

# Talking about the Application and Thinking of SAMR Learning Model in Vocational Education

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## Abstract

**In the era of rapid technological development, the SAMR model, as an educational technology evaluation model, not only brings development to teaching, but also helps teachers to evaluate technical tasks, effectively improving students' learning ability and teachers' teaching ability. The current SAMR model is widely used and recognized, and has applications in various disciplines. As a way for teachers to design instruction, SAMR model considers how to combine teaching and technology. In vocational education that aims to develop students' vocational technical knowledge and vocational ability, it is based on the foundation of vocational technology. It is easier for teachers to consider how to integrate technology and education from a technical perspective. There are certain requirements in the process of combining, but also certain deficiencies. How to better combine technology and education and better develop education is the direction of our future efforts, and we need to think and learn together.**

## Keywords

**SAMR model; vocational education; learning model; educational technology.**

## 1. SAMR Model

### 1.1. Background

The SAMR model is a hierarchical model for describing the development of technology, proposed by Dr Ruben R. Puenteira in 2009, and was widely recognised and used in 2012 [1]. Based on an innovative model based on the selection, application and evaluation of the educational use of technology, the SAMR model is intended to help guide teachers in the integration of technology into the teaching classroom. For example, at this stage of the teaching process, teachers tend to use teaching tools such as projectors, Tencent conferencing and iPads and other teaching tools to assist in teaching. These technological tools are not only able to transcend the constraints of time and space on teaching, but also enable students to establish a more intuitive connection with the teacher during the teaching process.

### 1.2. Introduction to the SAMR Model

The SAMR model divides learning into four levels: substitution, enhancement, modification and redefinition [2]:

#### 1.2.1. Substitution

A new technology replaces a traditional tool, but the meaning of its use does not change in any essential way. For example, traditional note taking can only be recorded with paper and pen, sometimes limited to one of the two, but with the current technology support, we can use ipad to take notes, which not only has the advantages of traditional pen and paper, but is also more convenient, faster and environmentally friendly than the traditional way of taking notes.

#### 1.2.2. Augmentation

Refers to technology that does not fundamentally change the object, but improve the efficiency of completing the task from other aspects or allows the learners to do more in the same amount

of time. For example, the ipad we use to take notes can be connected to the internet to edit, save and share them online. This move allows users to edit documents beyond space time and increase the efficiency of learning.

### 1.2.3. Modification

This stage means that the new technology still does not change the object, but adds new content to the task, which increasing the user's experience and interest, integrating it into teaching and learning to increase students' interest in learning. For example, when using an ipad to take class notes, not only can they be edited and shared online, but other users on the same network can watch the creator's notes and leave comments and suggestions under the document.

### 1.2.4. Redefinition

The highest of the four stages, this phase of redefinition is where new technologies fundamentally change the task in meaningful ways. For example, using an ipad to take notes can not only allows documents to be shared online, with multiple people editing and commenting simultaneously, but also allows for online video recording, photo taking and searching for information across time and space, even for shared editing and collaboration on a global scale.

Ruben R. Puentedura considers these four stages to be the excessive methods that most teachers use when introducing technology in the classroom [3]. The first two stages are primary stage, and the latter two are the advanced stage. It can be seen that the complexity has increased significantly. It has been found through research that the essence of the SAMR model in first to described the degree of integration through the integration of teaching and technology, and the emphasizes the subjectivity of the learners. In this model, the four steps mentioned above must be implemented on the learner, relying on the students to complete the process, and the teacher is in a dominant position in the process [4]. It can be seen that the integration of the SAMR model and the learning process can enable students to better participate in the teaching, and better implement teaching in accordance with their aptitude and personalized teaching through scientific and technological means.

Some schools in China have already started to try to combine classroom with technological information methods for teaching, for example, the "construction, use, research" and promotion of smart classrooms in East China Normal University, through the smart classroom for teaching effectively to improve teaching efficiency [5]. And some scholars have proposed that the entry of multimedia technology into high-efficiency classrooms makes the management of multimedia classrooms a question worthy of consideration for managers[6].

## 2. The SAMR Model and Vocational Education

The SAMR model was proposed in 2009 and became widely used and recognised in 2012, various subjects have begun to try to integrating the SAMR model with their own subjects, with results in the subject areas of English, geography and languages, for example. In the field of education and technology, the SAMR model has a huge role to play on the development of the subjects as a teaching technology monitor. It is better to say that the professional and technical characteristics of vocational education are more related to the SAMR model than other disciplines close.

