

中華民國空中教育學會  
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# Relationship between Open University Teachers' Instructional Strategy and In-Service Students' Learning Outcome: A Case Study of Open University of Kaohsiung

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## Abstract

This study treated the in-service students of the Open University of Kaohsiung as subjects, explored their views of teachers' instructional strategies, such as lectures, group discussions, and online instructions, and probed into the impact on the enhancement of learning outcomes, such as learning satisfaction, knowledge, behavioral application, and job performance. A questionnaire survey (including paper and online survey) was conducted, and 350 questionnaires were distributed. The valid return rate was 85%. The data were analyzed by statistical analyses, such as descriptive statistics, t test, one-way ANOVA, and product-moment correlation. According to the findings, the in-service students of the Open University of Kaohsiung perceive significant and above average correlation between teachers' instructional strategy and enhancement of learning outcomes. The effects of the increase of learning satisfaction and knowledge are the highest, while the impacts of behavioral application and job performance are medium.

**Keywords:** open university, adult education, in-service study, instructional strategy, learning outcome.

# 1 Introduction

In order to accomplish instructional objectives, teachers of adult education must recognize adult students' learning characteristics, plan effective course contents, instructional methods, learning guidance, and learning evaluation, thus, assisting the learners to fulfill their learning goals. Knowles (1990) proposed 7 steps of andragogy for adults' effective learning, including construction of positive learning atmosphere, creation of mutual planning (teachers and learners collectively plan training content and practice), diagnosis of learning demands, the establishment of the objectives of projects, setting a learning experience model (decision regarding method of learning or instruction), instruction of learning activities by appropriate techniques, teaching materials, evaluation of learning outcomes, and recognition of new learning demands.

When planning learning activities, adult education teachers should consider the following key points. First, based on learners, develop learners' learning demands and responsibilities and encourage adults to establish self-oriented learning habits. Secondly, effective learning should be based on adults' life experience and development of tasks. The motivation and effect are more significant. Thirdly, in order to create effective learning, learners must participate in activity design, including the setting of goals, recognition of demands, learning method design, etc. Fourthly, teachers should play the role of learning partners, provide learning situations, and support adult learning. Finally, since andragogy model is a dynamic process model, 7 principles take places by turn. For instance, the construction of a positive learning atmosphere is not simply the first step,

but should be constantly reinforced in the instructional process, and the remaining principles are no exception (Hu, 1998; Wei, 2013).

Learning outcome is also called learning effect. This study focuses on adult students' learning outcome; hence, learning outcome in this study refers to adult students' participation in the various learning activities of courses in adult education institutions in order to accomplish the expected learning objectives. Performance of learning outcome must be based on the evaluation of the learning process and results. The effect of in-service adult students' participation in course learning can be assessed by their satisfaction with the learning items, such as teachers, instructional materials, course, instruction, equipment, and administrative services offered in adult education institutions during the learning process. Secondly, it depends on the improvement of knowledge, skills, values, attitude, and affection acquired. Thirdly, after class, it should continue tracing the improvement of the occupational competence performance of the practice of acquisition; finally, it should determine if the occupational competence improvement of the practice of acquisition reinforces the overall performance of individuals, departments, and organizations.

Hence, this study treats in-service adult students who participate in adult education activities in the Open University of Kaohsiung as samples to recognize the general practices of the teachers' instructional strategy, determine whether their learning objectives and demands are satisfied, whether they enhance their knowledge and competence, whether they can apply what they have learned to their workplace,

and whether they successfully strengthen their workplace performance. The abovementioned issues are the motivation of this study.

According to previous research and motivation, this study elaborates the purposes, as below:

- 1.1.1 To recognize the current situation of Open University teachers' instructional strategies and in-service students' learning outcome.
- 1.1.2 To construct a questionnaire on Open University teachers' instructional strategies and in-service students' learning outcome.
- 1.1.3 To analyze the effects of Open University teachers' instructional strategies on in-service students' learning outcome.
- 1.1.4 According to research findings, this study offers conclusions and proposes suggestions for the Open University to practice appropriate instructional strategies on in-service students in order to effectively enhance their learning outcome.

