Pre-Vocational Education (PVE) Workshop Management Professional Development Needs of Jordanian PVE Teachers

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ABSTRACT

The purpose of this study was to examine the perceived training needs of PVE teachers relating to workshop management and teaching utilizing Borich needs assessment model. The questionnaire was administered to a random cluster sample of (356) PVE teachers from four educational directorates in Irbid governorate in the northern region of Jordan. The importance and competence scores were used to calculate the PVE teachers in-service training needs by calculating a mean weighted discrepancy score (MWDS) for each competency. The study found that PVE teachers were in need of professional development education in all areas of laboratory management: the workshop and equipment maintenance, workshop safety, planning for the workshop teaching, and workshop teaching. Individuals involved with PVE teachers in-service training and education can use the findings of this study to inform the development of in-service training and educational offerings.

Keywords: Pre-Vocational Education Teachers, Needs Assessment, Borich's Need Assessment Model.

INTRODUCTION

PVE is a school subject introduced into the basic education in Jordan in 1990. It is an amalgamation of many learning areas. These learning areas include; health and general safety, home affairs and general life skills, engineering skills and light maintenance, agriculture and environment, economy and technology, and hotel management and tourism. Regarding the content and structure of PVE programme in Jordan, it was designed in line with UNESCO's 1974 recommendations which state that such programme should (UNESCO, 1974, p. 7):

a) be based on problem-solving and experimental approach and involve experience in planning methods and decision making.

b) introduce the learner to a broad spectrum of technological fields and, at the same time, to the productive work situation.

c) develop a certain command of valuable practical skills such as tool use, repair and maintenance and safety procedures, whether applicable to future education, training and employment or to leisure time, and a respect for their value.

d) develop an appreciation of good design and

craftsmanship and the ability to select goods on the basis of their quality.

e) develop the ability to communicate including the use of graphical means.

f) develop the ability to measure and calculate accurately.

be closely related to the local environment without, however, being limited to it' (UNESCO, 1974, p. 7).

In order to achieve such ambitious objectives, PVE teachers must stay current with the best professional practices and content related to all PVE learning areas. The uniqueness of PVE as a practical subject requires the teacher to shoulder some tasks, which differ from those required from his/her counterparts who teach more academic subjects (Tweissat, 1998; Atkins, 1984; Al-Saideh, 2002; Jawarneh, 2013). The delivery of the practical aspects of PVE requires the use of tools and equipment in appropriate environment. Such appropriate environment may be found especially in the workshop. A workshop is a unique learning situation in which learners may experiment, test, construct, assemble, disassemble, repair, design, create, imagine and study. According to Onele (2014) workshop is generally a place where practical activities involving measurement, cutting, sizing, smoothing, assembly, repairs, finishing among other activities, which are essential components in PVE are carried out. The workshop, therefore, provides a space where PVE teachers are required to help their students

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practice what they are taught in the classroom, as well as for storing the equipment, tools and materials used for such practical purposes.

The teaching of PVE requires teachers who can demonstrate competencies desirable for intellectual growth of students, provide students with foundations for advance study in various types of education and above, the teaching of PVE requires teachers to provide students with practical activities that will contribute to each student becoming an effective citizen capable of making sound judgment regarding their future career. PVE is a unique subject in character in that the curriculum includes six learning areas. These learning areas relate to multiple occupational clusters and related subjects (MoE, 2008, 2011; Moore, 1986). Each learning area makes its own special demand in terms of instructional approaches and teaching methods, the required materials and facilities, and has specific objectives and accompanying activities (MoE, 2008, 2011; Al-Sa'aideh, 2002, 2010). Also, implied by their roles, PVE teachers are involved in more extra duties than those who teach academic subjects. Such duties include vocational guidance and maintenance activities. Additionally, preparation for practical training of students implies more requirements than those required for academic subjects in terms of equipment and facilities, and assessment of the acquisition of practical abilities (Tweisat, 1998; MoE, 2008, 2011).

From the context of this subject and experiences students are expected to acquire and be exposed to a vast array of content possibilities. It necessarily follows that teachers who actually implement the curriculum of PVE ought to be well prepared. Researchers like Al-Sa'aideh (2002, 2008, 2010), observed that the present teachers teaching PVE are grossly incompetent and incapable. In a similar survey, Jawarneh (2013) on PVE teachers noted that out of all the militating factors against the full implementation of PVE, the teacher quality factor ranks highest. It was observed that the common finding among all researchers who studied PVE implementation in Jordan was that the majority of the PVE teachers employed to teach the subject cannot handle the practical activities relating to PVE learning areas because they lack the skills necessary for workshop management and teaching.

Problem of the Study

Practical activities constitutes an essential component of PVE. It is obvious, therefore, that without suitable workshop management, PVE implementation will be difficult if not impossible. However, the acquisition of adequate tools and equipment, and the provision of adequate workshop space and in the absence of an adequate supply of relevant and qualified PVE teachers who possess the necessary management skills to implement PVE teaching in the workshop, will continue to amount to poor PVE implementation. The researcher observed that the present crops of teachers teaching PVE at the middle basic stage of schooling in Jordan are grossly incompetent and incapable. Tweisat (1998), Al-Sa'aideh (2002) and later Jawarneh (2013) lamented that none of the PVE workshops in the basic education schools in Jordan approaches the ideal in workshop layout and most of the present workshop arrangements are the result of a series of compromises. The researcher believe that such compromises were direct consequence of PVE teachers lack of workshop management and teaching skills.

