

## Teaching Recognition Platform Auxiliary Teaching Convenience

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**Abstract:** How to make good use of the network technology, to help teachers understand students' e-portfolios quickly, and thus to adjust the teaching method. Teachers can use various teaching methods to help students' learning effectiveness is one valuable key in today's technical education development. One or Two weeks of registration period after school start. Most teachers cannot quickly know student's portfolio on paper in the first couple of weeks in Taiwan. And student's portfolio on paper cannot show their learning results in this course. As a result, it leads to a no effectiveness teaching work. The goal of the study is to use Facial Expression Detection Technology with Network Cloud Service (Teaching Recognition Platform, TRP) pass students' e-portfolios to teacher. Teacher's teaching method can fit into the students' need in class. This study, teacher is to wear a pair glasses with a miniature camera and a Bluetooth teacher uses the camera to get the pictures of students' faces and sending them by Bluetooth. The Bluetooth then passes a signal on telling the wireless network to connect the images to the schools' learning database. By using it, the teacher can rapidly get their students' e-portfolios back in time from the schools' learning database by all the available mobile such as laptop, PDA, PAD, Smart Phone, etc. By the TRP, teachers can adjust teaching contents and methods and make their teaching more pleasant and effective.

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**Keywords:** facial expression detection technology, service cloud, student e-portfolio, Teaching Recognition Platform (TRP)

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### Introduction

In the Internet era, the school will announce teacher's basic information on a web page. Therefore, it's much easier and faster for students to know teacher than teacher to know students. In Taiwan, class size is ranging from 35 to 50 students and some even more. It becomes a hard work for a teacher to know students prepare knowledge in this course. Especially a teacher may face more than one class of students in a semester.

Furthermore, among most of the colleges and universities in Taiwan, even before the schools start, the registration offices will provide hard copies of students' basic information and learning background which are authorized by the students to the teachers for their references. However, the schools do allow their students have an option to add or to drop any class within the first 2-3 weeks. During this time period, the teachers may lack of obtaining all students' information and lead to a less effective teaching effort.

Moreover, in secondary schools in Taiwan, according to the regulation which addressed in the learning disabilities Handbook by the Ministry of Education<sup>1</sup>, if school-age children diagnosed with learning disabilities by doctors may not be accepted in special education schools. They will be arranged for regular schools for their

education. If the teachers do not obtain their learning background or not to be informed, it will be very difficult for teachers to know the needs of these kids and provide adequate and fortified teaching for them.

Lastly, in Taiwan, parents like to teach their kids to be good listeners during the lectures. The philosophy of "Do not talk in class!" establishes a very quiet atmosphere existing in most classes and schools in Taiwan. Students are either too shy to ask questions or are afraid of asking so called "stupid" questions. Unlike the classes in western countries, this type of lack of interaction between teachers and students result in a less understanding and a less effective teaching.

Based on the above reasons, how to build a good communication channel between teachers and students is what this project about. Fast and efficient help teachers to obtain students' learning background which are authorized by the students. Saving a lot of paper for not to print out hard copies of students' information to teachers. Helping some kids with learning disabilities get better education. Finding a solution for most Taiwanese students who are afraid to ask questions and help the teachers know how well their students understand.

Human can use both verbal and non-verbal ways to communicate with one another. A person could communicate with people by showing his/her facial expression, body gesture, and other non-verbal clues. In fact, it is especially true in the communications of emotions. Studies have shown that a staggering 93% of affective communication takes place either non-verbally, para-linguistically through facial expressions, gestures, or vocal inflections<sup>2,3</sup>.

Facial Expression Detection Technology originated in the 1960s. It reached a practical stage when a monitoring system for safety purpose has been used. The idea of Cloud technology is to provide services over the internet instead of installing application software on personal computers. As a consequence, it eliminates the cost and simplifies the maintenance work. However, even till today, the combinations of these two technologies have not been found in a real case which is applied in teaching.

The roots of learning are because of curiosity and thinking. If people have no curiosity, they will not be able to see clearly how the world works. If teachers apply adequate technology to help with their teaching, students will be more motivated in their learning. Moreover, to increase the degree of understanding between teachers and students is definitely an objective for us as school teachers to pursue.

Kearsley and Lynch<sup>4</sup> pointed out that high-quality technology benefits in improving quality of students' work, increasing student attendance rate, helping the administrative operations, and avoiding teacher burnout. Díaz, Aedo Cuevas, and Kinshuk<sup>5</sup> also pointed out, proper information technology dramatically increases the interest of learning, a better attitude and self-recognition towards learning for students. Most of all, it promotes the interactive relationship between teachers and students.