## **2 Literature review of adult instructional strategies and learning outcomes**

### **2.1 Literature review on adult instructional strategy**

Peterson (1983) stated that aged people prefer learning by discussing with peers and group learning; Owens, Nolan, and Mckinnon (1992) classified learning preference into personal learning preference, collaborative learning preference, and competitive learning preference (Sun, Wei, and Li, 2013). In addition, Peterson (1983), Spigner-Littles and Anderson (1999), and Sun, Wei, and Li et al. (2013) argued that adult education teachers should encourage adult learners to participate in learning and teaching with lectures and discussion, and create a supportive learning atmosphere without stress.

From the perspective of adult learners' reinforcement of work competence, Tsai and Hsu (2004) and Chen (2013) suggested that adult learners' learning fields include workplace learning of an enterprise or industrial work sites; competence-oriented adult learning; educational training provided by educational training organizations; application-oriented technical training or professional learning; recurrent education by school system; formal subject oriented adult learning and social (community) learning in living community; informal and liberal community consciousness; and social action adult learning.

In the trend of online learning, Lu and Lu (2005) stated that the design of the instructional strategy of the Open University adult education institution, which practices adult online instruction in Taiwan, can be, as follows: 1) online instruction can provide digital online instruction and discussions to enrich the instructional environment; 2) provide digital platforms to cooperate with off-campus institutions, promote lifelong education and digital learning platforms through industrial-academic cooperation; 3) introduce digital instructional materials on the platform to enhance interactions between learners and teachers; 4) online learning can construct learning process systems to result in personal learning files; 5) online learning networks can integrate administrative and teaching organizational systems, combine school administration and teaching resource, and enhance the efficiency of instructional and administrative organizations.

Based on previous related studies on adult instructional strategies, this study focuses on the three dimensions of adult instructional strategies; lectures, group discussions, and online instructions, including 15 items, as follows:

- A. Lectures: A-1. Brilliant and dynamic lecture content; A-2. Instructional content is enhanced by supportive teaching materials; A-3. Learning attention is strengthened by body language; A-4. Specific themes of teaching materials in the lecture; A-5. Frequent two-way interaction and communication with students.
- B. Group discussion: B-1. Group discussions of instructional topics; B-2. Assignments should be accomplished by work division of group; B-3. Different group projects



- who present acquisition of learning; B-4. The groups are scored according to learning outcomes; B-5. Public praise of group members with excellent performance.
- C. Online instruction: C-1. Students are assigned to watch online digital instructional materials and present acquisition of learning; C-2. Students are assigned to participate in online topic discussions; C-3. Students are assigned to participate in online tests; C-4. Students are regulated to submit their assignments on line; C-5. Students are evaluated by total learning performance of online instructional materials.

## 2.2 Literature review on adult learning outcome

Goldstein (1993) stated that the evaluation of training outcome means to collect information related to training by systematic measures, which are used as reference to select, adopt, evaluate, and modify training. Jedrzejewski (1995) further elaborated that training effect refers to the following: 1) evaluation of training outcome to determine if the goal of the training project is accomplished; 2) executive process of training projects and final outcomes are the focuses of evaluation; 3) to determine if the training project fulfilled the established goal; 4) to evaluate the advantages and disadvantages of a training project; 5) to recognize the projects with the most profit and those with the least profit in the training process; 6) to determine if the training project enhances participants' personal work performance and overall performance of organization; 7) to determine if the training project is appropriate to accomplish the established goal; 8) to judge if the training project is valuable.

According to different training phases, evaluations can be generally classified into in-training evaluation and after-training evaluation. The former is also called process evaluation or formative evaluation, such as “Does the training course respond to the demand?”, “Are the training hours and time appropriate?”, “What is the participants’ reaction?” and “Do participants obtain some specific knowledge?”; the latter is also called comprehensive evaluation, such as “Do participants obtain all knowledge?”, “How much knowledge can be applied to work”, “Does participants’ behavioral change meet the training goal?”, “cost benefit of training result”, etc. (Lee, 2010; Sun and Lee, 2007).

This study adopts the Talent Quality Management System (TTQS), which is implemented by the Workforce Development Agency of Taiwan and based on five processes, Plan, Design, Do, Review, and Outcome, as well as 19 indicators of talent development quality management of enterprises and training institutions. This study treats “17a Reaction”, “17b Learning”, “17c Behavior”, and “17d Result”, which are of the 17<sup>th</sup> indicator of Outcome as the framework and the items of the learning outcome scale (Hsieh, 2012; Kao, 2014; Lin and Chiu, 2010; Wang, 2011; Workforce Development Agency, Ministry of Labor, 2016).

