A Study for the Performance Evaluation of Volunteer Teams-The Case of Evaluation for the Affecting Factors of Public Fire Education Conducted by Women Disaster Prevention Advocate in Taiwan

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Abstract*— *Public fire education work is one of the Fire Agency's important fire prevention services. This paper makes use of a questionnaire designed according to relevant documents and work nature of the Women Disaster Prevention Advocate (WDPA) to investigate the effects of public fire education. Members of WDPA are then surveyed in Taiwan in order to gauge the effectiveness of the existing public fire education factors, and using statistical regression analysis. Results from the WDPA Self-Evaluation analysis are used to rank the most affecting factors on the effects of the public fire education. It is found that self-growth is the most important, next is job-involvement, third is training content, then by followed is job recognition.

Keywords*— *Regression Models, Women Disaster Prevention Advocate（WDPA）, Volunteer.

I. INTRODUCTION

In recent years, due to environmental climate changes and rising popular demand for public safety, the Taiwanese Fire Agency, in addition to the usual three great tasks that it must carry out as clearly stipulated in the first clause of the original fire law: fire prevention, disaster rescue, and emergency rescue, fire-fighters, following the implementation of the Disasters Prevention and Rescue Law, must also undertake a variety of disaster prevention and rescue work, such as disaster prevention, disaster preparedness, emergency contingency, and disaster recovery. Among them, public fire education work originally was an extremely important part of the fire-fighting prevention task, its purpose to instill the concept of fire safety goal into every citizen, improving the public concepts of fire and disaster prevention, emphasizing the relative importance of the concept of prevention than treatment, helping to prevent disasters such as fires before they occur, however, as fire-fighting units must currently bear a gradually increasing amount of work, and are faced with the dual pressure of climate change and labor shortages, will fire-fighters still be able to successfully provide fire-prevention education? They therefore must continue to rely on someone else for assistance or integrate the strength of lay nongovernmental groups to help the Fire Agency carry out educational work. Since 1999, county and city governments adhering to the guidance of the Ministry of the Interior National Fire Agency are setting up Women Disaster Prevention Advocate（WDPA）, whose goal is, by means of easily-relatable feminine characteristics such as mildness and warmth, to recruit female members who are civically-minded, dedicated in their service and enter communities with a soft advocacy style, going door to door, taking on matters such as home disaster hazardous factors and evacuation obstacles, and fully carrying out residential public fire education work.

Sweis (2006) found in his calculations that 20% of fires over the years have been residential fires, with many being households whose children had played with fire; the residential fire-prevention strategy established by Chien & Wu (2008) in Taipei City contends the importance of continually promoting public fire education; Jason Beringer (2000) believe that it is necessary to develop community residence safety training; Zhang et al. (2006) state that in order to decrease the risk and harm from fires, fire-prevention education must especially be provided for communities with single, elderly residents. Also according to statistical analysis by the Ministry of the Interior, the number of fire incidents nationwide through the years has fallen from 15,560 incidents in 2000 to 1,458 cases in 2010 (see Table 1). Additionally, it is known that from statistical data that the number of fire victims (see Table 1), also fell from 262 persons in 2000 to 83 persons in 2010, and except for 2008, all were lower than the number of deaths in the past. It can be known from above that the national fire situation, both the number of fire victims and incidents are gradually decreasing year-by-year, with the reason being not only because of changes in building materials and the implementation of a fire-fighting safety inspection system, but the raising of fire

prevention concepts such as emphasizing that fire-prevention advocacy education people on fire and electrical use is also an important factor. Additionally, in each kind of fire-fighting administration with prevention results, the public fire education work administered by Women Disaster Prevention Advocate has also been one of the important affecting factors.

However, as the Women Disaster Prevention Advocate is a volunteer group, the resources and management that each jurisdiction's budget plans can provide for the WDPA is extremely limited. So how can the greatest level of efficiency be extracted from amidst a scarcity of resources, allowing the Women Disaster Prevention Advocate to implement and achieve its service goals, laying down fire prevention education's roots by bringing fire-prevention education into every community and household is a question. The good and the bad of how this work is implemented is related to the security of people's lives and property, and therefore, how to effectively continue promoting public fire education work, which is a topic to which the Fire Agency should continue attach importance and concern in the future. This study hopes that by reviewing documents and referencing the findings of relevant theories, it can identify how public fire education work can achieve the most optimal specific methods and targets in its advocacy results, and conforming to questionnaire survey, try to use a practical statistical method to identify the main factors and weigh the impact of the results from the public fire education work implemented by Women Disaster Prevention Advocate.

TABLE 1
BUILDING MATERIAL FIRE ACCORDING TO USE CATEGORY DIFFERENTIATION STATISTICAL TABLE BETWEEN 2000 TO 2010.