Aligned with students and societal needs, PVE curriculum learning areas include health and general safety, home affairs and general life skills, engineering skills and light maintenance, agriculture and environment, economy and technology, and hotel management and tourism. In order to achieve PVE objectives, teachers must continually work to stay in the forefront of good teaching practices in regard to pedagogy and technology. More importantly, they must have the skills and knowledge necessary to manage the workshop in order to create a conducive learning environment. To meet this demand, these teachers need annual in-service training opportunities from both the MoE in Jordan and educational institutions. It is through in-service training that PVE teachers expand their knowledge and improve their pedagogical and workshop management and teaching skills.

Relevant Studies

In Jordan, one single study has been conducted that tried to determine PVE teachers' in-service needs pertaining to workshop management and teaching. Rawargah and Malkawi (2001) conducted a study aimed at identifying PVE teachers' in-service training needs relevant to workshop management. An instrument consisting of (36) multiple choice items was used after the validity and the reliability were established. the instrument was administered to a sample of (165) PVE teachers. Findings of the study showed that the

knowledge skills that PVE teachers' possessed regarding workshop administration, were below the minimum level. Sex, degree, and teaching experience had statistically significant effect on PVE teachers' responses.

Cannon, Kitchel, Duncan and Arnette (2011) conducted a study to identify the teaching and learning professional development needs of [state] secondary technology teachers. Teachers' perceived level of importance and competence for 35 teaching and learning items were used to calculate mean weighted discrepancy scores (MWDS). Approximately 63% (n=46) of [state] secondary technology teachers participated in the study. The MWDS analysis indicated that the highest rated perceived training needs in the teaching and learning area were "Utilize Computer Numerical Control (CNC) software and applications", "Teaching students to think critically and creatively", "Motivating students to learn", "Integration of science standards into the CTE curriculum", and "Teaching problem-solving & decision-making skills".

McKim and Saucier (2011) investigated the agricultural mechanics laboratory management in-service needs of Wyoming secondary agriculture teachers who are responsible for managing agricultural mechanics laboratories. Data were collected with a Web-based questionnaire designed to determine teachers' perceptions of the importance of 70 selected agricultural mechanics laboratory management competencies and their self-assessed ability to perform those competencies. The Borich (1980) needs assessment model was used to assess and evaluate the in-service needs of the teachers. Findings indicated that Wyoming secondary agriculture teachers were in need of agricultural mechanics laboratory management in-service education in the areas of: first aid, correcting hazardous laboratory conditions, and general laboratory safety.

Golden (2013) conducted a study to identify areas in which teachers perceive to need assistance in order to improve themselves, their students and their program. The study focused on Georgia middle school agriculture teachers' perceived levels of need in various competency areas. A needs assessment was used to gather data from current Georgia middle school agriculture teachers. The findings of the study indicated that Georgia middle school agriculture teachers' greatest overall needs for in-service training were in community and FFA competency areas. More specifically, teachers indicated to need help writing grants, utilizing the Ag Career Network,

completing Secretary, Reporter and Treasurer books, motivating students to learn and recruiting business partners.

In Nigeria, Onele (2014) surveyed a sample of 861 school administrators, basic technology teachers and the basic technology workshop staff to identify the planning techniques needed to improve the teaching and learning of basic technology. A structured questionnaire consisting of 25 items was developed and used for data collection. The data collected were analyzed using Mean statistic in order to answer the research question posed for the study. Based on the data analyzed, it was found from that twenty four workshop planning techniques were needed. The identified planning techniques include "ensuring the availability of equipment to be used for instruction", "Ensuring the availability of tools to be used for instruction", "ensuring the availability of materials to be used for instruction", and "identification of practical lesson objectives." The study also showed that there was no significant difference in the mean responses of the school administrators, basic technology teachers and the basic technology workshop staff on the planning techniques needed for the teaching and learning of basic technology in Nigeria.

To determine perceived level of importance, competence, and preservice/in-service training needs for a set of non-instructional, agriculture teacher competencies, specifically associated with duties related to managing the "total program" of agricultural education, Ricketts, Duncan, Peake and Uesseler (2005) surveyed agriculture teachers (N = 348) in Georgia. Sixty one percent of the teachers (n = 212) completed a modified version of Joerger's (2002) Minnesota Beginning Agricultural Education Teacher In-service Programming Needs Assessment instrument, which was based on Borich's (1980) Needs Assessment Model. Mean and Standard Deviation were calculated to indicate teachers' perceived level of importance and competence for each professional competency, while Mean Weighted Discrepancy Scores were calculated to represent in-service and pre-service needs. Findings from the stuy indicated that teachers considered all of the noninstructional competencies needed for managing the total program of agricultural education important. The findings also revealed that teachers considered themselves at least somewhat competent in each of the competencies. The most important training need for either pre-service teacher education or professional

development was advising students about post-secondary education in agriculture. Other highly rated pre-service/in-service training needs included preparing FFA proficiency award applications and FFA degree applications, developing an effective public relations program, and developing Supervised Agricultural Experience (SAE) opportunities for students.

To prioritize the in-service needs of beginning teachers of agriculture in the state of Missouri. The target populations for the study consisted of beginning agriculture teachers in Missouri during the 1994-95academic year (N=37) and members of the Joint State Staff in Agricultural Education, which included teachers educators and state supervisor (N=16). Census populations were used. The Borich needs assessment model was used to assess the perceived level of importance and competence of beginning teachers regarding 50 professional competencies. From the results of the Borich needs assessment model, 12 competencies were identified as having a greater need for in-service education. The 12 competencies include: completing reports for local/state administrators, motivating students to learn, preparing FFA degree applications, developing an effective public relations program, preparing proficiency award applications, teaching agriscience-integrating science and agriculture, and utilizing alocal advisory committee.

