

## 影響網路虛擬社群之互動因素研究

A Study on the Interactive Factors of a Web-based Virtual Learning Community

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*The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.*  
--Alvin Toffler

## 一、中文摘要

唯有經由虛擬學習社群的社群成員方能不斷地互相傳遞各式資訊，而在互動過程中扮演主動參與的角色。本研究經由焦點團體訪談、計劃文件分析、問卷、以及討論與觀察等方法綜整「員無法達成理想之互動狀態因素，並據以提出具體更新建議。出乎研究者意料的即時實施，讓本研究的預期貢獻--建置一個理想的虛擬網路社群的互動學習環境提早邁向實現之路。

**關鍵詞：**網路虛擬社群、互動因素、學習加油站、國小資源網站

### Abstract

Learning is an active process and should call into play our fully imaginative and creative capabilities so that subject itself becomes a delight to participants of any virtual learning community. The "K-12 Gas Station" plays a critical role in the efforts of building up a technology-based learning environment. Based upon learning community rationale, precise suggestions on the revision of the website were made by the researchers. To transform the "bulletin board" oriented web site into a "learning community" oriented virtual center, the remodeling builds up new community-support features. Finally, the researchers proclaim further suggestions for implementation strategies

**Keywords:** Virtual Learning Community, Interactive Factors, Primary Education

**The Virtual Learning Resource Center**

Bringing rich learning environment to students in grades K-12 is a high priority for the Ministry of Education in Taiwan. If we are going to bring quality e-learning materials to all students, produce technology literate citizens, and meet the national education goal to be first in the world in academic achievement, we must provide teachers and pupils with rich content for all subject matters in grades K-12. To reach certain apex-level goal, the Ministry of Education has to deal with the major problems of low availability of computer hardware, insufficient courseware and incompetent humanware.

Educators in Taiwan have invested in the technology of internet-based classrooms in years. The Ministry of Education at Taiwan has granted 25 million US dollars for courseware and at least one billion US dollars for island-wide wired campus infrastructure at 1997- 2000 fiscal years. Over 250 teachers and principles from eighty elementary and middle schools, representing twenty-five executive districts, selected to serve as Change Agents of the "K-12 Gas Station" (<sup>[1]</sup>a virtual Learning Resources Center at <http://content.edu.tw>). Their major tasks are to design, produce, and implement web-based courseware on the "Learning Resources Center Project." All Change Agents met every other month during the school year to discuss issues. They share ideas, results, and frustrations via the e-mail and TANET. The project was overseen by a nine-professor steering committee and managed by a leadership team of seven government officers.

The overarching goal of this project was to make a quality as well as quantity oriented learning environment for K-12 schools in Taiwan. However, the actual effectiveness or impact of such diligence is now generally considered

suspect (e.g., <sup>[2]</sup>Wu et al, 2000).

## **Action Evaluation of the Center**

All participants function as reflective practitioners together, reflecting and examining the goals, values and activities. These interactions are done continuously during the project. The researcher serves as one counselor and engages in the project from the beginning, articulating and negotiating their goals, their values, and their proposed action plans.

Information used to write this paper was collected from the following sources: (a) Review of documents: The researcher reviewed each school's proposal as well as the evaluation result for each; (b) Semi-structured focus-group interviews: These interviews conducted by the researcher at the sites. Each interview lasted approximately two hours. In some cases, follow-up phone calls and e-mail were made to gather additional information; (c) Informal observations: The researcher made short, informal observations trainees participating in training activities of workshop and training programs; (d) Peer-evaluation questionnaires: The questionnaire collected island-wide responses of 119 teachers concerning their instructional practices with computers, barriers of computer usage, needs for computer-based resources, educational background, and computer as well as curriculum in-service training; (e) e-mail communication and web-forum; and (f) the self-reflections of the researcher as a member of the steering committee.

