

# An Analysis of the Function and Training Strategies of Teaching Assistants at Technological and Vocational Colleges in Taiwan

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**Abstract.** The study is to investigate the role, the duties and efficacy of teaching assistants based on instructors' opinions from eighteen technological and vocational colleges in central Taiwan and further made suggestions for training strategies to improve efficacy. This research adopts Interview and questionnaires, 450 questionnaires distributed and 307 returned. The result shows that teachers think TAs should focus on experimental operation. Moreover, there is no difference between teachers' viewpoints from public and private schools. As for evaluation criteria, TAs should understand related regulations. In terms of training strategy, those with excellent professional grades are prioritized to be teaching assistants.

**Keywords:** Teaching assistants, training strategy, teaching quality.

## 1 Introduction

Scholars at America's Ministry of Education found that the relationship between teachers and students would influence learning cognition and effective learning (Frymier & Houser, 2000). Students regarded that their experiences were mainly retrieved from teachers' behaviors. Therefore, teachers have to pass on their knowledge to students (Roach, 1991). The function of TAs is communicators, exchangers and a bridge between teachers and students. In 2003, the Ministry of Education in Taiwan launched a Humanities Social Science Education Project, which introduced TA system from foreign universities. After four-year experimental research, the Ministry of Education found that under TAs' help, web-based multimedia, small group discussion, website construction, and cooperative instruction were adopted, which transformed the traditional boring general education courses into interesting interactive courses and the kind of learning with student-centered, TAs in the middle, and teachers as supporters.

TAs play an important role in improving teachers' instruction quality. What training policies should be implemented to make use of TAs' function? What evaluation systems are involved to maintain and increase TAs' working efficacy? These crucial issues are of great urgency but so far no researcher has investigated about this aspect.

The purpose of the present research is to investigate the viewpoints toward TAs' functions and roles perceived by teachers from technological and vocational colleges with TA system. Further suggestions are made for relevant schools to implement excellent TA policies to improve teaching qualities in technological and vocational colleges and help the implementation of teachers' instruction and remedial teaching.

Based on the above mentioned research purposes, the present study makes the following hypothesis.

1.1 There is significant difference with personal and background variables of TAs' function and efficacy with their preparation prior to instruction, during instruction, after instruction and remedial instruction.

1.2 There is significant difference toward training of TAs with personal and background variables.

1.3 There is significant difference toward the role and efficacy improvement of teaching quality with personal and background variables.

## **2 Literature Review**

### **2.1 The Role and Abilities of TAs**

TA (TA) refers to those who assist instructors with their teaching activities, and are responsible for instruction consultation, discussions, experiments, practices, correcting assignments and other related teaching-assisted works. DeCesare (2003) maintained that TAs aid instructors with satisfying students' learning. Butler et al. (1993) pointed out that TA policy was implemented in Northern America and graduate students tended to serve the role. The core value of this system is student-oriented and has been a learning guidance in advanced education in developed countries for many years.

TAs' abilities involve related abilities with their job duties, which consist of knowledge, technique, attitude, efficacy and value of successfully acting a specific role. British educator Jarvis (1990) mentioned that ability referred to knowledge and skills required by an individual for doing a professional job effectively. Based on Derouen and Kleiner (1994).TAs' main roles lie in assisting teachers with instructional procedures, after-class instruction, preparation prior to classes and good learning environment. Therefore, to be a competent TA, related abilities should be required to be able to accomplish work tasks efficiently.

### **2.2 Selection and Training of TAs**

Educational institutes should select TAs from appropriate graduate or university students based on their ability and specialty in an open way. It was important to investigate the roles TAs would play in advance and then, based on these roles, select competent applicants as TAs (Quoted from Wu, 2000). The present study adopted function analysis make sure of each job duties of TAs and then analyzed the required abilities for those job duties for selection.

Training is to elevate the knowledge, skills and attitudes required for implementing their job duties or to develop TAs' problem-solving abilities when dealing with related activities. Therefore, TAs have to take professional courses to develop their abilities with assisting teachers in instruction. Park (2004) found six key strategies when training TAs, and the main strategies include selection criteria, TA development training, monitoring challenge standardized guidance and international TAs. Among them, the issue of TA training has gained more and more emphasis (Park, 2004). University of Illinois offers diverse courses to train TAs to increase TA's instruction quality (Hsu, 2006).

### **2.3 Training Institutes for TAs' Evaluation Criteria and Efficacy Improvement**

The central organization for TAs is called center for teaching and learning, such as Derek Bok Center for Teaching and Learning in Harvard University. It provides professional skills, general education training, experience exchanges, sharing of how to solve problems and situation simulation (Chen, 2006). Each year before each semester begins, it not only hold workshops and situation simulation but release teaching guidebooks to help TAs understand students' needs or answering problems they encounter during their teaching.