Saucier, McKim, Murphy, and Terry Jr. (2010) sought to determine the agricultural mechanics laboratory management needs of 98 agricultural education student teachers in Texas. Using the Borich (1980) needs assessment model, the researchers assessed student teachers' perceptions on the importance of teaching 70 agricultural mechanics laboratory management competencies. Additionally, the students' perceptions of their perceived abilities were assessed. These researchers concluded that Texas student teachers needed further instruction in the areas of "lab equipment diagnosis and repair, first aid, and safe disposal of hazardous materials.

The focus of a study conducted by Christensen, Warnick, Spielmaker, Tarpley, and Straquadine (2009) was to identify and prioritize the agricultural inservice needs of all Technology, Life, and Careers (TLC) teachers in one western state (N= 261) during the 2005-2006 academic year. The TLC course, required by the [State] Board of Education to be taught to all seventh-grade students, is their first formal career exploration experience. One of the components of the course is the exploration of the agriculture industry. An Internet survey based on the Borich needs assessment model was used. Findings of the study indicated that the teachers ranked the following five objectives as the most needed for inservice overall: explore and identify careers in bio-energy; explore and identify careers in environmental monitoring; explore and identify careers in biotechnology and cloning; explore agricultural career opportunities in science and engineering; and, explore and identify careers in GIS/GPS applications such as precision agriculture and livestock identification.

Shultz, Anderson, Shultz and Paulsen (2014) conducted a study to determine the agricultural mechanics in-service needs of secondary agricultural educators in Iowa. Researchers used descriptive measures and mean weighted discrepancy scores to determine teacher perceptions of content importance, teaching competence, and in-service training needs. Findings from the study revealed that the highest perceived importance were welding safety, construction and shop safety, and shielded metal arc welding. Agricultural mechanics instructors rated themselves least prepared to teach computer aided design, profile leveling, and hot metal work. As shown by mean weighted discrepancy scores, areas of highest additional training need were global positioning systems, electrical safety, and computer aided design.

Due to the inability of basic technology teachers to teach basic technology programme effectively in Nigeria, Atsumbe, Raymond, Idris, and Mele (2012) designed a study to determine the retraining needs of basic technology teachers. Head teachers of vocational subjects and basic technology teachers in secondary schools in Kogi state constitute the respondents (n=216). The researchers used a 50 item questionnaire to collect the data. The data was analyzed using frequency counts and mean statistics. Findings of the study revealed that basic technology teachers needs training and re-training in pedagogical skills and their background in various practical skills areas of basic technology were rickety and defective. Further analysis revealed that these teachers hardly manifest any affective work skills. The areas of serious concern include the teachers' knowledge of career education, the teachers' knowledge of their professional responsibilities, utilization of organization and management skills, demonstrating a repertoire of appropriate instructional models and teaching skills, relating instructions to learner's cultural environment and

identifying the variegated needs of learners as well as formulating objectives based on such needs.

Osman, K., Halim, L., and Meerah, S. (2006) conducted a study to determine the perceived needs of 1,690 practicing secondary school science teachers in Malaysia characterized by gender, school location, and area of specialization. The researchers used main instrument used is a questionnaire which seeks feedback on the eight dimensions of science teachers' needs: generic pedagogical knowledge and skills, knowledge and skills in Science subjects, managing and delivering science instruction, diagnosing and evaluating students, planning science instruction, administering science instructional facilities and equipment, integration of multimedia technology and the use of English language in science instruction. Results demonstrated that the most prevalent needs of the Malaysian secondary school science teachers were the integration of multimedia and the use of English in science instruction.

These previous studies focused on in– service needs of technical-vocational teachers in the area of agricultural mechanics laboratory management. Most researchers use a modified version of the Borich model to evaluate the "perceived level of importance" and "perceived level of competence" of teachers pertaining to professional competencies identified by research and related to the issues of workshop management. Several researchers sought to compare the ranking of in-service needs based on a mean weighted discrepancy score (MWDS), i.e., the Borich model. In these studies the researchers asserted that the discrepancy method, like the Borich model, was more effective than a direct assessment. Unfortunately, the researcher could not spot any study in Jordan and the Arab world that determines PVE teachers' training needs using Borich's needs assessment model.

Al-Sa'aideh (2002, 2010) and Jawarneh (2013) emphasized the need for appropriate and timely in-service activities for PVE teachers to ensure that they are properly equipped to contend with changing conditions in PVE. While researchers can agree that appropriate inservice training must be provided to PVE teachers, it is much more difficult to identify the training that is most appropriate and most needed. This study sought to identify Jordanians' PVE teachers' perceived professional development needs as they pertain to workshop management and teaching.

Purpose and Objectives

The purpose of this study was to determine PVE teachers' perceived levels of importance and competence as they relate to workshop management and teaching, and use that information to determine the perceived in-service needs of this population. More specifically, the following objectives guided this study:
1. Determine the demographic characteristics and educational background of PVE teachers.
2. Determine PVE teachers perceived professional development needs relating to workshop teaching and management.