The outcome of TTQS is based on Kirkpatrick (1994), who classified evaluation of training outcome into four levels of an evaluation model of learning outcome: 1) reaction levels; it generalizes a satisfaction survey analysis as the reference to modify the next course. 2) learning levels; to test, practice report, or other specific learning goals, where the results and problems are generalized in final report as reference to modify the next

course; 3) behavior levels; assists with learners to practice after-school action program evaluation, and show related records and specific outcomes; 4) results levels; assists with learners to determine if training outcome meets the requirements of an organization or workplace, and shows related records and specific learning outcomes (Kao, 2016; Workforce Development Agency, Ministry of Labor, 2016).

Dale, A., Jackson, N. & Hill, N. (2005), Centeno, M. & Corrêa, M. V. (2008), Kushnir, et al. (2008), Chien (2012), Wang (2013), Chiang (2013), and Kao(2017) adopted Kirkpatrick's four-level model to construct a learning outcome model or serve as the factors of study in order to explore various social variables (such as gender, age, educational background, type of occupation, position, organizational history, and organizational scale) and operational variables of education and training, in order to explore and analyze the relationships and effects of learning outcome.

Based on previous related research on the variables of adult students' learning outcome, this study adopts four dimensions: learning satisfaction, reinforcement of knowledge and competence, practice of acquisition, and performance, as well as 20 learning outcome items, as follows:

A. Learning satisfaction: A-1. I am satisfied with teachers' instruction; A-2. I am satisfied with the content of instructional materials; A-3. I am satisfied with service of administrators; A-4. I am satisfied with the instructional equipment; A-5. I am satisfied with the school rules and operations.

- B. Reinforcement of knowledge and competence: B-1. I obtained professional knowledge of different subjects; B-2. I obtained professional skills of different subjects; B-3. I reinforced my enthusiasm for work and dedication spirit; B-4. I reinforced my confidence at work; B-5. I strengthened my adaptation to work.
- C. Practice of acquisition: C-1. I apply the professional knowledge I obtained at work; C-2. I can apply the professional skills obtained at work; C-3. I can totally be devoted to work; C-4. I can demonstrate knowledge and competence obtained in the workplace; C-5. I can apply knowledge and competence obtained to change my work situation.
- D. Performance: D-1. My work performance is enhanced; D-2. My salary and welfare is increased; D-3. My position is upgraded; D-4. The performance of my department is enhanced; D-5. Total return on investment of the organization (sector) is enhanced.

