

THE RELATIONSHIP BETWEEN THE EMBEDDED INSTRUCTION APPROACH AND MODERN CITIZENSHIP COMPETENCY

Chen-Fong Wu

*Department of Business Administration, College of Management, Providence University, Taiwan
cfwu@pu.edu.tw*

ABSTRACT

Since 2011, universities in Taiwan have been pursuing a new direction in education — embedding citizenship in professional courses to help students achieve professional competencies and modern citizenship competency. By applying both quantitative research and case analysis, the study presents 2 conclusions. First, student ethical literacy reached the highest level and aesthetic literacy reached the lowest among the learning outcomes of the 5 civic literacies by applying the embedded instruction approach. Second, the 8 embedded teaching methods significantly influenced the student recognition level of citizenship; among these methods, *performance/exhibition* and *disputation* had the greatest efficiency. The course case analysis of this study also demonstrated that a practice-oriented teaching strategy, such as encouraging students to undertake learning projects and public exhibitions, is considerably effective in promoting citizenship.

Keywords: general education, citizenship, embedded, professional courses

INTRODUCTION

The Ministry of Education (MOE) in Taiwan has formally implemented the Cultivating Citizenship Program in universities since August 2011. By considering each school as a unit, the program attempted to facilitate the development of modern citizenship by creating a sound learning environment and reforming the instruction approach of the entire school. The program emphasizes cultivating citizenship through five civic literacies, including the literacies of ethics, democracy, science, aesthetics, and media. The program is expected to enable undergraduate students to develop modern citizenship competency besides engaging in professional knowledge and help them obtain a global view and zeal for participation in social affairs. Since the initiation of the Cultivating Citizenship Program in 2011, a total of 46 universities have applied for grants by the MOE, but only nine universities with remarkable programs passed the evaluation and received the subsidy. University P, the sample in this study, is one of the three subsidized universities among dozens of universities in central Taiwan (Ministry of Education Advisory Office, 2012). The purpose of this study was to analyze the characteristics of the learning outcomes of University P's students after the end of the first program term (i.e., from August 1, 2011 to December 31, 2012).

The Taiwan MOE empowered the nine subsidized universities by granting them greater autonomy to implement the Cultivating Citizenship Program regarding aspects such as course design, instruction approach, and assessment of learning outcomes depending on the characteristics of the university. The MOE also held midterm and endterm outcome workshops so that universities could learn how to implement and improve citizenship. The MOE could also evaluate the program outcomes of the nine subsidized universities as a basis for deciding whether to continue subsidizing them for the following term [i.e., the MOE granted NTDS\$6 million and the university matched 30% of the grant for a total of NTDS\$8 million (approximately USD\$0.27 million) subsidy per term]. The subsidization indicates an honor as well as a performance index for the school; thus, universities in Taiwan actively compete for the subsidy regardless of its small amount. University P received the second-term subsidy granted by the MOE in January 2013 for good implementation outcomes of the program during the first term.

University P was the only sample in this study. However, it is possible to yield dependable reliability and validity study results by applying two methods and comparing them: the Analysis of Moment Structures (AMOS, a quantitative research method), used for analyzing the relationship between student learning outcomes and teaching methods, and the case analysis method, for studying the characteristics of the teaching methods. An instructional framework of citizenship in disputation and practice was also developed using the study. The framework indicates that, to cultivate citizenship, the mold of the traditional class lecture in which students play the role of the one-way audience must be broken; instead, the class learning space should be in the “real” environment outside the classroom, where students personally participate in activities such as cultural and creative activities such as art exhibitions. Meanwhile, financial support and proper lecture training for instructors from the school, as well as social and industrial resources applicable for student use, are effective instructional

strategies to promote citizenship embedded in professional courses.

THEORETICAL BACKGROUND

Humanism Lost in University Education

Wooing excellence, performance, and good evaluation indicators favored by universities has recently replaced the discourse about ideals in university education, and humanism is rapidly being eroded. Universities have become less rich in ideals as pillars of an academic hall in holistic education and have ironically become a “company” bidding for excellence (Tsou, 2012). In other words, the traditional ideals and values in universities have diminished, and the humanistic spirit and literacy have been forgotten. Such “lost humanism” has averted people from social participation or reflection and practice of social issues in real life.

University education faces severe criticisms. For example, both Snow (1965) and Leavis (1962) indicated that the British education was restricted to the extent that liberal arts do not interact with science. Snow encouraged students majoring in liberal arts to take more science elective courses, and vice versa. Leavis called for a focus on the humanistic spirit as the core of university education. Because global capitalism has “controlled” universities and made them prejudiced in favor of quick success and instant benefits, education has virtually become a commodity. In a capitalistic society, the notion that “greed is good” becomes logic, and the humanistic spirit and citizenship evaporate (Lu, 2012).

