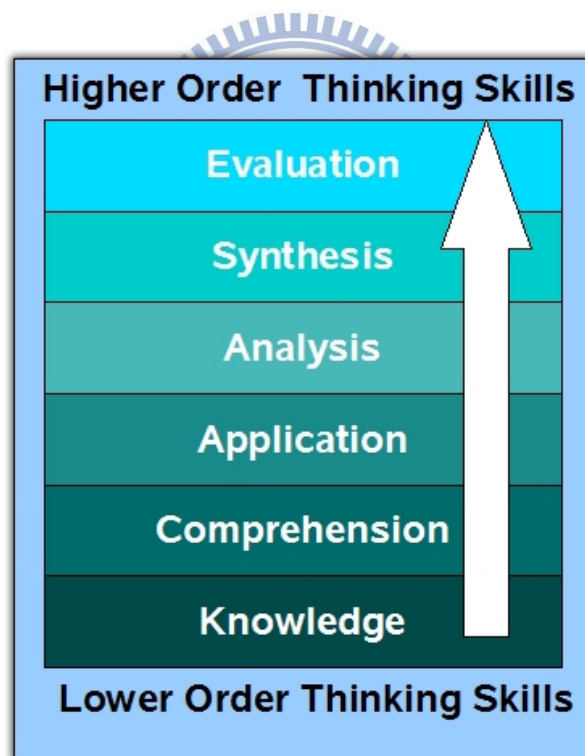
**Retrieved from:** Psychomotor Domain taxonomy  
<http://ets.tlt.psu.edu/learningdesign/objectives/psychomotor>

## Appendix C

### The interpretation of Bloom's Taxonomy map in 1956 version.

In contrast with the two-dimensional of the revised Taxonomy, the original framework is single dimension.

In the 1950's Benjamin Bloom developed his taxonomy of cognitive objectives, Bloom's Taxonomy. This categorized and ordered thinking skills and objectives. His taxonomy follows the thinking process. You cannot understand a concept if you do not first remember it, similarly you can not apply knowledge and concepts if you do not understand them. It is a continuum from Lower Order Thinking Skills (LOTS) to Higher Order Thinking Skills (HOTS). Bloom labels each category with a gerund.

