

行政院國家科學委員會專題研究計畫 成果報告

探討國小自閉症學童採行數位教育平台輔助工具學習聲音
辨識之成效 ~ 進行實驗組與控制組之研究
研究成果報告(精簡版)

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行政院國家科學委員會補助專題研究計畫成果報告

探討國小自閉症學童採行數位教育平台輔助工具
學習聲音辨識之成效~進行實驗組與控制組之研究
The Exploration of the Effects on the Adoption of Digital
Educational Platform as an Assisting Tool for Learning Audio
Recognition by the Autism Students in the Elementary School
~ An Research on Lab Team and Control Team

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計畫發表刊物

本計劃已經發表刊物

Huay Chang, “A Noble Digital Educational Platform for Elementary School Autism Students in Learning Audio Recognition Course”, 8th ASEE Global Colloquium on Engineering Education, Budapest, Hungary, 12-15 October 2009.

本計劃已投稿刊物

Huay Chang, “A Noble Expert System for Autism Students”, Expert Systems with Applications, 2009.

計畫成果自評

計畫主持人在研究計畫中預期完成五項工作為：1.建置自閉症學童數位學習環境 2.建置自閉症學童教育治療資訊交流數位環境 3.建置自閉症學童學習歷程提供教師輔導諮詢 4.導入知識管理模式提供全方位數位學習資訊 5.導入數位學習環境創造自閉症學童學習契機。在經過一年的執行期間後，計畫主持人與三位兼任助理依據研究計畫的時程逐一進行並完成各階段工作，執行的過程描述呈現在本報告第三章，具體的研究結果呈現在本報告第四章，本計劃的結論呈現在本報告第五章。而在研究計畫中的參與人員，計畫主持人與三位兼任助理也都獲得預期的訓練成效。

本研究計畫在實驗階段中，實驗對象與特教教師對於本研究的平台內容不僅在製作過程參與且提供寶貴意見，並且對於平台的成果均相當的滿意。因為數位平台的使用可快速的提昇自閉症學童學習的成效，也可引導自閉症學生能更快速的適應不同情境的生活環境。秉持特教教師的愛心，特教教師相當期望本系統的功能可以擴大與持續更新，並且特教教師也希望此研究可持續進行並且嘉惠更多學校的自閉症學童。計畫主持人殷切期望國科會評審委員們同意持續提供本研究團隊研究機會，讓我們共同為弱勢學生進行持續深入的協助。

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摘要

在本研究計畫中，我們期望應用資訊技術建置數位教育平台做為一種輔助工具，以進行國小自閉症學童學習聲音辨識課程，並且此平台將朝資源分享目標開放；我們期望貢獻專業研究人員的責任，在台灣這個具有民主公平的社會中，實踐全民平等學習權的目標；我們期望照顧弱勢族群，在台灣這個充滿愛心溫暖的社會中，縮短國小自閉症學童的數位教育落差。在我們研究計畫中擬將建置的數位教育平台中，我們將提供我們在本研究計畫中所開發設計出適合國小自閉症學童學習聲音辨識的數位課程，除了支援國小特教教師進行長期匱乏的多元化聲音課程教學，並可彌補教育部已規劃出的國小自閉症學童學習課程之不足；同時，我們並期望將完整記錄每位國小自閉症學童學習的歷程，提供國小特教教師據以進行國小自閉症學童個別化學習之規劃設計；進而我們並期望將國小自閉症學童個別化學習之階段性成果，轉化成數位化教學評量，提供國小自閉症學童持續性參考資料。我們期望我們的研究計畫，可以具體幫助國小自閉症學童突破弱勢族群資源落差的常態現象，不僅創造出國小自閉症學童的學習新契機，並協助國小自閉症學童提昇社會的適應能力。

關鍵字：自閉症、數位學習、數位教育、知識管理

ABSTRACT

In this project, the author employs the corresponding technologies of the Digital Education Platform and the knowledge management model to present a System for the Elementary School Autism students in Learning Audio Recognition course. There are some special features in the system including a) A suitable multi-type audio course is created for autism students and this can robust the support for the special education teachers with multi-type audio course materials in teaching. In addition, this also can complete the insufficient of the Elementary School Autism Students Course programs designed by the Ministry of Education, b) A record and evaluation as to the process for autism students in Learning Audio Recognition course are generated and this can provide the reference for the special education teachers in further step for individual case. The teaching evaluation graphics will be created automatically through the learning process in the Digital Education Platform. The System breaks through the space and time limit integrates the special education resources and manages and shares the resources centrally. Numerous simulations have been made to demonstrate the efficiency of the System for Elementary School Autism students.

Keywords: autism, digital learning, digital education, knowledge management

1. Introduction

1.1. Research Background

The usage of internet is without the constraints of time and space and makes the knowledge spread rapidly and conveniently. The e-learning are promoted from government to schools. Many business of the digital industry join the e-learning market one by one. Nearly all of the e-learning classes and computer aided instruction programs are aimed at the general students. But there are a small group of special students who can't adopt the normal education resource as the general people do. So are the Autism students.