The Renaissance of Citizenship

Revisiting true university values is a way to overcome the problem of lost humanism. Academia in Taiwan has discussed the concept of citizenship, and reaffirmed the importance for university education to cultivate citizenship in general education.

Many scholars in Taiwan (Chen, 2012a; Chen, 2012b; Tsai, 2012) identified with the Cultivating Citizenship Program implemented by the Taiwan MOE. They believed that the program should be rooted in five major literacies — ethics, democracy, science, aesthetics, and media. The fusion of general education and professional education helps develop students that have modern citizen core competencies that allow them to explore public issues and solve problems. Therefore, the MOE launched the first term of the Cultivating Citizenship Program by financially aiding nine focal universities in August 2011. This is an innovative movement in university general education and a major development for a renaissance of citizenship.

Relationship between Instruction Approach and Citizenship

Embedding citizenship in professional courses is an approach that integrates general and professional courses and avoids excessive focus on professional rather than general courses at present. Instilling the element of citizenship in professional courses activates their contents and promotes student learning interest; therefore, the instructional approach plays a critical role in facilitating the Cultivating Citizenship Program (Chen, 2012b).

After analyzing the current state of citizenship education in universities in Taiwan, Chen (2012a) and Hung (2012) considered that few teachers could successfully apply citizenship to instructional approaches, and that quantifying citizenship seemed difficult. Therefore, they suggested that teachers consider cultivating citizenship in a “holistic” manner. This can be accomplished by departing from the one-directional classroom lecture and focusing on topics such as ethical practice for decision-making in a predicament (Tsai, 2012). The holistic method for cultivating citizenship also considers literacy as knowledge and competence in external hidden curriculums, such as sharing experience in practical training or imparting knowledge in interactions (Liu, 2012). In conclusion, these “know-hows” (Chu, 2012) of applying citizenship to instructional approaches are developed by learning to solve problems occurring in daily life and in society.

The embedded instruction approach is conducted by including topics of concern in teaching activities of different subjects. It arises from the concept of constructivism, in which learners actively construct their own knowledge from life circumstances (Ning, 1993). Instructors initiate students in topics of instruction and motivate them to actively explore and construct knowledge based on their own experiences, by which past learning experiences can connect with new concepts in reflection. These activities cultivate students’ new experiences. Finally, students obtain knowledge competence (Moursund, 1999; Post, Ellis, Humphreys, & Buggey, 1997; Thomas, 2000). In brief, the steps in the process of embedded instruction are (a) topic, (b) discussion, (c) reflection, and (d) practice. These steps yield knowledge and competencies (Chen, 2011; Tsai & Wu, 2004). The process resembles the aforementioned know-hows as the core of holistic cultivation of citizenship.

This study examined eight embedded teaching methods from methods commonly used in higher education. These include the traditional *pre-reading* and *out-of-school visits* methods, as well as the recently developed

methods compatible with the “discussion-reflection-practice” concept (i.e., *media-assisted materials, case analysis, film analysis, group learning, disputation, and performance/exhibition*).

Two constructs were developed: the citizenship-embedded instruction approach and the manner by which the instructional approach influences the level of student recognition of citizenship (ethics, democracy, science, aesthetics, and media). The learning outcomes students obtained from the teaching methods defined the recognition level construct. Therefore, a hypothesis is proposed as follows: the embedded instruction approach positively influences the level of student recognition of citizenship. Figure 1 shows the tentative framework developed in the study.