Besides these, Formal meetings and informal discussions with the MOE staffs play a critical role of this action evaluation. These meetings and discussions were held between Feb. 2000 and Dec. 2000 and covered aspects of website planning. After all the site visits were completed, researchers conducted several meetings with MOE staffs to discuss the research findings and to propose a revision suggestion based upon requirements of a learning community.

## **Research Findings**

Data from communications and interviews with participants strongly suggested that the whole project should make a sharp turn. Discussion among these change agents covered the important issues of vision, quality of web site, learnability of courseware and capabilities of teachers. The primary results described below

are reported in terms of four aspects of the project because the researcher feels that an exhaustive evaluation report is beyond the scope of this manuscript. The following are some major points emerging from this research (<sup>[3]</sup>Jih, 2001):

### Vague Vision

The vision of the virtual Learning Resources center is far way from the crystal clear visibility. The education administrators, the computing education professionals and teachers as primary users brought different vision and expectations into the change agent team. At the first year, 'just put anything on the web' become the major misconception of the learning resources center. The reason why they treat it that way was that none of the change agent has ever had experience on web before. Unfortunately, the ambiguity lasted for three years. Until today, they still try to figure out the major goal of the project.

### Wimp Website

A teacher views their professional responsibility as a process of continual, reflective inquiry and the exchange of ideas with their peers leading to the development of a shared community base. They value various opportunities to share their expertise with other teachers beyond the classroom or the school. Partnerships with community members, collaborations with colleagues, and engagement with and any educational activities do expand teachers' understanding of teaching practice in ways that are sometimes unavailable in school. Therefore, more availability of learning community access should be provided in order to encourage teachers' opportunities in terms of professional development.

Nevertheless, the K-12 Gas Station with a WIMP (windows, icon, menu, and pointing device) interface is a 'wimp' system. On the one hand, the de-centralized infrastructure of the web servers is quite manpower demanding. On the other hand, the simplified features and structures (For instance, there is no database server for users to share their work) of web site could not meet the needs of 'sharing' information for virtual communities.

### Incompetent Involvement

Although it cost a huge amount of budget, however the result turns out not so appealing. Several key persons of the Change Agents stated that they feel incapable about their involvement

in the project and that the whole project is “just waste of time and money.” Why? Well, because, they never have been designed or produced any web-courseware before this national project taking off. Some change agents considered themselves as “digitizers” – who specializes in scanning photos and/or digitizes video clips. Some of them even could not find one single subject matter teachers in their schools. Anyone who can make (or locate somebody else do) better image processing works become the superstar of the whole group. Nevertheless, none of them is familiar with or heard the instructional design or systemic development of courseware.

Teachers, as well as administrators, parents, and community professionals, have a vital role to play in educational reform of K-12 in Taiwan. They need the following professional development supports: need a transformation model rather than a transmission model, need pedagogical strategies, need appropriate infrastructure and computer resources and need to model strategies, give guidance and feedback, allow for revision (<sup>[4]</sup>Krajcik, 2000). However, certain support is absent from teacher training programs and the national project.

Only few teachers might integrate the e-materials into their teaching and learning processes. Yet, K-12 teachers have had few opportunities either to increase their domain content background or to have many of the handy learning materials that have been shown to improve student interest and achievement in all area of subjects. Researchers and practitioners proclaimed that, for technology innovation to occur, teachers must feel that they are a part of the reform. However, the major role of teacher should and must be a user of the learning environment, not a one-man team developer.

### Rare Resources

The leading characters in any gas station should be the gasoline itself. Consequently, rich learning resources in terms of raw materials, lesson plans, teaching guides, worksheets, activity books, references, and cooperative projects should be provided on the K-12 Gas Station. However, the major characters on the station are scanned pages or reprint pages of textbooks along with teaching guides and published materials available for each teacher. The real needs for learning resources is under development.

