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# Changes in Knowledge, Attitude, Skill, and Practice through Dual Training System toward Capacity Building For Entrepreneurial Community Development

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## ABSTRACT

*This article presents the analysis of the Dual Training System (DTS) approach to capacity building for entrepreneurial community development (ECD) through the Dualtech training curriculum. Descriptive method of research was used with referral system as basis for selecting respondents. Secondary data and survey questionnaires were used. Descriptive analysis was conducted using contingency tables and chi-square test. Results showed the four components of DTS training curriculum, knowledge, attitude, skill, and practice (KASP) were essential in the training program implementation. Weighted mean score showed that changes in the level of KASP of DTS respondents increased by about 50 percent. The DTS curriculum and the change in KASP were strongly associated. The changes in KASP in DTS curriculum and in the community, institution, individual/ family ECD variables were related. Changes in KASP in the ECD variables had weak to moderate association with the economic status of the respondents. The paper presents a set of recommendations to enhance the effectiveness of DTS.*

*Keywords: Attitude, Dual Training System, entrepreneurial community development, knowledge, skill, and practice*

## INTRODUCTION

### Background

### The Dual Training System (DTS)

The Dual Training System or DTS was officially adopted in the Philippines through the Dual Training System Act of 1994 which was signed into law on February 25, 1994.

The Technical Education and Skills Development Authority (TESDA) was directed by the Philippine government to oversee the DTS institutionalization in selected learning centers and technical schools nationwide. DTS is one of TESDA's enterprise-based programs whose approach is to convert selected industry practices/programs registered under the apprenticeship program into DTS modality. Instead of the regular on-the-job training, DTS was adopted.

DTS is defined under the Dual Training System Act of 1994 as an instructional delivery system of technical and vocational education and training. It is a 24-month or 2-year program that consists of a 12-month basic stage training program regularly done with in-school training and a 12-month advanced stage training program that involves both in-plant and in-school training. Training is guided by a training plan that is jointly formulated and executed by an accredited school or learning center and by the cooperating company which can be any of the accredited agricultural, industrial, and business institutions including the local government unit in the area.

Under DTS, both the establishment or company and the educational institution are tasked to equip the trainee to qualify for the job that he intends to apply for. The cooperating company provides practical training and the educational institution ensures sufficient level of specific and general theoretical instruction preparatory to employment. It is dual because it involves two parties providing instruction. Likewise, it is a system, because the two parties are functionally working together in coordinated efforts.

### Uniqueness of DTS

DTS may be considered a unique approach to capacity building. It employs the dualized training program that follows a transitory -phased implementation modality. Upon completion, DTS graduates are prepared to undergo more intensive engineering or technical training, in case they pursue higher education later. Under the dualized training program, the partnership arrangements between schools and workplace are facilitated.

As cited in its website, TESDA claims that DTS is beneficial to the students, cooperating companies, and the schools or training centers in the following ways:

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The students are able to: a) acquire quality training and proper skills, work attitude, and knowledge; b) attain enhanced employability after training; c) have better chances for career mobility; and d) earn allowance for transportation and other expenses.

The cooperating companies are able to: a) develop workers according to the company's needs; b) guarantee highly skilled and productive workers; and c) save on production cost through tax incentives.

The schools/training centers are able to: a) lessen need for sophisticated equipment and facilities; b) respond more to industries' needs; c) maximize use of equipment and facilities; d) offer better employment opportunities to graduates; e) enhance their public image; and f) enjoy tax exemption for imported equipment.

**DTS as an Enterprise-based Capacity Building Approach**

In the 8th Technical and Vocational Education and Training (TVET) forum (2008), three enterprise-based training (EBT) modalities or approaches were discussed: a) Apprenticeship/ Learnership, b) Dual training system, and c) On-the-job training (OJT). Table 1 describes the legal bases and the differences among the three approaches.

Basically, apprenticeship/learnership involves agreement between the apprentice and the establishment where one would acquire the training. Dual training focuses on the shared responsibility of the establishment and the learning institution to provide practical and theoretical training to the student. OJT is mostly focused on the exposure of students to the actual operations of the company where they are trained. While both apprenticeship and dual training approaches have legal bases, OJT is simply part of the school's curriculum.

As to the employability of DTS graduates, Ng (2007) claimed that students of Center for Industrial Technology and Enterprise (CITE) did actual work and produced real products and services. It had over 1,400 graduates who were 90 percent gainfully employed even if they were not college diploma holders. He further asserted that for the economy to develop, skills development is essential. Ng further asserted that dual training and CITE will continue to play a major role in the geographic area covered by the training.

Likewise, in a survey conducted among 512 graduates of Educational Research and Development Assistance (ERDA) Tech in May 2004 (Lighthouse Club Manila 2008), 40% furthered their studies in colleges and universities, mainly through scholarships. About 33% were working and the remaining 33% were new graduates who were waiting for the results of their applications for further studies and/or employment.