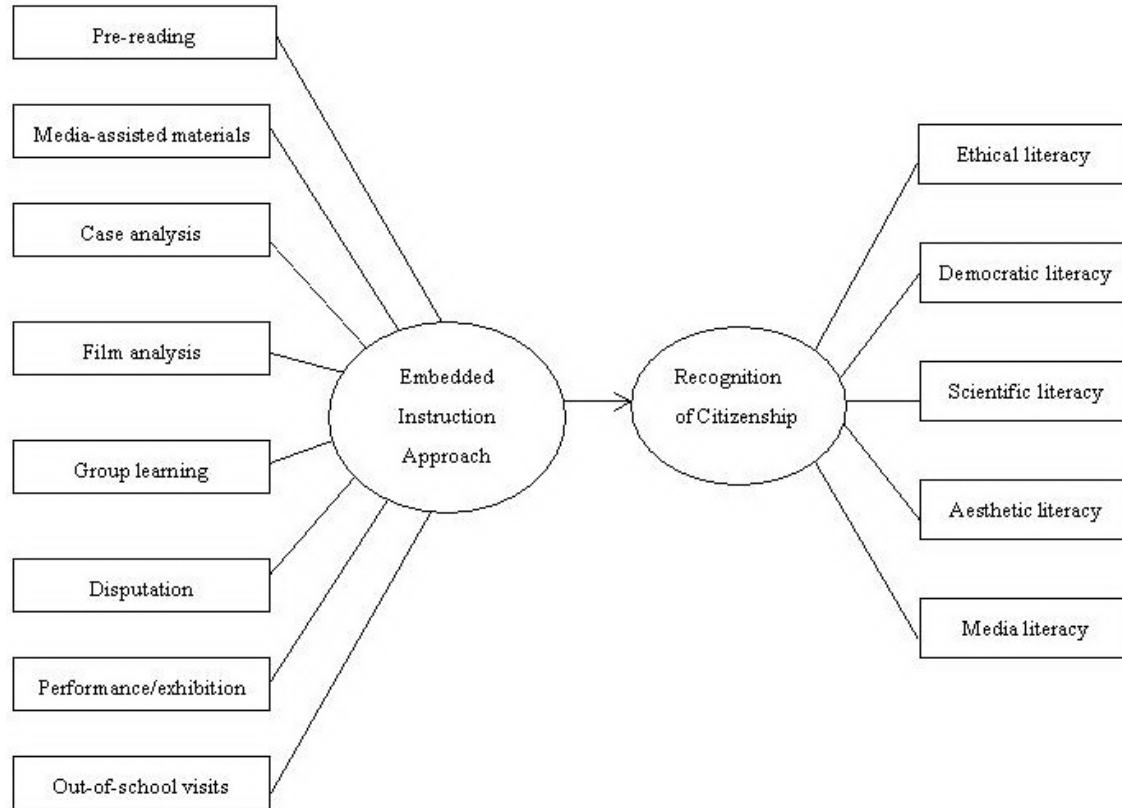


Figure 1: A tentative framework of citizenship-embedded instruction approach

METHODOLOGY AND ANALYSIS

The methodology in this study included two major parts. The first part was quantitative research. Using 800 questionnaires, we tested the level of the student recognition of citizenship through various teaching methods and verified whether the tentative framework in Figure 1 was sustainable. The second part was a qualitative course case analysis, which demonstrated contextual factors related to the constructs in the research framework by characterizing the teaching methods of four professional courses and students’ leading learning outcomes. The comparison and cross-verification of the dual research method may prove the credibility and practicability of the instructional approach whereby citizenship is embedded in the professional course.

Quantitative Research

The independent variables in this quantitative research are the eight teaching methods, including the traditional method and the multiple methods employed by participating classroom teachers in their embedded instruction. The dependent variables are the recognition level of the five civic literacies suggested by the Taiwan MOE, including ethical, democratic, scientific, aesthetic, and media literacies. Each literacy included five items for a total of 25 items designed by the researcher and revised and pretested by experts, with good reliability and validity.

The operational definitions of the five civic literacies (i.e., the dependent variables) are as follows (Ministry of Education Advisory Office, 2012):

- *ethical literacy* is the ability of a citizen to use moral reasoning and rational judgment while facing ethical issues in daily life.
- *democratic literacy* is the ability of a citizen to respect facts and communicate rationally.
- *scientific literacy* is the ability of a citizen to comprehend the results yielded by science and to participate willingly in the discussion of public issues related to science.
- *media literacy* is the ability of a citizen to critically appraise and contemplate media information, and then properly use media to express concern about public affairs.
- *aesthetic literacy* is the awareness and practice of a citizen to perceive aesthetics and the ability to experience and build an aesthetic society in the world.

Regarding the sample, University P was selected because it was one of the nine universities obtaining grants from the Taiwan MOE to implement the Cultivating Citizenship Program. In addition, the MOE allowed University P to implement the second-term program and to receive continued subsidies in January 2013 because of its outstanding implementation after the first term (i.e., 1.5 years) of the program. Therefore, University P is a representative school in Taiwan that is able to advance citizenship, and its implementation outcomes may be used as a reference for other universities.

University P applied the embedded instruction approach in the first term of the program by using embedded citizenship in 37 professional courses with 1,100 enrolled students. The questionnaire was administered to these students after the end of the first term, and 800 valid responses were received for a return rate of 72.7%. The analysis of these responses is as follows.