Vocational education allows students to acquire the professional knowledge, skills and ethics needed for a career or productive work. Integration with the SAMR model, which combines information technology with the teaching and learning process, can achieve twice the effect with half the effort. The SAMR model is used in the technical and technical teaching process, for example, mechanical and automotive technology professional courses can be combined with CAD, 3D modelling and other technologies to design a set of practical simulation courses in the

cloud corresponding to the theoretical courses. Students can learn, manipulate and run the models and machine structures through their own terminal devices, and through three-dimensional modelling technology, they can not only have an intuitive understanding of the machinery they are learning. It is also possible to manipulate the lens settings and learn the internal structure of the machine cognitively. This is more intuitive than the traditional teaching process where teachers use PowerPoint and lecture methods to explain theoretical knowledge. Even compared to practical classes where you are confronted with cumbersome and large machines, 3D modelling in the cloud can show the internal and external structure of things clearly and intuitively, through lens rotation and perspective technology, to achieve an intuitive and convenient effect. And teachers combine the two in the teaching process in real time and incorporate different technologies [7].

## **2.1. The Requirement to Integrate the SAMR Model with Vocational Education**

The 21st century is characterized by the massive access to all kinds of information, At the same time, the rapidly shared information has brought great challenges and opportunities to the education field, but the information is not always useful, which is beneficial to the teaching environment, equipment, teachers and even students have high requirements in all aspects

### **2.1.1. Internal Conditions**

The integration of technology into teaching does not happen overnight. Teachers, as the leaders of the teaching process, should have experience in the use of technology, actively and fully prepare for the relevant preparations before lessons, and combine their own excellent and rich knowledge and abilities to make better and more effective use of technology for teaching. This is not only a requirement for teachers using the SAMR model, but also a basic requirement for teachers under the continuous development of science and technology in the new era. Especially in the context of the outbreak of the new crown epidemic in 2020, technology and the teaching process are more closely integrated. It can be said that technological means, and mobile terminals have real-time and interactive characteristics. During this period, they have become the only platform for teaching and learning during this period and are widely used and recognised.

The entry of science and technology into the classroom requires more than just teachers. Students also have further requirements. Students must at least have the basic knowledge and ability to use science and technology, and they need to have certain basic economic conditions and equipment. This is undoubtedly a difficulty for some students with poor family finances.

### **2.1.2. External Conditions**

The use of technology in the teaching process not only requires teachers and students, but also has certain requirements for the teaching environment and teaching equipment. The combination of technology and teaching not only stays in the oral cavity, but also requires sufficient funds in the actual teaching process. Purchase, upgrade and replace teaching equipment. Especially in the current era of rapid technological development, the economic ability of schools is also a major test.

## **2.2. The Advantages of Combining the SAMR Model with VET Teaching**

In a study by He Yan and Liu Ping on mobile learning based on the SAMR model in the university English classroom, it was shown experimentally that targeted technology reinforcement in teaching according to the different levels of integration of the SAMR model can make a certain degree of difference in learners' learning strategies and learning outcomes, and that higher levels and means of technology integration can have a more positive impact on learning strategies and learning outcomes [8].

The SAMR model is implemented in vocational education. The role of science and technology in education is gradually deepened. Firstly, it provides a new teaching model and teaching tools for VET teaching, creating new learning pathways that can increase students' interest and motivation. Secondly, this model sees the use of each technology as a different level of task, and in the gradual process, it can assist teachers to better understand and reflect on educational technology. Thirdly, the integration of technology and teaching allows VET to better present tasks to students in a clear and intuitive way in terms of skills and technology, getting rid of the restriction of only being able to observe physical objects in practical classes, and through technology being able to simulate physical objects in the cloud and analyse and recognise them virtually, which can reduce the loss and waste of physical objects and also enable students to understand every detail and structure of objects in a clearer and more detailed way. Fourthly, by combining technology and the classroom in a progressive manner, it enables students to make mental expectations in advance. Through the advanced stage of technology tasks, teachers can also personalise their teaching to different students, so that they can tailor their teaching to their needs. As Kirkland (2014) explains, "Designing a rich learning task is a challenge for any teacher and trying to synthetically amplify the dynamic world of technology into a portfolio adds an additional element of risk and uncertainty". The SAMR model means that the meaningful help can be provided during the learning process[9].