Evaluation and assessment can be divided into— (1) establishment of course websites at Ceiba after new semester begins. The course websites will be assessed randomly. (2) including questionnaire item on implementation of TA system in midterm and final feedback questionnaire. The result of the questionnaire is for TAs' reference and it will also serve as an important criteria for the assessment and selection at the end of semester. (3) result report, final feedback questionnaire and implementation of course website, when each semester ends and field visits and evaluation on the effect of funded courses will be reference materials for funding future related courses (Chou, 2008; Tien, 2006).

## **3 Research Design and Implementation**

### **3.1 Research Participants**

The research samples were from eighteen technological and vocational colleges in central Taiwan. Questionnaires were distributed either by the researcher in person or through mail-delivery to each dean for implementing, distributing and collecting the data. Questionnaires were distributed through stratified sampling. Investigations were made with 3-6 teachers who had applied for TAs for more than one year at each department of 18 schools. Interview and questionnaire surveys were administered to college instructors. In total, 450 questionnaires were distributed and the overall returned questionnaires were 307 with a 68% return rate.

### **3.2 Research Tools**

The present study applied a self-arranged survey consisting teacher's basic information, TAs' functions and roles, TAs' abilities, training strategies and efficacy improvement. The above dimensions were graded with five-point Likert scale.

a. Questionnaire validity: In the beginning, the first draft of questionnaire was designed based on data collection. Then, eight teachers who had been voted as excellent teachers and twelve TA with at least one year experience were visited and their opinions served as reference for the questionnaire. When the first draft was constructed, it was evaluated by experts and suggestions were provided based on the suitability, content, and scoring of the questionnaire. After revision and modification, the questionnaire was sent via formal document to technological and vocational colleges in central Taiwan. Thirty teachers helped fill in the questionnaire for pre-test.

b. Factor analysis and reliability analysis: The present study adopted principal component analysis and varimax for factor analysis. KMO in the research data was 0.795~0.906 (higher than 0.5), thus it was suitable for factor analysis. Then, Cronbach's  $\alpha$  was adopted to measure questionnaire reliability and assess the consistency of questionnaire items. Items with more than 0.5 Cronbach  $\alpha$  were retained. The final analysis showed that the overall dimension was between 0.750~0.908, showing that the questionnaire had good reliability.

## **4 Results and Data Analysis**

### **4.1 Analysis of the Background Variables of Teachers from 18 Technological and Vocational Colleges**

Teachers are mostly males at 56.7% while females are at 43.3%. Teachers' teaching experiences are mostly between 6-15 years at 46.9% followed by less than 5 years at 26.4% and more than 36 years at 0.7%. It was shown that teachers' who applied for the assistance of TAs for teaching quality improvement were mostly of less than 15 years of teaching experience. Private schools took up the majority at 74.3% followed by public schools at 25.7%. In terms of teachers' colleges, business management account for the most at 32.9%, followed by technology engineering at 30.6%, medical and nursing at 12.7%, and law schools with the least at 1.6% and others include beauty, sports recreation, etc. at 8.5%. General administration and instruction account for TAs' duties with 28.3%, and followed by professional course consultation at 26.1%. Sources of funding were subsidized from school with 50.8 %, project funding with 40.4%, and others, endowment fund, with 8.8%. In terms of TAs' education background, graduates took up the most at 60.3%, followed by Bachelors at 26.1% and PhD students at 10.1%. It was found that master's students were the majority to be TAs, and this result corresponded to foreign literature.

### **4.2 Analysis of TAs' Roles and Duties**

The result indicated that teachers ranked during instruction assistance more, followed by prior to instruction preparation, and then after instruction duties as shown in table one. In before instruction aspect, understanding course content was the highest with mean 4.17, standard deviation 0.732 while calling the role and maintaining the class order before the class the lowest with mean 3.55 and standard deviation 0.932. In during instruction aspect, assisting students with practicum and experiment classes was the highest with mean 4.14 and standard deviation 0.809 while student order management and guidance was the lowest with mean 3.66 and standard deviation

0.865. In after instruction aspect, provide study consultation service was the highest with mean 4.07 and standard deviation 0.747 while assisting assessment of scores on final exam and weekly learning performances was the lowest with mean 3.66 and standard deviation 0.865.

With the above analysis and summaries of in-depth interview with experienced teachers, it was found that teachers from different academic fields put emphasis on different subject matters. Most teachers hoped that TAs could understand the course contents prior to instruction so that they can help students when they encounter questions during instruction and that they could guide each student well to improve teaching quality and learning effect (0307-2-B. The first two numbers stand for interview month, the third and fourth numbers stand for interview dates, the fifth number stands for interview section, and the sixth number stands for the interviewee code.) As Hung (2006) pointed out TAs provided backup supports in classes and timely illustration, explanation and supporting materials when necessary. By doing this, it not only transformed the traditional way of instruction when teachers were the only source of knowledge but also achieve an interactive learning mode with student-centered, TAs in the middle, and teachers as supplementary.