Questionnaire measures: Factor analysis and reliability test. Table 1 shows the Cronbach’s α of each measurement item. These values ranged between 0.754 and 0.923, which indicated a good standard of reliability (Wu, 2009).

Table 1: Factor analysis and reliability test

Questionnaire item	Eigenvalue	Interpreted variance (%)	Factor loading	Cronbach's Alpha
Ethical literacy	3.576	71.52%		0.900
The course motivated you in personal and social responsibility.			0.884	
The course developed your social morals.			0.869	
The course encouraged you to devote what you learned to the society.			0.844	
The course promoted your recognition on service value and altruistic motivation.			0.816	
The course encouraged you to probe into issues through rational thinking.			0.814	
Democratic literacy	3.296	65.92%		0.870
The course helped you learn how to interact and communicate with others.			0.878	
The course helped you expand interpersonal relationships.			0.857	
The course fostered your habit to respect for other opinions.			0.797	
The course helped you understand your role in the society.			0.764	
The course helped you understand proper gender interaction.			0.757	
Scientific literacy	3.424	68.48%		0.884
The course fostered your ability to use information technology as learning assistance.			0.873	
The course fostered your ability to search for information and resources.			0.858	
The course encouraged you to achieve learning outcomes by information technology.			0.856	
The course trained you to think logically through scientific ways.			0.797	
The course helped you to apply theoretical knowledge to real-life problem solving.			0.747	
Aesthetic literacy	3.393	67.85%		0.877
The course fostered your ways to appreciate music and art.			0.909	
The course fostered your interest in various cultural and artistic activities.			0.890	
The course promoted your ability to appreciate music and art.			0.888	
The course encouraged you to develop your personal creativity and traits.			0.749	
The course fostered your enthusiasm for the environment of your school and residence.			0.650	
Media literacy	3.820	76.41%		0.923
The course developed your ability for rational use of different media.			0.892	
The course developed your ability to avoid misleading media information.			0.878	
The course encouraged you to analyze media information and its true nature.			0.876	
The course fostered your respect for and attitude toward the media.			0.874	

	The course encouraged your critical thinking on different media.			0.851
(Independent variable) Instructors' teaching method	Teaching method	3.433	34.33%	0.754
	Performance/exhibition			0.770
	Group learning			0.746
	Disputation			0.645
	Case analysis			0.637
	Film analysis			0.623
	Out-of-school visits			0.598
	Media-assisted materials			0.489
	Pre-reading			0.631

Ranking of the recognition level of the five civic literacies. Table 2 shows the recognition level of the five literacies. According to the means of these levels, the participants exhibited the highest recognition level in ethical literacy and the lowest recognition level in aesthetic literacy.

Table 2: Means of the student recognition level on the five civic literacies embedded in professional courses

Civic Literacies	Mean	Note
Ethical literacy	4.06	Besides <i>aesthetic literacy</i> , the recognition levels of the other four literacies were similar.
Democratic literacy	3.92	
Scientific literacy	3.95	
Aesthetic literacy	3.57	
Media literacy	3.95	

SEM and path analysis of the model. For structural equation modeling (SEM) and path testing, the study used the AMOS statistical software to draw an SEM-related model path diagram for structural model analysis and to test the theoretical model in this study and the goodness-of-fit of observed data.

In the study, eight criteria were used to evaluate the overall model fit, including the chi-square degree of freedom (DF), goodness of fit index (GFI), adjusted goodness of fit index (AGFI), root mean square residual (RMR), root mean square error of approximation (RMSEA), normed fit index (NFI), incremental fit index (IFI), and comparative fit index (CFI). The results of the overall model fit evaluation and collation (Table 3) show that most index values reached the verifying criteria, indicating good fitness of the model (i.e., the theoretical model was compatible with the data observed).

Table 3: The overall model fit in this study

Evaluation criteria	Analysis outcome	Recommended value	Evaluation result (goodness of fit)	Reference
Chi-square ratio	Minimum chi-square (Cmin) = 381.54 DF=83 Chi-square ratio=4.597	□5	Match	Wu (2009)
GFI	0.942	□0.9	Match	Hair, Black, Babin, Anderson, & Tatham (2006)
AGFI	0.916	□0.9	Match	Hair et al. (2006)
CFI	0.933	□0.9	Match	Hair et al. (2006)
RMR	0.043	□0.05	Match	Hair et al. (2006)
RMSEA	0.067	□0.08	Match	Browne & Cudeck (1993)
NFI	0.916	□0.9	Match	Hair et al. (2006)
IFI	0.933	□0.9	Match	Hair et al. (2006)

For path analysis, the study applied the method of maximum likelihood to conduct outcome estimation and analysis of related paths and to test the proposed tentative research framework. Figure 2 shows the study results.

