

**The Framework for Effective Collaboration between Public Training
Institutions and Private Industries in the Context of National Dual Training
System (NDTS) Environment in Malaysia**

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ABSTRACT

The introduction of National Dual Training System (NDTS) in the Malaysian VET system to develop self-reliant and highly skilled workers to continually meet technological advancement needs of the industry is indeed timely. The Malaysian government wants to ensure the private industry and public training institutions (PUTRI) collaborate successfully towards developing the desired human resource talent pool capable of raising the income and economic status of the country to international standard. The private industries and PUTRI should be inspired and guided by the national human resource vision and collaborate through the dual system by sharing resources, expertise, facilities, information, and funds to develop the highly skilled workers. The purpose of this study is mainly to identify the key factors that have the strong potential to form the effective framework for the desired collaboration between public training institutions and private industries. With such framework the collaborative partners can ensure that the dual system implementation can benefit the learning process of their apprentices whose success will be paramount to serve the interests of all parties involved, including those of our national interests.

This research will identify several key factors that will form the framework for the dual system collaboration. The identified key factors are namely, a) Goal setting, b) Partnership development, c) Collaboration management, d) Impact of learning and competence, e) Evaluation of collaborative performance and dual system in use. This research engaged 23 interviews, 100 survey questionnaires and 4 focus group discussions and workshops. The results showed that the significant factors such as the importance of goal-setting, development of partnerships, partnership management, the impact of learning and skills development are most critical in the formation of collaboration framework.

Finally, the recommended framework has been subjected to rigorous scrutiny and gained approval by both practitioners and experts that it is applicable to our NDTS collaboration.

ABSTRAK

Pelaksanaan Sistem Latihan Dual Nasional (SLDN) dalam sistem latihan dan pendidikan vokasional Malaysia adalah untuk membangunkan pekerja yang berdikari dan berkemahiran tinggi untuk terus memenuhi keperluan kemajuan teknologi industri sememangnya tepat pada masanya. Kerajaan Malaysia ingin memastikan pihak industri dan institusi-institusi latihan kemahiran awam (ILKA) dapat bekerjasama dengan jayanya ke arah membangunkan sumber manusia mahir yang diingini yang mampu meningkatkan pendapatan dan status ekonomi negara bertaraf antarabangsa. Pihak industri dan ILKA perlu mempunyai inspirasi dan dipandu oleh wawasan sumber manusia negara dan bekerjasama melalui sistem SLDN dengan berkongsi sumber-sumber, kepakaran, kemudahan, maklumat, dan dana untuk membangunkan pekerja yang berkemahiran tinggi. Tujuan utama kajian ini adalah untuk mengenalpasti faktor-faktor utama yang mempunyai potensi yang kuat untuk membentuk rangkakerja yang berkesan bagi kerjasama yang diingini antara institusi latihan kemahiran awam dan industri. Dengan wujudnya rangkakerja itu rakan-rakan kerjasama boleh memastikan pelaksanaan latihan dual sistem yang berkesan dan boleh memberi manfaat kepada proses pembelajaran perantis yang mana kerjaya mereka akan mengutamakan perkhidmatan terbaik dan kepentingan semua pihak yang terlibat, termasuk kepentingan Negara.

Kajian ini akan mengenalpasti beberapa faktor utama yang akan membentuk rangkakerja untuk kerjasama dalam melaksanakan latihan dual sistem. Faktor-faktor utama yang telah dikenalpasti iaitu, a) Penetapan matlamat, b) Pembangunan perkongsian, c) Pengurusan kerjasama, d) Kesan pembelajaran dan kecekapan, e) Penilaian prestasi kerjasama dan sistem latihan dual yang digunakan. Kajian ini menggunakan 23 temubual, 100 soal selidik dan empat (4) perbincangan kumpulan fokus dan bengkel. Hasil kajian menunjukkan bahawa faktor-faktor penting seperti kepentingan menetapkan matlamat, pembangunan perkongsian, pengurusan perkongsian, kesan pembelajaran dan pembangunan kemahiran adalah yang paling kritikal dalam pembentukan rangkakerja kerjasama.

Sehubungan dengan ini rangkakerja yang dicadangkan telah melalui proses semakan dan penelitian yang rapi dan mendapat kelulusan oleh pengamal dan pakar-pakar bahawa ia boleh digunakan untuk kerjasama SLDN.

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LIST OF ABBREVIATION

BiBB	- Federal Institute for Vocational Training / Bundesinstitut für Berufsbildung, Bonn
BMBF	- Federal Ministry of Education and research, Berlin.
CIDB	- Construction Industry Development Board
DACUM	- Development of Curriculum
DSD	- Department of Skills Development or JPK
DSE	- Dual System Expert
ECCI	- European Chamber of Commerce and Industry
ERC	- Evaluation of Regional Collaboration tool
FAME	- Flexibility and Mobility in the European Labour Market
IKBN	- National Youth Skills Institute, Ministry of Youth and Sport
IKM	- MARA Skills Institute
ILJTM	- Industrial Training Institutions of Manpower Department
ITI	- Industrial Training Institute
JICA	- Japanese International Cooperation Agency
MD	- Manpower Department
MoHR	- Ministry of Human Resource,
NVTC	- National Vocational Training Council
NDTS	- National Dual Training System
NASDA	- National Skills Development Act 2006 (Act 652)
NOSS	- National Occupational Skill Standard
OECD	- Overseas Educational Cooperation Development
PUTRI	- Public Training Institute
PPP	- Public Private Partnership
SPM	- Sijil Pelajaran Malaysia (Malaysia Certificate of Education)
TAC	- Technical Advisory Committee
TVET	- Technical Vocational Education and Training
VET	- Vocational education and training
WPL	- Workplace Learning

CHAPTER 1

THE SCIENTIFIC AND PRACTICAL RELEVANCE FOR RESEARCH INTEREST

1.1 Introduction

The importance of collaboration between public training institutes and industry with regard to training for apprentices has been a subject of considerable debate in policy, business and industrial research. In organizational theory, as well as in organizational practice, increasing importance is attached to the concept of cooperation (Clases and Wehner 2004, p.99). Active cooperation between companies and vocational schools can have a significant impact on the learning progress of the beginner vocational trainee. Restructuring work-learning tasks (WLT) promotes a holistic education in school-based education and work place learning. In this way, a better adjustment of integration of academic and experiential learning to achieve an effective collaboration can be designed. A study by Heinemann and Rauner (2009) described knowledge for practical actions should involve planning, preparation, self-control skills and other skills. Employer's cooperation in the VET system design with the school can improve the quality of education and workers' skills. This chapter will deal with: the significant collaboration features in the investigation; the purpose of this study; research questions; the restrictions and the associations for the study; the formation of the first assumption, according to the research questions; and how this study will contribute to the knowledge repository that has accumulated in this field.