Table 1. Comparison of apprenticeship/learnership, dual training system, and on-the-job training as enterprise-based training approaches

| Enterprise-based Training Approach | Legal Basis | Description |
|---|---|---|
| Apprenticeship/ Learnership | 1. Republic Act No. 7796 (TESDA Act of 1994) and Its Implementing Rules and Regulations<br>2. P.D. No. 442 (Labor Code of the Philippines) and Its Implementing Rules and Regulations<br>3. Executive Order No. 111(Amending Certain Provisions of the Labor Code of the Philippines, As Amended) issued on December 24, 1986 | These are viewed as training and employment programs with focus on the skills acquisition of the apprentices and learners. Apprenticeship involves a contract between an apprentice and an enterprise on an approved occupation. Learnership is a practical training on learnable occupational skills which may or may not be supplemented by related theoretical instruction. |
| Dual training system | 1. Republic Act No. 7796 (TESDA Act of 1994) and Its Implementing Rules and Regulations<br>2. Republic Act No. 7686 (DTS Act of 1994) and Its Implementing Rules and Regulations | DTS is implemented using the Dualized Training Program (DTP) which is a transitory-phased implementation strategy. The establishments and educational institutions share the responsibility of developing in the trainee the best possible qualifications through practical training and theoretical instruction |
| OJT | Part of institution's curriculum | The On-the-Job Training (OJT) Program is normally part of the curriculum of the technical vocational institutions where students are exposed to actual operations in selected companies. OJT is hands-on training and the students are introduced to the values of discipline, hard work, and labor. The students may or may not be given allowance by participating companies. |

**KASP in the Context of Entrepreneurial Capacity**

Krathwohl *et al.* (1964) explained that there are three major domains or classifications or taxonomy of education: cognitive, affective, and psychomotor. The KASP model of education was interpreted by Torres (2000) using the term knowledge, skill, and attitude (KAS) to refer to the cognitive, psychomotor, and affective educational domains, respectively. These educational domains were also cited by Clark (1999) when he identified three domains of educational activities.

Kolb, as cited by Chapman (2003), emphasized the 'cycle of learning' as a central principle in his experiential learning theory which consisted of four-stage cycle of learning; 'immediate or concrete experiences' become the basis for 'observations and reflections'. These 'observations and reflections' are assimilated and refined into 'abstract concepts' that produce new implications for action to be 'actively tested' creating new experiences. Although Krathwohl *et al.* (1964) did not emphasize 'practice' as an important element of the learning process, Kolb explained 'active experimentation' which could be related to P for 'practice.'

In the present study, KASP was used as a determinant of one's capacity to analyze DTS in individual, institutional, and community contexts, where respondents assess their own entrepreneurial capacity or potential.

**Entrepreneurial Community Development**

Mellor et al. (2009) stated that entrepreneurship is the creation of new things that provide the emergence of new innovations, commodities, techniques, and goods which can lead to the extinction of old branches of an industry. Accordingly, several factors are needed to form a successful enterprise, namely: a) bright technology-based idea, b) capacity of people involved to bring it forward, and c) presence of a network. He believed that finding finance, which is a major problem of budding entrepreneurs, can be resolved by combining and applying the second and third factors. This indicates the importance of both people's capacity and network in pushing for entrepreneurship.

According to Maiese (2005), the term capacity-building is used in numerous contexts to describe a wide array of activities. In general, one's ability to solve problems and achieve objectives determines capacity. To build one's capacity is to strengthen one's ability to work with others for their mutual benefit and the necessary skills and tools to identify and resolve problems and issues.

One has to achieve his full potential as an individual, in particular, and as a community member, in general. Such necessitates knowledge and technical skills; institutional and organizational capacity; and the ability to prevent, manage, and resolve conflicts. It involves skills transfer, training, human resource management, organizational development, and strengthening of communities and social networks.

Being an enterprise-based training, DTS may be considered as a capacity-building approach to entrepreneurial community development (ECD). ECD pertains to the dynamics of various components and activities that would increase or change the entrepreneurial potentialities of an individual, family, and institution. Entrepreneurial community is referred to as a community that strives in stimulating or enabling its stakeholders to be active in entrepreneurial community activities. Meanwhile, community entrepreneurship refers to the respondents' perceived level of KASP in creating favorable climate for putting up a business.

**DTS in Dualtech Training Program**

Long before the DTS Act was signed into law, DTS had been implemented by the Dualtech Training Center (Dualtech) after it was introduced to the Philippines by the Hanns Seidel Foundation of Germany in 1982. Other training centers and schools implementing DTS were offshoots of the Dualtech's DTS. Technically, DTS has been practiced in the country for more than 25 years. Records show that it has 6,500 graduates, in which 1,300 were registered in its alumni center.

***Dualtech vision and mission.*** The vision and mission of the Dualtech Training Center is to "contribute to the common good by developing young people through the dual training system to become quality-trained, skilled, productive, enlightened, and morally upright persons fulfilling the needs of the industry and the community they serve".