### Misjudged Needs

Educational administrators have too often placed computers in each school and teacher's classroom with innocent expectation that technology would and should emerge into classroom activities. However, the truth is teachers always didn't ask for computers nor internet and would not or should not have any specific plans for using those current or future technologies. Fewer than one fifth subjects (20.2%) reported having using computers in their own classrooms. Over one third (37.0%) subjects view computers as a "Game station."

Approximately one half (47.1%) subjects rank computers as a major factor for short-sight of pupils.

### Compact Curricula

One non-technology problem is scheduling. Over one forth (28.6%) subjects proclaimed that the compact curriculum is a crucial barrier for computer usage. Elementary teachers have many different subjects to cover and so many pupils to teach and guide. It is beyond all reason for most teachers to integrate computer technology into daily school works.

### Inconvenient Instrument

The availability of computer is far from satisfaction in Taiwan's classrooms. Among those 119 subjects, 47 persons (39.5%) and 59 teachers (49.6%) complaint that there is no computer nor projector in their classrooms. Moreover, computers and internet often break down. Therefore, the difficult accession to technology becomes a major excuse for teachers not using computers into their teaching practices.

### **Conclusion, Suggestions and Future Work**

Learning is an active process and should call into play our fully imaginative and creative capabilities so that subject itself becomes a delight to learners of all ages. It is only when we make explicit use of new natures of learning technology that the “new” learning media would add multiple value to human learning of any subject.

No web site is perfect, but some get closer. The remodeling of the website is an in-time reaction to the findings of an action evaluation (<sup>[6]</sup>Jih, Lee, & Wu, 2001). To solve major problems of current “K-12 Gas Station”, the researchers have made complete and precise suggestions on the revision of the website in terms of hardware, platform, courseware, and

humanware according to the 'learning community' perspectives (<sup>[6]</sup> Greeno, Smith, & Moore, 1995; <sup>[7]</sup> Kearsley, 2000).

#### Hardware aspect

- ↳ To put computers and projection devices into regular (not computer) classrooms. To actually let computers 'walk into' each classroom and become learning accompanies for teachers as well as students and/or parents.
- ↳ To make policy supporting the access of computers.
- ↳ To adopt virtual server idea for replacing local 'real' server at each local center.

#### Courseware aspect

- ↳ To re-build a Website focusing on community-support features, such as, resources and information sharing mechanisms, challenge activity platforms, database servers and etc.
- ↳ To demand instructional design and development in courseware production.
- ↳ To stop the change agent project.
- ↳ To start an eCourseware Contest and use a quality-oriented criteria.

#### Humanware aspect

- ↳ To provide with goal-oriented and quality request training program for in-service teachers
- ↳ To focus on technology-learning activity integration training.

#### Learning community aspect

- ↳ A teacher could participate in a learning community is vital for his/ or her professional development. The K-12 Gas Station should start a variety of real-world interest groups or clubs to encourage the individual interaction of continuing enhancement of teaching strategies, exploration of innovative technology use collaboratively and individually, and construction of ownership in the group.
- ↳ The real-world interactive group forms the cornerstone of the learning community via the K-12 Gas Station in the cyber space.

A comprehensive reform of the structure and function of the web-based learning resources center, ways of e-course design and development, and the teacher training programs is underway (<sup>[8]</sup> Krajcik, 2000).

Teachers, administrators, parents, and community professionals, have a vital role to play in educational reform. They need the

following supports: need a transformation model rather than a transmission model, need pedagogical strategies, need appropriate infrastructure and computer resources and need to model strategies, give guidance and feedback, allow for revision (Krajcik, 2000). It is only when we make explicit use of new natures of learning technology that the new media would add multiple value to human learning of any subject. Many challenges to effective design remain in quality rich learning environments (<sup>[7]</sup> Jonassen, 2000). We look forward to the fruitful results of the follow-up reform.

*The real voyage of discovery consists not in seeking new landscapes, but in having new eyes. –Marcel Proust*

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