Most of the Autism children like mechanical equipments and appear interesting in the animated display of the monitor. Therefore, the computer assisted instruction method becomes the most favorite of the Autism children. The benefits of using the computer assisted instruction method include the consistence of the operation and reaction and the Drill & Practice method. The computer is not affected by the motion and the influence of the external environment. The computer displays the same teaching content repeatedly. The positive evaluations made by many scholars apply the usage of computers on the teaching of the Autism children [1]-[5].

1.2. Research Motivation

The creation of the paper is oriented from the following problems:

- The lack of school budgets in the special education program.
- The poor amount of special education's materials.
- The shortage of special education teachers.
- The gap between the special education and the society.

The specific research motivations are stated below:

Motivation I – The System can support the poor multi-audio course teaching and make up the insufficient of the Elementary school Autism students learning courses.

Motivation II – The proposed System can record the learning history of each Elementary Autism student that provides the Elementary special education teachers as the basis in designing the individual learning of the Elementary Autism student.

Motivation III –The proposed System can transform the Elementary Autism student's individual learning result into digital table for further curing reference.

1.3. Research Objective

There are three objectives in the System:

Object I – To establish a free digital education platform as the assisting tool for the Autism student individual learning in audio recognition.

Object II – To integrate the materials designed by the special education teachers and to reach the integration of teaching resources.

Object III – To record the learning history of each Autism student and support the special education teachers in arranging the continuous learning programs.

2. Literature Review

There are three parts in the literature reviews of this project stated below:

2.1 Special Education

The following four items are presented in the part of digital learning and special education:

There are four important points in special teaching: Matching the students' characteristics and require elastic range, doing the research in improving special education course, materials and teaching tools, implementing on the guideline of professional group cooperation and arranging individual education program [6].

2.2. Autism Students' Learning

The Introduction of Autism In [1]-[3] and [11]-[16], the following authors submitted their summarization toward the general behavior of the Autism students in the following: The Autism children lack the ability in understanding themselves and the interactions of social ability. Therefore, the Autism children don't talk to others in face. They have no reactions at all. They can't establish close relationships with family members. They can't play with other normal children. The games they preferred are simple and without change. The environment they live is simple.

The Autism Student's Learning Model – Structured Instruction In [7]-[10], [13] and [17]-[23], the authors submitted their summarization toward the learning mode-structured teaching for the Autism students in the following: The structured teaching mode is developed by the University of North Carona of U.S.A. It becomes one of the most important special education methods for the Autism students. The spirit of the structured teaching is to arrange a structured teaching environment and to create structured materials. The Autism students are encouraged to explore by the sense of vision. The Autism students are also trained to finish a series of learning activities. The teaching mode of the structured teaching includes the following four factors: the structured teaching environment, the structured daily activities, the individual work system and the structured sense of vision.

Computer Assisted Instruction v.s. Autism Student's learning Most of the Autism children like mechanical equipments and appear interesting in the animated display of the monitor. Therefore, the computer assisted instruction method becomes the most favorite of the Autism children. The benefits of using the computer assisted instruction method include the consistence of the operation and reaction and the Drill & Practice method. The computer is not affected by the motion and the influence of the external environment. The computer displays the same teaching content repeatedly. The positive evaluations made by many scholars apply the usage of computers on the teaching of the Autism children [1]-[3] and [24]-[27].

Autism Students and e-learning In [6]-[7] and [28]-[31], the authors submitted their opinions toward e-learning and summarize in the following: The definition of e-learning is that the learners and teachers break through the tradition face-to-face learning method and adopt the interactive teaching method through the internet. The e-learning breaks through the limitations of time and space. The learners adjust their learning progress. The teachers adjust the teaching programs based on the learners' learning result. The e-learning is like one-to-one teaching mode. The characteristics of e-learning include: multi-types of course contents, a channel for learning experience exchange, the virtual learning group and the professional network providers.

2.3 An Experimental Autism Student Audio Recognition Learning Network Platform

- A protocol type to the Autism Student Audio Recognition Learning Network Platform created in previous research is shown in Figure 1.

3. Research Methodology and System Design

The research methods in the paper include Literature Analysis Method, Depth Interview Method and Experimental Design Method. The detailed descriptions are listed below.

3.1 Literature Analysis Method

Many literatures concerning Autism fields are collected in the paper. The definition, category and exploration of the related knowledge are processed that support the establishment of the digital education platform in the System. The sources of the literatures include books, journals, research reports and the published reports of the Ministry of Education. After the analysis, comparison, processing and summarizing, the conclusions become the theoretical basis in this research.

3.2 Depth Interview Method

We also collect many precious opinions from the Elementary special education teachers. The real teaching situations are supported by the special education teachers. The content of the depth interviews are:

- Interview with the Elementary special education teachers.
- Provide the multimedia materials trial versions to the special education teachers.
- Collect the feedback opinions from the special education teachers.
- Transform the contents of the interview into the digital tables.

3.3 Experimental Design Method

We made several interviews with the Elementary special education teachers and invite the special education teachers become the experimental participants in the paper. The detailed experimental implementation and experimental result is introduced in following section.