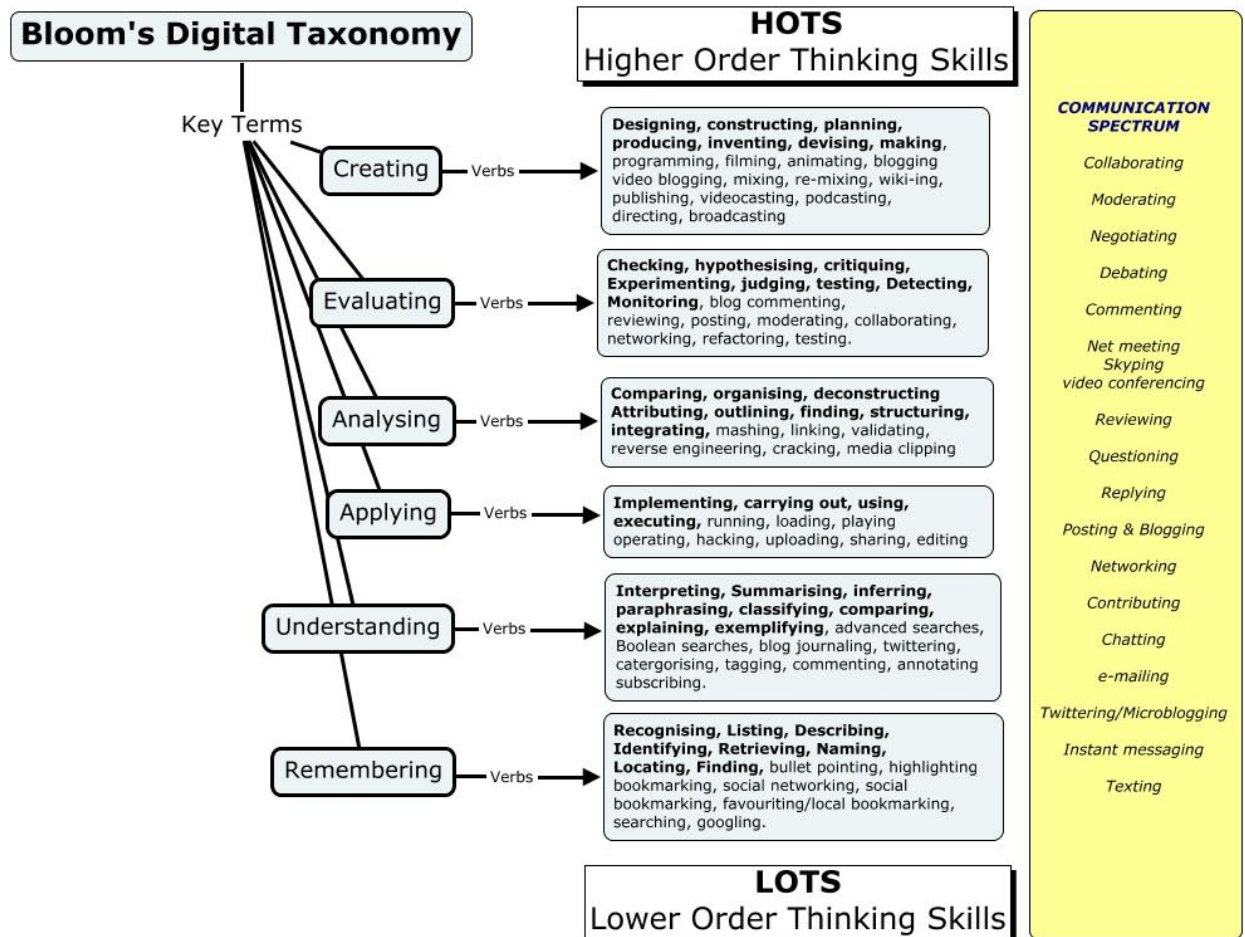


**Retrieved from:** Bloom's Taxonomy Blooms Digitally

<http://www.techlearning.com/showArticle.php?articleID=196605124>

## Appendix D

### The interpretation of Bloom's Digital Taxonomy map in 2009 version



#### Bloom's Digital Taxonomy and Collaboration.

In Drawing 3, Collaboration is included as a separate element as well as some elements being shared. Collaboration can take many forms (see above) and value of the collaboration can vary hugely. This is often independent of the mechanism used to collaborate. Also collaboration is not an integral part of the learning process for the individual, you don't have to collaborate to learn, but often your learning is enhance by doing so. Collaboration is a 21<sup>st</sup> Century skill of increasing importance and one that is used throughout the learning process. In some forms it is an element of Bloom's and in others it is just a mechanism which can be use to facilitate higher order thinking and learning.

Retrieved from: wikispaces

<http://echucaelearning.wikispaces.com/Thinking+Skills>

## Appendix E

### The knowledge dimension

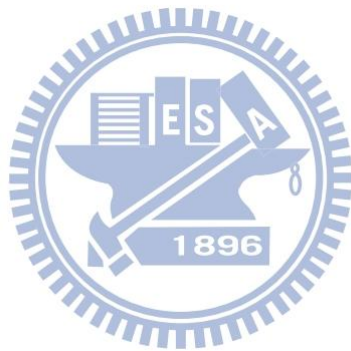
Major types and subtypes	examples
<p>A. Factual knowledge- The basic elements –The basic element learners must know to be acquainted with a discipline or solve problem in it</p>	
AA. Knowledge of terminology	Technical vocabulary, musical symbols
AB. Knowledge of specific details and elements	Major natural resources, reliable sources of information
<p>B. Conceptual knowledge- The interrelationships among the basic elements within a larger structure that enable them to function together</p>	
BA. Knowledge of classifications and categories	Periods of geological time, forms of business ownership Pythagorean theorem, ; law of supply and demand
BB. Knowledge of principles and generalizations	Theory of evolution, structure of Congress
BC. Knowledge of theories, models, and structures	
<p>C. Procedural knowledge- How to do something, methods of inquiry, and criteria for using skills, algorithms, techniques, and methods</p>	
CA. Knowledge of subject-specific skills and algorithms	Skills used in painting with watercolors, whole-number division algorithm
CB. Knowledge of subject-specific techniques and methods	Interviewing techniques, scientific method Criteria used to determine when to apply a procedure
CC. Knowledge of criteria for determining when to use appropriate procedures	involving Newton’s second law, criteria method to estimate Business cost
<p>D. Meta-cognitive knowledge- knowledge of cognitive in general as well as awareness and knowledge of one’s own cognitive</p>	



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DA. Strategic knowledge	Knowledge of outlining as a means of capturing the
DB. Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge	structure of a unit of subject matter in a textbook, knowledge of the use of heuristic
DC. Self-knowledge	Knowledge of the types of tests particular teachers administer, knowledge of the cognitive demands of different tasks
	Knowledge that critiquing essays is a personal strength whereas writing essays is a personal weakness; awareness of one's own knowledge level