### USE OF TECHNOLOGY IN THE CLASSROOM

In the 1960s, instructional television promised to change teaching and learning dramatically. College administrators and state legislators, hoping to "expand educational opportunity" (and ultimately save money) by using this electronic delivery system, invested millions in closed-circuit systems, TV production facilities, educational television stations, and even airborne broadcasting systems.

Due to advances in digital technology, extend the study domain to enter the computer and network's generation. Software environment designed to affect the effectiveness of learning. Can software environments and communication tools enrich opportunities to learn? Wittrock's<sup>6</sup> model of generative learning predicts that deep understanding is more likely to occur when individuals actively transform information and integrate it into existing cognitive structures. Assuming that learners participate in the information they have access to a rich source of information potentially supports the development of software environments. One claim for technology is that it allows users to manipulate symbols and organize textual information in new ways. Some communication environments are specifically designed to support certain ways of constructing knowledge, structure student interaction with the software<sup>7-10</sup>.

An efficient classroom teacher will tend to teach in many different ways to reach all her/his students. Teaching something only one way (such as lecturing to one's auditory learning channel) will miss all the students who do not learn best in that manner. Simply put in this web comment, good teaching is teaching through a variety of learning channels. Most students can learn the same content. Nevertheless, how they best that receive and then perceive that content is determined largely by their individual learning styles. Simply defined, a student's studying style is concentrated, internalizes and retain novel and often difficult bits of domain specific content knowledge, usually for testing and examination purposes.

A good application of technology must be able to help teachers found those individual differences among students, to provide appropriate and the right message. Any review of research and publication in this domain quickly reveals very positive features. Indeed, there appears almost urgency in the flood of literature available to support practitioners and policy makers in their decision-making, regarding and planning and use related to handheld tools for classrooms<sup>11-13</sup>.

Existing literature suggests that quality observation systems should be based on clear, objective standards of practice; be conducted by multiple, trained evaluators; and 3 consider multiple observations and sources of data collected over time<sup>14-17</sup>. The accumulation of detailed measurement of the classroom practices provides an opportunity for validation studies. The technologies support the students' learning situation in a timely manner, regardless of the teachers or students. The e-portfolios as learning tools and let teachers or students could understand their learning situation. Therefore, evaluation and assessment of "learning" then takes place within the e-portfolio framework.

Today, education operates in a much tighter fiscal environment and we cannot afford to make many mistakes. We therefore need better studies, focused on significant questions, to guide us in developing appropriate and cost-effective applications of the new technology. To make educational policy decisions or base large investments on anything less is foolhardy. In educational domain, teaching and learning e-tools develop have often been re-hosted, not re-defined<sup>18</sup>. The goal of learning tools design for the education environment might be improved with good guidance, inspiring examples. The planning process with direct input from the school's databases (such as teaching feedback records, learner records) and teaching management system. To provide a chance to share examples of good design e-learning environment, that can be tailored to meet the teacher's or student's particular requirements<sup>19</sup>. Therefore, the Face Recognition Technology and Cloud Services of these two mature and low-cost technologies, under at low cost investment for school. Could help teacher and

students each other own a good interactive teaching, learning and understanding in classroom.

### FACE RECOGNITION TECHNOLOGY/APPLICATIONS

There are three steps consist of Face Recognition Technology; Face Detection, Face Tracking, and Face Identification. Imagining that there is a guy walks towards you in a jungle area and you want to know if he is someone you know<sup>20</sup>. Your brain and your eyes will start actions as follows; First, find this guy and try to see his face is called Face Recognition. Second, even if the guy is found, he is far away from you or he cannot be seen clearly as he is blended with the environment. You may still keep your eyes on him and this is called Face Tracking. Finally, wait till you see clearly his face, your brain tells you whether you know this guy or he is just your neighbor, this is called Face Identification.

As a result, we know that if we want to identify a person, a memory is a must in human as well as that of to a computer. Figure 1 shows the recognition process. The system will first use Face Detector to get the image of the face. Then, by using Feature Extractor, converts the image to numerical characteristics which are called Numeric Features. At last, utilize Model Builder to complete the face model and to store in a database.

The accuracy of Face Recognition now reached a rate of 90%. Most applications are used in security system. Educational use is still under theoretical study<sup>21-24</sup>. Advanced countries in the world install facial recognition technology in various types of public places (including factories, cafes, airports, shopping areas and government buildings). The basic goal of the system is usually to identify people, or to identify people and track their movements. At present, the specific applications of this technology are diverse. And can combine with retail providers to develop face-to-face payment technology. In other areas, cafes are already using facial recognition technology to identify repeat customers and their regular orders<sup>25</sup>.

