Explain the Factors of Primary School Teachers Choosing Digitalized Teaching Materials with Theory of Planned Behavior

RONG-JYUE FANG¹, *CHIU-LI CHANG² HUA-LIN TSAI³, CHI-JEN LEE⁴,
¹Chair Professor, Department of Information Management, Southern Taiwan University of Technology, Taiwan
²³PHD, Department of Industrial Technology Education, National Kaohsiung Normal University, Taiwan
⁴Graduate student, Department of Industrial Technology Education, National Kaohsiung Normal University, Taiwan
*No.188, Zhong yi St., Fengshan City, Kaohsiung County 830,Taiwan,
*chiuli6316@gmail.com
rxf26@mail.stut.edu.tw
kittyhl@gmail.com
mickeylee@gmail.com

Abstract: - In the information educational environment, digital teaching materials grow vigorously under the push of government and enterprise. In the school, the teachers extremely easy obtain teaching CDs to assist teaching. The prevailing of internet lets various digital assist teaching materials of applying to network become nowadays a mainstream of digital learning. Digital teaching materials combine the words, pictures, cartoons, and audio-visual films, transferring information to digitization form. The users utilize computers to store or appear the materials, control the broadcast way and arrange the content. In instruction activities, passing the knowledge evaluation process of digital teaching materials and selecting appropriate digital teaching materials will let the instruction effect reach the optimization result. It will improve teachers’ the professional literacy. This research via theory of planned behavior with questionnaire investigation method explains behavior intention of primary school teachers choosing digitalized teaching materials.

Key-Words: theory of planned behavior, digitalized teaching materials

1 Introduction

With information technology grows, digital industry goes on developing in Taiwan. The progress of digital technology changes and influences our life and study way gradually.

Various electrons, information, and network popularize in 21st century, and then our world has entered the digital generation. Applying information technology in teaching brings the brand-new study way [1]. Applying the instruction media to appear the digital teaching material and transmit teachers' idea becomes the right-hand man of instruction activity.

Numerous digital resources are converted into available digital instruction resources for middle and primary schools teachers and students. This issue has already paid close attention to various countries [2]. The digitizated instruction materials have offered abundant and pluralistic resources for the teachers to use in teaching. They help teachers construct the instruction resources needed in personal instruction. Through the understanding of technology choice and appropriate adopted technology, the better technology innovation will be produced. So technology choice has its important meaning and value[3].

2 Literature review

2.1 Development of the digital teaching materials

The significances of the teaching materials are not only the basis of teacher's teaching but also the direction of student's study. Zhang ShuPing [4] defines that 'digital teaching materials' utilize a computer to combine various medium, including words, pictures, cartoons, video-information, and sounds. It enables us to have the materials to carry on study. In other words, the digital teaching materials are a kind of teaching materials, and just their making, processing, transmitting and using all have relations with information technology[5].

Digital teaching materials are one of instruction models in e-learning area and they are a quite important part [6]. In 'white paper of middle and primary schools information technology education', the students are expected to be able to use information technology to promote their studies, and
the teachers can make the best achievement of information technology and improve instruction quality [2]. Under the leadership of e-learning trend, digital teaching materials are getting more and more important with the difference of environments and demands. Great digital teaching materials not only improve learning methods to enhance learning interest for the students but also decrease learning time. The digital teaching materials let teachers collect, save and modify them easily.

With the arrival of information age, digital teaching materials have been applied in education and study for a time. Frankly speaking, a lot of instruction websites have constructed, but the teachers lack clear instruction goals and have not fully utilized the characteristic of multimedia[7]. For utilizing digital instruction resources effectively, cooperative mechanism, digital instruction resource net, digital instruction materials and instruction software have to be set up and developed continuously [2]. In future, teachers will utilize the instructional media to convey knowledge and the materials to the students. Under observation, exploration, planning and reflection, the students will be in a simulated real-world events or the story, and the teachers will design scenario-based materials so that the students can learn how to solve the problem by applying various contexts. In the selection of digital teaching materials, it depends on the teachers or students demand preferences to enhance teaching and learning. To apply the point of view, digital teaching materials through the digitization of a lively and system integration of contextual features to stimulate use of the motive can be applied to different types of users, create and construct knowledge, active learning environment, such as to make good utilization and there will be a great benefit to teaching and learning activities.

With the popularity devices of digital teaching materials such as the mobile phone, PDA mobile and e-book research, each person can study all the time, and will be exempted from the restrictions of time and space. Certainly, M-learning will become a great digital learning platform for learners in the future.

### 2.2 Factors of selecting suitable digital teaching materials

In order to reach high interactive instruction, it must combine the tactics, media, material and environment, i.e. Graham,etc. recommended blended learning way [8]. Teachers should fully make use of technological products to assist the teaching material design[9]. The digital teaching materials have the following characteristic:

- **Hypermedia**: It offers pluralism and enriches information.
- **Interaction**: It can repay immediately in studying.
- **Authenticity**: It integrates true world into the study environment.
- **Pluralism**: It has various and plural instruction contents.
- **Economy benefits**: It can be in accord with environmental protection.