3.3.1 System Plan Stages

There are three system plan stages, shown in Table 1.

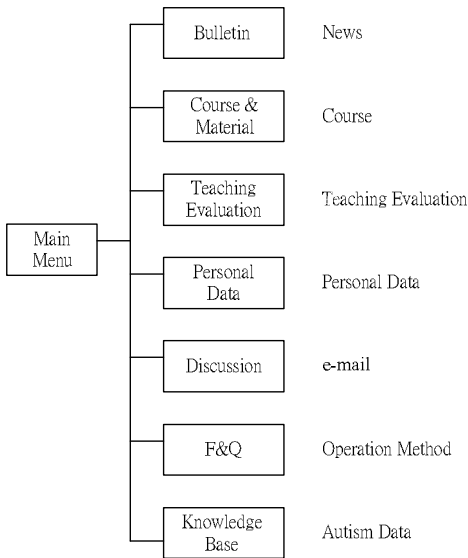


Figure 1 A protocol type Experimental System Function Framework

Table 1 The System Plan Stages

The Content of Each Stage	
Stage I	The collection and analysis of Autism data. The interview of Special Education professors. The requirements investigation of the users (Special education teachers, Elementary Autism students)
Stage II	The plan of audio recognition course – develop the frame mode of digital audio course. The initial part of audio recognition course – the daily life of Autism students. The establishments of digital education plan – develop the basic functions of the platform.
Stage III	Select and execute the ‘experimental team’ and ‘control team’.

3.3.2. System Environment

The whole system environment design in the System is on the basis of web-based. The system environment is shown in Figure 2.

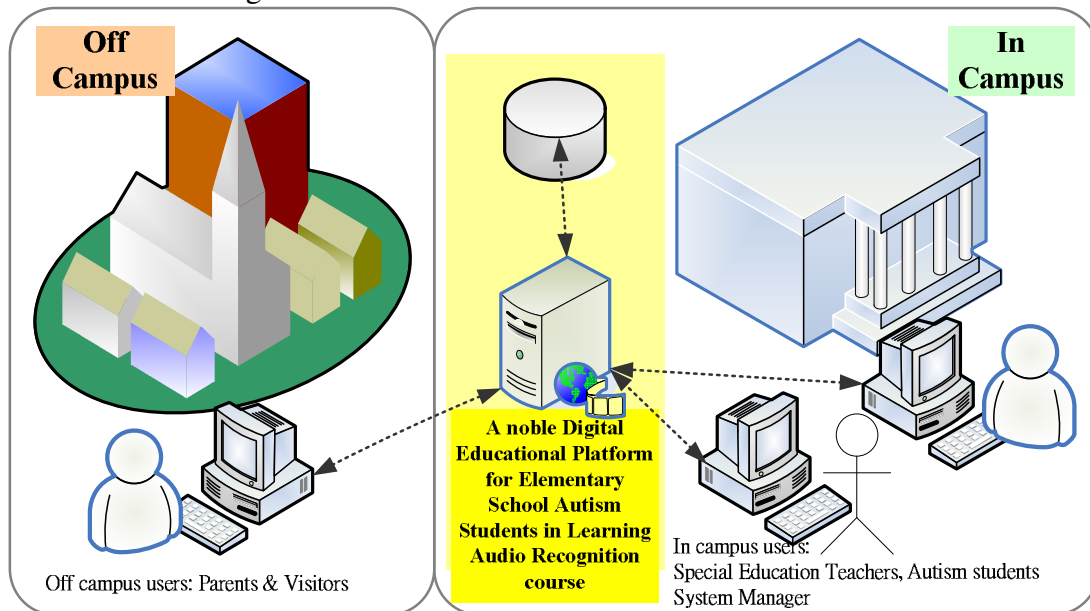


Figure 2 The System Environment

3.3.3. System Process

The SQL Server 2000 is adopted as the system developing tool in the database management. Various users are provided the functions of inputting and updating operations in the database management work shown in Figure 3.

3.3.4. Teaching Courses Planning

The teaching courses planning the significant teaching contents and the teaching evaluations are clearly defined in the System.

The Contents of the Audio Recognition Course

After the interviews with the special education teachers, the instruction contents are summarized and listed in Table 2.