The above vision-mission emphasizes that Dualtech would not only focus its effort to address the skills training needs of the students but would also inculcate positive values to produce morally upright individuals.

***The Dualtech program.*** The Dualtech Center offers a two-year Diploma course in Electromechanics Technology. To qualify in the Program, an applicant must satisfy the following requirements: a) be a high school graduate, b)16 – 24 years of age, c) male, d) single, e) physically fit, f) pass the computer-based entrance examination (Math and English), and g) pass the interview with commitment of parents/guardian.

The program prepares the scholars in handling the repair and maintenance of various industrial equipment and facilities in the manufacturing firms. It combines electrical, mechanical, and electronics technologies for an all-round multi-skilled worker. It aims to train scholars to be capable of working as industrial workers in a manufacturing environment.

The technical training program consisted of two phases using the day-release scheme under the Dual Training System. The first phase is the six-month Basic Skills Training Program (BSTP) where the scholar spends full-time for the in-school training. The second phase is the 18-month Advanced Skills Training Program (ASTP) where every week, scholars report to the company for five days for the in-plant training and then report to the school for one day for the in-school training.

***The dual training system (DTS) approach.*** Dualtech Center's approach to training and education is guided by the following principles of the Dual Training System:

a. DTS is Market Oriented. It is geared towards the training of skilled workers according to the demands of the employers.
b. It is a Partnership. DTS is a close partnership between the employment and educational systems. Constant effort to maintain that partnership in good standing is a must.
c. DTS applies Learning-by-Doing. DTS exposes the trainee to the actual work situation and enhances learning under realistic industry conditions.
d. DTS inherently depends on Private Sector Leadership. The private-sector industries, with their concern for maximum productivity and growth, should dictate the pace of the system's development. Without private-sector leadership cooperation, DTS will not work.
e. There should be social acceptance of the training system.
f. Companies share the cost of both in-school and in-plant training. This allows the school to give good quality training and enables both the company and the school to support the trainee with an allowance during the program.
g. The basic legal framework, which is Republic Act 7686, also known as the Dual Training System Act of 1994, is critical and provides the needed policy context wherein the long-term growth and development of the system is anchored on protecting and enhancing the vital roles of all the partners.

**Roles of Major Stakeholders**

***Roles of educational institution.*** By ensuring the direction of Dualtech for sustainability and achievement of its vision and mission, the Board of Directors of the educational institution designs the strategies and approves major changes in the organization. It examines and approves supplemental decisions for the plan. It even administers and helps the staff to market the DTS program. In other words, the Board is the one which sets the outcome and desired results of the DTS program while the staff or the employees make sure of its execution.

***Roles of cooperating industrial companies.*** The cooperating companies support the Dualtech program by accepting trainees for the in-plant training and shoulder obligations stipulated in a Memorandum of Agreement between them and Dualtech. This participation in this development undertaking could be part of the company's Corporate Social Responsibility or CSR. They are expected to follow the program which is based on the DTS. Indirectly, Dualtech becomes a conduit of these companies for their CSR programs which is in line with that of the Philippine Business for Social Progress or PBSP.

***Roles of students and graduates.*** Students are given orientation at the start and even during the program. Discussions on training policies and others are done from time-to-time to ensure that the students perform their duties and responsibilities both in the school and in the company.

The graduates of Dualtech are encouraged to support Dualtech and its undertakings. Starting from an initial interview with any of the managers of Dualtech, it is emphasized that that the would -be graduates are as important as the cooperating companies in helping Dualtech in the conduct of its operations.

**Objectives**

The present study was done to analyze DTS as an approach to capacity building for ECD through the Dualtech training curriculum. Specifically, it aimed to:

1. determine the socio-demographic profile and the economic status of the respondents;
2. analyze the perceived changes in the level of KASP of the respondents through DTS;
3. analyze the relationship of perceived changes in KASP to economic empowerment status of the respondents and to selected DTS ECD variables; and
4. assess the effectiveness of DTS measured in terms of the level of KASP as an approach to capacity-building for ECD.

**Framework**

Figure 1 shows the study's framework presenting the variables analyzed.. The socio-demographic profile and economic empowerment status of the respondents were determined. These variables were considered related to the change in their level of KASP in the DTS curriculum and in selected ECD variables. Particularly, the socio-demographic variables included the respondents' age, civil status, and year graduated. Meanwhile, economic variables included the respondents' monthly income, number of years employed, and position in the company.

The DTS approach as implemented by the Dualtech Training Center with specific set of components (training methodology, course delivery, major subject areas, and competency assessment variables) were used in the study.

For this study, the DTS components were used as the independent variables which could have affected selected dependent ECD variables. These served as bases to determine the changes in KASP among graduates before and after undergoing the Dualtech program or the DTS.