Using technology is the motive force changing instruction. It is the support tools of teacher's teaching and student's study, too. Zhu YaoMing [3] thought ‘technology is selected for use’, including appropriate technology, technology evaluation, technology adoption, technology readiness. The choice of the digital teaching materials must consider some factors [10]:

1. The category of integrating IT into instruction: Depend on the discipline demand.
2. The way of integrating IT into instruction: Consider the teaching materials, teaching methods, learning theory, etc.
3. The environment of integrating IT into instruction: Include the peripheral entity, software resources and the teacher's information literacy.

Cai FuXing [11] thought integrating IT into instruction should have several following ways:

1. Utilize Word, Power Point to state the courses content outline.
2. Utilize CAI teaching CD or VOD system to broadcast the CD film.
3. Utilize website or webpage to inquire and appear relevant materials.

Every publishing business makes free instruction media [12]. High interactive technology is the most suitable for situation instruction media [13]. Besides, six study network, study service station, instruction resource nets and textbook websites are all resources for learners.

Sun PeiZhen [4] found out most teachers have already understood generally the importance of IT in instruction, but they do not know that the information resources of the concrete can use in actual instruction. The kinds of the entity and digital teaching materials [14]:

1. Paper type teaching materials (books, paper materials...)

---

Proceedings of the 10th WSEAS Int. Conference on MULTIMEDIA SYSTEMS & SIGNAL PROCESSING

ISSN: 1790-5117

(2) Linear type teaching materials (tape, video-tape⋯)

(3) Digital type teaching materials (CD, VCD, DVD⋯)

(4) Webpage type teaching materials (look around, speech, simulation⋯)

(5) Network links (websites, library, museum⋯)

In sum, understanding the characteristic and kinds of the digital teaching materials, the teachers can depend on the instruction activity, student's speciality and actual situation to select the suitable teaching material for use.

2.3 Theory of Planned Behavior

Ajzen [15] propositioned 'Theory of Planned Behavior' (TPB). TPB is derived by 'Theory of Reasoned Action' (TRA). TRA thinks that predicting and explaining behavioral emergence must understand individual to this behavioral intention. And the behavior intention is influenced in terms of attitude or subjective norm. Ajzen[15] found that behavioral emergence must also depend on the intensity of individual control to the behavior, so joining the perceived behavior control becomes the TPB. Attitude, Subjective norm, and Perceived behavioral control are called the internal psychological variables. They are often used for predicting and explaining personal behavioral intention and behavior.

![Fig1. Theory of Planned Behavior, source: Icek Ajzen, 2006, p1](image)

(1) Behavior: The behavior is defined in terms of its Target, Action, Context, and Time (TACT) elements.

(2) Behavior Intention: The behavior intention means individual adopts a particular behavioral intention.

(3) Attitude: The attitude means that positive or negative appraisal intensity of individual adopting some particular behavior.

(4) Subjective norm: The subjective norm means the social pressure of individuals adopting some particular behavior.

(5) Perceived behavioral control: The Perceived Behavioral Control means that ability of individual cognitive that carries out some particular behavioral. The actual behavior control means ability, resource and other requirements of individual display the particular behavior need.

(6) External variables

In the TPB, belief determines the intensity of attitude, subjective norm and Perceived behavioral control, and then influences behavioral intention and behavior. The forming of belief is influenced by external variables.