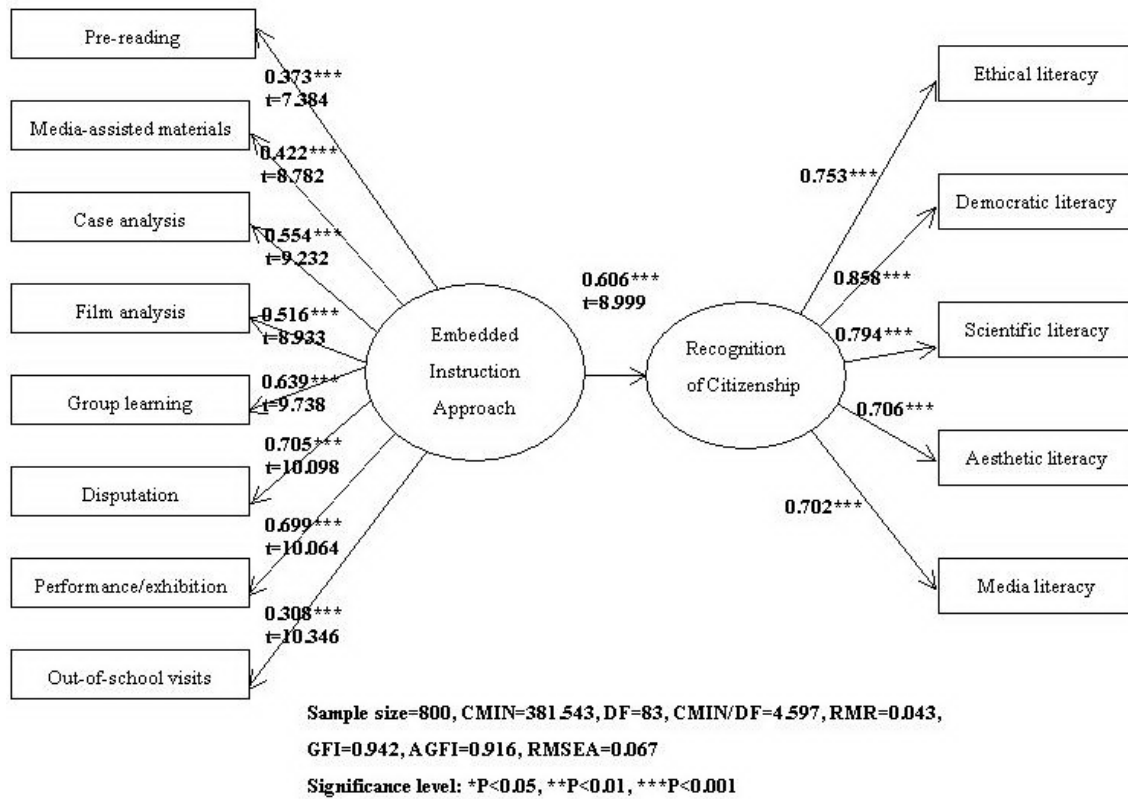


Figure 2: Path analysis of the model in this study

Table 4: Trait analysis of the four awarded embedded courses

Ranking	Course	Department	Course literacy	Teaching method and activity	Learning outcome assessment
#1	Artistic Design Thinking and Cultural and Creative Aesthetics: Visual Plan Exhibition	Junior, Dept. of Computer Science and Communication	Aesthetics	1. Visual theory and practice lecture 2. Group Tasks for exhibition activities 3. Group Cooperation for theme exhibition and on-site oral guidance	1. Quality of visual theme design in public exhibition 2. Outcomes of oral guidance in on-site exhibition 3. Abilities of listening, speaking, reading, and writing
#2	Field Research and Practice: Pop Music	Junior, Dept of Taiwan Literature	Media; Aesthetics	1. Pop music broadcaster visits 2. Fieldwork – singer interview	1. Reports of pop-music signer biography 2. Group presentation and peer assessment
#3	Disaster and Aboriginal Regulation Rebuilt	Junior, Dept. of Law	Ethics Democracy Science Media	1. Disaster area field survey 2. Film viewing and discussion 3. Group learning and extensive discussion 4. Oral presentation, inquiry, and argument	1. Records of disaster area field survey 2. Reflection on aboriginal dilemma in Taiwan, case report review, and interactive argument
#4	Social Enterprise	Senior, Dept. of Social Work	Ethics; Democracy Science; Media	1. Group learning 2. Record and discussion 3. Case discussion 4. Interactive argument 5. Study abroad	1. Design outcome presentation of social enterprise activities 2. Peer assessment of group works and response to inquiries