### CLOUD SERVICE APPLICATION

In order to reach a more efficient and effective goal, Taiwan's government and private enterprises cooperate with cloud service companies to integrate schools' departments to cloud network. For instance, build the core management center of cloud service, develop the cloud service application, customize and consolidate for cloud network, and establish cloud computing information center, and set up a cloud business service management solution center, etc.

In addition, schools at all levels in Taiwan actively adapt the cloud services. For example, Microsoft Taiwan cooperated with some universities and successfully deployed a cloud environment. They imported the Cloud Service Center, fixed the existing individual cloud system, helped integrate each department's server, and also supplied the required information and resources to internal research team in each school.

However, when using cloud service, it may encounter some potential risk<sup>26</sup>. For instance, network interruption ends the service without any warning, the confidentiality of database has possibility to be released, or fail to effectively link to various departments.

Even so, the cloud technology is still valuable in its convenience, instantaneity, and practicability in teaching and learning. A good cloud technology must have a solid backup system to avoid network outages, must strengthen the management to prevent data leakage, and must plan a full linkage of cloud structure. Thus,

we think the cloud technology should continuously develop and combine with current and future technology to innovate a new teaching platform which benefits our education.

### TEACHING RECOGNITION PLATFORM (TRP)

In reality of teaching, we knew that if a teacher can simply name his/her students during the lecture, it will increase the rate of class participation. (Perhaps the attendance rate will also increase because students know that the teacher knows who is in the class and who isn't.) Besides, if a teacher can discuss with his/her students concerning their learning background as well as their difficulties in learning, it will help the students with more aggressive attitude towards their learning.

The Teaching Recognition Platform (TRP) can instantly recognize the identity of the students. In practice, a teacher is to wear a pair of glasses with a miniature camera and a Bluetooth transmitter function in it to capture students' facial image. The image then will be transmitted through the Bluetooth receiver and send back to the server in the administrative department. Under a cloud system, executes face recognition application, transfers the data back to the teacher's digital mobile devices, and helps the teacher to know his/her students. TRP may distinguish some facial expression like confused or understanding from students as this may help the teachers know how there students' feedback during lecture.

However, human's facial expression can be very diverse and sometimes will not be showing his/her true feeling. A verierenced teacher may know something behind through a good communication with the students. As a consequence, teachers need to know that any technology only plays a role of supporting job. A better education absolutely relies on a well interaction and communication between teachers and students.

Finally, the combination of facial recognition technology application and behaviors that regulate student life is the core of the security of the science and technology campus. But from the perspective of application, the students who suffer the most from facial recognition technology in schools are those who cannot fully adapt to the standardized system, and those who live in the cracks of data monitoring. In short, there are still concerns that the way the data obtained from the facial recognition system will be used in conjunction with other aspects of the data school does not benefit outliers or those whose lives are not entirely suitable for discrete categories.

Looking back at our previous observations on facial recognition technology, it seems that the technology may be related to the reproduction of racialized class hierarchies in school environments with long-term social and cultural reproduction processes<sup>27</sup>. Another group that is so obvious are queer and transgender students in a school environment that is still completely different. The provocative argument of Keyes<sup>28</sup> illustrates this point, namely, "the far-reaching threat of data science to queer." Keyes defines "queer" mainly out of fluidity, autonomy, and a clear lack of definition and "freedom to set one's own path." Keyes believes that data-driven technologies such as facial recognition are fundamentally opposed to these characteristics. Data science includes norms, discrete categories, precise definitions and predictable future assumptions). Any blanks, omissions and blanks in the data configuration files of non-binary and non-standard students will inevitably lead to a reduction in the amount of calculation and a limited scope of diagnosis and decision-making for them. Major issues may be ignored, or other unnecessary assumptions may be made. Either way, the chance of these students being misrepresented is high.

### CONCLUSIONS

This study made a useful system of teaching--Teaching Recognition Platform (TRP); this platform provides closer interaction between the teacher and student communication channels. There are five contributions of this work.

- Convenience: Reduce the burden on a teacher's memory large number of students' names and learning the background.
- Environmental protection: Reduce tree felling, reduces paper usage, and reduce the waste of environmental resources.
- Real time: even if some after school 2-3 school enrollment groups to allow students the week of withdrawal rights, leading to class teachers cannot effectively know or understand the students' name or background; links through the TRP, you can change these situations happen in real time, the normalization of teaching immediately.
- Helping students with learning disabilities: due to the weaker students may not be able to express in class do not understand knowledge, lead to learning obstacles in these students, teachers could not lend a helping hand in due time. Through this TRP, early awareness can help teachers of these students, and helps them to learn effectively.
- Interactive teaching innovation: ashamed to speak to teachers, students ask questions, ask questions, and enhance the opportunities for interaction between teachers and students to teachers through the TRP for the class. This platform is also a teaching innovation.