1.2. Background of Problem Statement

1.2.1 The desired cooperation for the learning venues

In Malaysia, a VET reform was introduced in 2004. The strategic approach is to add a dual training system to institutionalized skill training by introducing a National Dual Training System (NDTS) which is a work-process approach. Learning arenas supporting the work processes-oriented approach, is replacing the old idea of school subjects (Deitmer, 2008, p.8). This model allows apprentices to learn about

the practical aspect of work process at industry, through monitoring, by the workplace supervisors who are often called foremen. Holistically, actions in the workplace will enhance the theoretical knowledge learned at school. Deitmer (2008, 20) states that "The apprentice shall deeply acquire theoretical and practical insights in his or her professional field. In this way, apprentices are in a better place to understand the context of the theory and practice of their vocational discipline".

This new domain or reformed approach of learning and teaching obviously requires the development of progressive interactive collaboration between parties that will gel experience-based workplaces and systematic theory-based learning at schools.

The effect of the new curriculum leads to improve teaching provision in the training institutes. The company also has to balance working plans to provide the experience of work process for the apprentice. The new method of learning and working at the training institute and the company permits the apprentice to learn about the real world of work. Through having this exposure, he shall be able to apply the understanding gained in the classroom to his company's real work tasks.

For Malaysia to accelerate the development of highly skilled workers with world-class and a high-income economy nation status, a reform of VET programmes by means of a National Dual Training System (NDTS), must be supported by the public training institutes and industry (in particular: instructors and coaches). This takes place by means of close cooperation in the implementation of NDTS. Thus, focused strategies are developing a framework for effective collaboration to mainstream and expand access to skill training at the training institutes and companies. Such actions will significantly improve the capacity of skilled workers and greatly increase their available numbers of highly skills workers entering the job market. This would be the kind of win-win scenario most wanting by all parties.

1.2.2 The ground level scenarios relating to the implementing of NDTS

NDTS, the new apprenticeship program, is intended to train skilled workers through sharing of resources, between public training institutions and the private sector. In this collaboration, industry must be willing to support students to learn work process knowledge, provide a pocket allowance of RM 350-500 per month and provide other facilities to the apprentice. In addition, industry needs to provide qualified trainers or supervisors from among the technical staff to act as supervisors,

coaches or facilitators. Therefore, the companies need to recognise that changes in the production system need to take place to match training needs and resources, including continuous financial commitment ones need to be made available in the name of the dual training system. Their reasons for such reactions are numerous. Many things must be changed to accommodate the needs of a dual training approach. In addition, it must be remembered that both employees and employers generally are not always confident that learning in dual training organizations can work in parallel to daily regular jobs responsibilities.

The Department of Skills Development (DSD), a department under the Ministry of Human Resources Malaysia, has been appointed as the agency responsible for administering, supervising, evaluating and ensuring the quality of the dual training approach. It is also the curriculum and standards developer and has responsibility for testing and final certification. It also monitors, evaluates and conducts research on the implementation of NDTs. Consequently, it plays a prominent role in promoting NDTs to the training institutes and private industry. About matters of coordination, DSD is unable to disperse its coordination role fully as it faces a shortage of funds to pay dual expert system (DSE), an appointed industry personnel and practitioners and officials for their schedule visits to training centres to conduct dual training assessment. (Respondent: IS, 2010, DSD, Assistant Director).

At the training institution, most of the trainings are concerned with running certificated full-time courses at management discretion that are decided and chosen at each institute's level. At the end of the semester, students are required to undertake workplace practical training for 3-6 months depending on the type of courses. A certificate may be awarded after they complete the training requirement and pass the entire exams. Private industry employers claimed that those graduates were proven to be a 'mismatch' when they could not meet the industry's workplace skills demands.

Meanwhile, all public training institutions are directed to implement training to produce skilled workers by using NDTs. Those institutions public training institutes administered by various ministries and departments such as: Department of Manpower (ILJTM); Ministry of Education (Vocational Schools and community colleges) and the Ministry of Youth and Sports (IKBN); Ministry of Rural and Regional development (IKM and GIAT MARA) and many other government agencies concerned with skills training. Nevertheless, most of the Institute do not show keen interested in private industry partnership espoused by NDTs. This is

because, first of all, there is not a great cause for cooperation, and secondly, staff of the institute wants to concentrate fully on training involving their full-time students.

In the Ninth Malaysia Plan review, based-on annual statistics, the country has 3.4 millions young people in the 17-20 age groups. The remaining of school leavers of the cohorts group joining the labour market without participating in higher education and training equal to 136,404 or 26.7%. The challenge is getting this enormous numbers of school leavers into the main skill training system. Thus the public training institutions and the owners of the private industry need to be an integral part of the NDTS equation. For this reason, serious working collaboration between the two players must be initiated.

Employers and trade associations often notice the lack of soft skills such as positive work ethics, communication skills, teamwork and decision-making and leadership abilities as a main factor affecting the marketability of Malaysian graduates. Malaysians are also significantly less skilled people at technician level compared with some neighbouring Asian countries and at the international stage. Technical and highly skilled workers comprise only 26% of the total workforce in Malaysia as compared to “61% in Germany” (Rauner, 2007, p.8). Malaysian government definitely faces the urgent task in ensuring that the country has enough highly qualified and multi-skilled human capital with high marketability. The move towards more customized products in world markets creates a demand for more skilled workers (Deitmer, Rashidi, 2007, p.20). Highly skilled workers are those with the right attitude, a capacity for self-reliant planning, self-reliant monitoring and self-reliant assessing (Hoepfner & Koch, 2003, p.31). In the modern era the development of skilled human resources forms the basis for a productive nation. For growth and development it is essential to have sufficient highly-skilled and knowledgeable workers. The House of Lords, UK (2007, p10 [article 13]) quoted that employee skill level is one of the three determinants (along with earnings and employment) of productivity differences between countries.