Year / Category	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Number of Fire Incidents (Incidents)	15560	13750	13244	8642	6611	5139	4332	3392	2886	2621	1458
Number of Fire Victims (Persons)	262	234	193	228	160	130	125	120	101	117	83

Source: Ministry of the Interior National Fire Agency statistical data for 2011

II. DOCUMENT REVIEW AND RESEARCH FRAMEWORK

2.1 Document Review

Which factors influence the results of the public fire education work conducted by the WDPA? These factors at the very least include the following examples:

2.1.1 Member Characteristics

Analyzing volunteer member characteristics with 2010 statistical data from the Ministry of the Interior, we discover that there are large discrepancies in the background data of those that undertake volunteer service, and that its work results can possibly have different levels of influence, such as occupation: Most are in home management, with a total of 47,925 people, accounting for 31.15% of all volunteers, next are those in manufacturing, followed by students. Furthermore, as for personal background data such as age, marital status, educational background, and profession, it has been indicated in the research of Wilson (2000), Mcguire (1989), and Wei-Liang Hsieh (2002), etc. that for motives for participation, work engagement, or organizational commitment there is partial influence, but work effect could result in an indirect or direct influence. Present studies are still quite few, therefore this study takes each kind of the personal characteristic parts mentioned above as variables, probing their influence on the effects of advocacy work effects conducted by the WDPA.

2.1.2 Administrative Operation

2.1.2.1 Unit Manpower

Internal statistical data from Ministry of the Interior National Fire Agency in 2010 indicates that, in that year, the fewest number of established WDPA teams and number or workers in a jurisdiction, were in Chiayi City, whose WDPA only had one team and a total number of forty people, while Kaohsiung City now has the most WDPA teams and number of employees, with a total of 33 teams and 932 people. To this study, the WDPA are volunteer groups, who, through their enthusiastic and gentle characteristics, expect to assist fire service improve inadequacies in fire prevention work. However, due to the fact that budget expenses, staff composition, differences in recruiting style, and the number of workers vary considerably from district to district, the frequency and content of the fire-prevention education also varies, Hong-Song Lin

(2004) indicates that it is possible that this influences advocacy results.

2.1.2.2 Administrative Management and Administrative Resources

Yong-Fu Ho and Guo-Ann Yang (1993) point out that to reach organizational targets, an organization needs to efficiently manage the obtaining, use, and maintenance of all its human resources for all processes and activities. Wei-Hsien Chang (2002)'s study points out that within nonprofit organizations, human resource concepts are applied with volunteers whom have yet to reach their potential, trying to use a more active, strategic mode of workforce planning to train, motivate, and maintain its momentum, expecting organization members to collectively give their all to achieve the organizational goals. Whitaker (1983) and Hsiang-mei Liu (1997) propose promoting the specific merit of volunteer service, which respectively are building whole volunteer organizations, strengthening educational training, encouraging mass participation, timely specific rewarding and integrating social resources. Tai-Yuan Chen (2003) points to the orientation of volunteer manpower resource management: human resource programs, recruiting, guidance for newcomers, training, performance evaluation, rewarding and encouraging, and punishing and ending relations. It can be know from the aforementioned study that administrative units can possibly influence the effects of advocacy, and management through the resources it provides.

2.1.3 Educational Training

The objective of FEMA (2008) educational training is to improve employee knowledge, attitude, and behavior, and Walker (2003) points out that training can help volunteer workers understand their own importance, and that target techniques for strengthening oneself can influence the organization. Anthony & Young (2003) proposed that volunteer educational training design must be strengthened: such as by meeting the knowledge, skills, and abilities needed for volunteer task, with experienced volunteers serving as training guides and designing appropriate combinations of practice opportunities and learning experiences. We can know from the aforementioned that setting educational training goals for the members of Women Disaster Prevention not only improves their professional knowledge and skills, but it can also change their attitudes, and so training could possibly have an influence on the effects of public fire education.

2.1.4 Motive for Participation

Pearce (1993) points out the diverse motive types of volunteers participating in volunteer service: such as the altruistic type, the selfish type, the ideological type, the type in for substantial reward, the type gaining requirements, the societal relations type, the passing time type, and the personal growth type. Mei-Jane Ho (2008), Man-ting Huang (2001) and Wan-yi Lin (1993) et al. point out that motives for volunteer participation service could possibly include self-growth, contribution to society, and obtaining social experience. Lai Mei Huang (2003) indicates that the voluntary service motives for volunteer participation are: self-orientation (using sense of self, system of values to decide whether or not to attend), oriented toward others (motive arising from societal pressure or with able to produce an influence as a starting point), and situational orientation (coming from organizational factors). The important factors in motive for participation for women's advocacy colleagues entering the organization can be known from the comprehensive outcomes from the aforementioned studies, and so this study hypothesizes that the motive for participation could have an influence on public fire education results.

2.1.5 Work Engagement

Ergenc (1984) points out that "work engagement" is the definition proposed by Lodahl & Kejner after integrating the concepts of psychologists and sociologists in 1965. Rabinowitz & Hall (1977) proposed a comprehensive theory mode of work experience, in which work engagement is influenced by personal characteristics, and work conditions and personal characteristics and work conditions effect one another. In all of their studies, Mei-Jane Ho (2008), Chun-Chu Chang (2003) and Rong-Tay Hwang (2007) et al., use the Lodahl & Kejner-designed scales as the fundamental design questionnaire content, and respectively assess work performance, level of satisfaction, etc. by job recognition, job involvement, etc. Integrating the aforementioned opinions of each scholar toward work engagement, although there are a few discrepancies in the cut angles, we can find that work engagement is being influenced by personal characteristics and work conditions, and furthermore, are differentiated into many discussion orientations. Therefore this study hypothesizes that work engagement could have influence on public fire education results.

