

TEACHERS AS ROLE MODELS FOR STUDENTS' LEARNING STYLES

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We used modeling advantage, a concept developed by Chiou and Yang (2006), to examine the likelihood that students will identify with a particular teaching model over other competing models. In this research we examined the effects of 2 kinds of teaching styles on students' learning styles during the collaborative teaching of technical courses. Undergraduates in a 1-semester course (229 women, 264 men; M age = 20.8 years, SD = 1.5) were given pretests and posttests to investigate how their learning styles related to their teachers' learning styles. The findings showed that the learning styles of students were associated with their role models, which reinforced Chiou and Yang's previous work with undergraduates in different subject areas. After a semester, the learning styles of students became congruent with those of their role models. Implications and limitations of the study are discussed.

Keywords: students, learning styles, modeling advantage, role model, technical education.

According to social learning theory (Bandura, 1977, 1986), human behavior is transmitted largely through exposure to role models, that is, modeling phenomena. Teachers identified by students as models in an educational context may play a particularly important role in students' learning processes (Lashley & Barron, 2006). Teaching in Taiwan's technological and vocational hospitality education system has been conducted by means of collaborative teaching in

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technical courses to raise the level of expertise in students' practical skills. To this end these technical courses are usually taught simultaneously by both professionals (technical teachers) and academic instructors (lecturing teachers). Technical teachers focus mainly on demonstrating practical skills, whereas lecturing teachers focus mainly on illustrating the principles and theories underlying those skills.

Assessing which teaching model has the greater impact on students' learning styles when two role models are juxtaposed would throw light on the influences of teachers on students in the collaborative teaching of technical courses. It would be valuable to conduct further investigation on the effects of teachers' learning styles on students' learning styles because these have been found to be closely related to academic engagement and achievement (e.g., Al-Balhan, 2008; Cassidy & Eachus, 2000; Egel, 2009). Chiou and Yang (2006) used a concept they called *modeling advantage* to examine the relative influences of different types of teacher modeling on students' learning. Modeling advantage refers to *the likelihood of students identifying with a particular teaching model over other competing models in a particular course*, and was employed by Chiou and Yang to investigate the different styles of modeling used by technical teachers and lecturing teachers in collaborative teaching. Their findings showed that students perceived a greater modeling advantage for the technical teachers than for the lecturing teachers. However, Chiou and Yang employed a self-developed model to depict participants' learning styles. In this study, we adopted Kolb's (1984) learning styles framework, which has been used more widely in the field instead of the self-developed model used by Chiou and Yang. We also used the Revised Learning Styles Inventory II (Kolb, 1985) to assess students' learning styles because its psychometric properties are better than those of the scale developed by Chiou and Yang. More importantly, the consistency scores that address the differences in learning styles between students and their role identification serve as a more direct measure than does the correlation analysis conducted by Chiou and Yang.

To expand the external validity of findings gained in previous studies, we recruited hospitality undergraduates whose majors were different from those in the study by Chiou and Yang, who were students in culinary arts, baking technology, and management. We believed that the modifications we made for this study would afford a more precise picture of how hospitality undergraduates' learning styles would be influenced by the competing role models in collaborative teaching.

METHOD

PARTICIPANTS AND PROCEDURE

The participants for this study were 493 hospitality undergraduates (229 women, 264 men; aged between 19 and 25 years, M age = 20.8 years, SD = 1.5) who were taking technical courses taught by a collaborative method (number of classes = 12). The population was stratified into three demographic areas: Northern, Central, and Southern Taiwan. Through purposeful sampling, participants were recruited in collaboration with the teachers ($n = 24$) who were engaged in the collaborative teaching of technical courses at vocational and technological colleges. Participants' consent was obtained before data collection. This survey was approved by the Institutional Review Board of National Kaohsiung Hospitality College.

Students who were participating in the study completed the first survey (the pretest) at the beginning of their second semester in college. Their perceptions of the modeling advantages of technical and lecturing teachers and the students' learning styles were measured in this survey. At the same time the learning styles of the two kinds of teachers were also assessed to obtain the data necessary to compute consistency scores between the students and teachers. At the end of the semester, the students completed a second survey (the posttest) to obtain data in order to examine whether or not the students' perception of the modeling advantages of their teachers and the impact of role models on their learning styles were stable.

MODELING ADVANTAGE

The Modeling Advantage of Models in Collaborative Teaching Scale, developed by Chiou and Yang (2006), was used to measure students' perceptions of the modeling advantages of the two kinds of teachers in the collaborative teaching setting. The full scale consists of two subscales with one of these used to assess students' perceptions of the modeling advantage of technical teachers (eight items; e.g., "To be able to perform like technical teachers is my ultimate goal in this class"), and the second subscale is used to measure their perceptions of the modeling advantage of lecturing teachers (eight items; e.g., "I really appreciate the academic knowledge of lecturing teachers"). Participants respond to 16 items on a 7-point scale with anchors of 1 = *totally disagree* to 7 = *totally agree*. Chiou and Yang (2006) used the confirmatory factor analysis with structural equation modeling to examine the construct validity of the scale and adopted a contrasted-group method to test the criterion-related validity (see Chiou & Yang, 2006, for more details). For the present data, the alpha coefficient for internal consistency was .87 for the technical teachers' subscale and .89 for the lecturing teachers' subscale, respectively.