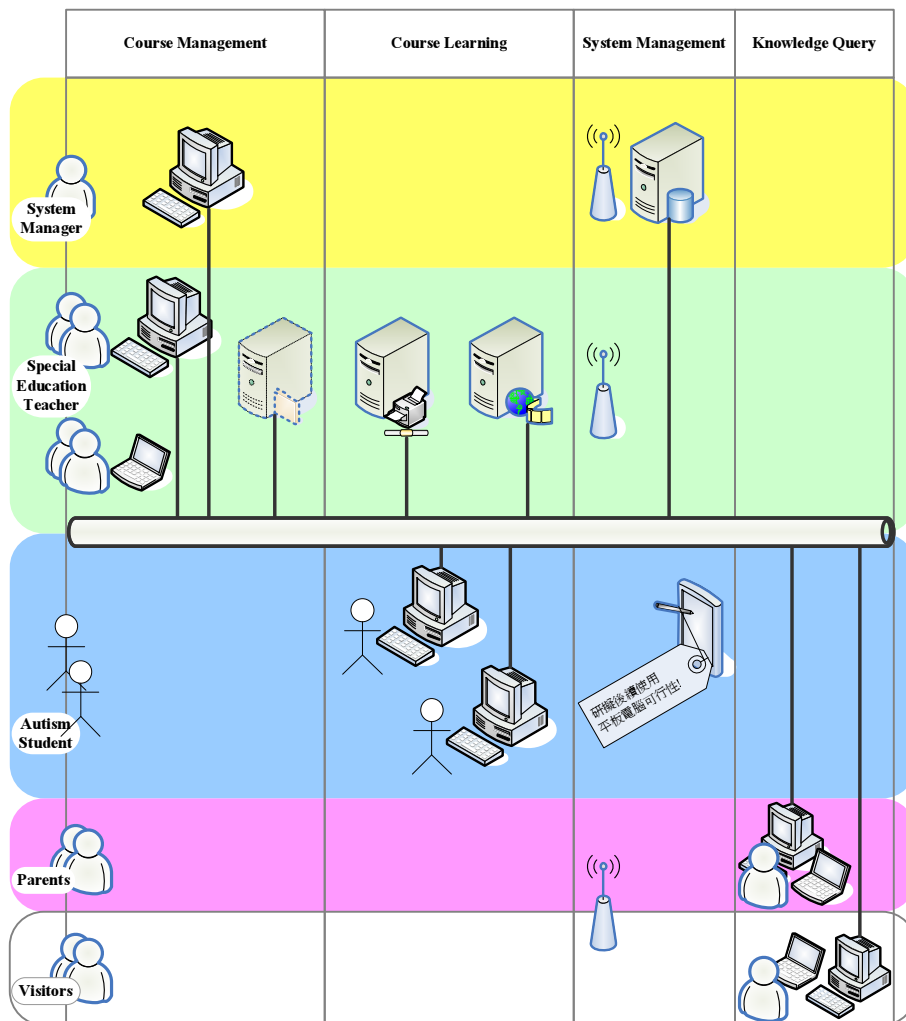


Figure 3 The System Process

Table 2 The Instruction Contents of the Audio Recognition Course in the System

The Contents of the Audio Recognition Course		
Guideline	‘Daily Life Issues’ if the guideline of the audio recognition course.	
Course Outline	I. Home	The different sound made in different rooms in home.
	II. Classroom	The different sound made in the classrooms.
	III. Campus	The different sound made in campus.
	IV. School Activities	The different sound made in different activities in school.
	V. Transportation	The different sound made by different transportations.
	VI. Park	The different sound made in the park.
	VII. Animals	The different sound made by different animals.
	VIII. Supermarket	The different sound made in the supermarket.
	Remark: The new courses will be added on the demands of Autism students.	
Course Mode	‘Simulation Course Mode’	
	The design of the Simulation Course Mode is on the one-by-one base. The special education teacher or Autism’s parents give instruction aside. The combination of the audio and pictures create the ‘Simulation Course Mode’ that helps the Autism students may recognize the daily life’s sound just like the normal people do. As shown in Figure 4.	

Figure 4 The Part of Family Life Course

The Teaching Evaluation of the Audio Recognition Course

The Complete Teaching Evaluation of the Audio Recognition Course made in the paper is shown in Table 3.

Table 3 The Instruction Evaluation of the Audio Recognition Course in the System



The Instruction Evaluation of the Audio Recognition Course	
Evaluation Objective	The Elementary school Autism students learning records are records in different stage in this research. The special education teachers use the records to develop individual learning plan for Autism student.
Instruction Evaluation Mode	
Instructor Records	Spread Sheet
The special teachers write down all the interactive reaction records of the Autism student during the class. Those records are produced by the computer periodically. As shown in Figure 5.	The evaluation records can be transformed into Excel file that can be used in creating multi-types of graphs for further research by the special education teachers. As shown in Figure 6.
	

Figure 5 Instructor's Evaluation Records

Figure 6 The Spread Sheet of Learning Evaluation

4. Experimental Design and Implementation

4.1 Experimental Environment

The and experimental environment of the System are stated below.

System Environment

The development process in the research of this System includes many interviews and collected valuable literatures those become the foundations of the operation system development design. The discussion with the special education teachers continued in the whole process in this research. The digital education platform is established in the Chung-Cheng Elementary School of Hsintien City. That is a very famous Elementary school in the North of Taiwan.

Experimental Samples

There are five samples in the Chung-Cheng Elementary School of Hsintien City, four of them belong to the light status of Autism, and the fifth belongs to the medium status of Autism. There is another sample in Guang-Ming Elementary School in Taoyuan City.

4.2 Experimental Implementation

The experiment in the research of the System is based on the establishment of the digital education platform. There are two types of experiment: Experiment I – The experimental teaching is implemented by the author. Experiment II – The experimental teaching is implemented by the special education teacher.