### **3 Research Methodology**

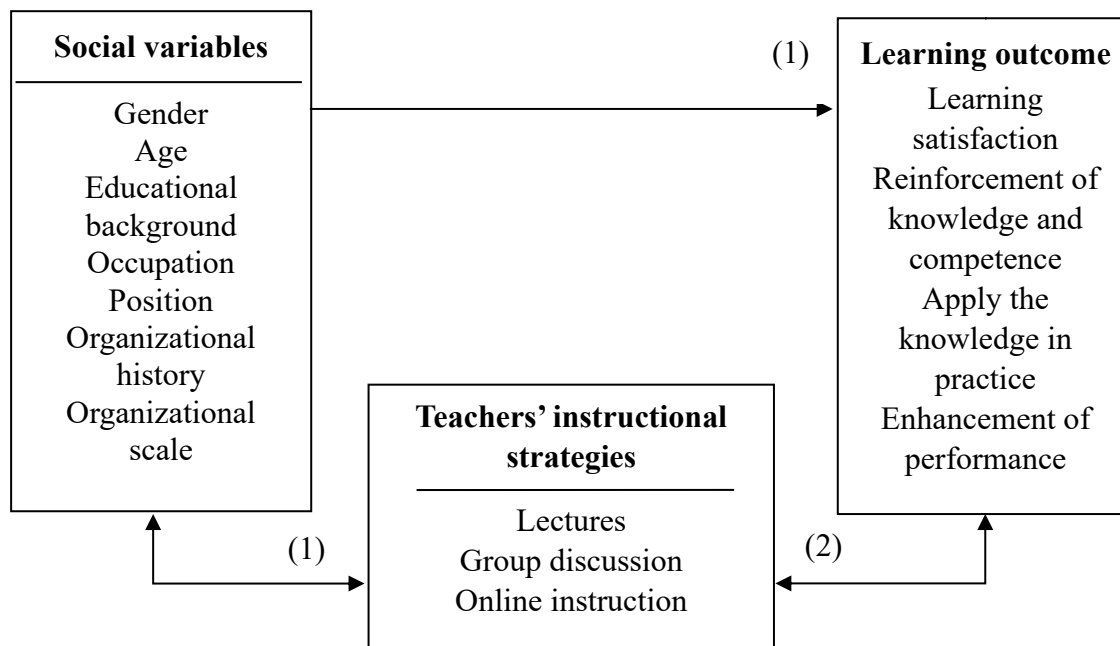
#### **3.1 Procedure**

First, by literature review and analysis, this study probes into Open University teachers' instructional strategies and students' learning outcome contents to construct a "questionnaire on the general situation of Open University teachers' instructional strategies and students' learning outcomes". Subsequently, this study treats the current in-service adult students who studied in formal and informal courses at the Open University of Kaohsiung as subjects to conduct a questionnaire pretest in order to

establish the reliability and validity of the questionnaire. This study establishes a formal questionnaire and conducts a formal questionnaire survey.

In addition, after the questionnaire survey, this study implements statistical analysis on the retrieved data of the questionnaire, and by descriptive statistics and inferential statistics, it recognizes the subjects' general views of teachers' instructional strategies and learning outcomes during participation in the learning activities. It also explores the cognitive differences of in-service adult students with different social variables on Open University teachers' instructional strategy and learning outcomes, as well as the correlation between the two. Finally, it generalizes the conclusions and proposes appropriate and feasible instructional strategies for the Open University in order to effectively enhance in-service adult students' learning outcomes.

The framework of the statistical analysis of this study is shown in Figure 1. Gender, age, educational background, occupation, position, organizational history, and organizational scale of in-service adult students in Open University are the social variables; while lectures, group discussions, and online instructions of teachers' instructional strategies are independent variables; finally, cognition of learning outcome, such as learning satisfaction, reinforcement of knowledge and competence, practice of acquisition, and enhancement of performance are independent variables. By empirical study through a questionnaire survey and inferential statistical analysis, this study explores the relationships among the variables.



*Fig. 1.* Research framework and statistical analysis: (1) by t test and one-way ANOVA, this study explores the cognitive differences of in-service adult students with different social backgrounds on Open University teachers' instructional strategy and their own learning outcome. (2) By Pearson product-moment correlation analysis, this study explores the correlation between Open University teachers' instructional strategy and in-service adult students' learning outcome.

## 3.2 Instruments

The research tool is a "questionnaire on the general situation of Open University teachers' instructional strategies and students' learning outcomes". By the analytical results of expert validity, this study offers two scales in the questionnaire draft, including 7 dimensions and 35 items. Among the items, some terms are revised and some items are

combined to result in the said questionnaire content. This study distributed 140 pretest questionnaires and retrieved 124 valid questionnaires. Content was explored by CFA and Cronbach's  $\alpha$  analysis, and the results are shown, as follows:

### 3.2.1 Scale of instructional strategy

The CFA report by LISREL shows the degree of freedom and chi-square statistics of the overall model. Degree of freedom is 2043, chi-square value is 11171.83, and P value is 0.001, which shows significant difference between the hypothesis model and the observation values. Other fit measures, NFI, NNFI, and CFI, are higher than 0.95, which means the structures of the items and dimensions are positive. In addition, according to analytical result of Cronbach's  $\alpha$ , all dimensions are higher than 0.88 and all items are higher than 0.83, which means that the internal consistency of the dimensions is high. Factor loading and Cronbach's  $\alpha$  of the items of the dimensions are shown, as follows:

- A. Regarding the factor loadings of the items of “lectures”, Items 01 to 05 are 0.64, 0.65, 0.68, 0.70, and 0.72, respectively. Cronbach's  $\alpha$  of the overall dimensions is 0.87. Correlation between the items and total item of dimension are higher than 0.86.
- B. Regarding the factor loadings of the items of “group discussion”, Items 06 to 10 are 0.60, 0.62, 0.64, 0.66, and 0.67, respectively. Cronbach's  $\alpha$  of the overall dimension is 0.84. Correlation between the items and total item of dimension are higher than 0.83.