This study attempted to explore the influence of teaching methods that instructors use in classes on the student recognition level of citizenship. The path coefficients in Figure 2 show that the *instruction approach* dimension positively influenced the *recognition of citizenship* dimension (path coefficient = 0.606, $t = 8.999$). In the dimension of instruction approach, all eight teaching methods showed significant effects, including *pre-reading* (path coefficient = 0.373, $t = 7.384$), *media-assisted materials* (path coefficient = 0.422, $t = 8.782$), *case analysis* (path coefficient = 0.554, $t = 9.232$), *film analysis* (path coefficient = 0.516, $t = 8.933$), *group learning* (path coefficient = 0.639, $t = 9.738$), *disputation* (path coefficient = 0.705, $t = 10.098$), *performance/exhibition* (path coefficient = 0.699, $t = 10.064$), and *out-of-school visits* (path coefficient

= 0.308, $t = 10.346$). *Disputation, performance/exhibition, and group learning* were the top three among these path coefficients. These three indicators can effectively characterize the *instruction approach* dimension. In addition, the hypothesis was validated.

Qualitative Research: Case Analysis of the Courses

University P held a campus “student learning outcome competition” after the first term of the Cultivating Citizenship Program ended. Enrolled students of the 37 professional courses that included embedded citizenship presented over 100 learning outcomes in written form. Thereafter, the university authorities invited intramural and extramural experts to review and rank these written reports. The study selected the top four ranked student works to analyze their traits, and the results are presented in Table 4.

The four awarded courses were characterized by extensive discussion between groups in group learning, on-site surveys, independent student cooperation and completion of tasks (e.g., planning exhibitions and oral presentations), and response to inquiries in public presentation. These learning processes were multiple citizenship learning activities, which included the training of listening, speaking, reading, and writing abilities. The main distinguishing factor between these courses was the type of citizenship included in the course. Literacies of ethics, democracy, science, and media were discernibly weighted more than aesthetic literacy.

DISCUSSION

The study applied both quantitative and qualitative investigations. The results show critical factors in cultivating citizenship, including instruction approaches and student learning contents.

First, citizenship education is not limited to class lectures with instructors. The core of the instruction should transform from the one-directional method of imparting disciplinary knowledge by the instructor to a method that cultivates student thinking ability. Thinking ability refers to the recognition abilities of students (i.e. disputation, analysis, and application). Xu (2012) indicated that the “recognition process orientation” approach focuses on student self-determination and reflective thinking, whereas instructors play a leading or assisting role. The approach also creates a teacher-student or student-student dialogic atmosphere, and guides students to combine academic knowledge with the real world through reflection and learning practice. The space in which citizenship education is conducted breaks the mold of the classroom and enters the real world that students live in. Through social participation and by experiencing the substantial impact of public issues, students can develop a notion of responsible social action. Figure 3 shows the recognition process orientation of citizenship education, which is a sequential learning and teaching process from in-class disputation and discussion to post-class practice and reflection.