We know from the aforementioned that this study, having reviewed relevant documents, and probed the possible influential factors in the effects of WDPA implement public fire education which include member characteristics, administrative operations, educational training, motive for participation, and work engagement as its main influential concepts. Administrative operations include: unit manpower, administrative management, and administrative resources. Sub-concepts

(variables); educational training includes: training times and training content; motives for participation thus include self-growth, contribution to society, and situational orientation etc.; and work engagement thus include: job recognition, and work participation etc. sub-concepts (variable), taking this as the basis by which to construct the interpretation mode of the effects of the public fire education conducted by WDPA.

2.2 Research Framework

The independent variables are hypothesized from the research framework as shown in Fig. 1: independent variable: Women Disaster Prevention Advocate member characteristics (Age, marital status, spousal occupation, education level, own profession, service times, service seniority, volunteering experience, and affiliated county or city), administrative operation of fire service (unit manpower, administrative management, and administrative resources), and educational training (training content and frequency), with the exception of the indirect influence produced by intervening variables: motive for participation (self-growth, contribution to society, and situational orientation) and work engagement (job recognition and job-involvement) on the dependent variable effects of public fire-education (Women Disaster Prevention Advocate Self-Evaluation), there also can possibly exist with direct influence.

This study tries to construct this one model, understand the relationship between each variable, and predict the dependent variable through the independent variable, establishing the interpretation mode of Taiwan's current public fire education effects.

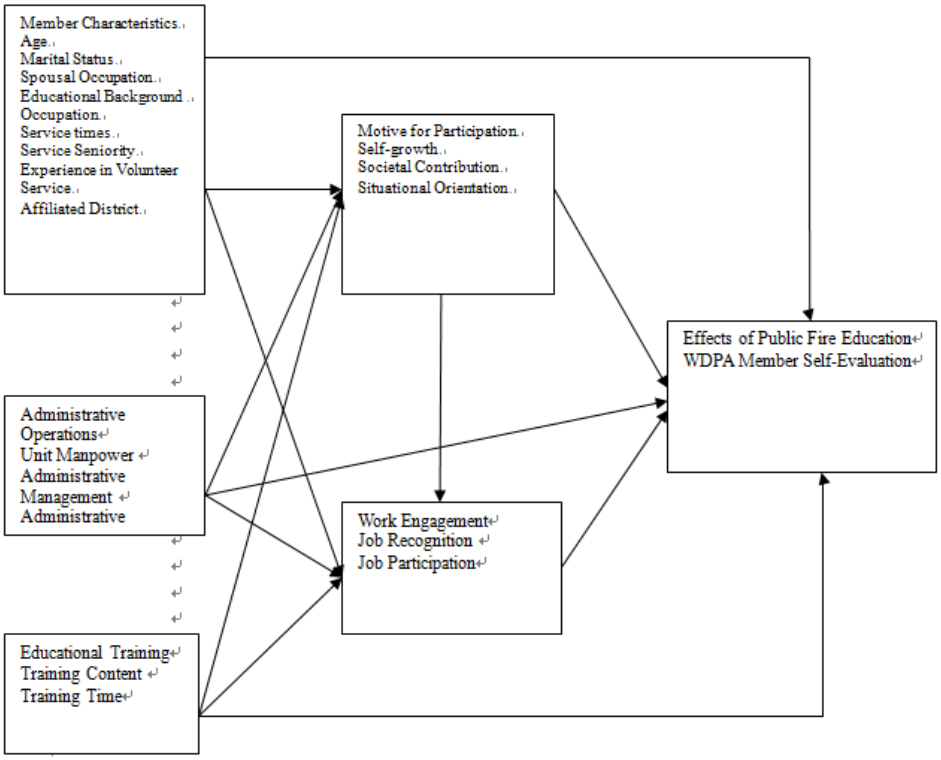

FIGURE 1 : RESEARCH FRAMEWORK FOR THE AFFECTING FACTORS OF PUBLIC FIRE EDUCATION.

III. SURVEY METHODOLOGY

This survey's questionnaire design, questionnaire content underwent five revisions, from the first draft to questionnaire content to completion. The process by which this questionnaire was designed was thus based upon the probing of relevant documents, finding the possible current situation of the Women Disaster Prevention Advocate's advocacy work and its influence on execution results, then the questionnaire was composed according to each factor and variable, and, following the guidance suggestions and pre-test corrections of scholars and experts, the questionnaire content was successively amended until completion.