4.3 Experimental Design Digital Education Platform

The system operation frames are presented in the following sub-sessions. Only the home page is listed below. As shown in Figure 7.

4.4 Experimental Result

The experimental results in the research are listed below.

4.4.1 Research Result Areas

The research result areas in the research of the System areas are shown in Figure 8.

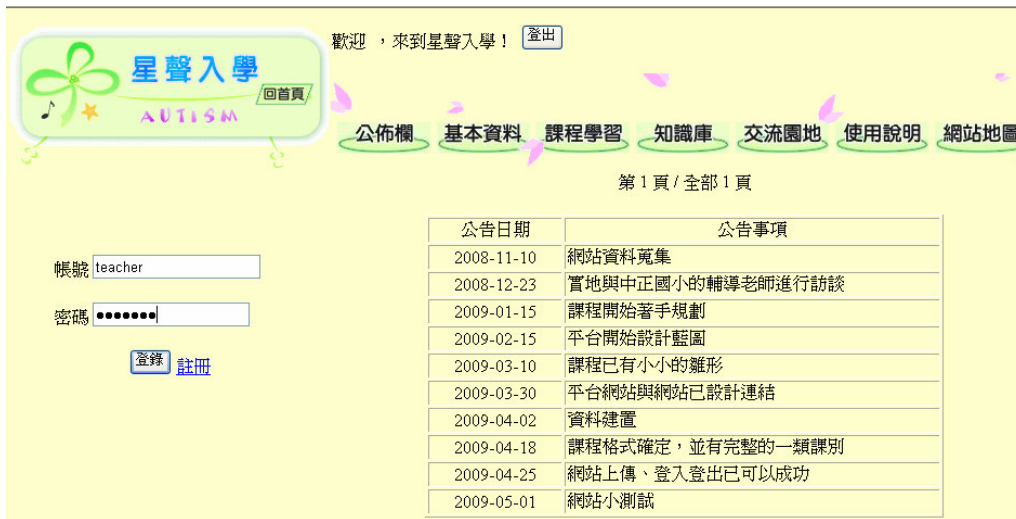


Figure 7 The Home Page of the Digital Education Platform in the research of the System

These three research result areas are described in each implementation stages. As shown in Table 4.

Table 4 The Execution Stages in the research of the System

The Research Results of Each Stage	
Stage I	The collection and analysis of Autism data. The interview of Special Education professors. The requirements investigation of the users (Special education teachers, Elementary Autism students)
Stage II	The plan of audio recognition course – developing the frame mode of digital audio course. (shown in 4.5.3) The initial part of audio recognition course – the daily life of Autism students. (shown in 4.5.4) The establishments of digital education plan – developing the basic functions of the platform. (shown in 4.5.2)
Stage III	Select and execute the ‘experimental team’ and ‘control team’. (shown in 4.5.5)

4.4.2 System Functions Framework Diagram

The System Functions Framework Diagram in the research of the System is shown in Figure 9.

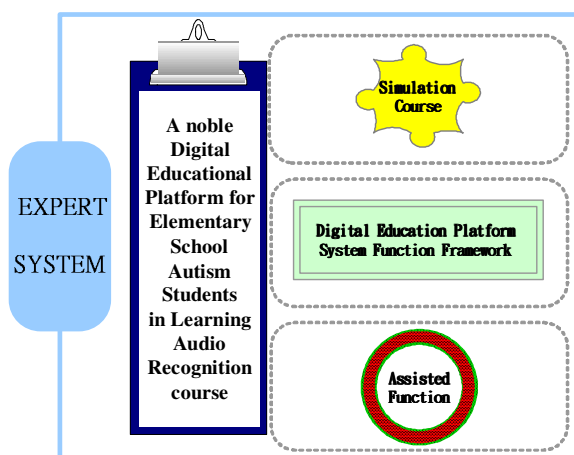


Figure 8 Research Result Areas in the research of the System

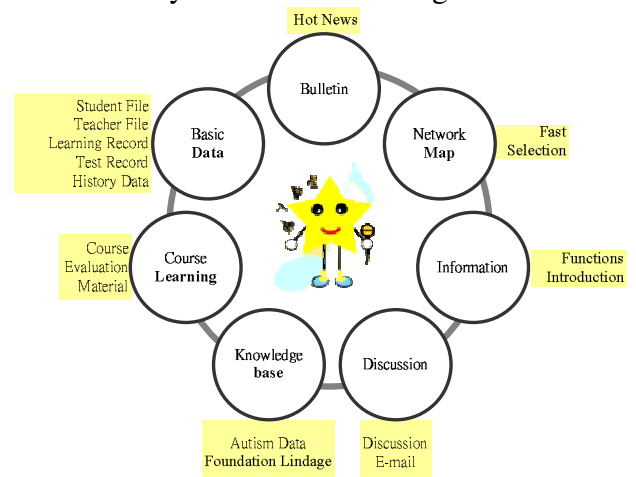
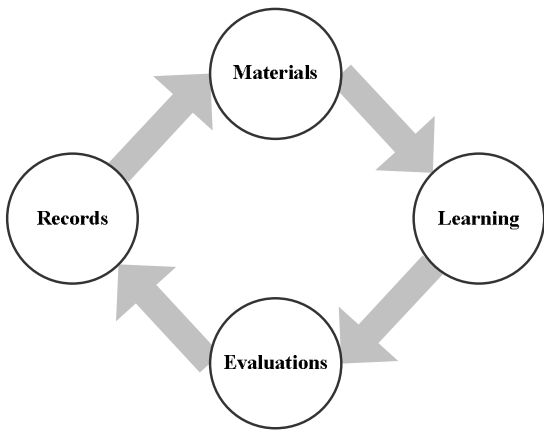