DTS became the basis in analyzing the changes in the level of KASP as perceived by the respondents and the extent of these changes were analyzed. Increase in the level of KASP was considered an improvement in the respondent's capacity to perform specific occupations and to become a productive member of the family and community.

The relationship between perceived changes in KASP to economic empowerment of the respondents and to selected DTS

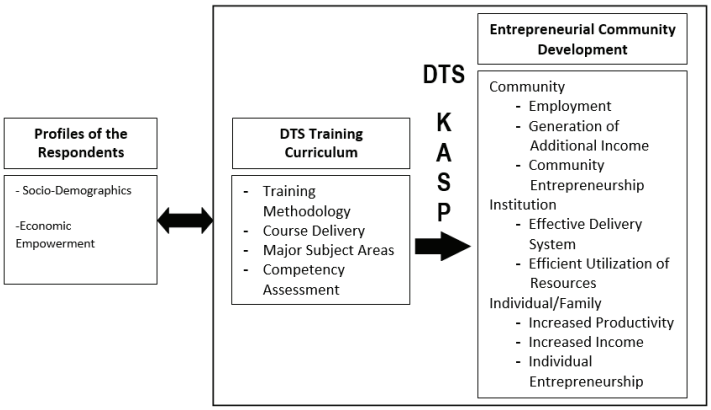


Figure 1. Conceptual framework showing the variables related to change in Dual Training System Knowledge, Attitude, Skill, and Practice (DTS-KASP) in entrepreneurial community development

ECD variables was analyzed. The corresponding changes in KASP levels achieved through DTS were determined, and correlated with economic empowerment of the respondents and selected ECD variables. The changes in KASP levels were deemed affected by the number of years of employment and the increase in income of the respondents. Also, these changes were also found to be related to the individual/family, institution, and community ECD variables.

Perceptions of impact on the individual/family, institution, and community variables indicated by changes in KASP of the graduates were evaluated. Changes in the graduates' KASP as these relate to the community were assessed in terms of employment, generation of additional income, and community entrepreneurship. Meanwhile, changes in KASP in terms of service delivery system and utilization of resources in the present company of the graduates were studied. Lastly, changes in KASP as these relate to the individual/family in terms of productivity, income, and entrepreneurship were also observed.

The observed changes in KASP levels were used to determine the overall effectiveness of DTS as an approach to capacity-building for ECD.

## METHODOLOGY

A descriptive method of research, specifically survey, was used covering primarily the CALABARZON areas where Dualtech Center and the cooperating companies were located. Other respondents who were residing in the Metro Manila area, Catanduanes, and China were also included as they were in the list referred to by the Dualtech Office. Only one respondent was from China and it was deemed that this difference in setting would not have a great impact on the research results. Hence, the place of work was not considered as a hindering factor to the study. The respondents came from an estimated population of more than 6,500 graduates of Dualtech Center. Most of the respondents were working in 10 selected DTS cooperating companies.

Referral system was used to select a minimum of 132 respondents. The assistance of the Dualtech graduates office was sought in locating graduates for efficient gathering of information. Sources of secondary data included relevant records and other historical facts. Surveys were conducted through questionnaires using various channels such as e-mails and hand-carried letters to speed up the data collection. These were followed up by phone calls.

The results were interpreted, described, and analyzed using contingency tables. Phi coefficient was used to determine relationships among variables. The magnitude of relationship was defined as follows:

Weak association : with phi coefficient of 0 to <0.1
Moderate association : with phi coefficient of 0.1 to 0.3
Strong association : with phi coefficient of > 0.3\

The set of questionnaire was designed to determine the change in the knowledge, attitude, skill, and practice of Dualtech graduates and the contributions of the DTS curriculum to the entrepreneurial KASP of the respondents as they relate to the community, the institution/company, and the respondents as individuals and to his family.

## RESULTS AND DISCUSSION

### Socio-Demographics of Respondents

Table 2 shows majority (68%) of the respondents were living in Laguna, followed by 14% from Batangas, and 5% from Manila. Two respondents were living in Catanduanes and abroad (China), respectively. Most of the respondents were absorbed by the cooperating companies after graduating from the DTS training.

Table 3 also shows that 38% of the respondents were in their early to mid-20s and majority (68%) were single. Likewise, respondents were occupying the following positions: supervisor, assembler, checker, operator, junior technician, m/c operator, water treatment operator, maintenance technician, engineering technician, technology manager, aircraft mechanic, equipment engineering supervisor, and others while some were assigned as income generating project officer and learning facilitator, etc.

### Economic Status of Respondents

With regard to economic status of the respondents, 48% had been working for at least two years as shown in Table 4. There were 40% who had monthly income of less than P10,000 as shown in Table 5. In relation to their age range and their number of years in the company, majority were still starting in their careers. Also, since DTS is a vocational course, graduates were initially given blue collar jobs that earned low compensation. But it was deemed that these data had little bearing on the capacity of the DTS graduates in their area of expertise and their potential to earn more in the future.