Despite the pressing needs, results from an initial studies done through interviews with expert and focus groups workshops revealed serious lack of understanding among the public training institutions, private industry owners and Department of Skill Development (DSD). To begin with, the three entities do not have a strong common interest that could motivate them to work together. Being the only commercial entity, private sector owner’s main motivation would be to make

money. They do not see NDTS giving them any immediate monetary result. In fact as mentioned earlier, NDTS even demands their immediate commitment in terms of cost, time, space and expertise. Public training institutions are represented by public servants. NDTS is never their core agenda. They have their own stakeholders to serve and students to train. DSD is another entity run by public servant from the Ministry of Human Resource with the duty to uphold the implementation interest of NDTS.

However, the main problem between industry and training institutions is a lack of understanding about cooperation requirements, especially regarding the roles of instructors and trainers. Private industry is criticizing public training institutions for not being up to date in relevant technical and work technology processes demanded by the industries. The training institutions are complaining that the industries are not providing enough information and assistance to the training institutions especially in preparing an appropriate curriculum. The training institutions are late in picking up the requirements of the industries. There is definitely a gap between the existing requirements of private industry and the day to day training taking place at the institutions. In summary, there exist a poor collaboration between public training centres and private industry in vocational training sphere.

DSD also has problem of its own. The issues, discussed by experts blamed on the quality of DSD's dual system experts (DSE). DSE's task is to convince the CEO or the managers of private industry to join NDTS. They have to ensure that the training institutes and industry have an agreed framework to carry out training under the rules of NDTS. They help both parties to work together, and to carry out training in accordance with the requirements of NDTS. From enrolment to graduation, DSE have to make three visits per year for each apprentice grouping. It is the responsibility of the DSE to ensure that training is conducted in accordance with the requirements of the DSD and that the procedures and certification of apprentices are administered appropriately. Basically the NDTS' ground and door to door operation are run by a group of low-paid part-time professionals entrusted with the duties to convince the 'reluctant' industry players to embrace the dual training scheme and collaborate with the "equally reluctant' trainers from the public training institutions. The description is a wicked summary of the harsh reality of NDTS implementation in Malaysia. It is a bitter pill to swallow, but this study is obligated to sound the alarm calling for a renewal formula for the collaboration.

Meanwhile the information about NDTs should be easily accessible, particularly on the benefits to be enjoyed by the participating parties (institutes, private industry and apprentices). At the moment there is almost no information or brochures about the NDTs program to be provided by DSD for public training institutions or schools. The information is crucial to explain the benefits of the NDTs program and to provide teachers or counsellors the material to inform their students about apprenticeship training opportunities.

1.2.3 Practical and policy reform of VET system to implement NDTs in Malaysia

In response to the need for higher skilled workers, a vocational education and training (VET) amendment was passed by the government. On May 19, 2004, the Malaysian House of Parliament approved the National Dual Training System (NDTS) as a new apprenticeship program to develop 31,000 highly skills workers by 2010. It states that the global changes in technology and in particular in the nation's industries, demand a more comprehensive training programme to help industry develop knowledge workers (NVTC 2005). The NDTs is an apprenticeship training programme adapted from German Dual System where teaching and learning is carried out both in the industry as well as in a public training institute. In Germany it takes 3-3.5 years (BiBB, 2006, p.9) while in Malaysia it takes about 2 years to complete the apprenticeship scheme.

By introducing NDTs plan, the Malaysian government hopes the private sector can collaborate with the public sector through sharing resources. In accordance with the NDTs approach, each skills training is to be done at the institute and company workplace. The NDTs approach differs from the traditional teaching methods in that 30% of learning is conducted in classes and the 70% practical portion takes place at work premises. In order to make school learning more action-oriented and better relate it to complex situations or problems in the workplace, the traditional separation between theoretical and practical education within particular subject and between different subjects must disappear (Koch 1994). The purpose of this scheme is to provide suitable professional and skilled employees to the industries. The aim of the Dual teaching philosophy approach is to develop an appreciation of work processes through using real equipment and machines and as

well as engaging in social interactions with practitioners in the workplace that can lead to the sharing information and experiences.

The study summarized below reflects the problems embedded in the trade and national education institutions. As highlighted by Spöttl (2000, p.138), there is a lack of research culture within the Malaysian industry. According to ILO Senior Policy Advisor, Mitchell (1997, p.109) the state education institutions play a minor role in meeting the in-service practice training needs of business firms, leading to the firms relying to a great extent on private training providers as their external training sources or in-firm training providers. According to Spöttl (2000, p.138), the National Occupational Skill Standards (NOSS) based on professional profiles are not relevant because the industry tends to focus on a modern work process orientation. Students taught and trained using NOSS curriculum found themselves unfamiliar with modern work processes. This is because the tasks given by instructors at the training institutes are in the form of discrete work-piece training projects. This contrasts with the dual training conducted at company workplace where the learning tasks are more substantial based on real work processes. Wong (1997) wrote that enterprises are reluctant to provide training and take instructors on secondment or support apprentices. He also revealed that the existing framework for collaboration in the planning of training is neither stable nor approved.

The attendance at meetings by company representatives is inconsistent and there is a lack of continuity. They do not show full commitment when come to “sharing of facilities”. Generally, there is a “lack of communication between industries and training institutions” and “...much has been said about the important of cooperation between industry and training providers, but VTIs s sometimes find that industry do not have enough places for student attachment and are unwilling to share information/knowledge on technology development (JICA, 2004, p.74). The lack of coordination between the state education institutions and the private industry occurs despite the government’s tax incentives and payments for training places.

There is also little research on assessment and developing a tool to assess the strength and weaknesses of the public and private sector’s collaboration. “The lack of information on the educational value” is regrettable in Cresswell (2003, p.78). To attain successful government policy in human resource development, an improvement in collaboration method between private sector and public training institutions must be devised. A feasible win-win framework has to be created, and

based on it the level of collaboration must be seriously monitored and evaluated regularly. On that note, this Malaysian ‘ground breaking’ research thesis commences with an evaluation of the interaction and collaboration between the training institutes and private industry.