C. Regarding the factor loading of “online instruction”, Items 11 to 15 are 0.63, 0.64, 0.67, 0.68, and 0.70, respectively. Cronbach's  $\alpha$  of the overall dimension is 0.86. Correlation between the items and total item of the dimension are higher than 0.84.

### **3.2.2 Scale of learning outcome**

This study conducts CFA analysis by LISREL. In the result obtained, since there are many items in the scale, it cannot show the relationship path diagram. Nevertheless, the analysis lists the degree of freedom and chi-square statistics of the overall model. Degree of freedom is 2043, chi-square value is 11171.83, and P value is 0.001, which shows significant difference between the hypothesis model and the observation value. Other fit measures NFI, NNFI, and CFI, are higher than 0., which means the structures of all items and dimensions are positive. Furthermore, the dimensions of the analytical result of Cronbach's  $\alpha$  are higher than 0.87, and items are higher than 0.80, which shows that the internal consistency of the dimensions is relatively high. Factor loading and Cronbach's  $\alpha$  of items of dimensions are shown, as follows:

A. Regarding the factor loadings of the items of “learning satisfaction”, Items 01 to 05 are 0.62, 0.63, 0.60, 0.64, and 0.61, respectively. Cronbach's  $\alpha$  of the overall dimension is 0.85. Correlation of the items and total item of dimension are higher than 0.82.

B. Regarding the factor loadings of the items of “reinforcement of knowledge and competence”, Items 06 to 10 are 0.63, 0.62, 0.65, 0.66, and 0.68, respectively.



Cronbach's  $\alpha$  of the overall dimension is 0.86. Correlation between the items and total item of dimension are higher than 0.83.

C. Regarding the factor loadings of the items of “apply knowledge into practice”, Items 11 to 15 are 0.58, 0.59, 0.60, 0.62, and 0.63, respectively. Cronbach's  $\alpha$  of the total dimension is 0.83. Correlation between the items and total item of dimension are higher than 0.82.

D. Regarding the factor loadings of the items of “performance”, Items 16 to 20 are 0.53, 0.55, 0.52, 0.56, and 0.54, respectively. Cronbach's  $\alpha$  of the overall dimension is 0.82. Correlation between the items and total item of dimension are higher than 0.80.

## 4 Research Results

By cluster random sampling, this study conducts a questionnaire survey on 800 in-service adult students of a general education course and a course in the technology management department of the Open University of Kaohsiung, and retrieves 674 valid samples. After retrieving the questionnaires, this study conducts statistical analysis, such as descriptive statistics, average mean, standard deviation, t test, one-way ANOVA, and product-moment correlation. The research findings are shown, as follows.

## 4.1 Descriptive statistics result

Among the valid samples of gender, there are 352 males (52.2% of the total subjects); there are 322 females (47.8% of the total subjects). The percentage of males is higher than females.

Regarding the distribution of age, the subjects are mostly aged 21~40, there are 363 people, and the percentage is 53.9% among all subjects; second is those aged 41~60, there are 278 people, and the percentage is 41.2%. The remaining are aged above 61 and the percentage is 4.9%.

Regarding the distribution of educational background, the subjects are mostly graduated from senior high schools and vocational schools. There are 376 subjects and the percentage is 55.8%; second is those graduated from colleges and universities, there are 265 subjects and the percentage is 39.3%. The remaining are graduated from graduate schools and the percentage is 4.9%.

Regarding the distribution of occupation, most subjects are in industry, commerce, and service industries, there are 345 subjects, and the percentage is 51.2%; second is the information technology industry, there are 216 subjects and they are 32.0%; the following are production and manufacturing industries, and the percentage is 10.5%, public servants (including military, government employees, teachers and policemen) and the percentage is 4.5%, and agriculture, forestry, fishery, and husbandry and the percentage is 1.8%.

Regarding the distribution of position, most subjects are employees, there are 502 subjects, and the percentage is 74.5%; following are department supervisors, there are 86 subjects and the percentage is 12.8%; there are 86 unit managers and the percentage is 12.8%.

Regarding the distribution of organizational history, most of the organizations are founded for more than 21 years, there are 264 subjects, and the percentage is 39.2%; following is within 5 years (including 5 years), there are 176 subjects, and the percentage is 26.1%; in addition, there are 150 subjects in organizations with 11—20 years of history, and the percentage is 22.3%. There are 84 subjects in organizations with 6—10 years of history, and the percentage is 12.5%.