Table 2. Profile of the graduate-respondents by location or address (N=132)

| Location | Frequency | % |
|---|---|---|
| Cavite | 5 | 4 |
| Laguna | 87 | 68 |
| Batangas | 18 | 14 |
| Rizal | 4 | 3 |
| Quezon | 3 | 2 |
| Manila | 7 | 5 |
| Bulacan | 2 | 2 |
| Catanduanes | 1 | 1 |
| China | 1 | 1 |
| **Total** | **128** | **100** |

Table 3. Profile of the graduate-respondents by age and civil status (N=132)

| Respondents | Age Range | | | | | Civil Status | |
|---|---|---|---|---|---|---|---|
| | 16-20 | 21-25 | 26-30 | 31-35 | 36-40 | Single | Married |
| Graduate-respondents | 36 | 50 | 28 | 11 | 7 | 90 | 35 |
| Percentage | 27 | 38 | 21 | 8 | 5 | 68 | 27 |

Table 4. Profile of the graduate-respondents by their number of years in the company (N=132)

| No. of Years in the company | Frequency | % |
|---|---|---|
| 2 yrs and above | 64 | 48.48 |
| below 2 yrs. | 35 | 26.52 |
| No data | 26 | 19.70 |
| Not applicable | 7 | 5.30 |
| **Total** | **132** | **100.00** |

Table 5. Profile of the graduate-respondents by their monthly income (N=132).

| MONTHLY INCOME RANGE | FREQUENCY | % |
|---|---|---|
| 1 - Below 10,000 per month | 53 | 40.15 |
| 2 - 10,000 to 15,000 | 45 | 34.09 |
| 3 - 16,000 to 20,000 | 14 | 10.61 |
| 4 - 21,000 to 25,000 | 4 | 3.03 |
| 5 - 26,000 to 30,000 | 2 | 1.52 |
| 6 - 30,000 above | 4 | 3.03 |
| No data | 5 | 3.79 |
| Not applicable | 5 | 3.79 |
| **Total** | **132** | **100** |

**Change in the Level of KASP**

Graduates of the DTS program were made to respond to one set of questionnaires where they would provide their own perception of their KASP before and after the DTS program. The change in the level of KASP of the respondents before and after undergoing DTS training was determined. Respondents answered questions by choosing from the following: 1=never, 2=rarely, 3=occasionally, 4=most of the time, and 5=always. The weighted mean of the responses was computed and percentage increases were determined. The overall percentage change in the level of KASP was measured by calculating the difference between the percentage of the scores before and after the DTS training.. The summary of the overall mean of incremental changes in the level of KASP of the respondents is shown in Table 6.

***Incremental change in the level of KASP in the DTS curriculum.*** The change in the level of knowledge relative to technical concepts had an overall mean of 55.85%. The change in attitude was at 42.95%, the level of skills was 56.17% while the corresponding change in the level of practice was 59.78 %.The increases in the levels of KASP showed that the DTS curriculum implementation contributed to the improvement of the entrepreneurial capacity of graduates by as much as 42-59 percent.

***Incremental change in the level of KASP in communities ECD variable.*** In terms of the level of KASP of respondents with respect to technical jobs, income generating activity, and enterprise establishment, the level of knowledge had an overall percentage change of 62.64. The level of positive attitude toward technical jobs available, potential income generating activity and enterprise establishment had an overall percentage change of 54.80. Their level of skill in the community variable had an overall percentage increase of 64 while the percentage change in the level of practice in the same area was at 57.77. The above positive changes in the level of KASP imply that the respondents had enhanced their entrepreneurial capacity by about 54-64%. They can better recognize potential jobs, income-generating projects, and community enterprises that match their capabilities.

***Incremental change in the level of KASP in the institution ECD variable.*** The overall percentage change in the level of knowledge of the respondents on measures for effective delivery of output and ways for efficient use of resources in their respective institutions was 69.17. With regard to their levels of attitude toward the same areas, the overall percentage change was 53.36. Their level of skill in the same areas had an overall percentage change of 52.59. Lastly, the levels of practice had an overall percentage change of 59.23. These increases indicate improved ability to help manage their respective work activities and later on in managing their own enterprises.

***Incremental change in the level of KASP in the family/ individual ECD variable.*** There was a 61.97% change in the respondents' level of knowledge in identifying means to in-

Table 6. Summary of the change in the level KASP in the DTS curriculum and selected ECD variables (N=132)

| DTS Curriculum and ECD Variables | Knowledge | Attitude | Skill | Practice |
|---|---|---|---|---|
| Change in the level of KASP in DTS curriculum | 55.85 | 42.95 | 56.17 | 59.78 |
| Change in the level of KASP in community variable | 62.64 | 54.80 | 64.00 | 57.77 |
| Change in the level of KASP in institution variable | 69.17 | 53.36 | 52.59 | 59.23 |
| Change in the level of KASP in family/ individual variable | 61.97 | 52.84 | 58.88 | 57. 48 |

crease productivity, determining opportunities to increase in income, and identifying potential business for oneself and family. Changes in attitude towards the same areas differed by of 52.84% while the changes in the level of skills were at 58.88%. Finally, the changes in the level of practice of the respondents which involved constant assessment of means to increase productivity, increase in family income, and actually run a business for oneself and family, were at 57.48%. The positive changes in the level of KASP ranging from 52 to 61 percent indicate that there was an improvement in the entrepreneurial capacity of the respondents to determine opportunities for an increase in income, identify means to increase productivity, and identify potential business for himself and for the family.