All of the investigative work in this study was undertaken by firefighters in each county and city, and to complete this questionnaire, the members of Women Disaster Prevention Advocate who are actually engaged in fire-prevention education

were surveyed. Therefore, the selection of sample source area was determined by which districts were relatively able to provide investigative interviews and assistance, with six districts together having been selected to serve as sample-collecting regions: New Taipei City, Taipei City, Taichung City, Nantou County, Kaohsiung City, and Ping Tong County.

This study in total received back 501 questionnaires, with 460 valid and 41 invalid, with sample investigation distribution situation as shown in Table 2.

TABLE 2
DISTRIBUTION OF INVESTIGATIVE SAMPLES.

Number of Items / District	Number of Valid Questionnaires	Number of Invalid Questionnaires	Total Number
New Taipei City	79	11	90
Taipei City	76	12	88
Taichung City	86	4	90
Nantou County	66	9	75
Kaohsiung City	77	3	80
Pingtung County	76	2	78
Total	460	41	501

3.1 Composing of Research Tools and Content

This study took the following factors to produce the questionnaire: member characteristics, administrative operation, educational training, motive for participation, work engagement, and the advocacy effects in the self-evaluations of colleagues in women's advocacy, etc. For its concept (factor variable) content, please refer to Table 3. In addition the relevant part of employee characteristics in the Women Disaster Prevention Advocate (Age, marital status, spousal occupation, education level, ones profession, service times, service seniority, volunteering experience, and affiliated district), as they belong to second-level item survey or continuous variables, have therefore not been listed on the table.

TABLE 3
THE MAIN CONTENT OF EACH SCALE IN THIS STUDY'S QUESTIONNAIRE.

Concept	# of Question Items	Content of Question Items
Unit Manpower	4 Items	Sufficiency of those in attendance; Style of manpower allocation; Attendance rate; Project advocacy force.
Administrative Management	7 Items	System assessment; System supervision; Rewarding of merit; Communication channels; Recruitment activity; Selection style; Budgeting.
Administrative Resources	8 Items	Equipment types; Equipment quantity; Equipment replenishing speed; Degree of equipment usability; Equipment replacement speed; Advocacy supply types; Advocacy supply quantity; Advocacy supply replenishment speed.
Training Time	7 Items	Training time for safe use of fire and electricity; Training time for safe use of gas; Training time for carbon monoxide prevention; Training time for evacuation essentials;

		Training time for using advocacy equipment; Training time for case education advocacy; Training time for advocacy skills.
Training Content	12 Items	Training conditions for safe use of fire and electricity; Training conditions for safe use of gas; Training conditions for carbon monoxide prevention; Training conditions for evacuation essentials; Training conditions for using advocacy equipment; Training conditions for case education advocacy; Training conditions for advocacy skills; Educational training practical situation; Level of satisfaction toward training time; Level of satisfaction toward training content; Level of satisfaction toward training style; Level of satisfaction toward qualified trainers
Self-growth	5 Items	Participated hoping to have more opportunities for service; Participated to obtain a sense of achievement outside of work; Participated wanting self-growth; Participated to develop their own strengths; Participated in order to learn more skills.
Societal Contribution	5 Items	Participated to make a contribution; Participated in order to a societal contribution; Participated in order acquire social experience; Participated because they had received other peoples' help before; Participated wanting to share experiences with other people.
Situational Orientation	5 Items	Participated because attracted to the work environment; Participated because attracted to the welfare benefits; Participated because attracted to the managerial system; Participated because attracted to the service aims; Participated because attracted to the training course.
Job Recognition	7 Items	After participating, life increased very few pleasures; Hopes she will be able to become a full-duty member of WDPA member; No significant reason, cannot easily discontinue advocacy work; Likes to participate in public fire education work; Advocacy work is the center of her life; Willing to invite friends to participate together; Extremely engaged in advocacy work.
Job-involvement	8 Items	Considers service content due to time outside of work; The quality of the course can influence self-evaluations; Plans in advance before service; Cares about the topic of advocacy; Willing to participate in related courses in time outside of work; Thinks participating in WDPA is meaningful work; Hopes to participate with public fire education work; Willing to take on responsibility for administrative work outside of advocacy.
Advocacy Effects on the Self-Evaluation	10 Items	Advocacy work has fully lowered the occurrence rate of fires; Advocacy work has helped people better understand how to prevent fires; Advocacy work has helped people understand how to prevent carbon monoxide poisoning; Advocacy work has helped people better understand evacuation methods; Advocacy work has taught people how to better operate fire extinguishers; Advocacy work has helped people better recognize the siren sound; Advocacy work has helped people better understand the essentials of gas safety; Advocacy work has helped people conduct home inspection by themselves; Advocacy work has helped people better understand electrical usage knowledge; Very confident in their execution of public fire education work.

3.2 Survey of Research Concepts

In order to improve the reliability of this questionnaire and what concepts or characteristics can theoretically be measured, this study also used the Cronbach α coefficient method and the factor analysis method for the questionnaire topics with which the examination was conducted. This improves the reliability of the questionnaire content and eliminates topics with theoretical concept deviations, causing the construct validity of this questionnaire to obtain the greatest support. Each scale's tool reliability and validity analysis surveys relevant to this study are below:

3.2.1 Administrative Operation

The survey of this concept includes three subscales: unit manpower, administrative management, and administrative resources.