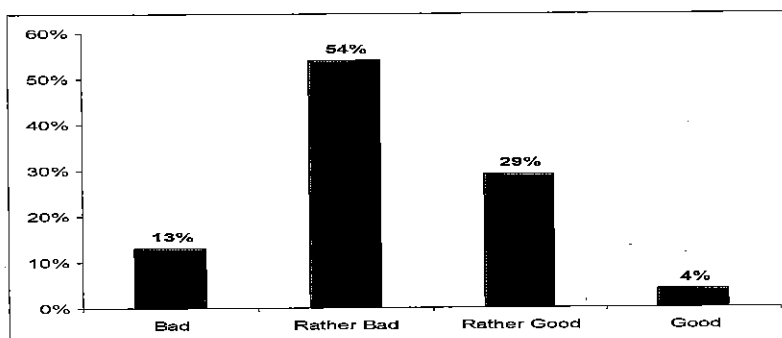
1.2.4 The relevance of the research project from a scientific perspective

In depth scientific global research on collaboration of public training institutes and private industry in Vocational Education and Training (VET) has perhaps not been done. Grollman et al (2003, p.11) believed that "cooperation and coordination of the learning between school and business is rare". However, there are few studies that have demonstrated significant evidence of the importance of collaboration in dual training by Heinemann, Maurer & Rauner in 2008 and Krewerth, Eberhard & Gei in 2008.

A study conducted by Krewerth, et al., (2008) showed the importance of collaborative working as a method of increasing learners and trainers professional development. Other relevant studies of the collaboration in Bremerhaven, Germany by Heinemann, et al., (2008) will be discussed.

A closer cooperation between the school and the company is essential for students for quality learning experiences related to work-learning tasks. Heinemann, Maurer & Rauner (2008, p.6) conducted a survey in the District of Bremerhaven. The survey involved about 1,560 trainees in more than 40 occupations. They found that only 4% of the trainee students who assessed the quality of cooperation between learning venues found it good. The majority 54% of the trainees who assessed the quality of cooperation between learning venues found it to be inadequate (rather bad). See figure 1.

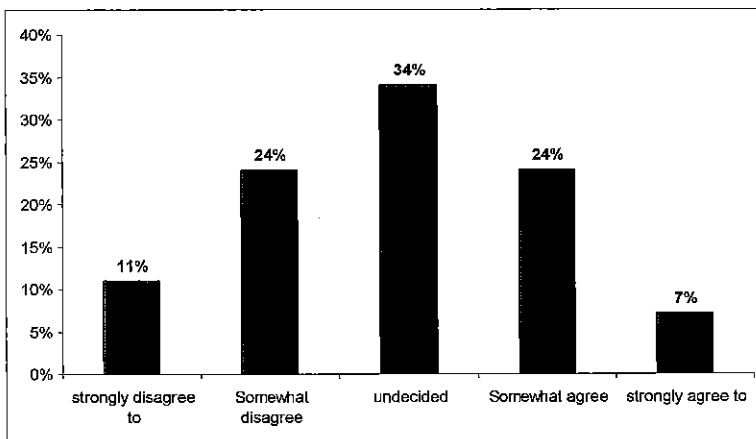
Figure 1: Assessment of quality of learning cooperation by trainees



(Source: Heinemann, Maurer & Rauner 2008, p.45)

The study revealed that a closer cooperation between school and workplace influences the quality of learning. It means learning in these two places was experienced as a complete entity for the students. When they asked apprentices to what extent they received good training to successfully deal with operational tasks, they received rather mixed responses (see Fig. 2). More than one-quarter of the apprentices responded that they now have a better understanding of the problems at the work place (24%). About 34% respondents were undecided while 24% respondents are “disagree” (Heinemann, Maurer & Rauner 2008, p.46).

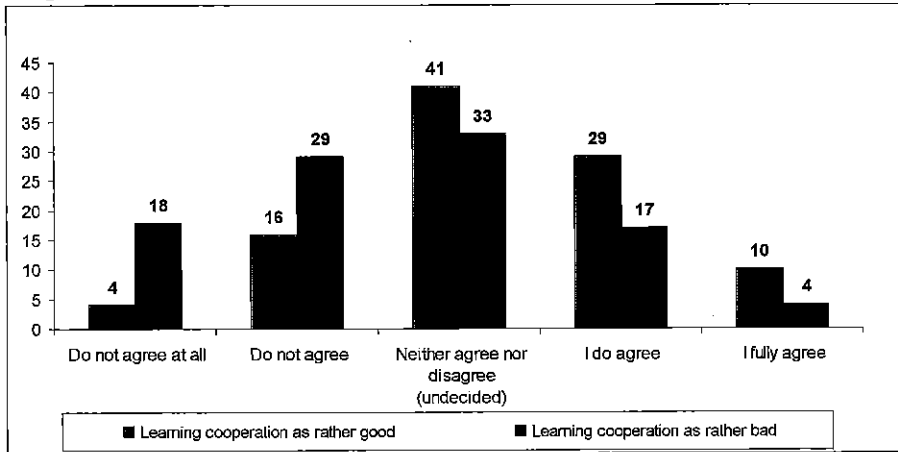
Figure 2: Assessment of the statement by apprentices - ‘professional education helps me to solve the tasks and problems in operational work’



(Source: Heinemann, Maurer & Rauner 2008, p.46)

In Figure 3 apprentices gave varying assessments of collaborative learning. In other words, some trainees recognized the relationship between the companies and vocational schools. They believed a dual system of education could assist in solving business tasks with a significant effect. However, the educational cooperation for development of skilled workers between industry owner and school are exceptionally rare. According to the report, the apprentices valued the communication that “...the VET teaching in class helps explain tasks and problems at the company work place (29%)”, and only 17% of respondents said that learning partnerships were quite distressing (Heinemann, Maurer & Rauner 2008, p.46).