**Table 1.** Teachers' overall perception toward TAs

Roles and duties						Abilities					
	Rank	Minimum	Maximum	Mean	Standard Deviation		Rank	Minimum	Maximum	Mean	Standard Deviation
During instruction	1	1.86	5.00	3.9483	.57601	Interpersonal relationship	1	3.00	5.00	4.1788	.497
Prior to instruction	2	1.43	5.00	3.8934	.58299	Professional abilities	2	2.33	5.00	4.1455	.5391
After instruction	3	1.80	5.00	3.8472	.56013	Training strategies					
Efficacy improvement						Practicum	1	1.67	5.00	3.9083	.58995
Career planning	1	1.00	5.00	4.0912	.54114	Selection	2	1.60	5.00	3.9042	.52873
Evaluation criteria and inspiration	2	1.00	5.00	3.8371	.65743	Strategy	3	1.71	5.00	3.8478	.60800

### 4.3 Analysis of Abilities of TAs

In this dimension, general interpersonal ability is higher than professional ability as described in table one. In interpersonal ability aspect, problem-solving ability was the highest with mean 4.36 and standard deviation 0.613 while class management ability was the lowest with mean 4.03 and standard deviation 0.745. In professional ability aspect, professional knowledge ability in a specific field was the highest with mean 4.33 and standard deviation 0.645 while ability to construction and maintain digital learning platform was the highest with mean 4.05 and standard deviation 0.744.

The interview data showed that teachers put more emphasis on TAs' problem-solving and communication negotiation abilities. Most teachers maintained that professional expertise should be the prerequisite selection criteria for recruiting TAs and can be trained through development and training. However, good interpersonal relationship ability is a personal characteristic and can not be trained in a short term. Moreover, good communication and negotiation ability is also required to solve problems (0310-2-C).

#### **4.4 Analysis of Training Strategies of TAs**

In this dimension, practicum got the highest score, followed by selection and strategies as shown in table one. In selection aspect, excellent college or graduate students recommended by teachers was the highest with mean 4.23 and standard deviation 0.686 while registration policy and low-income students are prioritized was the lowest with mean 3.51 and standard deviation 0.971. In strategy aspect,

holding TA conference before each semester begins was the highest with mean 3.96 and standard deviation 0.735 while demonstrating teaching outcomes demonstration at the end of semester was the lowest with mean 3.7 and standard deviation 0.872. In practicum aspect, face-to face training with teachers on a regular time schedule was the highest with mean 4.03 and standard deviation 0.676 while self-learning via e-learning-watching teaching demonstration through videotapes was the lowest with mean 3.79 and standard deviation 0.732.

The interview data showed that most teachers considered TA a professional job. They helped to assist teachers' instruction and solve students' problems; therefore, professional ability was required. In training methods, teachers maintained that it was necessary to hold conference before semester or during summer vacation to help TAs understand their job duties and contents and to release teaching guidebook to guide and direct TA on solving problems. Besides, training center should also arrange training on general administration and instruction techniques on a regular time schedule. The training center corresponded to Derek Bok Center for Teaching and Learning at Harvard University as was discussed in literature.

#### **4.5 Analysis of Improving TAs' Efficacy**

In this dimension, job planning was higher than evaluation criteria and inspiration as shown in table one. To improve TAs' efficacy, schools have to make organized job planning in advance. In job planning aspect, TAs are obliged to understand TA systems and related regulations was the highest with mean 4.21 and standard deviation 0.657 while establishing training center to train TAs was the lowest with mean 3.97 and standard deviation 0.808. In evaluation criteria and inspiration aspect, distribution of mid-term and final questionnaire on TAs was the highest with mean 3.91 and standard deviation 0.722 while establishing training center to assess course websites was the lowest with mean 3.72 and standard deviation 0.808.

With interview, most teachers regarded that TAs should understand related rules and regulations and that schools should establish work effect criteria as basis for TAs' evaluation criteria. Midterm and final feedback questionnaire should be distributed for effect assessment so that TAs can make self-checks and improvements. Discussion

meeting should be organized on a regular basis to help TAs understand their roles and duties to improve efficacy (0317-2-A).