Regarding the distribution of organizational scale, most subjects are in organizations with less than 50 employees, there are 309 subjects, and the percentage is 45.8%; second is 226 subjects in organizations with more than 201 employees, and the percentage is 33.5%. The following are organizations with 101-200 employees and the percentage is 11.6%, and organizations with 51-100 employees and the percentage is 9.1%.

## **4.2 Current situation of instructional strategy and learning outcome**

Regarding the Open University in-service adult students' current cognition of teachers' instructional strategies and learning outcomes, the statistical analysis results of average mean and standard deviation in different dimensions are shown in Table 1 and

Table 2. According to Table 1, regarding in-service adult students' cognition of the dimensions of teachers' instructional strategies, the average means are higher than 4.40, which shows that in-service adult students reveal high cognition of teachers' instructional strategies; according to Table 2, the average means of in-service adult students' dimensions of learning outcomes are higher than 4.10, thus, in-service adult students show a high degree of learning outcomes.

Table 1.

*Average mean and standard deviation of in-service adult students' cognition of dimensions of teachers' instructional strategies*

instructional strategies	Average mean	Standard deviation	Number of items
Lectures	4.62	2.72	5
Group discussion	4.40	3.74	5
Online instruction	4.54	2.97	5
Overall dimension of instructional strategy	4.52	8.49	15

n=674

Table 2.

*Average mean and standard deviation of in-service adult students' cognition of dimensions of learning outcome*

instructional strategies	Average mean	Standard deviation	Number of items
Learning satisfaction	4.12	2.89	5
Reinforcement of knowledge and competence	4.22	2.65	5
Apply knowledge into practice	4.13	2.95	5
performance	4.10	3.01	5
Overall dimension of learning outcome	4.16	10.86	20

n=674

### 4.3 Comparative result of social variable difference

Regarding the difference analysis of gender, t testing compares the cognitive differences of male and female in-service adult students on teachers' instructional strategies and learning outcomes. According to the statistical results, different genders show significant cognitive difference on learning satisfaction (t value=-2.09, P value=0.040), reinforcement of knowledge and competence (t value=-2.44, P

value=0.030), practice of acquisition (t value=-2.67, P value=0.007), performance (t value=-2.92 and P value=0.004), and overall dimension of learning outcome (t value=2.62 and P value=0.009). Factor means show that females are higher than males. According to previous results, female in-service adult learners' cognition of performance of the competence of dimensions of learning outcome is significantly higher than male in-service adult learners.

Regarding difference analysis of age, one-way ANOVA compares the perceived differences of in-service adult students of different ages on teachers' instructional strategies and learning outcome. According to the statistical results, in-service adult students of different ages do not show significant difference on dimensions of instructional strategy or learning outcome.

Regarding difference analysis of educational background, one-way ANOVA compares the perceived differences of in-service adult students of different educational backgrounds on teachers' instructional strategies and learning outcome. According to the statistical results, they show significant difference on learning satisfaction (F value=4.78 and P value=0.009), performance (F value=4.46 and P value=0.012), and overall dimension of learning outcome (F value=3.66 and P value=0.026). Nevertheless, after multi-comparison of the Scheffe method, students with different educational levels do not show significant difference.

Regarding different analysis of occupation, one-way ANOVA compares the perceived differences of in-service adult students with different occupations on teachers'

instructional strategies and learning outcome. According to the statistical results, lectures (F value=2.72 and P value=0.028) show significant difference. Nevertheless, after multi-comparison of the Scheffe method, different occupations do not show significant difference.

Regarding difference analysis of position, by one-way ANOVA, this study compares the perceived differences of in-service adult students with different positions on teachers' instructional strategies and learning outcome. According to the statistical results, group discussion (F value=5.82 and P value=0.003) shows significant difference. After multi-comparison of the Scheffe method, this study shows that department supervisors are significantly higher than employees. Hence, in-service students who are department supervisors reveal significantly higher cognition and perception of the instructional strategy of group discussions than those who are employees. The reason is in that department supervisors should rely on discussions to recognize the direction, method, and plans of management, thus, they show higher perception and demand of instructional strategy in group discussions.