Figure 9 System Functions Framework Diagram

4.4.3 The Research Result of ‘Audio Recognition Course Plan – Developing Digital Audio Course Framework Mode’

The Learning Circle – ‘Material, Learning, Evaluation and Record’ is shown in Figure 10.

The Various Users’ Framework Mode and the Usage Functions is shown in Figure 11.



	Course Management	Course Learning	System Management	Knowledge Query
System Manager	-Database Maintenance -Materials Evaluation		-Database Maintenance	-Database Maintenance
Special Education Teacher	-Materials Editing -Test Record -Learning History	-Test Record -Learning History	-Teachers Files	-Autism Knowledge
Autism Student		-Student Files -Courses Data -Teaching Evaluation -Learning History	-Students Files	
Parents		-Course Data -Learning Record		-Autism Knowledge Query
Visitors				-Autism Knowledge Query

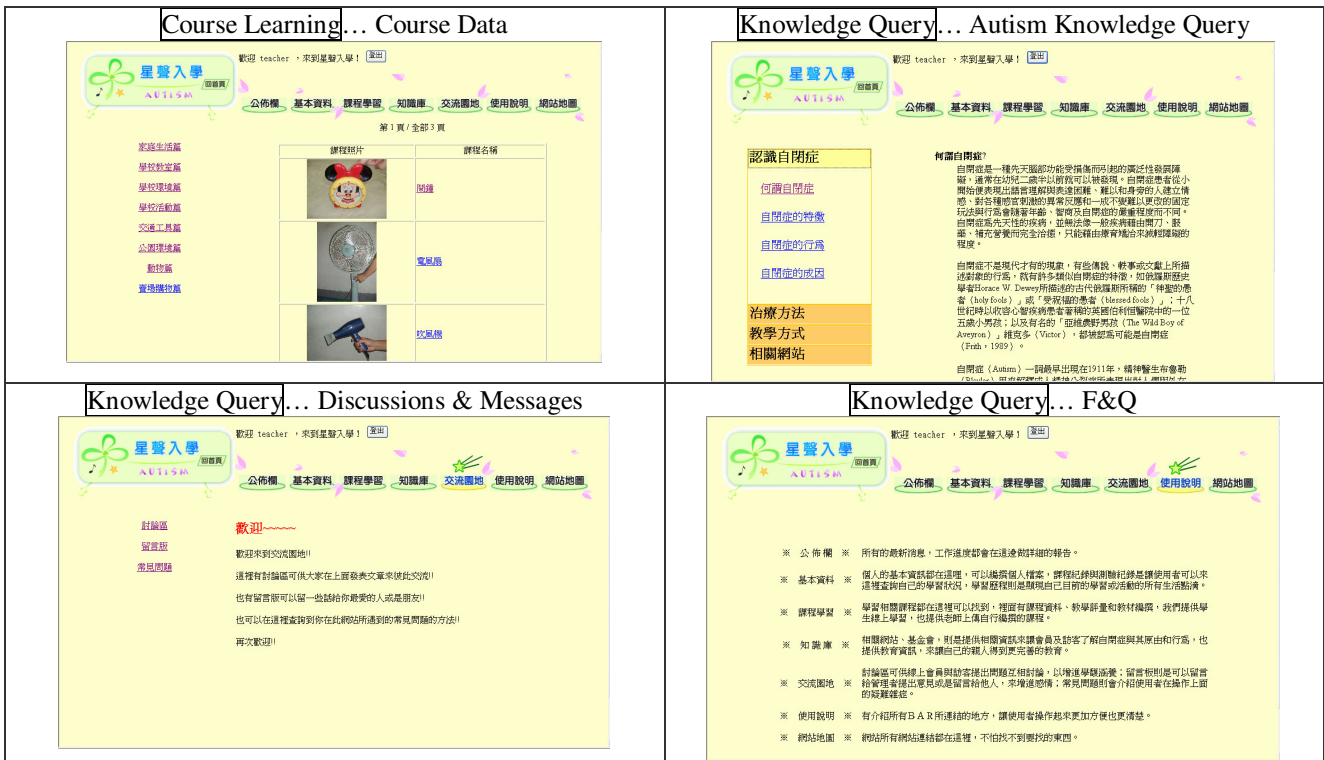
Figure 10 The Learning Circle – ‘Material, Learning, Evaluation and Record’ in the research of the System

Figure 11 The Various Users’ Framework Mode and the Usage Functions of the System

The Functions’ System Operating in the Four Categories - ‘Course Management, Course Learning, System Management and Knowledge Query’ is shown in Table 5.