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## Appendix F

### The cognitive dimension

Categories & cognitive process	Alternative names	Definitions and examples
<b>1. Remember- Retrieve relevant knowledge from long-term memory</b>		
<b>1.1 Recognizing</b>	Identifying	Locating knowledge in long-term memory that is consistent with presented material (e.g., Recognize the dates of important events in U.S. history)
<b>1.2 Recalling</b>	Retrieving	Retrieving relevant knowledge from long-term memory(e.g. Recall the dates of important events in U.S. history)
<b>2. Understanding- Construct meaning from instructional messages, including oral, written, and graphic communication</b>		
<b>2.1 Interpreting</b>	Clarifying, paraphrasing, representing, translating	Changing from one form of representation (e.g., numerical) to another(e.g., verbal) (e.g., Paraphrase important speeches and documents)
<b>2.2 Exemplifying</b>	Illustrating, instantiating	Finding a specific example or illustration of a concept or principle (e.g., Give examples of various artistic painting styles)
<b>2.3 Classifying</b>	Categorizing, subsuming	Determining that something belongs to a category (e.g., concept or principle) (e.g., Classify observed described cases of mental disorders)
<b>2.4 Summarizing</b>	Abstracting, generalizing	Abstracting a general theme or major point(s) (e.g., Write a short summary of the events portrayed on a videotape)
<b>2.5 Inferring</b>	Concluding, extrapolating, interpolating, predicting	Drawing a logical conclusion from presented information (e.g., In learning a foreign language, infer grammatical principles from examples)
<b>2.6 Comparing</b>	Contrasting, mapping, matching	Detecting correspondences between two ideas, objects, and the like (e.g., Compare historical events to contemporary situations)
<b>2.7 Exemplifying</b>	Constructing, models	Constructing a cause-and-effect model of a system (e.g., Explain the causes of important 18 <sup>th</sup> -century events in France)
<b>3. Apply- Carry out or use a procedure in a given situation</b>		

<b>3.1 Executing</b>	Carrying out	Applying a procedure to a familiar task (e.g., Divide one whole number by another whole number, both with multiple digits)
<b>3.2 Implementing</b>	Using	Applying a procedure to an unfamiliar task (e.g., Use Newton's Second Law in situations in which it is appropriate)
<b>4. Analyze- Break material into its constituent parts and determine how the parts relate to one another and to an overall structure or purpose</b>		
<b>4.1 Differentiating</b>	Discriminating, distinguishing, focusing, selecting	Distinguishing relevant from irrelevant parts or important from unimportant parts of presented material (e.g., Distinguish between relevant and irrelevant numbers in a mathematical word problem)
<b>4.2 Organizing</b>	Finding, coherence, integrating, outlining, Parsing, structuring	Determining how elements fit of function within a structure (e.g., Structure evidence in a historical description into evidence for and against a particular historical explanation)
<b>4.3 Attributing</b>	Deconstructing	Determine a point of view, bias, values, or intent underlying presented , material (e.g., Determine the point of view of the author of an essay in terms of his or her political perspective)
<b>5. Evaluate-Make judgments based on criteria and standard</b>		
<b>5.1 Checking</b>	Coordinating, Detecting, Monitoring, testing	Detecting inconsistencies or fallacies within a process or product; determining whether a process or product has internal consistency; detecting the effectiveness of a procedure as it is being implemented (e.g., Determine if a scientist's conclusions follow from observed data)
<b>5.2 Critiquing</b>	Judging	Detecting inconsistencies between a product and external criteria, determining whether a product has external consistency; detecting the appropriateness of a procedure for a given problem (e.g., Judge which of two methods is the best way to solve a given problem)
<b>6. Create- Put elements together to form a coherent or functional whole; reorganize elements into a new patterns or structure</b>		
<b>6.1 Generating</b>	Hypothesizing	Coming up with alternative hypotheses based in criteria (e.g., Generate hypotheses to account for an observed phenomenon)
<b>6.2 Planning</b>	Designing	Devising a procedure for accomplishing some task (e.g., Plan a research paper on a given historical topic)
<b>6.3 Producing</b>	Constructing	Inventing a product (e.g., Build habitats for a specific purpose)