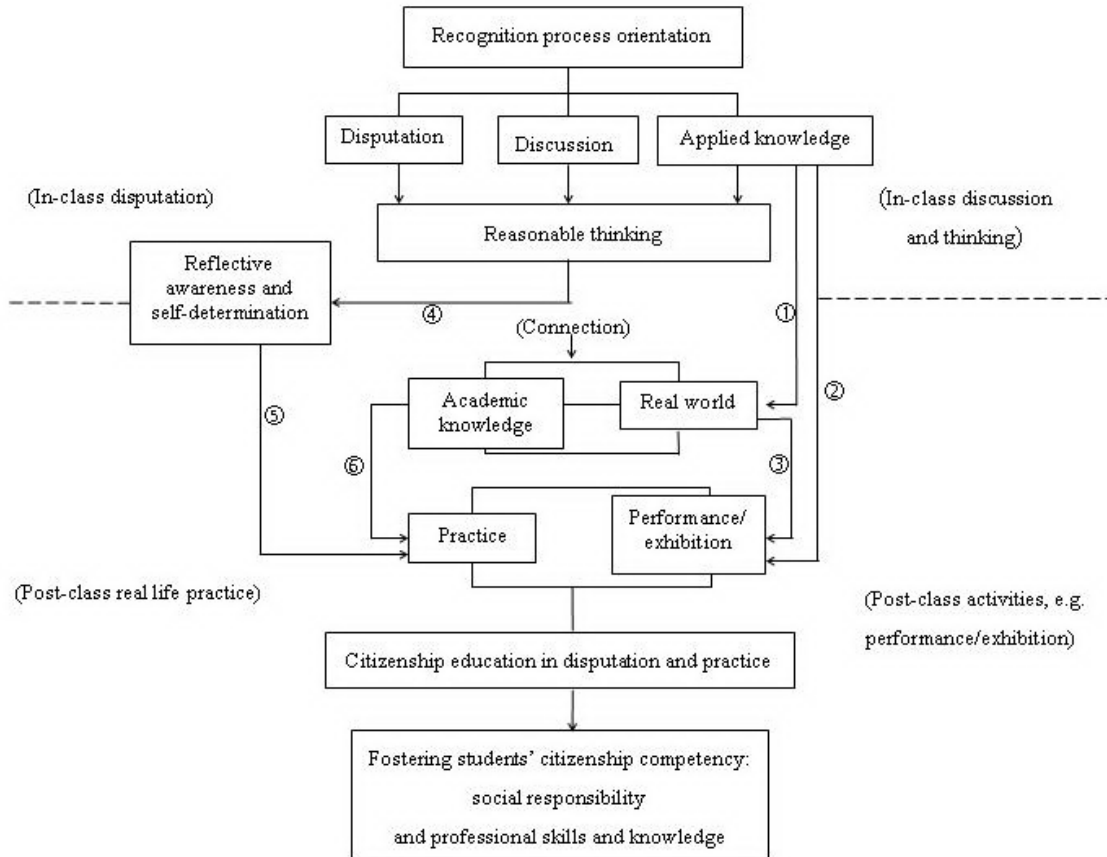


Figure 3: Diagram of the instructional framework of citizenship in disputation and practice

Source: This study

Second, all four awarded professional courses applied the embedded instruction approach of “disputation and practice” to foster students’ citizenship at a high level. Arrow 1 in Figure 3 indicates that the courses applied to real life (e.g., fieldwork in pop music, disaster area surveys, or study abroad). Arrow 2 shows the transformation of knowledge into practical action (e.g., performance/exhibition). Arrow 3 indicates that the completion of learning outcomes was the formation of knowledge from the “real world.”

In addition, Arrow 5 shows that the teaching methods in the four courses (e.g., group task planning for exhibition, group learning and extensive discussion, and interactive arguments) fostered students’ reasonable thinking, self-determination, and reflective awareness, and then advanced their practical abilities (i.e., learned how to present their works). Finally, Arrow 6 shows that students transferred academic knowledge acquired in class to practice.

Third, the quantitative research results in this study showed that aesthetic literacy was recognized at the lowest level. The result corresponds to that of another survey in Taiwan (Chen, 2012a), which questioned scholars specializing in citizenship about the importance of the five literacies. The result showed that aesthetic literacy was recognized at the lowest level because the category of aesthetic is too broad to be defined. Therefore, cultivating aesthetic literacy may start with the implementation of public and social issues, and then the competency of aesthetic literacy can develop.

Nevertheless, the Artistic Design Thinking and Cultural and Creative Aesthetics course, which emphasized aesthetic literacy, ranked the first among the four awarded courses. The reviewers considered the course an effective embedded instruction approach for aesthetic literacy because it explicitly emphasized the competency of aesthetics. The course guided students in group learning and distributed group tasks for visual design exhibition. Students arranged and decorated the exhibition site and provided on-site oral guidance independently; these practices were the main reason the course was ranked first.

CONCLUSION

This paper has given an account of and the reasons for the widespread use of the embedded instruction approach for teachers to embed citizenship in various courses. Applying the embedded instruction approach can merge the separate lines of intellectual pursuit of liberal arts and science and develop humanistic literacy in professional curriculums by departing from the one-directional classroom lecture and focusing more on projects undertaken or experience in the real environment outside the classroom. Additionally, the embedded instruction approach has to combine with out-of-school sharing workshops to advance instructors' teaching methods and innovation in teaching. For example, the Taiwan MOE has held 2 to 4 workshops of innovation in teaching each year from 2011 to 2014 for subsidized universities to share their implementation in the Cultivating Citizenship Program. These workshops then attracted extensive attention from many other universities in Taiwan to learn how to implement and improve citizenship.

The study provides a practicable framework to cultivate citizenship and serves as a reference for instructors or schools who are interested in implementing citizenship. Therefore, collating from the aforementioned results in the quantitative and qualitative research and the three contents in the discussion section, several conclusions are drawn as follows.