3.2.2 Educational Training:

The survey of this concept includes the subscales: training time and training content.

3.2.3 Motive for Participation

The survey of this concept includes three subscales: self-growth, contribution to society, and situational orientation.

3.2.4 Work Engagement

The survey of this concept includes two subscales: job recognition and job-involvement.

3.2.5 Advocacy Effect

The survey of this concept has only the WDPA Member Self-Evaluation as its sole subscale.

For a simple design, unit manpower is taken as an example to explain the survey method (as shown in Table 4), and as for the reliability and validity analyses of other concepts, they are summarized as shown in Table 5.

A. Fire-fighting Labor

The survey of the labor concept together has five topics, and this scale through reliability and validity analysis, internal consistency coefficient and characteristic value of this scale are, respectively, α=0.571 and 2.548, which indicate that this scale is still stable and able to effectively survey the concept of unit manpower (Refer to Table 4).

B. Survey of Other Concepts

The reliability and validity analyses of other concepts (including unit manpower) within the questionnaire imitate the survey style of the unit employees, with the results summarized as shown in Table 5.

The first paragraph under each heading or subheading should be flush left, and subsequent paragraphs should have a five-space indentation. A colon is inserted before an equation is presented, but there is no punctuation following the equation. All equations are numbered and referred to in the text solely by a number enclosed in a round bracket (i.e., (3) reads as "equation 3"). Ensure that any miscellaneous numbering system you use in your paper cannot be confused with a reference [4] or an equation (3) designation.

TABLE 4
FACTOR AND RELIABILITY ANALYSES OF FIRE-FIGHTING LABOR.

Topic	Factor Loadings
Usual number of those in attendance was sufficient	0.787
Deployment method when workforce is insufficient	0.853
Attendance Rate	0.729
Number of those in attendance for project advocacy was sufficient	0.806
Characteristic value (Eigenvalue)	2.548
Internal Consistency coefficient (Cronbach α)	0.571

TABLE 5
THE RELIABILITY AND VALIDITY ANALYSES OF THE EFFECTS OF PUBLIC FIRE EDUCATION CONDUCTED BY THE WDPA.

	Factor or Concept	Factor Loadings Characteristic value	Internal Consistency Coefficient (Cronbach α)
Administrative Operation	Unit Manpower	0.729~0.853 Eigen-valve 2.548	0.571
	Administrative Management	0.672~0.859 value 4.173	0.881
	Administrative Operation	0.799~0.851 value 5.469	0.934
Educational Training	Training time	0.880~0.939 value 5.885	0.968
	Training Content	0.646~0.818 value 6.825	0.930
Motive for Participation	Self-growth	0.794~0.894 value 3.651	0.907
	Societal Contribution	0.495~0.889 Characteristic value 3.245	0.829
	Situational Orientation	0.569~0.808 Characteristic value 2.500	0.736
Work Engagement	Job recognition	0.718~0.811 Characteristic value 4.445	0.901
	Job-involvement	0.659~0.807 Characteristic value 4.495	0.885
Advocacy Affect	WDPPB Member Self-Evaluation	0.695~0.897 Characteristic value 7.049	0.952

IV. RELEVANT ANALYSIS AND INTERPRETATION MODE CONSTRUCTION

According to the aforementioned research framework concepts, the variables (question items) in this study are, respectively, WDPA member characteristics, administrative operation, educational training, motive for participation, work engagement, and public fire education results. A correlation analysis will be conducted between each factor variable, and then the interpretation mode of advocacy results will be constructed.

4.1 Member Characteristics, Administrative Operation, Educational Training, Motive for Participation, and Work Engagement and Correlation Analysis of Advocacy Effect

From this study, correlation analysis is conducted between each factor, variable previous differences analysis outcomes and the data collected in this survey. By analyzing the outcomes as shown in Table 6, we can see trends between various factors and between the results of implementing public fire education work.

It can be known from Table 6 that in the six independent variables (seniority, unit strength, administrative management, administrative resources, training time, and training content) and the five intermediate variables (self-growth; contribution to society; situational orientation; job recognition, and job-involvement), there are nine variables which show relevant trends

with public fire education results from WDPA Self-Evaluation reach notable states, which respectively are self-growth, contribution to society, situational orientation, job recognition, job-involvement, seniority, unit manpower, administrative management, and training content. It can also be seen from the correlation coefficient that all nine (self-growth, contribution to society, situational orientation, job recognition, job-involvement, seniority, unit strength, administrative management, and training content) are all positive values, indicating that when self-growth, societal contribution, situational orientation, job recognition, and job-involvement decimals are even higher, the results of the public fire education in the WDPA Self-Evaluation are even more optimal; when the seniority decimal is even higher, it indicates that WDPA member service is even longer, which can raise the results of the public fire education in the WDPA Self-Evaluation; when unit manpower, administrative management and training content decimals are even higher, it indicates that fire service attendance strength is substantial, each administrative measure even better and training content even more complete, with even better results of public fire education in the WDPA Self-Evaluation.