Essentially, there were positive changes in the level of KASP of the DTS respondents in relation to DTS curriculum, community, institution, and individual ECD variables. The increase in the level of KASP ranging from 42-69 percent shows how the DTS curriculum had contributed to the noticeable improvement in the respondents' entrepreneurial capacity. Likewise, their level of KASP in terms of community, institution, and individual/family entrepreneurial capacity had improved through DTS, based on the respondents' own perception.

**Association of Respondents' Economic Status to the Change in the Level of KASP**

Association between the two economic variables (number of years in the company and monthly income) and the change in the level of KASP on ECD at the community level, institution level, and individual/family level were determined. Phi-coefficients of the variables were derived and analyzed.

In Table 7, there was a positively moderate association between the number of years in the company and attitude in community ECD variable while there was a negatively moderate association between the number of years in the company and the skill variables. This would mean that as the number of years increased, the rating for skill in community ECD variable decreased. This could be because long years of employment in their companies made the respondents more focused on their assigned work with less opportunity to practice their skills in their respective communities. Table 7 also shows that between monthly income and the change in the level of knowledge in community ECD variable, there was a moderate association in the knowledge level and in the skill levels. As the respondents' monthly income increased, rating of their knowledge in community ECD variable also increased. This was observed among the respondents with an increase in income because they may already have the opportunity to invest in other potential businesses in their community.

Table 8 indicates that there was a moderate association between the number of years in the company and in the change in the level of skill of respondents in institution ECD variable. This may mean that most respondents who stayed longer in their companies tend to rate the change in institutional skills higher, along with other KASP variables. This could be brought about by the respondents' confidence in their skill due to constant application in their respective places of work or institution. However, Table 8 shows that between monthly income and the change in the level of skills of respondents as they relate to the institution, there was only moderate association.

Table 9 shows that there was a moderate association between the number of years in the company and in the knowledge level in individual/family ECD variable. As the number of years in the company increased, the rating for this variable also increased. Most respondents who stayed longer in their companies tended to rate the change in knowledge in the individual/family ECD variable higher. This could be due to the respondents' perceived stability in their present work. They manage to allocate time looking for other business opportunities for the family when they retire from work. Table 9 indicates that there was a moderate association in the monthly income and the knowledge level in individual/family ECD variable which means that as the monthly income of the respondents increased, rating of the knowledge level also increased. Higher monthly income may be considered a reward that would let the respondents aspire to improve their productivity. The monetary gain would also empower the respondents to save and invest in other income-generating activities for the family.

It can be seen in Table 10 that the association between the economic empowerment variables and the change in the level of KASP in selected ECD variables was generally weak. Meanwhile, the degree of association between the number of years and the overall change in the level of KASP of respondents in the selected ECD variables had 78.125 percent weak associations and 21.875 percent moderate associations. Furthermore, it can be observed that the monthly income and the overall change in the level of KASP of respondents indicate that 56.25 percent were in weak associations and only 43.75 percent were in moderate associations. The above results imply that the changes in the level of KASP of the respondents after undergoing DTS training were not associated with how long they had been working, nor with ing, nor with the size of their earnings. The study

Table 7. Association between the economic empowerment of respondents and the change in their level of KASP on entrepreneurial community development at the community level (N=132).

| Category | Number of Years in the Company | Monthly Income |
|---|---|---|
| **Knowledge** | | |
| • I can identify technical jobs in the community that match my capabilities. | 0.0343 | 0.1394 |
| • I can identify additional income generating activity in the community. | 0.0343 | 0.1394 |
| • I can recognize the community's potential for entrepreneurship establishment. | -0.0373 | -0.0029 |
| • I am pleased with the available technical jobs in the community that match my capabilities. | -0.0216 | 0.0409 |
| • I like the existence of potential income generating activity in the community. | 0.1004 | 0.0988 |
| • I appreciate the community's potential for entrepreneurship establishment. | -0.0088 | 0.0971 |
| • I can execute the technical jobs in the community that match my capabilities. | 0.0762 | 0.1394 |
| • I can put up an additional income generating activity. | -0.0353 | -0.0361 |
| • I can put up a business conforming with the conditions of community entrepreneurship | -0.1106 | -0.1358 |
| • I always examine the technical jobs in the community that match my capabilities | -0.0495 | 0.0608 |
| • I always evaluate potential income generating activity in the community. | -0.0473 | 0.0609 |
| • I always consider community entrepreneurship in putting up a business. | -0.0341 | 0.0960 |