Regarding difference analysis of organizational history, one-way ANOVA compares the perceived differences of in-service adult students from different kinds of organizational history on teachers' instructional strategies and learning outcome. According to the statistical results, online instruction (F value=4.26 and P value=0.005) and overall instructional strategy (F value=2.82 and P value=0.038) show significant difference. After multi-comparison of the Scheffe method, in-service adult students from

organizations with organizational history of more than 21 years are significantly higher than those from organizations with organizational history of 11-20 years. It shows that, from organizations with longer organizational history, in-service adult students' perception and demand for online instructional strategies are higher. Secondly, in-service adult students from organizations with different organizational histories do not reveal significant difference on cognition of the overall instructional strategy.

Regarding difference analysis of the organizational scale, by one-way ANOVA, this study compares the perceived differences of in-service adult students from different organizational scales on teachers' instructional strategies and learning outcome. According to the statistical results, in-service adult students from different organizational scales do not show significant difference of perception on the dimensions of instructional strategy or learning outcome.

#### **4.4 Correlation analysis between instructional strategy and learning outcome**

By Pearson product-moment correlation analysis, this study explores the correlation and degree between Open University in-service adult students' cognition of teachers' instructional strategies and performance of dimensions of learning outcome. Product-moment correlation figures are shown in Table 3. According to the statistical results between in-service adult students' cognition of teachers' instructional strategies and dimensions and the overall dimension of learning outcome, it reveals medium and high degrees of positive correlation (correlation coefficients are higher than 0.66). It means



that when the effect of in-service adult students on teachers' instructional strategy is more significant, their learning outcome performance is higher.

Table 3.

*Correlation analysis between in-service adult students' cognition of instructional strategy and dimensions of learning outcome.*

	Lectures	Group discussion	Online instruction	Overall dimension of instructional strategy
Learning satisfaction	0.74***	0.77***	0.72***	0.70***
Reinforcement of knowledge and competence	0.81***	0.72***	0.80***	0.79***
Apply knowledge into practice	0.73***	0.75***	0.70***	0.77***
performance	0.76***	0.81***	0.74***	0.68***
Overall dimension of learning outcome	0.77***	0.76***	0.77***	0.80***

\*\*\*p< 0.001 n=674

## **5 Conclusion and Suggestions**

According to research findings, this study proposes research conclusions and offers suggestions, as follows:

### **5.1 Open University teachers can fulfill the function of lectures to enhance in-service students' learning outcome**

Based on the research findings, current in-service adult students of the Open University of Kaohsiung state that teachers' main instructional strategy is "lectures", followed by "online instruction" and "group discussion"; regarding cognition of learning outcome, "reinforcement of knowledge and competence" is the highest, followed by "practice of acquisition", "overall dimension of instructional strategy", and "performance". Hence, Open University teachers can fulfill the function of lectures, and apply them to manufacturing online courses and instructions for students' group discussion, in order to enhance students' comprehension of knowledge and application competence. It upgrades students' job performance in the workplace, and explains why there are various "well-known teachers" and "famous panelists" in society who influence different circles by their charisma in lectures. Hence, in the current trend, which encourages diverse and innovative instruction, "lectures" are still the base of all instructional methods. This function should be accomplished to enhance students' learning outcome and effectively accomplish teaching objectives.

## **5.2 Open University female in-service adult students' learning outcome is more significant**

According to the research findings, current female in-service adult students in the Open University of Kaohsiung show significantly higher perceptions of “learning satisfaction”, “reinforcement of knowledge and competence”, “practice of acquisition”, “performance”, and “overall dimension of learning outcome” than male in-service adult students. Gender psychology writer Tseng (2012) argued that “women are animals of hearing”. If this hypothesis is supported, it meets conclusion 5.1 of this study: lectures can enhance learning outcome and females’ hearing is seemingly superior to males’. Teachers’ lectures mean that students absorb the concept conveyed in the voice by hearing. Lectures can actually allow Open University in-service adult female students to enhance learning outcome. Therefore, for in-service students, Open University can recruit teachers with eloquence, superior expressive competence, and high professional practice experience to implement the lectures of courses and manufacturing of online courses, and guide group project study to upgrade male and female students’ learning outcomes.