Significance of the study

Understanding teachers' perceptions of their training needs relating to PVE workshop management and teaching is central to providing evidence-based options to policy makers on how to develop in-service training programs to meet such needs. Also, these perceived training needs could be used to develop programs for seminars and workshops for in-service PVE teachers, supervisors and administrators in the field of PVE. Consequently, the performance of teachers of PVE regarding the delivery of the practical activities will be improved. Findings from this study, it is anticipated, could aid in re-designing pre-service educational curricula of PVE teacher education institutions in Jordan.

With the exception of the study by Rawagah and Malkawi (2001) relating to PVEteachers' needs, the researcher could not spot any study that deals with PVE teachers training needs relevant to workshop management and teaching.

This is the first study, within the context of PVE in Jordan, that uses the Borich model to prioritize PVE teachers' training needs as they relate to PVE workshop management and teaching.

Study Limitations

This study is confined to identifying the perceptions of Jordanian PVE teachers who teach at the middle basic stage during the 1st semester of the 2013/2014 academic year in Irbid governorate.

Definitions of Terms

Pre-Vocational Education: It is a school subject which is compulsory for all students in grades 1-10 (age group 6-16yrs) of the basic education. It consists of six learning areas. These include health and general safety,

home affairs and general life skills, engineering skills and light maintenance, agriculture and environment, economy and technology, and hotel management and tourism.

Middle Basic stage: it consists of grades 7,8 & 9 of basic education (age group 11-13yrs).

Method
Population and Sample

The target population of this study was all PVE teachers in "Irbid Governorate" in the northern region in Jordan (*N*=545). There are eight educational directorates in Irbid Governorate. For the purpose of selecting a sample for this study, each educational directorate was considered a cluster. Out of the eight educational directorates, four were randomly selected and all teachers in the selected educational directorates were taken as a sample for the study (n= 356) using random cluster sampling.

Instrumentation

An instrument using the Borich (1980) needs assessment model was developed to assess the PVE teachers' perceived level of importance and perceived level of competence regarding 43 professional competencies. The instrument for this study was developed from previous research on the professional development needs of secondary career-technical education and agricultural education teachers (Cannon et al., 2012; Kitchel et al., 2010; Duncan, et al., 2006). Those researchers based their work on Borich's Needs Assessment Model (Borich, 1980). A two-section instrument was used to address the research objectives of this study. The first section sought to identify individuals' demographic characteristics (e.g., age, gender, level of qualification, type of qualification, years of teaching experience, highest degree obtained). The main demographic characteristics of the sample participants are shown in table (1).

Table (1)
The main demographic characteristics of the sample participants

Variable Name	Levels of Variable	Number (N)	Percentage (%)
Gender	Male	160	44.9
	Female	196	55.1
	Total	356	100.0
Level of Qualification	Community College Diploma	107	30.1
	Bachelor	199	55.9
	Bachelor +Diploma	26	7.3
	Master or Higher	24	6.7
	Total	356	100.0
Type of Qualification	Prevocational	310	87.1
	Other Vocational Qualification	45	12.6
	None Vocational Relevant	1	.3
	Total	356	100.0

The second section consisted of a double-matrix containing 43 statements representing PVE workshop competencies. The 5-point summated rating scale, double-matrix allowed subjects to respond to each statement twice; once rating the perceived level of importance for each competency (1 = No Importance, 2 = Below Average Importance, 3 = Average Importance, 4 = Above Average Importance, 5 = Utmost Importance), and once rating the individual's ability to perform each competency (1= No Ability, 2= Below Average Ability, 3= Average Ability,4 = Above Average Ability, 5 = Exceptional Ability).

Validity and Reliability

A panel of PVE specialists; consisting of faculty from Yarmouk University, University of Jordan, and Hashemite university; evaluated the instrument for face, content, and construct validity. The instrument items were also checked for clarity. A qualified person with vast experience in the field of measurement and evaluation was also asked to validate the items. The panel of PVE specialists found the items to be suitable for the Jordanian context. The panel further identified four categories: the workshop and equipment maintenance, workshop safety, planning for the workshop teaching, and

workshop teaching. The instrument was pilot tested on a group of PVE teachers from the population of the study. The PVE teachers selected for the pilot study were not included in the sample of the study. Reliability tests utilizing the SPSS Version 19.00 for windows program were conducted on the total questionnaire as well as the four categories included.

Cronbach's alpha was calculated to determine the reliability of importance (α= 0.91, 92, 0.88 & 0.94) and competence (α= 0.89, 0.91, 0.90 & 0.94) scales for the workshop and equipment maintenance, workshop safety, planning for the workshop teaching, and workshop teaching respectively.

Cronbach's alpha coefficients were calculated for the scales (importance and ability), yielding coefficients of 0.96 and 0.97 (n = 356) respectively. The results indicated an instrument with a high degree of internal consistency.

Data Analysis

All PVE teachers completed the survey instrument. Collected data were analyzed using the Statistical Package for the Social Sciences (SPSS) software. The importance and competence scores were used to calculate the PVE teacher in-service needs by calculating a mean weighted discrepancy score (MWDS) for each item. Microsoft Excel was used to calculate the MWDS. The MWDS score was calculated by subtracting the competency score from the importance score, multiplying that number by the mean importance rating of the item, and then calculating the average of these values across cases (Borich, 1980; Joerger, 2002).

Findings

Objective One: Determine the demographic characteristics and educational background of PVE teachers.