Table 5 The Functions’ System Operating in the Four Categories - ‘Course Management, Course Learning, System Management and Knowledge Query’ of the System

The Functions’ System Operating in the Four Categories - Course Management, Course Learning, System Management and Knowledge Query																																																			
<p>System Management... Login Frame</p> <table border="1"> <caption>公告事項</caption> <tr><th>公告日期</th><th>網站資料彙集</th></tr> <tr><td>2008-11-10</td><td>網站與市正國小轉導老師進行動線</td></tr> <tr><td>2008-12-23</td><td>課程開始著手規劃</td></tr> <tr><td>2009-01-15</td><td>平台開始設計藍圖</td></tr> <tr><td>2009-02-15</td><td>課程已有小小雛形</td></tr> <tr><td>2009-03-10</td><td>平台網站與網站已設計連結</td></tr> <tr><td>2009-03-30</td><td>資料建置</td></tr> <tr><td>2009-04-02</td><td>課程格式確定，並有完整的一課課別</td></tr> <tr><td>2009-04-18</td><td>網站上傳、登入退出已可以成功</td></tr> <tr><td>2009-04-25</td><td>網站小測試</td></tr> <tr><td>2009-05-01</td><td>網站小測試</td></tr> </table>	公告日期	網站資料彙集	2008-11-10	網站與市正國小轉導老師進行動線	2008-12-23	課程開始著手規劃	2009-01-15	平台開始設計藍圖	2009-02-15	課程已有小小雛形	2009-03-10	平台網站與網站已設計連結	2009-03-30	資料建置	2009-04-02	課程格式確定，並有完整的一課課別	2009-04-18	網站上傳、登入退出已可以成功	2009-04-25	網站小測試	2009-05-01	網站小測試	<p>Course Management... Materials Production</p>																												
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4.4.4 The Research Result of 'Audio Recognition Course Design

The Research Result of 'Audio Recognition Course Design includes two parts.

1) The Initial Part of the Audio Recognition Course Outlines for Elementary Autism Student

The part of the course design in the research of the System for the Elementary School Autism Students in Learning Audio Recognition course adopts Photoshop, Flash and Adobe Audition as the developing tools in the creation of multimedia system design phase. The Result of Audio Recognition Course Design is based on the research method and the learning priority list submitted by the expert of special education teachers.

There are eight course outlines in the audio recognition course outline for elementary autism students. A lot of courses are design in each course outline under the requirements of the special education teachers. As indicated in the prior session, the expert of special education teacher can collect appropriate graphs or pictures, audio files and the course introduction text, and then upload all the materials in the digital education platform. The new course is designed easily. As shown in Table 6



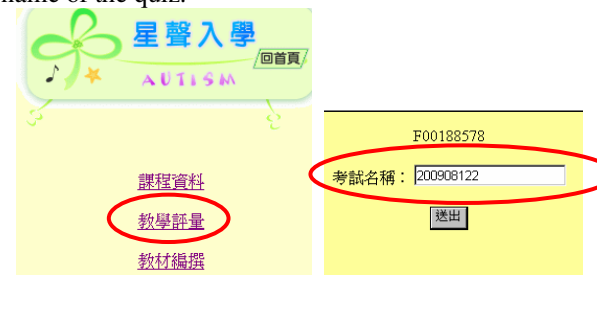
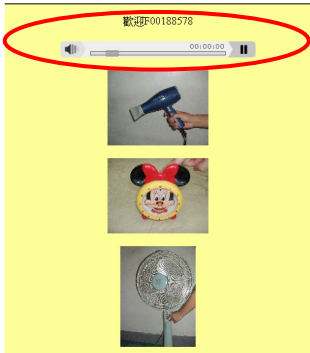


Table 6 The 'Audio Recognition Course Outlines' for Elementary Autism Student in the System

The Contents of the Audio Recognition Course		
Guideline	'Daily Life Issues' if the guideline of the audio recognition course.	
Course Outlines	I. Home	The different sound made in different rooms in home.
	II. Classroom	The different sound made in the classrooms.
	III. Campus	The different sound made in campus.
	IV. School Activities	The different sound made in different activities in school.
	V. Transportation	The different sound made by different transportations.
	VI. Park	The different sound made in the park.
	VII. Animals	The different sound made by different animals.
	VIII. Supermarket	The different sound made in the supermarket.
Remark: The new courses will be added on the demands of Autism students.		

2) The Course System Operation Frames of the Audio Recognition Course

The system operation frames of course learning and testing evaluation in the System are shown in Table 7.