## **5.3 Open University in-service adult students who are department supervisors have higher demand on group discussion instruction**

According to the research findings, the in-service adult students of the Open University of Kaohsiung who are currently department supervisors show higher perception and demand for teachers’ instructional strategy of group discussions. The main

reason is that department supervisors study in school to obtain problem-solving methods and strategies by studying practical projects upon the professional business of organizational supervisors. It is one of the main purposes of in-service adult students' study. Regarding in-service adult students' learning purposes and needs, as suggested by *The Book of Rites* and *Xueji*, "when one realizes that he is incompetent, he reflects on himself; when he encounters obstacles, he works harder". When they encounter difficulties at work, they should actively search for solutions in order to complete the tasks, particularly the supervisors in charge of departmental administration. In order to break through obstacles to execute tasks in the department and effectively upgrade job performance, they should study in Open University, and strengthen their professional knowledge and competence, in order to cope with problems at work. Hence, thematic courses and instructions can be personalized in order to meet the learning demand of supervisors of medium and high-ranking departments, and effectively assist students to accomplish the learning goals.

#### **5.4 Open University in-service adult students from organizations with longer history have higher demand for online instruction**

According to the research findings, the in-service adult students of the Open University of Kaohsiung from organizations with history of more than 21 years reveal higher cognition and demand for online instruction. The main reason is that, currently, Taiwan actively encourages different types and levels of enterprises to practice comprehensive information systematic operations, subsidizes small and

medium enterprises to construct websites, and assists them with the introduction of an information management system in the organization. In-service adult students from organizations with longer history study in Open University with online instruction as the main teaching strategy, thus, they considerably perceive the trend of current online learning. As their industrial organizations are experiencing comprehensive information systematic operation, they can upgrade computer competence and network applications, which can enhance the benefits of learning and application. Therefore, Open University can actively reinforce the content quality of online courses, and establish in-service online instruction courses to enhance employee competence for organizations with organizational history of more than 21 years, in order to fulfill the function of online instruction of Open University and upgrade occupational competence of employees from organizations with long history.

### **5.5 Open University teachers' implementation of instructional strategies can effectively enhance in-service adult students' learning outcome**

Based on the research findings, teachers' implementation of the instructional strategies of the Open University of Kaohsiung show medium and high levels of significant correlation with in-service adult students' learning outcome. According to Chang (2013), a correlation coefficient above 0.80 is high correlation. In this study, the correlation coefficients of "lectures" and "online instruction" with "reinforcement of knowledge and competence" are 0.81 and 0.80, respectively. The correlation coefficient of "group discussion" on "performance" is 0.81. The correlation coefficient between

“overall instructional strategy” and “overall learning outcome” is 0.80, which all refer to “high correlation”. Thus, the Open University can constantly enhance the practice of instructional strategies, such as “lectures”, “group discussion”, and “online instruction”, in order to effectively enhance in-service adult students’ learning outcomes, such as reinforcement of knowledge, competence, and performance. Secondly, regarding students’ learning outcomes, such as “learning satisfaction” and “practice of acquisition”, it can strengthen the related measures of instructional strategies, including reinforcement of the service quality of school administration, increases connections of the Open University with industrial circles, providing specific or virtual practice learning activities, and effective application of learning knowledge and competence in the workplace, in order to enhance in-service adult students’ learning outcome, satisfy their learning needs, and accomplish learning objectives.

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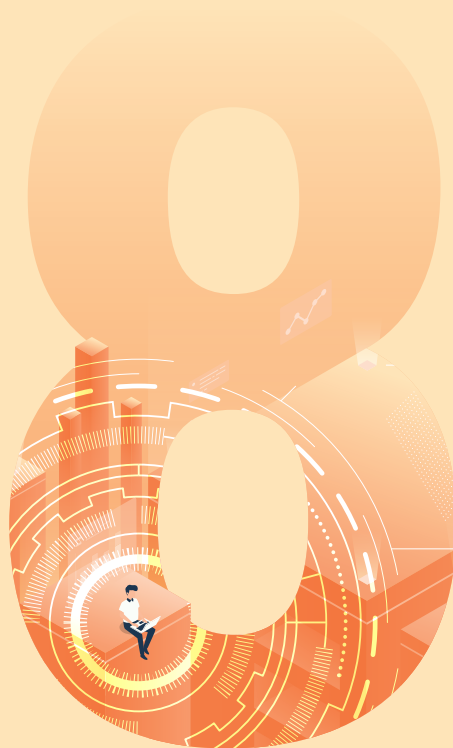
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