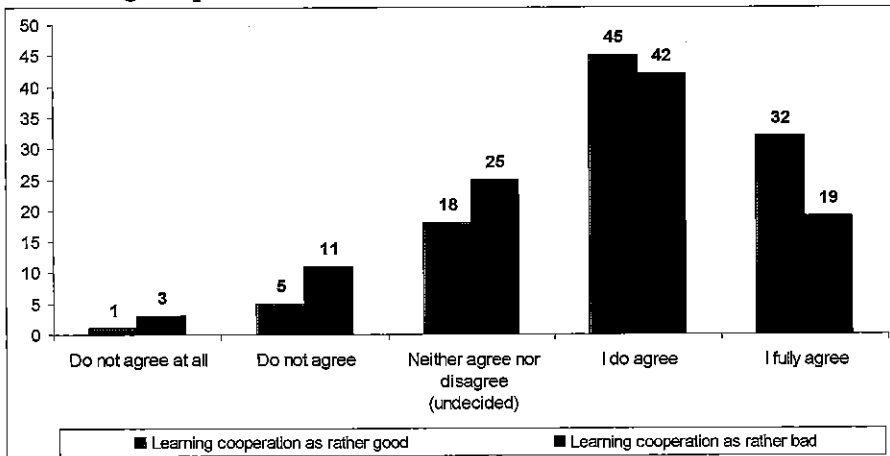
Figure 3: The study asked apprentices to respond to the statement, 'professional education helps me to explain the tasks and problems in professional employment in relation to the level of learning cooperation'



(Source: Heinemann, Maurer & Rauner 2008, p.46)

In general, students value the cooperation of schools and companies: (45%). About 42% of the students declared that support of their company's workplace and school is low (see Fig.4).

Figure 4: Assessments of the statements 'the information provided in vocational schools related to my working life is improved' by virtue of learning cooperation.



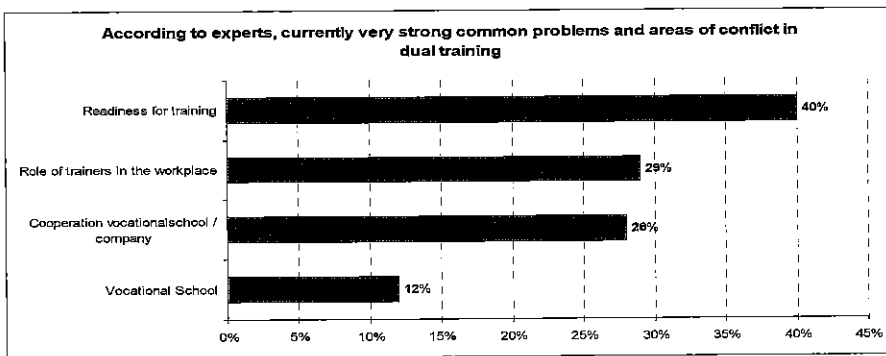
(Source: Heinemann, Maurer & Rauner 2008, p.46)

Krewerth, Eberhard & Gei (2008, p.12) also conducted an online study for the Federal Institute for Vocational Education (BiBB¹) monitoring 355 experts in Germany on their experiences in the dual system of vocational education. They found a number of common problems and trends. The study discovered that over a third of respondents (40%) supported the statement that a 'lack of interest in education is a

¹ The Federal Institute for Vocational Training (BiBB), which was established in 1970 on the basis of the Vocational Training Act, carries out the preparatory work to devise the content of the training ordinance on behalf of the federal Government. (BiBB 1993, p.2)

problem for young people (see Figure 5). In particular, the lack of passion and motivation, as well as inadequate interdisciplinary qualifications (such as reliability) on the job stood out. The report also mentioned that the teacher's role in the enterprise is quite complex (Krewwerth, et al., 2008, p.12). There is a lack of professionalism in “the role of trainers in the work place” (29%). The quality of coordination and support of vocational schools received 28%. They also stated that “communication between business and school is missing or incomplete” (Krewwerth, et al., 2008, p.12). Finally, the experts state that ‘the vocational schools’ (12%) provide insufficient support to trainees from the point of view of performance and knowledge.

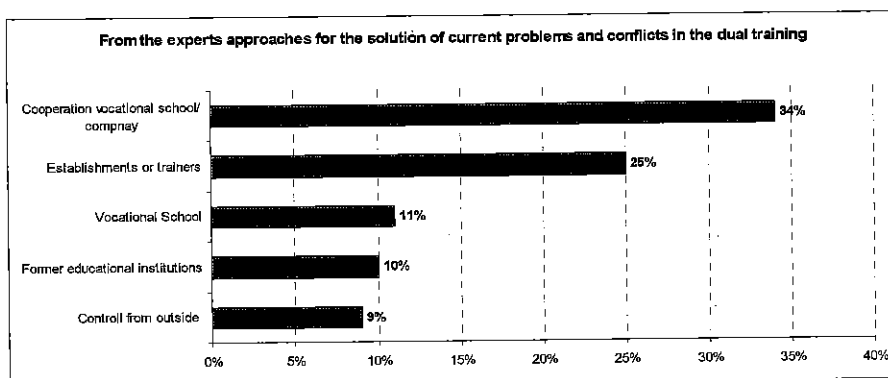
Figure 5: Problems and conflicts in the dual system (categorization open answers)



(Source: Krewwerth, Eberhard & Gei 2008, p.12)

Figure 6, shows that school and business should cooperate and share training activities much more. They should meet and manage open learning objectives from both sides. Cooperation’s problems and conflicts received 34%. The 178 experts believed that improvement in cooperation between the parties is vital. Krewwerth et al., (2008, p.12) stated that a third of the experts (34 %) declared that an improvement in cooperation is a crucial step towards resolving current problems. The respondents stated that the “... vocational school curricula [...] should be better coordinated. Moreover, establishments should encourage schools and businesses to work together in close contact [...]”.

Figure 6: Starting points for solving problems and conflicts in the dual system (Categorization of open nominations)



(Source: Krewerth, Eberhard & Gei 2008, p.12)

Work processes and vocational education curricula should be related to each other. Besides, good communication and organization support trainers and teachers build a strong relationship between the company and the school (Krewerth, et al., 2008, p.12). According to the expert's opinion, communication and collaboration must be strengthened individually and technically.

The two studies outlined above have indicated the importance of collaborative workplaces to increase resources for the professional development of apprentices and trainers. The company is a significant work-learning environment or training ground for students. To achieve good learning cooperation the learning venues must be willing to acknowledge the different contributions of the different sites and be willing to cooperate much stronger. The partners should seek open learning objectives and improve instructor's capacity to support trainees in relating work performance to learning. Active discussion between trainers and teachers, takes place rarely. In this regard, a framework and guidelines are needed to support the effective collaboration.