TABLE 6
THE REGRESSION MODEL AND COEFFICIENT OF DETERMINATION OF THE RESULTS OF THE PUBLIC FIRE EDUCATION IN THE WDPA SELF-EVALUATION.

Dependent Variables / Independent Variables	Results of the Public Fire Education in the WDPPB Self-Evaluation (X_9)	Personal Growth (X_4)	Societal Contribution (X_5)	Situational Orientation (X_6)	Job Recognition (X_7)	Job-involvement (X_8)
Seniority (X_1)						.733** (.130)
Unit Strength						
Administrative management (X_2)				.223*** (.305)		.227*** (.234)
Training Content (X_3)	.191*** (.222)	.103*** (.241)	.150*** (.358)		.111*** (.182)	
Self-growth (X_4)	.643*** (.319)					.416*** (.256)
Societal Contribution (X_5)		.557*** (.548)				.467*** (.282)
Situational Orientation (X_6)			.122*** (.151)			
Job Recognition (X_7)	.156* (.111)	.130*** (.186)	.303*** (.440)			
Job Involvement (X_8)	.321*** (.258)			.256*** (.340)	.594*** (.675)	
Constant	5.235	.899	2.848	4.854	4.296	6.037
R^2	.565	.727	.566	.268	.587	.373
Post-adjustment R^2	.561	.725	.563	.265	.585	.368

Notes: 1, Brackets for standardized regression coefficient
2, ***p<0.001, **p<0.01, *p<0.05

4.2 The Analysis of the WDPA Member Self-Evaluation Advocacy Effect Interpretation Model

From the aforementioned correlation analysis outcomes, a regression analysis is conducted with the selected factor variables that are relevant to each intermediate variable and dependent variable (As shown in Table 6). Hereby, gradual regression analysis is conducted with the results of public fire education, which respectively are, self-growth, societal contribution, situational orientation, job recognition, and job-involvement and the WDPA Self-Evaluation, as the dependent variables. Stepwise regression analysis outcomes are as shown in Table 7.

From Table 7 it is known that when using the results of the public fire education in the WDPA Self-Evaluation as dependent variables, the four factor variables of training content, self-growth, job recognition, and job-involvement, have a direct effect and reach a notable standard, with positive regression coefficients of the four factor variables, thus showing that the factors

such as training content, self-growth, job recognition, and job-involvement, have a positive interpretability on the WDPA Self-Evaluation. The scores of training content, self-growth, job recognition, and job-involvement are even higher (The educational training content that the unit provided is even more substantial, with even stronger motives for self-growth and work engagement even higher), and even more optimal effects of the public fire education in the WDPA Self-Evaluation, with the influence of self-growth as largest among them (standardized regression coefficient=0.319).

TABLE 7
THE CORRELATION ANALYSIS OF EACH INFLUENTIAL FACTOR CONCEPT IN THE RESULTS OF THE PUBLIC FIRE EDUCATION IN THE WDPA SELF-EVALUATION.

Factor Variable	WDPA Self-Evaluation	Self-growth	Social Contribution	Situational Orientation	Job Recognition	Job Involvement
WDPPB Self-Evaluation	1.000					
Self-growth	.671**	1.000				
Social Contribution	.635**	.815**	1.000			
Situational Orientation	.248**	.259**	.410**	1.000		
Job Recognition	.614**	.656**	.658**	.366**	1.000	
Job Involvement	.595**	.518**	.543**	.427**	.748**	1.000
Seniority	.111*	.102*	.097*	-.071	.089	.156**
Unit Strength	.245**	.221**	.236**	.183**	.237**	.184**
Administrative Management	.147**	.082	.168**	.403**	.215**	.287**
Administrative Resources	-.037	-.042	.030	.316**	.050	.114*
Training time	.075	.043	.003	-.055	-.057	-.117
Training Content	.584**	.654**	.599**	.272**	.452**	.400**
Notes: **p<0.01, *p<0.05						

TABLE 8
THE INFLUENCE OF EACH FACTOR VARIABLE ON THE PUBLIC FIRE EDUCATION EFFECTS OF THE WDPAB SELF-EVALUATION.

Dependent Variable	Influencing Variable	Direct Effect	Indirect Effect	Total Effect	Rank
Results of Public fire education in the WDPPB Self-Evaluation (X_9)	Seniority (X_1)	-	0.056	0.056	7
	Administrative Management (X_2)	-	0.086	0.086	6
	Training Content (X_3)	0.222	0.265	0.487	1
	Self-growth (X_4)	0.319	0.085[a]	0.404	3
	Societal Contribution (X_5)	-	0.321	0.321	4
	Situational Orientation (X_6)	-	0.048	0.048	8
	Job Recognition (X_7)	0.111	0.196	0.307	5
	Job Involvement (X_8)	0.258	0.176[b]	0.434	2