As in the study by Chiou and Yang (2006), participants in our study perceived distinct modeling advantages for technical and lecturing teachers, and this enabled us to examine the effects of role models on students' learning styles. Participants whose scores for the technical-teacher subscale were higher than their scores for the lecturing-teacher subscale by at least half of the standard deviation of difference scores were classified into the *Technical Teachers as Role Models* group ($n = 186$, 89 women, 97 men; M age = 20.5 years, $SD = 1.4$), whereas participants whose scores for the lecturing-teacher subscale were higher were placed in the *Lecturing Teachers as Role Models* group ($n = 86$, 42 women, 44 men; M age = 20.4 years, $SD = 1.6$). One major reason underlying this classification was to maximize the variance and minimize the classification errors.

LEARNING STYLES

With regard to the collaborative teaching of technical courses, Chiou and Yang (2006) proposed that the technical teachers, who are responsible for demonstrating practical skills, would produce modeling influences on those with an experience-driven learning style, whereas the lecturing teachers, who are responsible for illustrating principles and theories, would produce modeling influences on those with a theory-driven learning style. A theoretical analysis of the experience-driven and theory-driven modes suggested to us that there was some similarity with the four concepts of Kolb's learning-style framework (1984, 1985): active experimentation (AE) depends on experimenting with changing situations and finding a practical approach; abstract conceptualization (AC) involves using logic and ideas to understand problems or situations; concrete experience (CE) emphasizes involvement with people in everyday situations; reflective observation (RO) indicates that an individual understands different points of view and relies on his or her own thoughts and feelings in forming opinions. Following our rationale, the experience-driven mode should be congruent with CE and AE learning styles, whereas the theory-driven mode should be congruent with AC and RO learning styles.

We used the Revised Learning Styles Inventory II (LSI II-R; Knight, Elfenbein, & Martin, 1997), a revised version of the LSI II (Kolb, 1985), because it has been shown that the psychometric properties of the revised scale were sufficiently enhanced (e.g., Hauer, Straub, & Wolf, 2005; Veres, Sim, & Locklear, 1991). Participants were presented with 12 sentence stems followed by four phrases for each item and asked to rank them in ascending order (from 1 to 4) according to which phrase best described their learning style. The sentence endings were randomized so that the four learning styles (AE, AC, CE, and RO) were not presented in the same order for each item. The higher the score the better the description of the respondent's learning style. Response scores were then placed

into one of four equations. A total for each equation was then derived, which equated to the mean score (ranging from 1 to 12) of a numerical value for each of the four learning modes. According to Kolb's learning style framework (1984, 1985), the technical teachers would be more closely related to students' CE and AE modes, whereas the lecturing teachers would be more closely related to students' AC and RO modes. Hence, we then added the value obtained for CE to the value obtained for AE and this yielded one combination score ranging from 2 to 24. We added the value derived for AC to the value derived from RO to yield the other combination score ranging from 2 to 24. In our sample, the alpha coefficients for internal consistency were found to be .87 for the CE scale, .83 for the AE scale, .85 for the AC scale, and .84 for the RO scale, respectively.

RESULTS

STUDENTS' ROLE MODELS AND LEARNING STYLES

With respect to whether the learning styles of the students would be influenced by their role models, only the participants who showed significant differences in modeling advantage scores between the two kinds of teachers were included in testing ($n = 186$ for the technical teachers as role models group and $n = 86$ for the lecturing teachers as role models group). Those participants ($n = 221$) who did not show distinct differences in modeling advantage scores between the two kinds of teachers were excluded from subsequent analyses.

TABLE 1
MEANS AND STANDARD DEVIATIONS OF STUDENTS' COMBINATION SCORES FOR
KOLB'S LEARNING STYLES BY THEIR ROLE MODELS

Learning styles	Role Model Group			
	Technical teachers ($n = 186$)		Lecturing teachers ($n = 86$)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pretest				
CE-AE	15.12	3.94	9.57	3.48
AC-RO	10.87	3.90	16.44	3.47
Posttest				
CE-AE	16.19	4.49	8.60	4.81
AC-RO	9.83	4.50	17.40	4.82

Note: CE = concrete experience; AE = active experimentation; AC = abstract conceptualization; RO = Reflective Observation.

The selected participants' combination scores for Kolb's learning styles data at pretest and posttest (see Table 1) were then submitted to the conditions of a 2 (learning styles: the concrete experience-active experimentation mode vs. the abstract conceptualization-reflective observation mode) \times 2 (role models group:

the technical teachers vs. the lecturing teachers) mixed-factorial model, treating learning styles as a within-subjects factor and the role models as a between-subjects factor. In the pretest data, a significant interaction of learning styles and role models was found, $F(1, 270) = 127.08, p < .001, \eta^2 = .32$. Follow-up testing showed that those participants who identified the technical teachers as role models scored higher in the combination score for the CE-AE mode ($M_{\text{Pretest}} = 15.12$) than in the score for the AC-RO mode ($M_{\text{Pretest}} = 10.87$), $t(185) = 7.40, p < .001$, Cohen's $d = .54$. In contrast, those participants who identified the lecturing teachers as role models scored higher in the combination score for the AC-RO mode ($M_{\text{Pretest}} = 16.44$) than in the score for the CE-AE mode ($M_{\text{Pretest}} = 9.57$), $t(85) = 9.18, p < .001$, Cohen's $d = .99$.