Keep (2000, p.11), asserted that '...there is a strong belief by policy makers in a parallel, and possibly linked concept of the high performance workplaces, where people management systems are lead to a virtuous circle of partnership, high-trust relations and skill development'. Thurow (1994, p.52) in Keep (2000, p.12) suggested that "in today's economy there is only one source of sustainable competitive advantage – skills. Everything else is available to everyone on a more or less uniform base". To achieve high skilled jobs and high-performance organizations, students need better

links between workplace experiences and theory based learning at school (Deitmer 2008)

To achieve reform in VET active collaboration between training institutes and industries is required. The training institute has to initiate cooperation with the industrial owners through joint-committees. The committee has to determine their course of action through identifying occupational profiles, auditing the companies work, doing student assessment, registration of programs and ensuring the other resources are there to build stronger collaboration between the partners.

Nevertheless, the collaboration is always short-lived and sometimes the parties are there just co-exists. The purpose of this research project is to investigate factors for developing a framework to support effective collaboration between instructors and coaches, in order to implement NDTS. The success of this collaboration will in turn promotes new pedagogical methodologies in learning and teaching work processes by linking contextual work process knowledge with theoretical knowledge so that apprentices can learn to perform their duties more effectively.

1.3 Purpose of the Research

The purpose of this study is to examine factors that influence the effectiveness of the current status of cooperation between public training institutes and industries involved in the implementation of the NDTS. Successful collaboration is essential in the development of a skilled workforce through apprenticeship programmes in Malaysia, based on collaboration between public VET institutions and industries. This study investigates whether the identified factors could be the basis for the development of a better framework for this interactive collaboration between the dual partners that will assist trainers and teachers in implementing a quality work-based training according to the dual-system approach. The result of this investigation may be used to formulate a new conceptual and operational framework for the development of a stronger relationship between the participating stakeholders from the public training institutions and private industry.

1.4 The Research Questions

My study has examined factors that may affect the successful collaboration between instructors and trainers from public training institutes and industries by addressing the following questions;

- i. to what degree does cooperation, partnership development, and management of cooperation, have an impact on learning and competence development;
- ii. how does one evaluate the collaborative performance of the public training institutes and private industry in the implementation of the Malaysian National Dual Training System (NDTS);
- iii. What is the appropriate framework to be used to infuse an effective collaboration?

The result of the study will provide the basis to construct a model framework for a successful collaboration. The Objectives of the study are as followed:

- i. To understand the influence of goal setting for successful collaboration between private industry and public training institutions.
- ii. To determine factors that influences the development of partnerships in implementing effective collaboration in the learning process according to the NDTS principle of duality.
- iii. To identify factors that affect management for effective collaboration between private industry and public training institutions in the implementation of NDTS.
- iv. To determine the impact of collaboration towards learning venues for the development of skills and knowledge for apprentices.
- v. To evaluate the collaborative capabilities and dual-system in use that affects successful cooperation.
- vi. To create a new organizing framework for effective cooperation in the implementation of parallel NDTS

To answer all objectives and sub-questions of the study, the research instrument used were interviews, a focus group and survey questionnaires. For the analysis of data, a descriptive statistical method was used that indicates the level of every factor. The instrument used for the survey is explained in detail in Chapter 5.

1.4.1 Research Sub-Question 1: What is the influence of goal setting for successful collaboration between industry and public training institutions?

To answer this research question, an exploration method was used to familiarize one with the issues in the implementation of the NDTS. The initial data collection was carried out by conducting interviews with trainers, industrial experts, directors and managers. The interviews were with those already implementing the NDTS and also involved those who are not yet familiar with the training scheme (see Questionnaire in Annex C). The purpose of the interviews was to collect as much information about experiences in the implementation of the NDTS. The nature of the interactive cooperation in planning and executing one's role and responsibility in implementing NDTS is investigated. These responses are used to support the accuracy of the information captured from the focus group discussion and survey questionnaires.

1.4.2 Research Sub-Question 2: What are the factors that influence the development of partnerships in implementing effective collaboration in a learning process according to the principle of duality of NDTS?

To determine the factor that influences the effective collaboration, a partnership development tool (ERC) is necessary to capture experiences encountered. A focus group discussion workshop was arranged to address this question. The purpose of having a focus group is to conduct an assessment on the criteria which can be also used for further development of the system. By having the partners together, one enables them to validate the assessment tool designed to improve cooperation under the dual partnership arrangement. They understand the method designed as formative for the continuous evaluation process of the team. Those involved in collaboration processes play the most prominent role in developing the partnership. This means that both dual partners (Institutes and industry) get the opportunity to achieve consensus about the actual partnership situation between the company and the institute in implementing the NDTS. In this workshop, the partners also discuss the weaknesses and strengths of the cooperation while focusing on improvements in the implementation of the NDTS.

1.4.3 Research Sub-Question 3: What are the collaboration management factors that influence effective collaboration between private industry and public training institutions in the implementation of NDTs?

To identify the effective management of collaboration factor, a focus group discussion involving the trainers, instructors, coordinators, supervisors and managers was conducted. The survey finding was used to strengthen the focus group outcomes. Task for the trainers (instructors/coaches) had increased due to the demand to coordinate work organization, technological requirements of work processes and new work learning tasks and curriculum. They have new roles as coordinators, planners, managing the courses, planning the training schedule, content analysis, curriculum developer, training materials developer and assessor. The study used this focus group to gather information about leadership styles and forms of assistance that promote cooperation in the implementation of NDTs. Success factors for the partnerships were identified. This study took into account the time, location, area, and the people who are directly involved with the dual training projects. Their experience, especially those of the coordinator, instructors and coaches were noted. The group were highly influential as players in the evaluation of the project. They were there at any given time for smooth running of the project. They have the knowledge and support from the management and they know the requirements of the working committee and the students. Without the support of this group, it is difficult for the study to obtain information on how to implement the project effectively.

The primary criteria or component association is stipulated in the research Sub-Question 1. Shelbourn, et al., (2005, p.26) stressed that “It is important to realise that no two collaborations progressing in the same way or within the same timeframe”. The lack of knowledge and experience on the dualism of practice implementation may hinder the progress of NDTs in Malaysia. Thus, bringing the key players together to see what is required for effective collaboration helps the study and readers understand inter-organizational collaboration.

1.4.4 Research Sub-Question 4: What is the impact of collaboration on learning venues on the development of apprentices’ skills and competencies?