*Adjectival Rating: 0 - <0.1 – Weak association; 0.1– 0.3 – Moderate Association; >0.3 – Strong Association*

Table 8. Association between economic empowerment of respondents and the change in their level of KASP on the entrepreneurial community development at the institution level (N=132).

| Category | Number of Years in the Company Phi Coefficient | Monthly Income Phi Coefficient |
|---|---|---|
| **Knowledge** | | |
| • I determine measures for effective delivery of output. | 0.1008 | 0.1267 |
| • I establish ways for efficient use of resources. | 0.1266 | 0.1174 |
| **Attitude** | | |
| • I like the idea of a good delivery system. | 0.0636 | 0.0409 |
| • I support efficient use of resources. | 0.0472 | 0.1188 |
| **Skill** | | |
| • I apply appropriate measures for effective delivery of output. | 0.1600 | 0.2574 |
| • I implement procedures for efficient use of resources. | -0.0051 | 0.0253 |
| **Practice** | | |
| • I always apply principles of effective delivery system. | 0.0814 | 0.1235 |
| • I always observe procedures for efficient use of resources. | 0.1033 | 0.1676 |

*Adjectival Rating: 0 - <0.1 – Weak association; 0.1– 0.3 – Moderate Association; >0.3 – Strong Association*

Table 9. Association between the economic empowerment of respondents and the change in their level of KASP on entrepreneurial community development at the individual/family level (N=132)

| Category | Number of Years in the Company Phi Coefficient | Monthly Income Phi Coefficient |
|---|---|---|
| **Knowledge** | | |
| • I identify means to increase my productivity. | 0.1225 | 0.1760 |
| • I determine opportunities for increase in income. | 0.0901 | 0.1102 |
| • I identify potential business for myself and for the family. | 0.0511 | 0.1485 |
| **Attitude** | | |
| • I am inclined to find ways to increase my productivity. | -0.0197 | 0.1077 |
| • I aspire for possible opportunities to increase my/family income. | -0.0490 | 0.0375 |
| • I aspire to put up a business for myself | -0.0566 | 0.0660 |
| **Skill** | | |
| • I can execute means to increase my productivity. | 0.0059 | 0.0413 |
| • I can find ways to increase my income. | 0.0210 | 0.0009 |
| • I can put up a business for myself and | -0.0756 | 0.0480 |
| **Practice** | | |
| • I constantly assess available means to increase my productivity. | -0.0192 | -0.0025 |
| • I always find ways to increase income for myself and the family. | -0.0070 | 0.0820 |
| • I am running a business for myself and the family. | -0.0473 | -0.0115 |

Adjectival Rating: 0 - <0.1 – Weak association; 0.1– 0.3 – Moderate Association; >0.3 – Strong Association

Table 10. Summary of associations between the respondents' economic empowerment and the change in their level of KASP in selected DTS entrepreneurial community development variables

| Description | Number of Years in the Company and KASP Categories | | Monthly Income and KASP Categories | |
|---|---|---|---|---|
| | Freq | % | Freq | % |
| Weak Association | 25 | 78.125 | 18 | 56.25 |
| Moderate Association | 7 | 21.875 | 14 | 43.75 |
| Strong Association | | | | |
| Total | 32 | 100 | 32 | 100 |

further analyzed other factors such as the relationship between the perceived changes in KASP and the selected DTS ECD.

**Associations between Change in the Level of KASP in DTS Curriculum and ECD Variables**

Phi coefficients were derived to determine the association between the change in the level of KASP in the DTS curriculum and selected ECD variables such as community, institution, and individual/family variables. Table 11 summarizes these associations. Out of 40 items referring to association in terms of change in the level of knowledge, 23 had strong associations in the community, institution, and individual/family variables. Table 11 also shows that in the attitude variable, 36 out of 40 items observed showed strong association, which could indicate the DTS curriculum's capacity for attitudinal formation. This shows a high level of influence of the DTS curriculum on the attitude of respondents, particularly in the community and individual/family variables. This is followed by 30 strong associations in terms of the skill variable and the practice variable with 27 strong associations. The above results indicate that more than 50 percent of items referring to associations between the level of KASP in the DTS curriculum and the selected ECD variables can be considered as statistically strong relationships.

The results also show that the changes in the level of KASP in the DTS training curriculum are proportionate to the changes in the level of KASP in ECD variables. This implies that there is matching in capabilities of the respondents to the needs of the community, institution, and family/individual. This may also mean that the curriculum contributed to the graduate respondents' entrepreneurial capacity as manifested through the changes in their KASP levels.

The marked changes in the respondents' KASP through DTS indicate the effectiveness of DTS, evident in the strong associations between the DTS curriculum and the selected ECD variables particularly in the community, institution, and individual/family variables.