As indicated in Table 1, the majority of PVE teachers 310 (87.1%) hold a qualification in PVE. Forty-Five PVE teachers (12.6%) of the respondents identified themselves as having a qualification relevant to one of the six PVE learning areas. More than half of the respondents were female (n = 196, f = 55.1%).

Of the 356 respondents, 30.1% hold a community college diploma, 55.9% hold a bachelor degree, 7.3% hold a high diploma, and 6.7% of the respondents hold a master degree or higher. With regard to teaching

experience, PVE teachers with 6 to 10 years of experience represented the largest category (n = 168, f = 47.2%). PVE teachers with 11 or more years of teaching experiences represented the second largest group (n = 144, f = 40.4%). PVE teachers completing the survey were asked to identify which learning area of the PVE curriculum they delivered. Of the 196 female respondents, 178 (91%) delivered the "home affairs and general life skills" learning area and 18 (9%) indicated that they have delivered both "the home affairs and general life skills' and "health and general safety" learning areas. For the male schools the picture was different. Of the 158 male PVE teachers 147 (93%) indicated that they have delivered "engineering skills and light maintenance' PVE learning area and 12 (7.5%) indicated that they have delivered both "engineering skills and light maintenance" and "health and general safety" PVE learning areas.

Objective Two: Determine perceived workshop management and teaching needs of PVE teachers.

To determine perceived PVE teachers training needs, A MWDS was computed for each competency in the four areas relating to workshop management and teaching. Those competencies with the highest MWDS represent the competencies with the greatest need for additional professional development. First with regard to the training needs related to the workshop and equipment maintenance, the results are presented in table (2).

As shown in table 2, the highest rated workshop and maintenance in-service training need was "Making minor repairs to PVE workshop facility" (MWDS= 10.04), followed by "Diagnosing malfunctioning PVE workshop equipment" (MWDS= 9.98), "Performing routine maintenance of PVE workshop equipment (e.g., adjust belt tension, lubricate moving parts, and dress grinding wheels)" (MWDS= 8.62), "Making minor PVE workshop equipment repairs" (MWDS= 8.58), and "Developing a procedure to insure proper PVE workshop clean up" (MWDS= 5.98) respectively. All competencies in this category had MWDS greater than 5 indicating greater need for in-service.

Second with regard to the training needs related to the workshop safety, the results are presented in table (3).

Table (2)

Importance, Ability and Mean Weighted Discrepancy Scores for competencies related to the workshop and equipment maintenance category (n=356)

No.	Competency	Importance		Ability		MWDS
		Mean	S.D.	Mean	S.D.	
1	Diagnosing malfunctioning PVE workshop equipment;	4.19	0.74	1.81	0.74	9.98
2	Making minor PVE workshop equipment repairs;	4.08	0.69	1.92	0.67	8.58
3	Performing routine maintenance of PVE workshop equipment (e.g., adjust belt tension, lubricate moving parts, and dress grinding wheels);	4.06	0.83	1.94	0.83	8.62
4	Developing a procedure to insure proper PVE workshop clean up;	3.78	0.78	2.22	0.78	5.98
5	Making minor repairs to PVE workshop facility;	4.20	0.77	1.80	0.77	10.04
Response Scale of 1=Not Important, 2=Little Importance, 3=Somewhat Important, 4=Important, 5=Very Important.						

Table (3)

Importance, Ability and Mean Weighted Discrepancy Scores for competencies related to the workshop safety category (n=356)

No.	Competency	Importance		Ability		MWDS
		Mean	S.D.	Mean	S.D.	
6	Administering first aid.	4.40	0.76	1.60	0.76	12.27
7	Provisions for adequate ventilation and illumination in the workshop.	3.98	1.09	2.02	1.09	7.83
8	Maintaining healthy environmental conditions in the workshop.	4.04	0.98	1.96	0.98	8.40
9	Conducting regular safety inspections of the laboratory.	3.82	1.06	2.18	1.06	6.29
10	Providing students safety instruction.	4.08	0.61	1.92	0.61	8.80
11	Documenting student safety instruction.	4.08	0.78	1.92	0.78	8.83
12	Selecting protective equipment for student use (e.g., safety eyewear).	3.82	1.16	2.18	1.16	6.29
13	Arrange to locate machines switches and socket outlets in the workshop for convenience and safety.	3.74	1.11	2.26	1.11	5.57
14	Arranging equipment in the workshop to enhance safety/ efficiency/learning;	3.96	0.71	2.04	0.71	7.64
15	Provisions for students to have easy access to materials, tools and equipment;	4.23	0.71	1.77	0.71	10.38
Response Scale of 1=Not Important, 2=Little Importance, 3=Somewhat Important, 4=Important, 5=Very Important.						

As shown in table 3, the highest rated workshop safety in-service training need was "Administering first aid" (MWDS= 12.27), followed by "Provisions for students to have easy access to materials, tools and equipment" (MWDS= 10.38), "Documenting student safety instruction" (MWDS= 8.83), "Providing students safety instruction" (MWDS= 8.80), and "Maintaining healthy environmental conditions in the workshop" (MWDS= 8.40) respectively. The least rated workshop safety in-service training need was "Arrange to locate machines switches and socket outlets in the workshop for convenience and safety" (MWDS= 5.57). All competencies in this category had MWDS greater than zero indicating greater need for in-service training.

Regarding the perceived in-service needs relating to planning for the workshop teaching, The 14 professional

competencies in this category were ranked using the MWDS as shown in table (4).