Notes: a. The indirect effects of self-growth (X_4) on the results of the public fire education in the WDPA Self-Evaluation (X_9)=$P_{84}\ P_{98} + P_{84}\ P_{78}\ P_{97}$

b. The indirect effects of job involvement (X_8) on the results of the public fire education in the WDPA Self-Evaluation (X_9)= $P_{78}\ P_{97} + P_{78}\ P_{57}\ P_{45}\ P_{94} + P_{78}\ P_{47}\ P_{94} + P_{68}\ P_{56}\ P_{45}\ P_{94}$

Fig. 2 is, under the significance level of 0.05, the path analysis chart of the public fire education effect of the WDPA Self-Evaluation. As can be seen from the chart, seniority, administrative management, societal contribution, and situational orientation did not have a direct influence upon the results of the public fire education in the WDPA Self-Evaluation, however, they did respectfully produce an indirect influence on the results of the public fire education in the WDPA Self-

Evaluation via job-involvement and self-growth; training content and job-involvement, in addition to having a direct influence on the results of the public fire education in the WDPA Self-Evaluation, also produces an indirect influence on the results of the public fire education in the WDPA Self-Evaluation via job recognition; self-growth, in addition to having a direct influence on the results of the public fire education in the WDPA Self-Evaluation, also produces an indirect influence on the results of the public fire education in the WDPA Self-Evaluation via job-involvement; job recognition, in addition to having a direct influence on the results of the public fire education in the WDPA Self-Evaluation, also produces an indirect influence on the results of public fire education in the WDPA Self-Evaluation via self-growth. Among them, when the results of public fire education in the WDPA Self-Evaluation are used as dependent variables, self-growth, job recognition, job-involvement, and training content, etc., all have notable direct influences on the results of the public fire education effect of the WDPA Self-Evaluation.

The regression equations can be arranged from Table 7 and Fig. 2 as below:

$X_4=0.899+ 0.103X_3+ 0.557X_5+ 0.130X_7$

$X_5=2.848+ 0.150X_3+ 0.122\ X_6+ 0.303X_7$

$X_6=4.854+ 0.223X_2+ 0.256X_8$

$X_7=4.296+ 0.111X_3+ 0.594X_8$

$X_8=6.037+ 0.733X_1+ 0.227X_2+ 0.416X_4+ 0.467X_5$

$X_9=5.235+ 0.191X_3+ 0.643X_4+ 0.156X_7+ 0.321X_8$

From Table 8 we know that if we compare each factor variable's influential importance on the public fire education effects of the WDPA Self-Evaluation with the direct results, the influence of self-growth is the most important, followed by job-involvement, training content as third, and job recognition being last. If we also take the indirect results into consideration, the most important factor influencing the results of the public fire education in the WDPA Self-Evaluation is training content, followed by job-involvement, and then self-growth, with societal contribution as fourth, job recognition as fifth, administrative management as sixth, seniority as seventh, and situational orientation being last. Therefore, we can rely on the influential variables' order of importance, which effectively raises the results of the public fire education in the WDPA Self-Evaluation. To ensure a high-quality product, diagrams and lettering MUST be either computer-drafted or drawn using India ink.

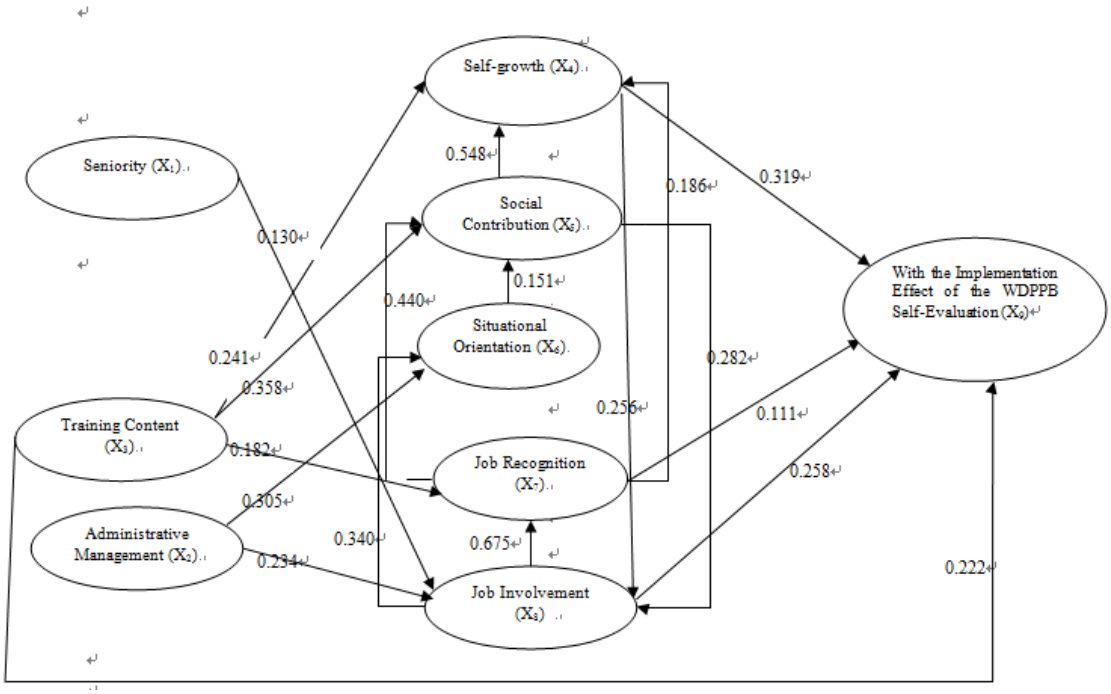

FIGURE 2 : THE PATH ANALYSIS CHART OF THE PUBLIC FIRE EDUCATION EFFECTS OF THE WDPA SELF-EVALUATION.