Table 7 The Course System Operation Frames

The Course System Design Frames of the Audio Recognition Course	
<p>Course Data... While the student select the course data function, the eight course types appears in the rotation animation style. The student may select any one of the course types.</p> 	<p>Course Data... Continued the former selected course type, all the courses list appears. Once the student selects the course, sound broadcasts.</p> 
<p>Instruction Evaluation... The right column window appears while the student selects the instruction evaluation function. The student is asked to input the name of the quiz.</p> 	<p>Quiz... Press the horn while the test begins. The students select the corresponding graph based on the content of the audio.</p> 
<p>The Feedback of the Wrong Answer ... The 'wrong' answer feedback sign appears in the left upper frame.</p> 	<p>The Feedback of the Correct Answer... The 'correct' answer feedback sign appears in the left upper frame.</p> 

4.4.5 Experimental Result

The independent variables of this experiment include ‘the policy of the Taiwan Ministry of Education, the policy of Taiwan Elementary school, the individual resource of the special education, the individual level of the Autism student, the family resource of the Autism student and the resource of the volunteer. A few experiment variables are created for each independent variable. These experiment variables represent positive experiment result and represent research value and benefit after the implementation of this experiment. The detailed of the experimental result is described in the following, as shown in Table 8.

Table 8 The Experimental Result

Participants	Experimental Variations	Experimental Result
The Policy of the Ministry of Education	Material Equipment	The Policy of Ministry of Education lacks clear instruction policy in the area of Elementary Autism students learning audio recognition course. If the research extends, the accumulation of long period data may become valuable reference information for the Ministry of Education.
The Policy of Elementary School	Material Equipment Performance	The Digital Education Platform in this System creates a self-producing-material uploading function for the special education teacher and aims the objective of data sharing. The reducing time for the special education in material producing upgrades the teacher’s teaching performance apparently.
Special Education Teacher Individual Resource	Materials Computer Equipments Numbers of Students Service Passion	The digital education platform provides the material uploading function for the special education teachers. Due to the specific characteristics of the Autism students, every special education teacher can collect appropriate materials for them. The performance of the Autism students in learning audio recognition speeds up when the special education teachers use the specified computer equipment resource in teaching.

		<p>In previous of this research, many scholars indicate that the Autism students prefer the individual learning function. The digital education platform also includes the drill and practice teaching function that emphasizes the learning efficiency of the Autism students.</p> <p>The digital education platform provides teaching evaluation function that helps the special education teacher understand the learning result of the Autism students. According to the learning result, the special education teacher also adjusts the teaching plan.</p> <p>The digital education platform also provides the learning history record. The special education teacher monitors the Autism students' records at any time. This evaluation efficiency appears apparently in this research.</p>
Autism Students Individual Level	Individual Level	The course outlines of the digital education platform are planned on the basis of Autism students' living environment. It appears the positive efficiency in helping the Autism student getting involve in the real life environment. Especially the Autism students represent the high interesting and good ability in computer technical equipments. The digital education platform uses computer as the required tool that attracts them much. The multimedia becomes the major principles in designing the courses. Combining with the audio, the attraction and the concentration of the Autism students in learning appears positive efficiency. The real pictures are used in the content of the courses those help the Autism students get involve in the real life environment.
	Computer Preference Computer Familiarity	
Autism Students Family Resource	Computer Accompany Time Expectation	Once the Autism students own private computers in their home and their parents have enough time to accompany with them. The Autism students can get used to the living environment by drill practice. The parents of the Autism students also understand their children's learning records in this digital education platform.
Technical Service Volunteers Resource	Numbers of Members Time Education Plan	Each of the special education teachers is assigned to teach more than one Autism student. Therefore, the volunteers are quite needed to support the teaching activities in this research. The assisted learning makes the Autism students reach the same teaching objective. The numbers of the volunteers is a difficult factor to control and affect the Autism students' learning efficiency directly.

5. Conclusions

In this project, the author employed the corresponding technologies of the Digital Education Platform and the knowledge management model as well as combined with all the Autism students' various kinds of information and summarized the interviews' feedback of the college professors and elementary special education teachers, the digital education platform was established and the initial courses were designed, too. There are eight types of course outlines. The real pictures (photographed in this System) and audio files (recorded in this System) are used in the course and presented in the multimedia mode that attracts the Autism students' learning focus and involve them into real living environment. Up to now there is very few of research use the same research mode.

The course outlines of the digital education platform are planned on the basis of Autism students living environment those represent positive efficiency in assisting Autism students getting involve in real live. In this digital education platform, the special education can make a drill practice program for each Autism student that represents a clear learning efficiency for Autism student. The teaching evaluation function is also provided for the special education in monitoring Autism students' learning result. The function of learning history record is also a channel for the special education and the Autism students' parents understanding their learning records and efficiency. The special education teachers can design their own materials and using the uploading function in this platform that reaches the objective of resource sharing.

The experiment stage of this System is implemented in a famous Elemental in Taiwan. The independent variables of this experiment include 'the policy of the Taiwan Ministry of Education, the policy of Taiwan Elementary school, the individual resource of the special education, the individual level of the Autism student, the family resource of the Autism student and the resource of the volunteer. A few experiment variables are created for each independent variable. These experiment variables represent positive experiment result and represent research value and benefit after the implementation of this experiment.

The paper can help the Elementary Autism students learning audio recognition. Once the users' feedback and further suggestions can be submitted and used in expanding the teaching course phases and adding more multi-functions would benefit more and more Autism students.

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