Table (4)
Importance, Ability and Mean Weighted Discrepancy Scores for competencies related to the workshop and equipment maintenance category (n=356)

No.	Competency	Importance		Ability		MWDS
		Mean	Standard Deviation	Mean	S.D.	
16	Ensuring the availability of equipment to be used for instruction.	4.08	0.73	1.92	0.73	8.83
17	Ensuring the availability of tools to be used for instruction.	4.11	0.90	1.89	0.90	9.09
18	Ensuring the availability of materials to be used for instruction.	4.13	0.77	1.87	0.77	9.38
19	Identification of practical lesson objectives.	3.96	0.85	2.04	0.85	7.64
20	Grouping of the lessons based on available work stations.	3.49	1.25	2.51	1.25	3.46
21	Listing clearly the roles expected to be performed by the teacher.	3.58	1.21	2.42	1.21	4.17
22	Clearly stating the roles to be performed by the students	3.99	1.03	2.01	1.03	7.89
23	Drawing up step-by-step procedure to be used in carrying out each task.	4.15	0.74	1.85	0.74	9.56
24	Preparation of learning sequence to be adopted.	3.89	0.96	2.11	0.96	6.96
25	Listing in order, the learning activities to be done.	3.70	1.19	2.30	1.19	5.18
26	Developing educational projects/activities for students.	3.92	1.19	2.08	1.19	5.85
27	Developing objective criteria for evaluation of student projects activities.	4.03	0.97	1.97	0.97	8.31
28	Developing a student discipline policy.	3.72	0.84	2.28	0.84	5.37
29	Maintaining an adequate inventory of consumable supplies.	3.74	0.68	2.26	0.68	5.52
Response Scale of 1=Not Important, 2=Little Importance, 3=Somewhat Important, 4=Important, 5=Very Important.						

As shown in table 4, the highest rated planning for workshop teaching in-service training need was "Drawing up step-by-step procedure to be used in carrying out each task" (MWDS= 9.56), followed by "Ensuring the availability of materials to be used for instruction" (MWDS= 9.38), "Ensuring the availability of tools to be used for instruction" (MWDS= 9.09), "Ensuring the availability of equipment to be used for instruction" (MWDS= 8.83), and "Developing objective criteria for evaluation of student projects activities" (MWDS= 8.31) respectively. The least rated workshop safety in-service training need was "Grouping of the lessons based on available work stations" (MWDS= 3.46). All competencies in this category had MWDS

greater than zero indicating greater need for in-service training.

The fourth category of needs consisted of 14 competencies related to the workshop teaching. The MWDS for each competency was calculated and the results were presented in table (5).

As shown in table 5, the highest rated workshop teaching in-service training need was "Providing guidance and career exploration activities to students" (MWDS= 11.87), followed by "Demonstrating knowledge of career prospects and opportunities relevant to various PVE areas" (MWDS= 9.18), "Teaching problem-solving & decision-making skills" (MWDS= 8.74), "Teaching proper safety practices in the workshop"

(MWDS= 7.67), and "Using ICT tools to facilitate student learning, creativity and innovation" (MWDS= 6.69) respectively. The least rated workshop teaching in-service training need was "Observing safety precautions

when performing specific task" (MWDS= 3.57). All competencies in this category had MWDS greater than zero indicating greater need for in-service training.

Table (5)

Importance, Ability and Mean Weighted Discrepancy Scores for competencies related to the workshop safety category (n=356)

No.	Competency	Importance		Ability		MWDS
		Mean	Standard Deviation	Mean	S.D.	
30	Implementing instructions that are consistent with the practical lesson plan.	3.74	0.71	2.26	0.71	5.52
31	Applying instructional models and teaching skills appropriate to specified objectives and to particular learners.	3.70	0.93	2.30	0.93	5.18
32	Using resources appropriate to instructional objectives.	3.86	0.88	2.14	0.88	6.64
33	Modifying instruction on the basis of learner's verbal and non-verbal feedback during instruction.	3.56	1.26	2.44	1.26	4.03
34	Using ICT tools to facilitate student learning, creativity and innovation.	3.87	0.81	2.13	0.81	6.69
35	Appreciating the value of equipment and consumables and using them prudently.	3.82	1.14	2.18	1.14	6.29
36	Teaching proper safety practices in the workshop.	3.97	1.09	2.03	1.09	7.67
37	Teaching problem-solving & decision-making skills.	4.07	0.67	1.93	0.67	8.74
38	Teaching students to think critically and creatively.	3.80	1.06	2.20	1.06	6.06
39	Demonstrating knowledge of career prospects and opportunities relevant to various PVE areas.	4.12	0.71	1.88	0.71	9.18
40	Providing guidance and career exploration activities to students.	4.37	0.70	1.63	0.70	11.87
41	Observing safety precautions when performing specific task.	3.51	1.18	2.49	1.18	3.57
42	Maintaining a student discipline policy.	3.64	1.23	2.36	1.23	4.69
43	Developing positive maintenance culture in handling tools and equipments.	3.77	0.95	2.23	0.95	5.80
Response Scale of 1=Not Important, 2=Little Importance, 3=Somewhat Important, 4=Important, 5=Very Important.						