### 2.3. Inadequate

Although the combination of technology and teaching development has now been widely used and recognized, some teachers still refuse technology to enter teaching because they do not know how to do it [10]. And due to the lack of technology and equipment, we still cannot break through some obstacles. First of all, although technology facilitates our lives, everything has two sides. When we put such technology in front of students and the initiative is entirely in the hands of students, it is difficult to ensure that the behavior can produce meaningful active learning, and it may even be possible. On the contrary, the technology of access to the Internet is full of temptations. It is difficult for us to be sure that students can devote themselves to every task, and there is no guarantee of the efficiency of learning. Secondly, with everyone using technology to teach, students are no longer faced with a live classroom, but with cold machines, and over time, students may feel 'alone', whereas humans, as pack animals, need to socialise. Several studies have also pointed out that to be successful in distance learning, students need a sense of community and connection. Furthermore, although technology has facilitated our lives and teaching, there may be an over-reliance on technology. Teachers design a teaching task and then get it done once and for all, no longer improving their knowledge and teaching ability, and teaching according to a designed curriculum in a uniform manner, the teaching process becomes a processing plant, which is not conducive to the development of students' abilities and creativity. Finally, technology is a double-edged sword. The large-scale use of scientific and technological teaching has caused some of our basic abilities to be lost due to lack of enhancement. For example, the widespread use of smart input methods now leads the phenomenon of people to "lift pens and forget characters". In the same way, excessive reliance on science and technology teaching may also make us no longer have individuality and form a solid thinking, which is not conducive to the progress of teaching and the development of students.

## 3. Thinking and Enlightenment on the Application of SAMR Model in Vocational Education

As shown above, there are advantages and disadvantages to combining technology and education, and how best to integrate technology and teaching and produce a 1+1>2 effect requires the following approaches:

### 3.1. Improve Teachers' Teaching Ability and Technological Ability

Teachers should abandon authoritative thinking, be brave to accept new things, combine new technology with their own good abilities, take the promotion of student learning as their own responsibility, and think deeply about how to use technology to maximize teaching effects [11].

### 3.2. Improve Students' Learning Awareness

In the face of the virtual and ever-changing online world, it is necessary to strengthen students' cybersecurity concepts and awareness, so that students can distinguish right from wrong, resist the temptation, and improve their ability to consciously use technology for learning.

### 3.3. Increase Capital Investment

The rapid development of technology has accelerated the upgrading of technical equipment, that is, the use of cloud teaching, the investment of basic equipment also requires more funds than ordinary schools.

### 3.4. Increase Parental Acceptance of Technology-Based Products

The spread of information technology in the classroom is bound to be accompanied by the introduction of many technological devices into the classroom, and the use of computers, iPads or mobile phones in the classroom will become the normal. However, there will be parents who are concerned about their students' access to electronic devices during their studies, believing that they will not only harm their students' eyesight, but also cause them to become addicted to the devices and not want to study. There is a need to improve parents' acceptance of electronic devices and to better embrace technology in the classroom to improve students' learning efficiency.

### 3.5. Increase Interest By Adding Ways to Learn Content

A single lesson can make the classroom boring and dull, especially with technology-based teaching, and without the teacher's lively teaching style, it takes time for teachers to design more interesting lessons to increase students' interest and motivation.

### 3.6. Teachers Strengthen Guidance

Teachers strengthen guidance to enable students to learn cooperative learning. No longer facing a lively classroom, but cooperating with unfamiliar "partners" through the screen will produce a sense of distance and rejection. Teachers should strengthen guidance, carry out cooperative learning many times, and conduct group discussions and exchanges to strengthen cooperation.

## 4. Conclusion

The SAMR model is a deep integration of technology. Although the integration of technology and teaching cannot be achieved overnight, its four stages represent that the greater the degree of technology entering the classroom, the more high-level learning goals can be achieved. It is also a kind of challenge and thinking for vocational teachers. In today's highly technological development, how to use technology to teach and how to use technology to maximize the teaching effect. The focus of the teaching process should focus on technology or technology-based teaching. Effect is the goal of our continuous efforts and development in the future.

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