V. RESULT AND DISCUSSION

The purpose of this study is to understand the influencing conditions of each variable (question item), including independent variables (administrative management and disaster rescue resources), within each concept on the dependent variable (the results of the public fire education in the WDPA Self-Evaluation), and by predicting the dependent variable with the independent variable, we establish the interpretation mode of the results of the public fire education in the WDPA Self-Evaluation. According to the analytical results of this study, they are discussed as follows:

1. Each training program arranged by the fire service for the WDPA should place a priority on being able to produce the most help for members. This study finds that members focus on training content and style for their educational training programs, rather than on the frequency of training. However, most jurisdictions currently plan the WDPA training as year-round training held once each month, with basic training offered one or more times annually. The monthly year-long training is self-run by itself, and places a priority on strengthening and reviewing public fire education techniques, while the annual basic training is planned more as a course that imparts new knowledge, and so despite having received repeated training, have not felt significant help from the frequency of training. It is therefore suggested that fire-fighting units coordinate with the National Fire Agency's seed instructor training, strengthen unit fire-prevention education faculty every year, and assisting the strengthening of training content when planning to use public fire education faculty at each monthly self-training held by subgroups.
2. As for the motives for participation and work engagement in the WDPA members who participate in public fire education work, this study finds that for those who have a stronger motive for participating in WDPA and who have more recognition and participation level of public fire education work, could exert even more effort to enhance the advocacy effectiveness of public fire education work. After having analyzed the sub-variables motive for participation and work engagement, we know from Table 6 that self-growth motive is the most important factor influencing the results of public fire education, indicating that the implementing of public fire education work had even better results with those members who hope to obtain more opportunities for self-growth through participation in public fire education work who have a high level of job recognition with public fire education, and are willing to spend more effort participating in women's advocacy work. By further observing the aforementioned motives for self-growth, work engagement, and advocacy results, we find that all have the important variable of training content as a direct or indirect influence, and therefore suggest that fire-fighting units fully understand the requests, plans, and requests of women's advocacy colleagues, enrich the content of each advocacy course content and provide diverse training methods, not only raising the aspirations of women's advocacy colleagues to participate in public fire education work, and level of engagement with work, but also able to cause the results of public fire education to become increasingly sophisticated.
3. By analyzing how fire-fighting units handled each administrative operation and educational training situation, we find that by arranging adequate attendance strength and strengthening each WDPA organization management activity (measures such as supervision, evaluation, incentives, etc.), can induce WDPA members to be more willing to participate and improve engagement in public fire education work, further enhancing the results of advocacy. There is not a large discrepancy between general awareness and each variable of the relevant administrative operations above on the motive for participation and job involvement, and from the analysis of results indicate that each of the fire-fighting units' activities has a positive effect on the results of the public fire education conducted by, and so fire-fighting units should continue implementing diligence.

VI. CONCLUSION

Fire-prevention education advocacy is the core work of fire prevention, but currently the demands of fire-fighting work are increasing and there is insufficient manpower to conduct door-to-door public fire education promotion. Therefore, from 1999 onward, fire-fighting units have guided fire stations in each jurisdiction to establish volunteer groups, such as the WDPA. Members of such volunteer groups assist the fire service by visiting peoples' homes, relating to the needs of community members, assisting people in inspecting their household environment for potential hazards, improving residential and personal safety, and carrying out disaster-preparation advocacy. This study finds that as for the influential importance on the job performance the results of the public fire education in the WDPA Self-Evaluation, self-growth has the most important influence, followed by job-involvement, training content, and then job recognition.

However, as the effects of public advocacy are dependent on the credibility or the attractiveness of the communication source, the integrity and repeatability of information content, the universality and thoroughness of communication channels,

the personality characteristics of recipients, and target difficulty level, therefore it is imperative to strengthen self-growth for the members of WDPA by supplementing training content such as new fire-fighting professional knowledge, communication skills, more job-involvement opportunities and experiences. The government should instruct them to take on the viewpoint of the people when promoting concepts, especially in convincing the people through interpersonal communication to adopt new ideas will receive better results. When promoting fire-prevention education, they should guide people to recognize and validate the fire service standpoint and new government policy, gradually shifting from the former negativity of the "Decree Advocacy" approach to the "Governmental Marketing," which takes on the viewpoint of the general public. This way, those at the receiving end of the advocacy will have better understanding of fire-prevention, and there will also be more significant improvement for people's awareness, attitudes and accomplishments on fire-prevention disaster-prevention, thereby enhancing positive results of public fire education and ensuring the safety of everyone's lives and property.

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