Table 11. Summary of associations between the change in the level of KASP of the respondents in the DTS curriculum and selected ECD variables(N=132)

| ECD Variable | Associations to DTS Curriculum in terms of Change in the Level of KASP | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Knowledge | | | Attitude | | | Skill | | | Practice | | |
| | Weak | Moderate | Strong | Weak | Moderate | Strong | Weak | Moderate | Strong | Weak | Moderate | Strong |
| Community | 2 | 5 | 8 | 0 | 1 | 14 | 0 | 4 | 11 | 0 | 0 | 15 |
| Institution | 0 | 3 | 7 | 0 | 1 | 9 | 0 | 4 | 6 | 0 | 3 | 7 |
| Individual/ | 1 | 6 | 8 | 0 | 2 | 13 | 0 | 2 | 13 | 0 | 10 | 5 |
| No. of Phi | 3 | 14 | 23 | 0 | 4 | 36 | 0 | 10 | 30 | 0 | 13 | 27 |
| Total | | 40 | | | 40 | | | 40 | | | 40 | |

*Adjectival Rating: 0 - <0.1 – Weak association; 0.1– 0.3 – Moderate Association; >0.3 – Strong Association*

## CONCLUSIONS

**The socio-demographic and the economic empowerment of the respondents.** DTS respondents from Dualtech were generally from Laguna, young, single, occupying positions ranging from supervisory to technicians, working for at least two years in blue collar jobs, and with relatively low monthly income of PhP 10,000.

**Perceived changes in the level of KASP of the respondents through DTS.** The respondents perceived changes in their level of KASP after attending DTS training. The changes in KASP are mainly attributed to the DTS curriculum and the ECD variables at the individual/family, institution, and community levels.

There is a strong association between the DTS curriculum and the change in attitude as well as in change in skill, knowledge, and practice, respectively.

**Relationship of changes in KASP to economic status and selected DTS ECD variables.** There is a weak to moderate relationship between the ECD variables and the economic variables such as number of years in the company and the monthly income. This means that the changes in the level of KASP in the ECD variables may not be directly affected by the economic status of the respondents.

**Effectiveness of DTS in terms of increase in the level of KASP.** Given the above results, it can be concluded that DTS as an approach is effective in capacity building for entrepreneurial capacity development. It may also be applicable to other areas of discipline such as agriculture and forestry, as a learning approach that endeavors to improve the entrepreneurial capacity of students.

## RECOMMENDATIONS

The result of the study can be helpful in revisiting the current policy on course completion requiring practicum/OJT and consider DTS as a means to offer undergraduate or diploma courses designed to develop trained personnel in forestry and ecosystems management.

Since DTS is an approach to capacity building, as represented by the increase in the level of knowledge, skills, practice, and attitude, it can be used as an alternative approach to the conventional classroom learning in any discipline. Particularly, scientific and technical courses such as agriculture, forestry, natural resources, and environment may apply DTS as an approach to learning. The approach may not only equip the students/trainees intellectually but may also improve their entrepreneurial capacity. Graduates may have the opportunities not only as researchers and scientists but also as entrepreneurs. For the state universities and colleges, they may be able to use their improved entrepreneurial capacity to promote mature technologies that they were able to develop and thus contribute to their community's development. DTS can also be applied in extension activities for capacitating extension workers, technicians, target learners, and others.

DTS as an approach was observed to engender positive changes in the level of KASP of the respondents and considered effective approach to learning although DTS implementers should still seek for more ways to strengthen the DTS program and its components in relation to the ECD of students or trainees by instituting the following:

a. implement intensive orientation on the roles of DTS implementers and its cooperating companies DTS;
b. install motivational mechanisms such as courses and activities related to financial management, capital sourcing,

feasibility studies, attendance to trade fairs, etc. to strengthen the concept of entrepreneurship;

c. teach the students not just to become technicians but also to find other work or possible business opportunities;
d. allot schedules to continuously reinforce the work values and cultural formation of the trainees/students;
e. acquire new training equipment as needed to supply technical training requirements; and
f. allocate more funds for technology enhancement.

The contributory factors in curriculum effectiveness included values and cultural formation and strict application and recognition of human and spiritual development of the trainees and DTS implementers. This would also inspire cooperating companies to see DTS as an alternative program for future technical workers.

To get the actual perceptions of all Dualtech graduates, further studies should be designed in such a way that majority of the graduates will be reached by surveys.

Implementers of the K to 12 program may consider adopting the DTS curriculum in designing high school curriculum in preparation for vocational courses or college degrees. These institutions may collaborate with TESDA or the Dualtech center for possible training and/or mentoring.

Further research should consider the involvement of cooperating companies and other stakeholders such as TESDA, parents, and other technical schools in the DTS implementation. Further studies could use other quantitative methods and deep qualitative research to probe deeper on the effectiveness of the DTS approach for ECD.

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