The study also wanted to explore the impact of NDTs on the development of highly skills workers. The study gathers information on the expectations of the companies when they entered into NDTs partnership. The expectations were spelt

out in terms of benefits to individuals, trainers, coaches and the organization. To address this series of interviews were conducted with the apprentices, director and industrial manager (See example on Annex D). The findings of the interviews will be counter balanced by the information gathered from literature review, focus group discussion and survey. Attwell, et al., 1997 gave their remarks on trainers' improvement along the lines of: professional development, professional competencies, pedagogical and instructional competencies, organizational and interpersonal skills and competencies in integrated learning. While Rauner (2007, p.3-6) believed in 'the smooth transition of students from school to work when regulated properly'. Corbett, Rasmussen and Rauner (1991, p.15-19) stated 'that talented workers shape the Technology'. Lave and Wenger (1991, p.49) believed learning as increasing participation in communities of practice concerns the whole person acting in the world", Rauner (2007, p.5), held that 'the acquisition of work process knowledge by the apprentice takes place at a much faster pace at the workplace" and "The education system and working world are linked to each other in a demand as well as supply oriented". Hoepfner and Koch (2003. p.13) stressed 'the need for self-reliant learners'. Rauner (2007, p.11-15) talked about 'the development of the learner from novice to expert status'. Finally, Kirpal (2004, p.9) believed that 'the apprentice can develop his/her vocational identity through participating in a community of practice'. They state that students, coaches, and organizations will acquire the skills and increase competitiveness by means of a dual system if it is run properly. The study seeks to observe how such dual training is taking place in Malaysia.

1.4.5 Research Sub-Question 5: How is to evaluate collaborative performance and dual system in use that affects the successful cooperation?

Information on effective partnerships was gained through feedback from partners that work together closely in NDTS implementation. Focus group workshops were organized to obtain information on convergent and divergent experiences. Assessment of the actual situation helped to determine the actual performance of the cooperation between participating parties to ensure that the project endures.

The results of this working group were channelled back into the system, and consequently resulted in improvement of the implementation of the joint mission to

train apprentices in a real industrial and technological work process environment. This collaboration may also enhance the expertise and the professionalism of apprentices and trainers.

1.4.6 Research Sub-Question 6: How to develop a new framework or model for effective cooperation in the implementation of NDTS?

To answer this question the study preferred to look at various collaboration frameworks as practiced in different countries. The appropriate best practices were compared with the intention to come up with a new framework for the NDTS. Montiel-Overall (2005, p.1-5) indicated that a new theoretical structure and framework is needed to assist individuals and groups engage in successful collaboration.

The research questions also attempted to understand and identify the key components/elements, process factors and outcomes of all parties collaborating for implementation of the NDTS. However, since the term ‘collaboration’ is quite broad, this research limits itself to consider five components for effective collaboration in the context of the NDTS implementation.

In this context, the word “collaboration” may sometimes mean the same as ‘cooperation’, ‘partnership’ and ‘network’ as used by many researchers in international and European research and development arenas. Five tentative "key components/elements" are outlined below:

- i. Goals of Cooperation clear, well defined and achievable.
- ii. Partnership development addresses communication, cooperation and trust.
- iii. Management of Cooperation addresses rules and procedures, clear allocation of responsibility and fair distribution of modules to be implemented according to agreements.
- iv. Impact of learning competencies addresses the needs of students, instructors and coaches as well as organizational learning.
- v. Evaluation of the collaborative performance in the Dual system between public training institute and company are clearly spelt. Improvement areas for external interest in dual system are clearly defined.

- vi. Development of a new framework is defined in a manner which is structured, flexible and as well as cost-effective.

1.5 Limitation and Organization of Study

The sampling unit selected for this study was from a limited group of companies and public training institutions participating in the NDTs apprenticeship scheme. The number of public training Institutes that started the NDTs programme under the Department of Manpower (DoM) was small. The accuracy of the research depends on the accuracy of information given by respondents through questionnaires, interviews and focus group discussions. The study focused on those participants from the institutes and industry who were invited to be members of the focus group. The potential to promote effective collaboration and eventually the development of framework for effective collaboration is the main aim of the study.

1.6 Formation of first assumption and some tentative hypotheses

The assumption of this study is that the dual partners can better identify the benefits and usefulness of NDTs. More partners are expected to join the system when they see relationships of trust and communication emerging. The greater grasp the stakeholders have of the concept of dual education, the greater are their adherence to NDTs. If effective design tools (ERC –Evaluation of Regional Cooperation) could demonstrate strengths and weaknesses in relation to value, structure and process, the impact on the selection of potential partners (companies) may be felt.

The main hypotheses explored in this study are as follows:

- i. That the ground rules of communication help groups to solve problems in working together on the NDTs project.
- ii. That communication can be increased during group workshop using ERC involving coaches and instructors.
- iii. That the focus group discussion workshop can identify the strengths and weaknesses of communication in NDTs
- iv. That the use of ERC in Focus Group discussions leads to the increase of communication by the individuals and groups working together on the NDTs project

In summary, based on the previous research and analysis, the cooperation between public training institutes and private industries requires an effective training collaboration framework to produce highly skilled workers. The potential critical factors identified are presented in 2.4.

1.7 Expected Benefits of Effective Collaboration (EC) in NDTs

The benefits of collaboration outlined by the Department of Skill Development in the Guidelines and rule of implementation are outlined below (DSD 2009, p.11-13);

i. Monetary/cost-saving aspect

- The cost of recruitment of new skilled workers is reduced;
- A firm specific and introduction training to newcomers is not needed;
- The cost of selection of new workers is nil.

ii. Eligibility for financial incentives such as;

- Tax rebate under Income Tax Act 1967;
- The firm is eligible to claim from a Human Resource Development Berhad fund to which they have contributed under the levy collected by the government.

iii. An increase in Productivity

- Enhance the quality of work because the workers are trained according to industrial standards;
- Enhance productivity because workers following NDTs comply with the job profile;
- Increase competitiveness because a company is supplied with skilled workers;
- Increased usage of new technology because the apprentices are exposed to latest technology.

iv. Development of Human Capital

- Enhancement of learning because training is carried out during the stated period based on multiple industrial work processes;
- Enhancing workers performance and job satisfaction;

- Increasing company image as a producer of highly skills-workers;
- Implementing national social responsibility;
- Providing additional mechanism for upgrading an existing workers' skills;
- Providing opportunity to expose existing industrial workers to new knowledge and coaching skills (DSD, 2009. p.11-13)

1.8 The research steps as outlined in each chapter

This section provides a summary of the eight chapters in this thesis

Chapter 1 provides an introduction to the research and the main problems addressed. The aim of the chapter is to outline the purpose of the research, the background issues, provide a statement of the problem addressed, discuss the significance of the study, identify the precise objectives of the research, the framework, limitations of the study, organization of the study, its potential, formation of the first assumption, some preliminary hypotheses. The research project as outlined in the different chapters is also described. This chapter also puts forward the research questions and outlines why this research is required to contribute to a bank of knowledge and show how this knowledge can enhance effective collaboration. It also presents a literature review that explains the research direction from scientific, government policy making and international perspective in dealing with the issue of dualism in a VET oriented collaborative learning and working environment.