### FUTURE DEVELOPMENT AND ISSUES

1. School systems integration: Office of Academic Affairs, Office of Student Affairs, plus counseling room data synchronization.
2. The integration of the school system: students by the Office of Academic Affairs, Office of Student Affairs, and counseling rooms, and other units authorized data integration platform through the TRP sent to the teachers' side, can help teachers to have more information to analyze each student to learn the background, the flexibility to adjust teaching content and teaching approach.
3. Student data privacy and moral cognition of teachers: students learn background information is authorized after they agreed to teach in school administrative personnel or teachers. But that does not mean you can feel free to disclose to unrelated persons; therefore, TRP before you start to use, design teacher login process is important for this platform, such as the "data encryption" and "verification code" or "digital signature" and other network security. Teachers have the responsibility and obligation to protect student data; it is duty-bound to moral standards.
4. Combined with the convenience of video: understanding the interaction between teachers and students, as teachers of diligent teaching reference in the future.

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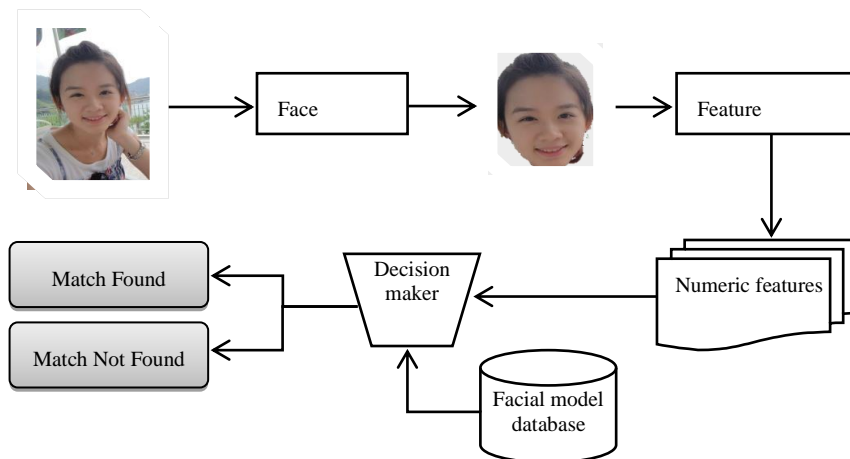


Figure 1. The flowchart of the face recognition system



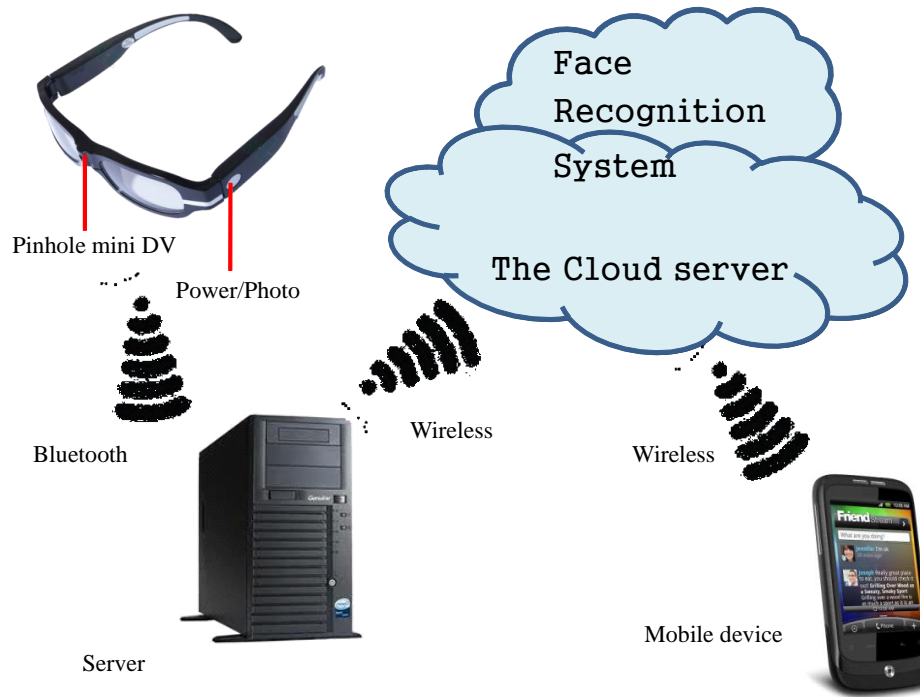


Figure 2. Teaching Recognition Platform, TRP