In terms of the posttest data, we also found a significant interaction of learning styles and role models, $F(1, 270) = 159.48, p < .001, \eta^2 = .37$. Follow-up testing showed that participants who identified the technical teachers as role models scored higher in the CE-AE mode ($M_{\text{Posttest}} = 16.19$) than in the AC-RO mode ($M_{\text{Posttest}} = 9.83$), $t(185) = 9.64, p < .001$, Cohen's $d = .71$. On the contrary, participants who identified the lecturing teachers as role models scored higher in the AC-RO mode ($M_{\text{Posttest}} = 18.64$) than in the CE-AE mode ($M_{\text{Posttest}} = 12.28$), $t(85) = 8.46, p < .001$, Cohen's $d = .91$.

CONSISTENCY IN LEARNING STYLES BETWEEN STUDENTS AND ROLE MODELS

When we examined the consistency of learning styles between students and teachers, only the students who showed significant differences in modeling advantage between the two kinds of teachers at pretest were used for analysis (272 participants perceived either the technical teachers or the lecturing teachers as their role models). The dependent measure was the consistency scores (the absolute value) that were computed among the scores of the four learning style modes of the teachers at pretest and the students' ratings of those learning style modes at posttest. Lower scores represent a lower degree of discrepancy (and greater consistency). The consistency data were submitted to the conditions of a 2 (consistency with role models) \times 2 (role models group) mixed analysis of variance (ANOVA), treating learning style consistency as a within-subjects factor and the role models as a between-subjects factor.

ANOVA revealed a significant two-way interaction, $F(1, 270) = 119.57, p < .001, \eta^2 = .31$. Follow-up testing revealed that the technical teachers as role models group showed greater consistency in their learning styles with the technical teachers ($M = 8.60, SD = 6.22$) than with the lecturing teachers ($M = 15.52, SD = 8.19$), $t(185) = -8.12, p < .001$, Cohen's $d = .59$. In contrast, the lecturing teachers as role models group displayed greater consistency with the lecturing teachers ($M = 8.93, SD = 7.44$) than with the technical teachers ($M = 18.35, SD = 8.58$), $t(85) = -7.88, p < .001$, Cohen's $d = .85$.

DISCUSSION

In this longitudinal research we reinforced the findings of the previous work by Chiou and Yang (2006). Our findings indicate that the participants who identified technical teachers as their role models displayed a greater tendency toward the concrete experience and active experimentation modes, whereas those who identified lecturing teachers as their role models exhibited a greater tendency toward the abstract conceptualization and reflective observation modes. These findings echo Marshall's (1991) argument that those teachers identified by students as role models affect students' learning styles. In terms of consistency in learning styles between students and their role models in a collaborative teaching situation, our results show that consistency was greater when the teachers were identified as role models than when they were not identified as role models. Findings in our research are in accordance with an international and cross-cultural study in which it was found that hospitality and tourism students typically prefer learning styles that are concrete rather than abstract, and active rather than reflective (Lashley & Barron, 2006).

It should be noted that this study had some limitations. The participants in this research were Taiwanese undergraduates from technological and vocational colleges, and this study was conducted in a unique cultural context; thus, the generalization of its findings to other academic contexts and disciplines should be treated with caution, and its generalizability needs to be further explored. In terms of future directions, the gender of the teacher may also shape interactions between teachers and students (Carrington et al., 2007). It would be interesting to examine whether or not the differential model effects of competing models are contingent on teachers and students being the same gender. Moreover, from the perspective of personal identity development (Bromnick & Swallow, 1999), the relationship between undergraduates' perceptions of their self-identity and of their role models is worthy of investigation.

In sum, the results of our study indicate that when two kinds of teachers work in collaboration teaching technical courses for hospitality undergraduates they serve as role models. Hospitality undergraduates' learning styles appeared to be consistent with those of their role models. Educators and administrators in higher education should pay more attention to the differential modeling effects of teacher role models in courses with collaborative teaching. Results from our study indicate that hospitality students' learning styles were more likely to be affected by technical teachers and, therefore, the students tended toward the concrete experience and active experimentation modes. To help students achieve the requirements necessary for graduating in the course, which consist of both understanding theories and demonstrating practical skills, educators need to understand the role of modeling advantage in the development of those students'

learning style preferences. In particular, teachers need to adapt their teaching style to accommodate hospitality students' tendency to avoid or ignore the learning styles of theorizing or reflection (Lashley, 1999), and should, therefore, take into consideration differential modeling of competing models when using Kolb's experiential learning cycle to encourage the development of balanced learning.

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