First, the hypothesis of that embedded instruction approaches positively influence the level of the student recognition of citizenship is valid. Future citizenship education can apply more practical teaching methods, such as group learning, disputation, and performances and exhibitions.

Second, civic literacies, such as aesthetic literacy, do not always have tangible definitions and practices. Some teachers may find effectively applying them difficult. However, through the application of practice-oriented learning with teaching methods fostering student interest in explicit knowledge, it is easier for different types of knowledge or civic literacies to spread. In addition, citizenship education improves if the creation of knowledge undergoes a sequential process of communication, diffusion, and systematization (Lozano, 2003).

Third, the study developed an instructional framework of citizenship in disputation and practice. The conceptual framework can function systematically to cultivate students' citizenship competency (i.e., the ability to combine social responsibility with professional how-to knowledge). It may be used in expanding the teaching and learning of citizenship education.

Finally, the study is limited to one sample, University P, because of its discernible and effective outcomes in implementing citizenship. The impedances of other universities in implementation are not discussed. This is perhaps a major research direction for future studies.

ACKNOWLEDGMENTS

We thank the Taiwan MOE for the emphasis on citizenship, financial support for universities participating in the Cultivating Citizenship Program, and a teaching and learning platform of citizenship for universities in Taiwan. It has considerably enabled implementing citizenship education.

REFERENCES

- Browne, W. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park, CA: Sage.
- Chen, C. H. (2012a). Core competence indicators and learning outcome evaluation. In *Proceeding of international conference on cultivating citizens' core competence* (pp. 105-120).
- Chen, J. H. (2012b). Designing core competence embedded in professional courses (Taiwan experience). In *Proceeding of international conference on cultivating citizens' core competence* (pp. 79-92).
- Chen, L. H. (2011). A Civic Action Model for Global-Issues Curriculum Design and Some Exemplary Cases. *Taiwan Foundation for Democracy*, 8(1), 48-82.
- Chu, J. M. (2012). Core Shifting from Knowledge to Ability. *General Education Online*, 42, 16-18.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006), *Multivariate data analysis*. Englewood Cliffs, NJ: Prentice-Hall.
- Hung, Y. H. (2012). Definition and selection of key competences. In *Proceeding of international conference on cultivating citizens' core competence* (pp. 45-71).
- Leavis, F. R. (1962). *Two cultures? The significance of C. P. Snow*. London: Chatto & Windus.
- Liu, Y. C. (2012). Speaking of University Literacy Education. *General Education Online*, 42, 12-14.
- Lozano, Josep M. (2003), An Approach to Organizational Ethics. *Ethical Perspectives*, 10(1), 46-65.
- Lu, H. J. (2012). General Education and Humanistic Spirit: Reflection on C. P. Snow's "The Two Cultures" Theory. *Journal of General and Literal Education*, 7, 57-82.

- Ministry of Education Advisory Office. (2012). *Humanities and Social Science, HSS*. Available: <http://hss.edu.tw>.
- Moursund, D. (1999). *Project-based learning using information technology*. Eugene, OR: International Society for Technology in Education.
- Ning, T. C. (1993). The instructional approach of constructive teaching: A radical constructivist view. *Journal of Elementary Education, 5*, 33-41.
- Post, T. R., Ellis, A. K., Humphreys, A. H., & Buggey, L. J. (1997). *Interdisciplinary approaches to curriculum: Themes for teaching*. Upper Saddle River, NJ: Merrill.
- Snow, C. P. (1965). *The two cultures: And a second look*. London: Cambridge University Press.
- Thomas, J. W. (2000). A review of research on project-based learning. Report prepared for The Autodesk Foundation. Available: http://www.bie.org/index.php/site/RE/pbl_research/29.
- Tsai, F. C. (2012). Ethical literacy education in the professional field. In *Proceeding of international conference on cultivating citizens' core competence* (pp. 99-104).
- Tsai, M. C., & Wu, C. J. (2004). The infusion curriculum designing of life education. In *Normal University Conference on Education* (pp. 409-436).
- Tsou, C. H. (2012). University General Education and Humanistic Literacy of Modern Citizens – Habermas's Reflection on the Diagnosis of University. *Journal of General and Liberal Education, 7*, 17-55.
- Wu, M. L. (2009). *Structural equation modeling: The operation and application of AMOS*. Taipei: Wu-nan.
- Xu, H. X. (2012). From the Course of "Introduction to Science" to the Course of "Thinking": A Case Study of the Progress of Developing General Education Courses by University Instructors. *Journal of General and Liberal Education, 7*, 117-152.