## Appendix G

### The questions of interview

<b>Stage One- Introduction &amp; Warm-up</b>
Object    Getting both interview and interviewee comfortable in talking Average time cost    10mins
<i>1. Introduce myself</i>
-Hi Vicky, thank you for being here. -We are...This is my business card....
<i>2. A small talk</i>
-How was your day? Have you had your lunch yet? -The weather today is warm.....
<i>3. Interpret the interview</i>
-The following interview will be held in three parts... -If you have any confused or questions, please feel free to ask....
<b>Stage Two- General Issues</b>
Object    Understanding the interviewee's background and general baking learning experience Average time cost    25mins
<i>1. Personal profile</i>
-How should I address you? -What is your job? -Could you tell me a little bit about yourself?
<i>2. Background of baking learning experience</i>
-Could you share anything about your baking experience? -When did you start learning baking? -What are the reasons that make you start baking? -When did baking become your habit or profession? -How often do you do baking? -What kinds of baking are you interested? Frequency? -Describe the last time you do baking? -Where is your baking taken place? -How long did you spend on baking each time?
<i>3. Technology usage background</i>

-Do you familiar with computer/internet/mobile device? Camera/ DV/video?  
 -How do you use it? Frequency? When?  
 -Use it for what purpose?

**Stage Three- Deep Focus**

Object Drawing out the detail of baking learning experience  
 Average time cost 40mins

*1. Get deep in baking learning experience*

- Describe the last time your baking learning experience?  
 -How to learn baking?  
 -Why use these methods to learn?  
 -What is you typically baking flow? Describe in detail.  
 -What are some activities related to baking? Have you ever attended? Why?  
 -How to improve your baking knowledge or skill in daily life? Frequency? Why use these ways to improve?  
 -What are some people or institutions related to baking? Have you ever got in touch with them? Any example?  
 -Have you ever discussed your baking experience with others? How? When? Any example?  
 -How to avoid your baking memories fading out? What do you do to keep it? Why? When?  
 -Do you have any anticipation in your baking?

*2. Positive sharing baking experience*

-Have you ever shared your baking experience? Why? How? When? Frequency? With whom? Where?

**Stage Four- Wrap-up**

Object Getting feedback of the interview experience  
 Average time cost 15mins

*1. The perspective of interviewee in the interview*

-Was there anything made you uncomfortable?  
 -Was there anything you would like to be different?  
 -Do you have anything you want to share with us?

*2. Appreciation*

Thank you for sharing with lots interesting experience with us. We really appreciate it. If you are interesting in our research...

## Appendix H

Three stratum affinity diagram of forty notes in Chinese

各種因素 阻礙學習	因時間、地點、金錢、個人能力等因素阻礙學習	因學習管道需要耗費時間長，降低學習意願 eg 影片太長或證照班一次要報名三個月	因學費太貴阻礙學習 eg 日本進修團、證照班、大廠展覽、大陸造型蛋糕學校	因資源太遠阻礙學習或練習 eg 上課地點太遠，好的原料設備店家太遠	因為把烘焙當職業，故學烘焙的過程處處考量盈虧，無法單純聚焦在學習這件事上	因語文能力不足，儘管知道國外資源多但無法充分利用
	學習資源品質不足，阻礙學習	教學資源不夠全面仔細，讓學習受挫 eg 食譜書&網友分享&線上影片&老師教學內容都常常都漏西漏		坊間烘焙教室多半學的不多也不精，因師傅不懂學理講不出為什麼，且一次教一樣、人多、指觀摩、或實做做的輕鬆不明究理		
	分享文化沒有充分建立，阻礙學習	有經驗的人因為學習心得得來不易，藏私不願意分享		同領域的人多少會防範，不是學這個領域的親友聊不起來，故平時沒甚麼真正交流的機會		
利用工具 來輔助學習	利用網路來輔助學習	充分利用網路搜尋關鍵字來學習 eg 找部落格、品項、問題、影片、新點子	只將科技做為輔助工具，無依賴它記錄分享或學習 eg 不會依賴網路搜尋、社群分享、軟體編修、相機照食物	email 訂閱部落格定期追蹤 還有訂閱博客來書店的最新書消息		
	練習所需門檻高，不	烘焙製作練習每一次要全副武裝 eg 因通常具有時效性，不同		練習需要適當的場地和設備，只能在固定的地點練習，無法隨時		