Discussion

The purpose of this study was to determine the perceived workshop management and teaching professional development needs of PVE teachers using the Borich Needs Assessment Model adapted from previous research (Atsumbe, Raymond, Idris and Mele 2012; Saucier and McKim, 2011; Duncan et al., 2006; Garton & Chung, 1996; Joerger, 2002). Utilizing the mean weighted discrepancy score, this study found that PVE teachers in Jordan had professional development

needs in all of the areas of workshop management and teaching. All of the five training needs, table 2, relating to the area of the workshop and equipment maintenance were needed by PVE teachers. these findings accord with the findings obtained by McKim, B. and Saucier (2011) who found that Texas school–based, agricultural education student teachers had the highest professional development education needs in the construct areas of laboratory and equipment maintenance and laboratory safety. These student teachers also had professional

development needs in the areas of laboratory teaching, program management, and tool, equipment, and supply management. These findings are inconsistent with the findings from previous research by Crews and Bodenhamer (2009) who found that classroom management, curriculum development, computer application skills, student motivation, and instructional strategies as the most needed pre-service business education teaching needs as identified by in-service teachers.

The five training needs relating to the area of the workshop safety in which teachers had the highest need for professional development were administering first aid, provisions for students to have easy access to materials, tools and equipment, Documenting student safety instruction, Providing students safety instruction and Maintaining healthy environmental conditions in the workshop. McKim et al. (2010) concluded that laboratory managers of secondary agricultural mechanics programs in Wyoming had the greatest in-service training need in "first aid, correcting hazardous laboratory conditions, and general laboratory safety. They also concluded that most of the agricultural mechanics laboratory management competencies that Wyoming secondary agriculture teachers require in-service education in are related to safety. Maultsby (1997) found that the agricultural science teachers perceived that the competency "Identify safety and laboratory procedures" was the most important needed competency. In line with these results, Lester (2012) indicated that the Laboratory construct, which consists of laboratory management and safety, was ranked as having the highest need for professional development by secondary Arizona agricultural educators. More recently, Shultz et al (2014) found that the areas of highest perceived importance of secondary agricultural educators in Iowa were welding safety and construction and shop safety. This finding contradicts a previous finding by Leiby (2010) regarding the professional development needs of current agricultural education teachers in the area of safety.

In the area of planning for the workshop teaching, drawing up step-by-step procedure to be used in carrying out each task, ensuring the availability of materials to be used for instruction, ensuring the availability of tools to be used for instruction and ensuring the availability of equipment to be used for instruction were perceived by teachers as the highest needed competencies for professional development.

The findings of this study revealed that the respondents agreed that the 14 workshop planning techniques related to the category of workshop planning were needed to improve the teaching and learning of PVE in Jordan. These findings were in agreement with Olaitan, et al (1999); Okoro (2006) and Onele (2014) that workshop planning skills were required by the teachers of pre-vocational courses in the Junior Secondary Schools in Nigeria for effectiveness in their workshop practices. However, in a study conducted by Osman, Halim and Meerah (2006) to determine science teachers' needs to improve their science instruction in Malaysia. The researchers found that science teachers were competent with regard to administering science instructional facilities and equipment in science laboratory. Workshop planning is an indispensable technique for PVE teachers in order to optimize the utilization of workshop facilities for achievement of PVE goals (Onele, 2014). The quality and quantity of practical activities conducted by students in PVE rests upon the availability of facilities and the management of such facilities (Al-Sa'aideh, 2008; Jawarneh, 2013).

The five competencies in which teachers had the highest need for professional development relating to the area of workshop teaching were providing guidance and career exploration activities to students, demonstrating knowledge of career prospects and opportunities relevant to various PVE areas, teaching problem-solving & decision-making skills, Teaching proper safety practices in the workshop and Using ICT tools to facilitate student learning, creativity and innovation.

The acceptance of all the items in table five by PVE teachers as needed competencies is not coming as a surprise, particularly the competencies that deal with knowledge of career guidance and exploration. This is because the knowledge of career is crucial to PVE teachers who should aspire to implement the concept in the workshop during practical activities. According to the MoE (2011), Al-Saideh, (2002) and Tweissi (1998) PVE teachers at the basic education stage should be able to stimulate occupational interest and provide exploratory and PVE experiences centered on a study of specific occupations and occupational clusters. According to MoE (2008) PVE teacher should be able to provide correct occupational information to the students. This is because career is concerned with the preparation of students for successful work life by improving the basis for their career choice and facilitates the learning of job skills.

The PVE teachers also ranked teaching problem-solving and decision-making skill among the top learning professional development needs. These findings are consistent with the findings from previous research, which surveyed career and technical education teachers in the USA. Career and technical education teachers in the USA had identified teaching problem-solving and decision making skills as one of the most pressing perceived professional development needs (Cannon, et al., 2012; Kitchel, et al., 2010). The PVE teachers perceived teaching proper safety practices among the most needed professional competencies in this category. These findings are not similar to the perceptions teachers held of their competencies for this item as identified by Cannon, et al (2012) research. Similar studies (Franklin, 2011; McKim, Saucier & Reynolds, 2010; McKim and Saucier, 2011) reported that laboratory safety was ranked by agricultural educators as one of the areas with the strongest need for professional development. However, the findings from this study are inconsistent with the findings of a study conducted by Sorensen et al, (2010) who found that utilize the community in providing opportunities for students i.e. advisory committees, agricultural organizations, etc. as the highest needed competency for professional development training needs among Utah agricultural teachers. In Jordan, Rawargah and Malkawi (2001) found that PVE teachers competencies to manage and teach in the workshop were below the minimum level.