#### **4.6 Analysis of TAs' Job Duties and Training Policies with Teachers of Different Variables**

Analysis of one way ANOVA was conducted. With t test, a significant difference was found in practicum with p value  $0.012 < 0.05$  and no significant differences in other dimension. Other dimensions, such as teachers' work years, sources of fund, TA educational background and TA work duties, all had p value  $> 0.05$ , which showed no significant effect on each dimension. In terms of the effect of each dimension, a significant difference with teachers from different colleges was found with selection p value 0.40, strategy p value .001, practicum p value .002, and job planning p value .001, and all of their values were  $< 0.05$ , meaning a significant difference. In term of teacher's school, the p value of prior to instruction was .000, selection p value at .015, strategy p value at .005, practicum p value at .044, job planning p value at .000, evaluation criteria and inspiration p value at .014, and all of them were  $< 0.05$ , meaning a significant difference. It was revealed that teachers from different schools held different viewpoints on TA's prior instruction works, selection, strategy, practicum, job planning, evaluation criteria and inspiration training strategies.

## **5 Conclusion and Suggestion**

### **5.1 Teachers' Emphasis on TA's Works and Abilities**

It was found teachers put more emphasis on instructional illustration, operation, and discipline management in class or safety guidance during experiment. The development of TA's main abilities includes interpersonal relationship and professional ability. In interpersonal relationship, problem-solving ability was the most important ability valued by teachers. In professional ability, professional knowledge ability in a specific field was mostly valued. From the above, it was found that teachers hoped that TAs could help them achieve the following purposes: (1) Innovative instruction. (2) Emphasis on each student's learning. (3) Emphasis on individual differences. (4) Good after instruction consultation on each student. (5) Enhancement on actual practice and safety.

### **5.2 Teachers' Viewpoints on TA's Training Strategies**

Teachers maintained that TA with excellent academic score and holding conferences before semester were the best training strategies. In practicum, face-to face training with teachers on a regular time schedule was the best strategy. They also regarded that competent TAs can be selected according to teachers' course needs. Schools could also organize Admission Committee based on course categories and establish selection criteria, teaching contents, TA's rights and obligation, and conference

systems. Finally, selected TAs would have a face-to-face interview with teachers to check their job duties (0324-2-d).

### 5.3 Teachers Viewpoints on TAs' Evaluation Criteria and Inspiration Strategies

Teachers maintained that TAs should be obliged to understand the systems and related regulations of their evaluation criteria and inspiration. It was also necessary to establish basic requirements and abilities for TAs and hold instruction workshops for those who are new TAs. Besides, teachers regarded that distribution of mid-term and final questionnaire on TAs was the most important and the questionnaire result should also be analyzed to evaluate the effect.

### 5.4 Viewpoints on TAs' Training Strategies from Teachers with Different Variables

It was found that teachers belonging to different colleges, public and private schools held different viewpoints in terms of TAs' work duties, training strategies and evaluation criteria. Therefore, schools can establish different TA work duties and training strategies based on their individual course characteristics to make use of teaching effect and help students solve academic questions.

## References

1. Butler, D.D., Laumer Jr., J.F., Moore, M.: A content analysis of pedagogical and policy information used in training graduate teaching assistants. *Journal for Higher Education Management* 91, 27–37 (1993)
2. Chen, M., Huang, C.: Teaching assistant makes lessons exciting. *Evaluation Biomonthly* 3, 16–17 (2006)
3. Chen, Z.: Cornell University, teaching assistant system profile. Education Center. National Taiwan University Newsletter (2008), <http://ctld.ntu.edu.tw/epaper/?p=12> (retrieved July 1, 2008)
4. DeCesare, M.: On being a graduate teaching assistant (2003), <http://www.csun.edu/~mdecesare/> (retrieved March 22, 2005)
5. Derek Bok Center for Teaching and Learning, <http://bokcenter.harvard.edu> (retrieved December 4, 2007)
6. Frymier, A.B., Houser, M.L.: The teacher-student relationship as an interpersonal personal relationships. *Communication Education* 49(3), 207–219 (2000)
7. Hsu, X.C.: Keeping pace of teaching performance and the teaching academic research - seven recipes to improve teaching quality at the University of Illinois. *Evaluation Biomonthly* 3, 16–17 (2006)
8. Jarvis, P.: An international dictionary of adult and continuing education. Routledge, London (1990)
9. Li, Z.: Establishment of mechanisms for effective teaching-teacher development is the core issue of higher education evaluation. *Evaluation Biomonthly* 3, 9–12 (2006a)
10. Lu, G.Y.: University of Virginia teaching assistant system profile. Education Center, National Taiwan University bending Newsletter (2006), <http://ctld.ntu.edu.tw/paper> (retrieved November 30, 2006)



11. Park, C.: The graduate teaching assistant (GTA):Lessons from North American experience. *Teaching in Higher Education* 9(3), 349–361 (2004)
12. Roach, K.D.: Graduate teaching assistants' use of behavior alteration techniques in the university classroom. *Communication Quarterly* 39(2), 178–188 (1991)
13. Tien, F.H.: Introduction to Center for Learning and Teaching at University of Michigan NTU Teaching Practicum and Consultation Newsletter, 37,2. Unpublished thesis, Kaohsiung, Taiwan (2006)