	能隨時隨地練習	品項的準備、製作、等待時間都不一樣，且因設備原料關係，一次都要做很多個		隨地複習 eg 中度電機烤箱地點 夠大，另外接電	
	練習過程或學習資源不易紀錄，無法複習	上課照片筆記錄影和自己的筆記分次多而零散，東記一筆、西記一筆，不會整理，之後也不會去看	因練習過程有些步驟不能等，又手忙腳亂，所以不會特別紀錄	動態影音不方便記錄和呈現，影響使用意願 eg 電視節目的配方來不急抄、youtube 不易儲存、看影片邊看邊做跟不上又沒手按停	不太有分享的習慣，不會刻意照相或是照完就自己存著，有時做漂亮或開心的時候會上傳照片給大家看成果
	用記錄來輔助學習	會將所接觸到覺得有用的資訊做紀錄儲存 eg 上課教材、電視節目、網路資源		會將學習心得和領悟到的細節做紀錄，下次失敗或忘記時有個參考依據	
	視覺呈現刺激學習動力	別人分享的圖片看起來美或特別好吃，是讓自己想參考學習很大的誘因			
	學習資源必須能清楚說明	書或網路必須要圖文能充分配合，文字解釋配方步驟的同時，圖也顯示那個階段的狀態長相，才有辦法理解			
	各種因素增加學習成效	分階段目的進行學習	不同的學習階段和目的會使用不同的媒介學習 eg 初學看影片最有用、研發時看學理書、做蛋糕裝飾或造型看影片、做特殊西點找特殊食譜書		初學一切從基礎學起，領域專有名詞、固定步驟做法、常用原料等都要先知道熟悉運用
建立個人學習風格		會將所學調整成適合自己的做法或口味或更健康的配料			
針對個人		針對自己學習	選擇性的學習	會找符合自己	固定訂閱追蹤

	所需做學習	的弱點找方法 主動加強 eg 去應徵一之鄉 西點烘焙師、 報名各種課程、去日本進修	eg 影片只看有興趣的部分、 食譜書只看想 做的那一頁、 有需要才找資料	程度的學習管道來學習，簡單的說明或看得懂做法的影片	幾個較不錯老師網友朋友的部落格，email 收到有興趣才點入看詳細
	累積經驗能輔助學習效率	經驗足夠之後，再學習同領域的新東西會相對快很多，能掌握基礎再變化 eg 可能知道配方，或瞄兩眼圖片或作法就做得出來了			
學習必須全面且完整	學習要能掌握重點訣竅	學習若有人能指點技巧訣竅或開導解惑較能夠進步 eg 上課老師能充分指點，若上課不互動或只觀摩，效果就跟在家看影片一樣		該學的都學了，若沒有細心和天分，還是不會做得好 eg 上一堆課、影片看了一百遍，找不出技巧也沒用	
	會多元學習整合	平日會透過各種管道累積新靈感 eg 美食節目新食材、上網或參加烘焙展看新東西、到處試吃甜點店家	多元涉獵學習 eg 各種書、網友、店家、課程、活動、各國資源、朋友、網路社群都去參與接觸	做烘焙到最後只要是吃的都會有興趣，想要廣泛學習和多方嘗試	學習管道不可能單一，需要多元才能整合 eg 影片提供動態+網路找配方、看書之後再上網搜尋、不同網友提供的資料交叉對比
	找不到適合自己的學習方式	學習資源五花八門，找不到適切的學習參考管道或內容，導致學習過程不斷失敗 eg 國外資源多，但口味原料不隊或太難來、每個老師網友分享的不一樣，不		學習資源多，重點在自己有沒有方向	



		知道要照誰的		
	需要不斷的練習和實作經驗累積學習成效	重視實作手感經驗和不斷的練習，否則無法進步太多 eg 只看動態影片沒摸到實體，真正要做還是會有問題	初學最快的方法是有人教、帶著做，實際參與感覺和經驗	學理對研發有幫助，但沒實作練習沒有用，畢竟想的跟做出來的有差，要做了才會發現問題，不是只是計畫
社交因素 增加學習 動力	學習需要理想和熱誠做支撐	堅持自己的信念是持續練習學習的動力 eg 能夠做出健康養生品質好的食材、為家人或社會做出最健康的甜點	把學習烘焙當興趣，平日吃飽沒事就做給自己吃、做給家人朋友吃，喜歡嘗試新東西	
	樂於分享心得經驗，多了學習的管道	不會吝嗇分享傳授既有知識經驗 eg 主動開班授課、線上分享資源、回答別人問題		
	會和親友交流學習心得，共同成長	會和志同道合沒有營利關係的朋友討論交流心得分享，共同學習成長	學習或練習的過程需要有朋友親人的陪伴理解鼓勵支持和認同	上課或網路交流認識的朋友，會變成這個圈子共同的夥伴，會討論要去哪上課或哪買原料便宜