The findings from this study revealed that PVE teachers lacked, alarmingly, the capacity to function in many areas relating to PVE workshop. Al-Sa'aideh (2008, 2010) concluded that PVE teachers' practical knowledge manifest a lot of deficiencies. A similar study by Jawarneh (2013) revealed that the current PVE teachers suffer lack of knowledge in several areas of PVE. This lack of knowledge among PVE teachers was ascribed to inefficient in-service education training which was not enough to qualify them to teach all aspects of the PVE. Al-Sa'aideh (2008, 2010) stressed the fact that PVE requires an integrated approach, since the curriculum is integrated in nature. He further emphasized that teacher of PVE needs trainings that are inter-disciplinary in nature and focuses on the practical aspects of PVE curriculum.

An interesting demographic finding of this study was the relatively high percentage of teachers (30.1%) whose highest level of education was a college diploma. This

low level of some of PVE teachers may have contributed to the findings of this study. One of the aspects of the First National Conference for Educational Reform (FNCER) conducted in Amman in 1987 was the requirement of a highly qualified teacher in every classroom (MoE, 1988). Therefore, PVE teachers should, at a minimum, hold a bachelor's degree (Al-Sa'aideh, 2002). One could infer from this finding that a significant number of PVE teachers, who as a part of professional development plans, might benefit from training and education courses that lead to the completion of a bachelor's degree, at a minimum.

Another interesting finding from this study was that although the ministry of education in Jordan stipulates that content delivered in PVE is intended to be the same regardless of students' gender (MoE, 1995), gender stereotypes related to PVE activities implemented in schools are strongly alive. PVE male teachers gravitate towards implementing PVE areas that are associated with traditionally male occupations. It seems that the implementation of "engineering skills and light maintenance" area of PVE is prevalent in male schools whereas, "the home affairs and general life skills" home economics area in PVE is exclusively implemented by female schools. These results are consistent with results obtained by Al-Sa'aideh (2010). In the case of PVE in Jordan, most of the teachers are usually prepared in particular specific areas as subject specialists (not as PVE teachers). This may lead teachers to teach in their areas of specialisation, and they may be tempted to neglect the content of other areas. This fact makes it difficult to achieve the curriculum objectives unless teachers are trained to achieve subject matter abilities in the other areas of the PVE curriculum that are irrelevant to their background specialities.

Conclusion and Recommendations

PVE teachers require in-service education related to all workshop management competencies. PVE workshops are an invaluable resource to PVE teachers. Well prepared and knowledgeable PVE teachers can safely and effectively guide students in the development of practical and hands-on skills. and. However, without competent and knowledgeable PVE teachers, the PVE workshop can quickly become an underutilized and unsafe environment. Therefore, in-service education is necessary to address discrepancies that exist between the teachers' perceived importance of PVE workshop management competencies

and their ability to perform the competencies. Based on the results of this study, the following recommendations are presented:

1. PVE Teacher educators and other educational professionals with a stake in PVE should use the results of this study as a guide in the development of future professional development activities.

2. Future research should be conducted to determine the most effective and efficient methods to meet this in-service need.

3. Different in-service training activities should be developed in harmony with schools' gender (male or female).

4. Review of pertinent research literature failed to discover studies using similar methodology in Jordan relating to PVE content areas or similar programs in the Arab world. Because of the lack of workshop management in-service needs research in PVE content areas, the methodology of this study may serve as a guide for other researchers in the profession and the findings used for comparison.

5. Researchers should use the results of this study as a guide to determine the specific content of professional development activities in order to meet the perceived in-service needs.

6. Follow-up research should be conducted in order to determine the effectiveness of any implemented professional development activities to meet the perceived in service needs of PVE teachers.

7. Researchers should determine whether a need exists to provide the appropriate courses and professional development activities at higher education institutions in order to provide teachers with an opportunity to obtain a bachelor's degree. The professional development of PVE teachers has been identified as an important priority of the national PVE research agenda (Tweissi, 2013; Al-Sa'aideh, 2011).

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الاحتياجات التدريبية لمعلمي التربية المهنية في الاردن في إدارة المشغل المهني

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ملخص

هدفت هذه الدراسة الى الكشف عن الاحتياجات التدريبية لمعلمي التربية المهنية فيما يتعلق بإدارة المشغل المهني والتدريس فيه وفقا لنموذج بوريش في تحديد الاحتياجات التدريبية. ولتحقيق أهداف الدراسة، تم بناء استبانة مكونة من مصفوفتين إحداهما تتعلق بدرجة أهمية الكفاية والأخرى تتعلق بدرجة حاجة المعلم لتلك الكفاية . ولترتيب الاحتياجات التدريبية لمعلمي التربية المهنية وفقا للأهمية ودرجة الحاجة، تم استخدام نموذج بوريش لتحديد الاحتياجات التدريبية، وذلك من خلال حساب (MWDS) "الوسط الحسابي للقيم المتباينة الموزونة" ولكل فقرة من فقرات الاستبانة. أظهرت نتائج الدراسة أن معلمي التربية المهنية لديهم احتياجات تدريبية في جميع المجالات التي احتوت عليها الاستبانة، وهي: مجال صيانة المشغل والمعدات ومجال السلامة في المشغل المهني ومجال التخطيط للتدريس في المشغل المهني ومجال التدريس في المشغل المهني. ويمكن للقائمين على تدريب معلمي التربية المهنية في أثناء الخدمة، الاستفادة من نتائج هذه الدراسة في إعداد برامج تدريبية تلبي احتياجات المعلمين.

الكلمات الدالة: معلمو التربية المهنية، تقييم الاحتياجات، نموذج بوريش لتحديد الاحتياجات.