Chapter 2 develops the issue further by discussing the state-of-the art research in this area of coordination of learning venues at companies and public training institutes. This chapter explores the general principles and practices of dualistic learning venues in Germany and Malaysia by providing a significant review of effective collaboration theories that incorporate the harmonization of business, education and technology. The chapter also examines factors fostering successful collaboration in learning venues with regard to workplace learning and how the stakeholders evaluate the cooperation.

As this research addresses the process of effective collaboration, the literature review needs to be historical and current. Models of other non training types of collaboration were also referenced. Such literature reference is necessary because of almost zero availability of the literature on collaboration between government training centres and private sectors especially in Dual System training in Malaysia. Through the research focus on Dual System training in contemporary Malaysia, it will also produce in-depth literature reviews, particularly Germany being the source of the Dual System approach, on their companies' collaboration. Practices on collaboration in other developed countries such as England, Australia and United States were also examined. Such effort is necessary to understand "current practice for collaborative working within collaborative organizations (Shelbourn, et al., 2005, p. 26-34)".

Chapter 3 provides the relevant theoretical perspectives on influential research dealing with collaboration factors. The following principles of the dual system that underpin VET, incorporate various theories such as principle of duality, situated learning, novice-to-expert, community of practices, self-reliant learning, professionalization of trainers and apprentices, shaping of technology, school-to-work approach etc. Those theories dominate collaborative working processes and outcomes of the dual system project. This outcome is central to the implementation of NDTs and requires stakeholders to fully "engage" in steering and strengthening the process. Ultimately to validate critical success factors influencing collaboration (and using the ERC tool) the study evaluates the process of effective collaboration between public training institutions and private industries.

Chapter 4 examines the key factors that affect the interaction of research venues and vocational training venues. The development of a strategic analysis tool is based on the fundamental factors identified in Chapter 2 and Chapter 3. Shelbourn, et al., (2005, p.7) argued that effective collaboration is based on "...a recognised framework" and "...a high degree of collaboration among the participant group" The next section will consider the methodology for the development of assessment tools based on the five key elements identified in Chapter 2, 3, and 4.

Chapter 5 explains the research methodology and the reasons for using it. It addresses several factors related to this research methodology including ethical concerns, triangulation, validity and reliability. This chapter also covers the various strategies such as the use of published sources (literature review) to establish current

state-of-the art practices on collaborative working both in the Dual system and other systems. It describes field studies to establish current practices for collaborative working within collaborative organizations. These empirical data collection methods include structured and semi-structured interviews, survey questionnaires and focus group discussion workshops. The purpose of the focus group workshops is to examine the information encompassed, “within the collaborating organizations to determine the need for collaborative working”. They are key issues to be considered at the organizational, project and user levels at learning venues. The purpose of the ERC tool is to collect and analyze the focus group raw data. Finally the collection of other data by triangulation or mixed methods is discussed in this chapter.

Chapter 6 discusses the results of the study based on information obtained from interviews, focus groups and surveys. An entire review is presented in the next chapter. This chapter discusses the analysis of the empirical findings and relates them to the theories and practices and the extensive studies covered in Chapters 2 and Chapter 3. The study applies a triangulation of research analysis and empirical findings. The analysis is presented according to the six research questions governing the research questions that form the basis for the research.

Chapter 7 presents the findings and discusses the analysis of data from interviews, questionnaire surveys, focus group discussions, and analysis of case studies described in Chapter 6. Findings from this research can allow construction for the development of effective partnerships between government training institutions and private industry. The study will compare the data collected based on empirical research with the literature review findings.

Chapter 8 concludes the study by covering overall findings on the conceptual and holistic framework for effective collaboration to be developed, validated, refined and tested. This research which is expected to have implications on policy direction of NDTs in Malaysia proposes recommendations for the collaborative effort, possible guideline frameworks, and future study research.

1.9 Summary

The main aim of this first chapter is to highlight the background, and purpose of the research, the research questions and the limitations of the study. Briefly, it describes the influence of the key components that trigger this research based on scientific and political policies. In Chapter 1 highlights the belief that it is beneficial

that the dual partners recognise the benefit and usefulness of NDTs so that more industries owners will participate actively. The greater the relationship of trust and communication, the greater potential there is for collaboration by members of private industry in the dual system.

The better the stakeholders understand the impact of dual learning, the greater will their contribution be for NDTs. If effective design tools (ERC) can demonstrate strengths and weaknesses, value, structure and process, this can have an impact on potential partners who are still undecided and reluctant. The hope is that this study will generate intense conferencing in forging closer collaboration between public training institutions and private industry in implementing training using NDTs.

This study is investigating the environment, in which two parties are working together in NDTs, for the purpose of producing highly skilled workers. Malaysia wishes to establish a model for an effective collaboration framework to implement NDTs for the apprentices learning activities. To achieve reform in VET active collaboration between training institutes and industry is required. The institutes have to initiate their cooperation with the industry owners by the establishment of joint-committees. The committee has to determine their course of action through identifying occupational profiles, auditing company work tasks and ensuring that resources exist to build strong collaboration between partners.

Nevertheless, collaboration is often short-lived and sometimes just continues to co-exist. This research investigates the factors that need to come into play in developing a framework to support effective collaboration between instructors and coaches in the implementation of NDTs. The success of this collaboration promotes a new learning and teaching methodology based on work processes. This act of linking contextual theory to the company's business work processes will enable the apprentice to learn to perform their duties more effectively. Finally, the "Fly high" individual or company acquires skills that change thinking by setting high performance made possible by a more conducive environment of a learning organization.

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