2.4 Association Research

<table>
<thead>
<tr>
<th>Author</th>
<th>Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gatch &amp; Kendzierski [16]</td>
<td>For 100 18-26 year-old students participating in aerobic exercise intended to study, results indicate that the behavior attitudes and subjective norms predict intentions movement reached a significant level, where behavior attitudes are more important than subjective norms by adding perceptual behavior and controlling over their intention to increase the movement forecasts showing planned behavior theories to predict.</td>
</tr>
<tr>
<td>Dzewaltowski, Noble &amp; Shaw [17]</td>
<td>254 readers to repair physical education university students for the concept study to compare social cognitive theories, management theories of action and planning behavior theories in participating in physical activity, the results show that the Scheme behavior theories support behavior attitudes, perceived behavior control to predict intentions, subjective behavior.</td>
</tr>
<tr>
<td>Study (Author)</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Godin et al. [18]</td>
<td>To 161 with coronary heart disease was studied in engaging in regulatory legal campaign intended to behavior attitudes, subjective norms, perceived obstacles, habits, perceived difficulties and individual sports subjective beliefs, perceived severity of vascular re-infarction, and trading behavior harmful to the intention of predictors in multiple regression analysis showed that 41% of regulations were explained the intention of legal movement volume variations thereof, while the perceived obstacles, habits and perceptual difficulties to significant predictors. In the multivariate analysis found that a number of variations thereof, high / low movement intended to prevent factors in the perception of time management difficulties, psychological difficulties and adaptation has significant idle three high scores.</td>
</tr>
<tr>
<td>Theodorakis [19]</td>
<td>To 98 10-13 years old participating in the Department of swimming, swimming Ju Lok Training children study and to consider theories of behavior around the swimming Training participating in the intention of the actual number of participants and sub-forecast. Profit using multiple regression analysis shows that planned behavior theories of subjective norms and perceived behavior control can effectively predict the behavior intentions.</td>
</tr>
<tr>
<td>Atsalakis &amp; Sleap[20]</td>
<td>To 400 primary school children a year-class mother was studied to investigate the mother has the child participating in a one-month program of physical activity (Physical Activity Program) behavior intention and behavior study found that planned behavior theories can be effectively predict the intention.</td>
</tr>
<tr>
<td>Henson[21]</td>
<td>Survey 13-19 year-old African-American, Puerto Lai all Americans, European Americans and other female adolescent smoking intention year high scores by Road Path analysis found that study samples of smoking attitudes were significant predictors of smoking intentions, its regression line between the number of between .44 to .62.</td>
</tr>
<tr>
<td>Nguyen, Beland &amp; Otis[22]</td>
<td>Study of 30 to 60-year-old adult smokers willing to engage in one or two can improve heart-healthy behaviors, these behaviors, including smoking, eating low heat volume of food, exercise, study found that behavior attitudes, subjective norms, . Perceived behavior control involved in health behavior intentions predict showed significant levels, including the standardization of behavior attitudes regression line between the number of between .33 to .34.</td>
</tr>
<tr>
<td>Workman [23]</td>
<td>Theory of Planned Behavior with expert decision-making system to explore the use of non-use and abuse. The results showed a positive attitude and social norms to promote the use of expert decision-making system, perceived behavioral control had no apparent effect. Interactive social impact and attitudes and expert decision-making system of the abuse, there is a significant nonlinear relationship.</td>
</tr>
<tr>
<td>Claudia[24]</td>
<td>Deconstruction Theory of Planned Behavior in order to explore the beliefs of teachers.</td>
</tr>
</tbody>
</table>
to effectively increase the theoretical predictions showing perceptual control of behavior intention to influence behavior variable amount.

The aims of this study are health behavior, social behavior and learning, sports and leisure behaviors, etc. The results show that the Scheme metropolis behavior theories are good and comfortable. Teachers combined the effect factors of information technology into teaching behavior theories, and they will make the three beliefs. This study attempts to explore the use factors of digital teaching materials by behavior theories.

3 Research method

3.1 Study idea

This research regards TPB as the theory structure of explaining the behavioral intention that primary school teachers select the digital teaching materials. For studying the influence factor of primary school, the teachers select separately digital teaching materials from the three directions like the attitude, subjective norm, and perceived behavioral control. Further, they regard the characteristics of digital teaching materials as external variable in order to understand the factor. They probe and define research direction, purpose and hypothesis from the literature review. Then making experts degree questionnaires to collect the data, they carry on analysis after the questionnaires is retrieved and explored the causality among the studying variables. Finally, they write down the result and suggestion according to the analysis.

3.2 Research-structured

In this study, Theory of Planned Behavior is as a study of the teaching of digital teaching materials. The conceptual framework of behavioral intention is utilized. And the influencing factors are studied from (1) the attitude of elementary school teachers using digital materials; (2) the subjective norms of elementary school teachers using digital materials; (3) the perceived behavior control of elementary school teachers using digital materials. Comparing with traditional instructional methods and digital teaching materials, the content is getting more and more diverse.

Research framework shown in Figure 2:
3.3 Study tools

In accordance with research way, Ajzen offered questionnaire examples and suggestions on website, and edited expert validity questionnaire ' the factor scale questionnaire of that primary school teachers choose the digital teaching materials '. This research divides into six variables, ' the attitude ' subjective norm ' perceived behavioral control ' ' behavior intention ' the behavior and ' the characteristic of the digital teaching materials '. The questionnaire is divided into two components, the first component is the personal basic materials, the second component is the factor scale of the primary school teachers choose the digital teaching materials. In addition, after the first draft is finished, according with theme appropriate, questionnaire content and the form verify finally and finalize a text after revising by the directed professor. This questionnaire adopts Cronbach α coefficient to test the internal consistency reliability of the scale, regarding as the reference of the screening topic. Using the statistical suit software carries on statistical analysis, including describing statistics, t test, Pearson’s product-moment correlation, regression analysis.

4 Conclusion

Development of the instruction media produced many kinds of digital teaching materials. The integration of digital technology makes the instruction resources more abundant, pluralism and individually.

The digital teaching material has been offered new learning method of non-limit space and time for instruction. The digital teaching materials are made by combining different multimedia, for example: instruction CD, multimedia teaching material, instruction webpage, CAI, PowerPoint etc. Because teachers have different choices from different situations, they select different digital teaching materials to apply to instruction activity and to present the plural instruction way. So, the topic of studying digital teaching material is very important and meaningful.

References


